A Visual, Community-Engaged Exploration of Menstrual Practices and Motivations Among Adolescent Girls in Far-West Nepal

by

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Abstract

Menstrual health, a growing global public health issue, refers to social, political, structural, educational and environmental factors that affect experiences of menstruation and impact health. Challenges associated with menstruation include the lack of access to materials and sanitation facilities, low knowledge about menstruation, and taboos and stigma that perpetuate unsafe practices. In Nepal, menstrual restrictions are widespread, putting menstruators at risk for poor health outcomes. Menstrual health research and interventions in Nepal must thoughtfully examine practices and beliefs, and propose solutions considering social values and the health and development context.

Arts-based methods and community-engaged approaches are particularly appropriate for investigating sensitive topics such as menstrual health. This dissertation first reviews studies that have applied film methods in public health research. It then introduces a novel, visual, community-engaged research method called Collaborative Filmmaking. Finally, it presents the results from applying Collaborative Filmmaking to study menstruation in Nepal.

Results from the review identified 15 film methods used in public health, which offer numerous methodological strengths such as providing rich descriptions, capturing emic perspectives, increasing comfort in participation, and empowering participants. Collaborative Filmmaking is a six-step method that builds upon these strengths. Adopting a community-engaged approach, participants of Collaborative Filmmaking are trained to create, analyze, and screen their own films in the community. Piloting Collaborative Filmmaking in far-west Nepal provided nuanced, sensory insight into menstrual practices and motivations among adolescent girls. An array of menstrual practices related to cleansing, cooking,

eating and drinking, touching, worshipping, sleeping, and maintaining physical distance were uncovered. The practices fell along a continuum and varied by caste/ethnic and religious background. Motivations for following menstrual practices included religious and spiritual beliefs, family tradition, negative consequences, and social pressure.

This dissertation contributes to both visual methods and menstrual health scholarship. Collaborative Filmmaking is an effective method for engaging participants in exploring a sensitive topic, generating nuanced data, and is powerful for disseminating results. In terms of menstrual health, this dissertation extends the literature by describing key differences in menstrual practices among girls from different caste/ethnic and religious groups in Nepal for consideration in future interventions and polices.

Table of Contents

List of Tables

List of Figures

Preface

This dissertation was completed with generous funding support from numerous centers and departments. Thank you to the University of Pittsburgh Asian Studies Center (Indo-Pacific Graduate Student Research Grant), University of Pittsburgh Center for Global Health, University Center for International Studies, University of Pittsburgh Nationality Rooms Scholarship (Dr. and Mrs. Ryonosuke Shino Award), and the University of Pittsburgh Graduate School of Public Health Department of Behavioral and Community Health Sciences (Silverman Scholarship). I extend thanks to the award committee members and scholars who offered important insights throughout the proposal development stage of this research, and who saw value in researching the role of visual methods in public health.

My dissertation studies were also supported by a Boren Award for Nepali (National Security Education Program), a Foreign Language and Area Studies (FLAS) Fellowship for Nepali (U.S. Dept. of Education), and a Summer Nepali Program Award from Cornell University. These awards were instrumental in helping me develop a more holistic understanding of Nepali history, government, culture, and customs that are so critical for understanding health behaviors and outcomes in context. Having the opportunity to develop language skills in Nepali allowed me to engage at a deeper level during my data collection period and helped provide deeper meaning to the literature and conversations that informed this work.

My academic advisor and dissertation chair, Dr. Jessie Burke, cannot be thanked enough for her steadfast support. Even before I entered the graduate program at Pitt, in early conversations over Skype (she in Pittsburgh, and I in Nepal), Jessie provided sound advice and innovate ideas; I was immediately captivated by her creative energy and rigorous approaches to applying and developing research methodologies; I knew she would make the perfect academic mentor to guide me on my PhD journey. Her generosity in supporting me throughout the years has been unprecedented – from conferences, to speaking engagements, to film screenings and working groups – she has always encouraged me to extend

myself into new territory and has graciously provided me the emotional and financial support to do so. Jessie believed in the potential of collaborative creative approaches in the field of public health from the beginning, and she fostered a rich environment for me to experiment with new ideas that eventually led to this dissertation. I am truly thankful for her mentorship and friendship and cannot thank her enough for going on this visual research adventure with me, which, as it turns out, was extremely rewarding and a ton of fun.

From the first day of my PhD, Dr. Martha Terry's engaging teaching, captivating readings, and delightful conversations have shaped my ideas and research approaches. She has been my "menstruation buddy" on days I felt alone, and we have shared countless days discussing ideas in her colorful office, always with jazz music in the background, of course. Dr. Terry's productive teaching, writing and mentoring career in women's reproductive health and menstruation have helped me to build a foundation in this field. I thank her for her mentorship and for shaping my thinking about anthropological approaches in global public health. Because of her, I still want to be an anthropologist when I grow up.

My committee members span across multiple disciplines and areas of expertise and have been instrumental in shaping not only my dissertation but also my approach to research. Dr. Marni Sommer provided insightful feedback on my film and menstrual health work during my early days studying the topic in Bangladesh in 2012. Her success in shaping the field and putting menstrual health on the global public health agenda is one that I deeply admire, and her countless pieces of research and writings on the topic have been integral to building my understanding of the topic. I am honored to have both her support and critical eye, both of which have tremendously improved my work and stretched my thinking. Additionally, I am indebted to Dr. Shalini Ayyagari, who has been an important ethnographic film mentor and has helped me to better understand the role of film as a research tool throughout history and various disciplines. She opened my mind to a whole new world of film literature, which has influenced the way I think about visual approaches. I would also like to extend a huge thank you to Dr. Muge Finkel, who, as a gender and development specialist, helped me to develop a deeper awareness and framework for thinking about feminist theory, and what menstrual heath means in the context of international development. My

studies with Dr. Finkel have motivated me to think big, and to consider how to craft and most effectively communicate my work, especially as it relates to global development.

My dissertation research was truly a collaborative effort and would not have been possible without my partnership with the Nepal Fertility Care Center (NFCC). Pema Lhaki, a Nepal menstrual health expert, as well as a dear friend and mentor, has deeply influenced the directions of my research. Since 2015, she has been a driving force in helping me carve out my own place in the menstrual health research realm in Nepal. She has always helped me to stay grounded and ensure that the research I conduct is useful for those working on the front lines of this issue in Nepal. My partnership with Pema and her team at NFCC made this research a reality, and I am deeply thankful for the friendship and collaborative hands they have extended to me. In addition, I would especially like to thank Panchu Khadka and Bipu Maharjan of NFCC, who spent extensive time with me in the field; without their passion and drive (not to mention translation skills!) this research would not be nearly what it is today.

Drs. Sara Parker and Kay Standing of Liverpool John Moores University have been instrumental in supporting the dissemination efforts of the results of this dissertation. I thank them for believing in this work, and for helping to spread the results of this dissertation far and wide. It has been a joy to collaborate with them on gender and menstrual health work in Nepal, and I know it is only the beginning of a long career of collaborations for which I am truly thrilled.

A number of Nepal-based organizations, government agencies and initiatives have also been instrumental in conducting this dissertation that I must thank: Government of Nepal Department of Women and Children, Nepal Health Research Council, UNFPA/UN Women/UN RCO Harmful Practices Working Group, colleagues from the Menstrual Hygiene Management (MHM) Practitioner's Alliance in Kathmandu, GIZ and organizers of the MenstruAction Conference in Kathmandu, Image Ark, colleagues from the World Food Programme, and the Kathmandu International Mountain Film Festival.

I am incredibly thankful to my support network at the University of Pittsburgh Graduate School of Public Health. My incredible team of student researchers at Pitt Public Health, Monica Merante and Trevor Cutlip, deserve an overflow of thanks given their inputs in the design of the analysis framework

for Collaborative Filmmaking, and for their dedication during the long process of qualitative analysis. Additionally, Drs. Elizabeth Felter, Michael Yonas, Jeanette Trauth, Tiffany Gary-Webb, Thistle Elias, Todd Bear, James Egan, Ada Youk, Robert Coulter, Teagen O'Malley, as well as Barb Folb, Joanne Russell, Allison Hydzic, and Matt Borkowski, have all provided inspiration and support to me in innumerable ways throughout my studies. Finally, my doctoral cohort has been a strong support system throughout this journey, and I thank each of them for lending an ear, reading drafts, and for the countless peer reviews they offered.

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I also thank my family and friends for offering me so much patience and support, especially during this period where late nights and unreturned phone calls became the norm. I am so thankful for my partner, Alex Zanin, for not only offering critical inputs on this project as a creative thinker, but also for taking care of me. To my parents and family, thank you for being here and your endless words of encouragement.

Lastly, I must acknowledge the generosity of the seven adolescent producers that shared their lives with us for this study. Their participation and passion were key to generating this knowledge about menstrual practices and motivations and Nepal, and I am thankful that they opened their lives and trusted us with their stories. Their courage and passion are truly inspirational.

A Note from the Author

As an MPH-trained documentary filmmaker with a geographical focus on South Asia, my overarching goal entering the PhD program in Behavioral and Community Health Sciences was to blend my passions for international health and film in a meaningful way. After working in the film industry for years, I found myself being pulled back to research, attracted to the power that the scientific method brought to knowledge generation. Research is extremely influential, and I heavily relied on it to inform the cinematic stories that I told as a filmmaker. At the same time, I also witnessed first-hand the power of moving images and sound to communicate with people and to bring about social change. Sitting in darkened theaters, I observed reactions that films brought to people's faces and listened to the personal stories that characters graciously shared on the silver screen; these stories revealed that communities are comprised of individuals like you and me, and those individuals each have unique strengths and needs, and deserve to be heard.

In this dissertation I sought to answer the question: Can film methods be applied in public health research to bolster a deeper and more nuanced understanding of health? The short answer is yes, but of course, as with all research methods, it must be applied with flexibility and care. In this dissertation I present a research method that is supported by systematic rigor to understand deeply-rooted health behaviors and motivations, as well as the creative and visual inputs that engage community members to share their experiences in powerful ways. It turns out that research and film each have powerful benefits that can be utilized together to increase understanding.

While this dissertation research is the culmination of many years of brainstorming and training at the University of Pittsburgh, it also outlines numerous areas for future research. I suspect that this is only the beginning of what I hope is a long career that explores the application of visual research methods and community-engaged approaches for inquiries in global public health.

1.0 Introduction

Menstruation is a natural, physiological process.[1,2] The common biological experience is shared by nearly all women and girls of reproductive age; however, societies give different meanings to menstruation, which are manifested in a variety of cultural practices. In some parts of Nepal, *chhaupadi,* a form of menstrual seclusion, is practiced in which women and girls sleep in separate sheds during their menstrual cycle and after childbirth.[3–6] During this time, they are considered polluted[7,8] and follow several restrictions and exclusions.[3,9–11]

1.1 Introduction to Dissertation Approach and Specific Aims

Given the complexities of menstrual practices in Nepal, which are religiously and culturally situated, policies, interventions, and studies must thoughtfully examine practices and propose solutions that consider the social values of communities, the caste system, and religious beliefs. Such factors play a critical role in perpetuating the *chhaupadi* practice as well as other menstrual restrictions.

Broadly, this dissertation is grounded in a community-engaged approach, where the study conceptualization, design, implementation, analysis and dissemination of results were completed in partnership with a local, non-governmental organization (NGO) called the Nepal Fertility Care Center (NFCC). Community-engaged approaches are critical for informing future policies and interventions that are context-specific and sustainable, while respecting local traditions and belief systems to ensure that negative health outcomes associated with poor menstrual practices in Nepal are curtailed. The goal of the partnership was to ensure that the research conducted was culturally relevant, in which the study goals, research methods, and results were informed by local experts familiar with cultural, religious, and societal norms.[12]

Working closely with NFCC also assisted with the logistics of study implementation and dissemination of the study results. NFCC is a key member of national level working groups comprised of governmental and NGO stakeholders, and is familiar with both district and community-level mechanisms for study implementation (e.g. site permissions and relationships with community leaders for entrée) and results dissemination (e.g. workshops and community meetings). Additionally, this study builds upon the investigator's ten years of work and research experience in South Asia, and over four years working directly with NFCC on menstrual health interventions, evaluations, and research studies in Nepal.

The three aims of this dissertation study address select research gaps in understanding menstrual health in Nepal, building upon one another to provide novel information about the context of menstrual health in the country (Figure 1).

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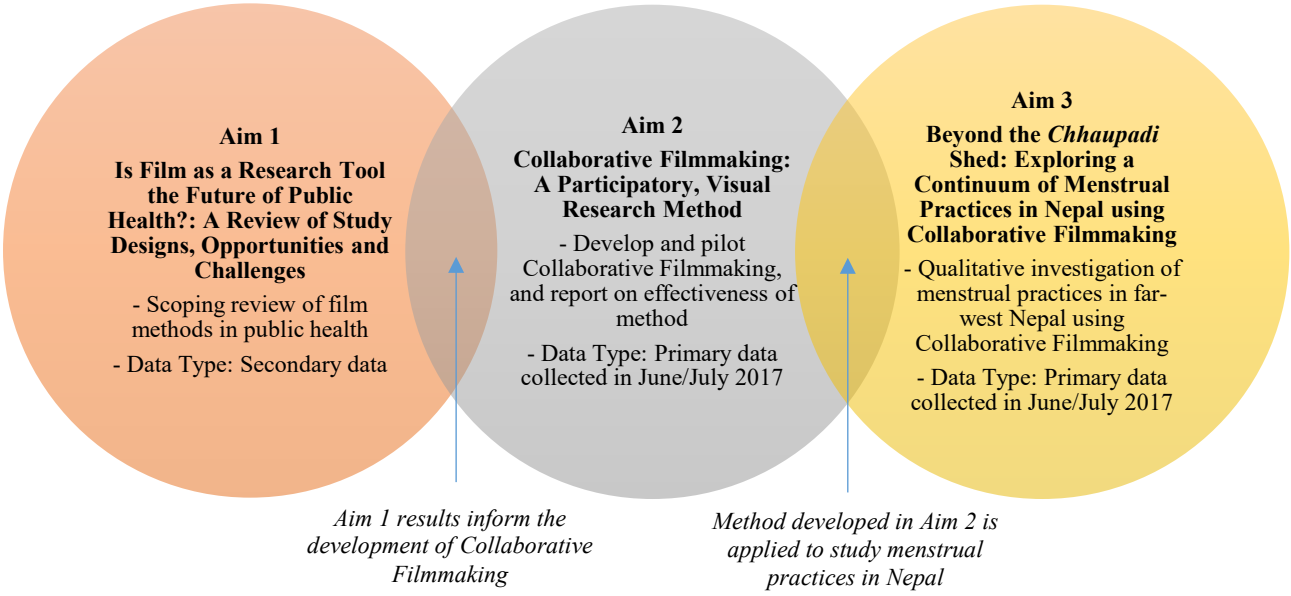

Figure 1 Dissertation Aims.

This dissertation is comprised of a background and significance section (Chapter 1), followed by three specific aims, each of which constitutes a separate chapter (Chapters 2-4). The final chapter consists of a discussion of the research findings in the context of broader relevant literature and future research opportunities are discussed (Chapter 5). Broadly, the dissertation first explores the state of the evidence (Aim 1), uses the state of the evidence to inform the development of a novel, participatory research method called Collaborative Filmmaking (Aim 2), and finally, applies Collaborative Filmmaking to closely examine caste/ethnic and religious differences in menstrual behaviors and beliefs in Nepal (Aim 3).

Aim 1 of this dissertation seeks to synthesize peer-reviewed, public health research studies that apply film methods. It provides a comprehensive review of how film methods were applied, and lessons learned from using the methods in practice. To address this aim, a scoping review of the peer-reviewed published literature was conducted. The results of this study informed the method development and analysis processes for Aim 2 and identified challenges and opportunities to consider.

Aim 2 focuses on developing a community-engaged research method called Collaborative Filmmaking, building upon strengths and opportunities identified in Aim 1. To address this aim, a pilot study applying the method was conducted in Nepal, and a focus group discussion with participants was held to better understand participant experiences using the method. Under this aim, ethical challenges, feasibility, lessons learned and implications for future Collaborative Filmmaking research are discussed.

Aim 3 explores menstrual practices and motivations in Nepal by analyzing data collected via Collaborative Filmmaking. To address this aim, a qualitative exploration was conducted on Collaborative Filmmaking data to provide a nuanced description of menstrual practices and motivations in far-west Nepal.

Together, these three aims contribute to filling knowledge gaps on the nuances of menstrual practices in Nepal and provide insight regarding the use of a collaborative, visual method for exploring

sensitive health topics. The results will be used to inform future menstrual health policies and interventions in Nepal, and findings regarding Collaborative Filmmaking as a method aim to inform the design of future participatory studies that seek to engage participants in creative ways and to advocate for change and improved health outcomes.

1.2 Menstrual Health Background and Significance

Menstruation is a natural, physiological process for most healthy women and girls that prepares the body for a possible pregnancy.[13–16] If a pregnancy does not occur, the body discharges blood, nutrients and tissue from the uterus through the vagina, which is known as a period.[17,18] For 1.8 billion women, girls, transgender men and non-binary persons of reproductive age globally, the menstrual period is a monthly event, and although it is natural, for many it is associated with a host of challenges.[17]

Menstruation commences during adolescence at an event called menarche, or one's first menstrual period.[17] The age of menarche varies depending on geographic region, race, ethnicity,[13,19] literacy and diet,[20] but typically occurs between the ages of eight and 16.[13] Generally, studies have found that menarche occurs earlier among those who have experienced stressful family events, such as divorce[19] or sexual abuse.[21] Beliefs and practices around menarche and menstruation vary across cultures,[19] but menarche is often viewed as a signal of transition from childhood to adulthood,[22–24] and is a fundamental factor of human reproduction[13] and sexual and reproductive health.[25]

Though menstruation is a natural phenomenon and its occurrence is generally a sign of good health, it can be a difficult experience for millions of women and girls, especially in low-resource settings.[24] Challenges range from the lack of access to affordable absorbent materials[23] to shortage of improved sanitation facilities to hygienically manage menstruation with privacy,[23,26,27] and missed educational opportunities during menstruation, though evidence regarding the extent to which this is occurring and consequences of missing school is mixed.[28,29] In addition, in many cultures menstruation is

shrouded with silence, myths and taboos.[23,28,30–34] Discriminatory menstrual practices not only lead to embarrassment and shame, but also make it challenging to manage menstruation hygienically and with dignity.[34]

Menstrual health challenges affect several different sectors and development outcomes. Addressing menstrual health challenges is critical for achieving the Sustainable Development Goals (SDGs), specifically goals 3-6, 8, and 12.[35] For example, SDG 3 – Ensure healthy lives and promote well-being for all at all ages – cannot be achieved if women and girls do not have access to hygienic supplies and accurate information to adopt safe and healthy menstrual practices; SDG 4 – Ensure inclusive and equitable quality education and promote life-long learning opportunities for all – cannot be achieved if girls miss school during menstruation,[35] which highlights the need for inclusive education policies that incorporate menstrual health needs of menstruators[1] in school settings.[36]

Menstruation is also a human rights issue. Lack of access to materials and private, hygienic and safe spaces to manage menstruation violates the basic right to dignity and the human right to water, sanitation and health.[17,37] Menstruation also affects rights to work and education, and gender equality driven by taboos that perpetuate views about women and girls being inferior.[38] Framing menstruation as a human rights issue allows for strategic engagement with government actors at multiple levels who may not necessarily be familiar with the challenges associated with menstruation in order to support a positive policy environment for addressing menstruation as a health and rights issue.[39]

History and Terminology

Research, interventions and policymaking around menstruation in public health to date have widely focused on maintaining hygiene and adequate privacy in low-resource settings, and the need for adequate water and sanitation facilities under the term Menstrual Hygiene Management (MHM).[23,27,40]

[1] The term "menstruators" is used as a more inclusive term that includes all people who menstruate, including girls, women, transgender and non-binary persons. Throughout this dissertation the term "women and girls" may also be used interchangeably with the term menstruators, but refers to all those who menstruate regardless of gender identity.[17]

The term MHM originated in the water, sanitation and hygiene (WASH) sector[17] and is defined as "women and adolescent girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required, and having access to facilities to dispose of used menstrual management materials. They understand the basic facts linked to the menstrual cycle and how to manage it with dignity and without discomfort of fear."[27(p1557)] This definition, which includes information on what is required for adequate MHM, was developed at the World Health Organization (WHO)/UNICEF Joint Monitoring Programme (JMP) on Water Supply and Sanitation in 2012. The JMP also outlined Water, Sanitation and Hygiene (WASH) indicators and targets for addressing MHM challenges in the WASH sector.[41] Additionally, the JMP provides a definition of menstrual hygiene management facilities:

> Adequate menstrual hygiene management facilities in schools and health centers provide privacy for changing materials and for washing hands, private parts and clothes with soap and water; include access to water and soap within a place that provides an adequate level of privacy for washing stains from clothes and drying re-usable menstrual materials; include disposal facilities for used menstrual materials (from collection point to final disposal).[41(p7)]

This definition considers both personal MHM, or hygienic behaviors, as well as public requirements such as safe facilities, practical information about menstruation, materials to manage menstruation, and adequate disposal facilities.[42] In 2012, WaterAid published a comprehensive toolkit for developing and implementing MHM interventions in the developing world, *Menstrual Hygiene Matters*,[29] which was instrumental in moving the field of MHM forward.[43]

In 2014, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) introduced the term menstrual health, which builds upon MHM by investigating systemic factors that affect healthy menstrual management.[17,24,25,44] The term menstrual health is described as an "encompassing term that includes both menstrual hygiene management (MHM) as well as the broader systemic factors that link menstruation with health, well-being, gender, education, equity, empowerment,

and rights."[24(p17)] These include accurate and timely knowledge about menstruation, affordability and access to menstrual materials, informed professionals, water and sanitation facilities, positive social norms, disposal facilities, and advocacy and policy to improve menstrual experiences for women and girls.[24] Given the nature of the challenges associated with menstruation, a multi-sectoral response that brings together fields and disciplines such as health, water and sanitation, education, and engineering is required to address both hygiene challenges and systemic factors that affect experiences of menstruation.[27]

As of 2019, challenges associated with menstruation are recognized globally as a public health issue.[45] The topic has even entered mainstream conversations in recent years, promoted by global media outlets such as Newsweek, The Huffington Post, and The New York Times, and magazines such as Cosmopolitan.[43]

Physical and Psychosocial Health Risks Associated with Menstruation

Evidence suggests that during menstruation, menstruators are at risk for numerous physical and psychosocial health risks.[46] These health risks include urogenital infections, though further investigation regarding infections directly associated with menstrual health is needed,[15,47–49] gender based violence,[11,29,50] stigma,[32] shame,[51,52] and anxiety[15,25,53] (Figure 2).

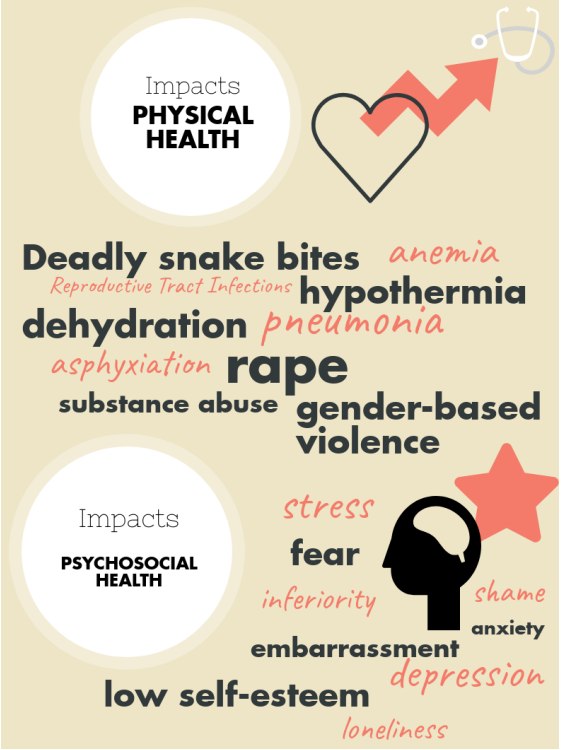

Figure 2 Examples of Menstrual Health Outcomes.

A few studies have found a link between poor menstrual hygiene and reproductive tract infections (RTIs).[25,54,55] Poor menstrual hygiene, often linked to cultural beliefs, available resources, and/or knowledge about menstruation[13,56] has been linked to RTIs, specifically bacterial vaginosis (BV), according to one study conducted in India.[57] This raises concerns as BV can lead to adverse pregnancy outcomes including preterm delivery,[58] acquisition of sexually transmitted infections,[54] and other health complications.[48] However, data on the burden of infection attributed to menstrual hygiene are limited.[13] A systematic review of menstrual health studies in 2013 identified 14 studies that explored reproductive tract infections and MHM but concluded that the methodologies varied and the overall quality of these studies was low.[13] Since then, additional studies have been conducted. One study conducted in Odisha, India, in 2015 with 486 women used lab-confirmed diagnosis and found that women who used reusable cloths were significantly more likely to report symptoms of urogenital infections (UI) (AOR=2.3, 95%

CI: 1.5-3.4), and were also more likely to be diagnosed with a UI or BV compared to those who used disposable sanitary products (AOR=2.8, 95% CI: 1.7-4.5).[44] Another study conducted in the same location with 558 women found that of the infections diagnosed, BV was the most prevalent (41%), and those with BV were more likely to wash less frequently (aPRR=1.25, 95% CI: 1.0-1.5) and change absorbent material outside a toilet facility (aPRR = 1.21, 95% CI: 1.0-1.48).[55] The study also found that a higher frequency of changing absorbent material was protective (aPRR = 0.56, 95%CI: 0.4–0.75).[55] These studies add to the limited body of evidence that suggests an association between poor menstrual practices and higher prevalence of RTIs,[55] but more research is needed.

Menstruation can also have physical health effects in the form of cramps and pain,[59] or dysmenorrhea. Dysmenorrhea refers to the pain associated with periods, which often includes pelvic pain occurring during menstruation and other symptoms such as headaches, back pain, nausea, vomiting, and diarrhea.[2] One study conducted in India with medical students found that 33% of the participants suffered from dysmenorrhea.[2] Another study conducted with adolescent girls aged 14-19 in Kadapa, India, found that 68% experienced painful periods,[60] whereas a study in Australia among metropolitan secondary school students found dysmenorrhea as high as 80% among female students.[61] Studies have also found an association between painful periods and work and school absences,[61,62] and decreased quality of life during menstruation.[63]

Other studies have found increases in high-risk sexual behavior linked to menstrual health challenges,[25] which can increase exposure to sexual and reproductive health threats.[64] For example, evidence from East Africa revealed that young girls participate in transactional sex in exchange for money to purchase commercial sanitary products.[25] A cross-sectional quantitative study in Kenya found that though engaging in sex for money to purchase pads was low (1.3%), girls under the age of 15 had significantly higher odds compared with girls over age 15 of engaging in transactional sex to pay for pads (AOR 2.84, 95% CI: 0.89–9.11).[64] A qualitative study in Kenya also gathered evidence of this practice.[28] Additionally, a mixed-method study conducted in Tanzania, Uganda, and South Sudan found that

schoolgirls are engaging in sex with males to generate income to meet basic needs, which includes sanitary supplies to manage menstruation, due to limited support from their families.[65]

Studies have also confirmed a link between menstrual health and gender based violence.[25] The literature points to women's and girls' vulnerabilities to harassment, physical assault, and/or rape when their access to WASH facilities is limited.[25] During menstruation, women and girls have an increased need for WASH facilities to change their menstrual products, and studies have found that when they go to collect water, take a bath, or defecate in the open at night, they are at risk for gender based violence.[66]

The literature also highlights additional physical health effects common among menstruating girls, including high rates of anemia and emaciation.[22] Furthermore, some women and girls are forbidden from eating certain types of nutritious foods during menstruation linked to cultural and religious norms,[6,15,22,67] and studies have also found that girls resort to substance abuse (e.g. smoking and alcohol consumption) to cope with the stress associated with menstruation.[6,22]

Other menstrual health challenges are social, cultural, or psychological in nature. In many countries, menstruation is a taboo topic, and is shrouded in silence and/or misinformation.[25] Discriminatory menstrual practices and cultural taboos are a regular occurrence in many parts of the world.[7,33,68,69] For example, in parts of India and Nepal, some women and girls are forbidden from fully participating in activities such as cooking, religious practices, attending to guests, and bathing to name a few.[6,31,70] This environment of taboos and restrictions can result in menstruation being associated with fear,[9] loneliness,[71] stress,[9,22] inferiority,[72] disgust, shame,[15] and embarrassment.[50] Feelings of shame and embarrassment may also stem from being uninformed or misinformed about menstruation before menarche, which can cause girls to be alarmed when it occurs.[73]

1.3 Nepal Context

Geography

Nepal is a landlocked, geographically small yet diverse Himalayan nation of 29 million people.[74] It is home to hundreds of mother-tongue languages, ten religious categories, and 125 different caste/ethnic groups.[75] Situated in South Asia, Nepal ranks 144 out of 188 countries according to the Human Development Index, which assesses three basic dimensions of human development: a long and healthy life, being knowledgeable, and a decent standard of living.[76] The country is working towards stability after a decade-long insurgency that ended in 2006, and devastating earthquakes that killed more than 9,000 people in 2015.[77]

Nepal is bordered on the north by the Tibetan Autonomous Region, and India on the south, east, and west. It is topographically split into three distinct regions, which range from low-lying plains in the south to some of the world tallest mountains in the north. The *tarai* (lowland) region along the southern border with India is the country's most fertile region and comprises 23% of the country's land area and 47% of the total population.[78] North of the *tarai* is the hill region, covering 43% of the country's area, with altitudes ranging from 2,000 feet to 15,999 feet above sea level. Within the hill region there are a handful of valleys, including Pokhara and the capital Kathmandu, which support large portions of the hill population. Forty-five percent of the total population lives in the hills. The northern border of Nepal is known as the mountainous region. In this region, peaks range from 16,000 feet to over 29,000 feet above sea level and it is home to the world's highest mountain, Mt. Everest (29,029 feet). Though this region covers 34% of the country's land mass, it is inhabited by only 8% of the country's total population.[78]

Caste System

The caste system in Nepal is a social stratification system based on ritual impurity that widely impacts everyday lives of people living in Nepal.[79] As described by Mary Cameron, an anthropologist who has worked extensively on caste in Nepal, "caste is best understood as having two different aspects –

one oriented toward the systematic classifying and ranking of people and the other constituting everyday transactions and relations."[79(p11)] One's caste is inherited at birth and determines status and social responsibilities. Occupation, endogamy, social class and political power are important components of the definition of caste.[80,81] According to a recent UN Literature Review on harmful practices in Nepal, "caste is hierarchical, permanent, hereditary, rooted in concepts of ritual pollution and impurity, and it segregates society by putting restrictions on occupation and who one can marry."[81(p16)] The review also describes caste-based discrimination as a harmful practice with potentially deleterious effects on several development outcomes.[81]

Nepal has a long history of rule by high caste Hindus (Brahman and Chhetri) over other ethnic groups (Janajati) and low caste groups (Dalit).[81,82] In 1854, the National Code, *Muluki Ain,* was enacted as the guiding document for organizing Nepali society with the aim of bringing all people under one regulatory Hindu authority.[83] Since then, the caste system has been used to limit certain people from purchasing land, getting an education, or taking leadership roles in the government.[84] Caste-based discrimination has been illegal since 1963 in Nepal,[79] however, disparities in health and education across caste/ethnic groups persist,[84–88] and the National Planning Commission has called for more studies that explore disparities associated with caste/ethnicity.[86]

Additionally, the Asian Development Bank discusses the "complex caste and ethnic structure"[89(p2)] in the country as one of the greatest challenges to development. When it comes to menstruation in Nepal, a scoping review suggests that "Hindu ethnic groups such as Brahman, Chhetri, and Newar, have more restrictions than Janajatis (ethnic Nepalis)."[22(p7)] However, only a few studies have explored how these caste/ethnic differences directly relate to health outcomes.[86] In one study on caste/ethnicity and health in Nepal, researchers expressed that research exploring caste/ethnic differences is often evaded to "avoid controversy about social categories."[86(p1)] Yet there is a general consensus among the government, communities, and civil society that studying caste/ethnicity is required to develop comprehensive and inclusive policies and programs.[86]

Caste/ethnicity is the term used in the National Demographic Health Survey[90] and Nepal National Census;[75] using caste and ethnicity together allows for the inclusion of ethnicities that are not technically a part of the caste system, such as "*Musalman*" (Muslims). Chhetri is the largest caste/ethnic group in Nepal, making up 16.6% of the total population, followed by Brahman-Hill (12.2%), Magar (7.1%), Tharu (6.6%), Tamang (5.8%), Newar (5.0%), Kami (4.8%), Muslim (4.4%), Yadav (4.0%), and Rai (2.3%).[75]

The 125 caste/ethnic groups in Nepal are typically categorized into a few broad categories. At the top of the caste system are Brahman (historically priests) and Chhetri (historically warriors and rulers) groups.[91] In the middle is where indigenous ethnic groups are placed (Janajatis), who are generally Tibeto-Burman speaking and follow Buddhist and animist religions.[82,92] At the bottom of the caste system are Dalits, who were once considered the "untouchables."[91] Generally, high caste Brahman and Chhetri groups control politics, the education system, and businesses, while the middle-ranking Janajatis, Muslims, and low caste Dalits have been socially, economically and politically marginalized throughout istory.[81,91–93]

Religion and Language

Nepal is also religiously diverse, with the majority of the population following Hinduism (81.3%), followed by Buddhism (9.0%), Islam (4.4%), Kirat (indigenous religion with Hindu influence[94]) (3.1%), and Christianity (1.4%).[75] Higher mountain regions of Nepal have been influenced by Tibetan Buddhism, and the jungle areas are generally influenced by shamanistic (i.e., altered states of consciousness to interact with the spirit world) and animistic (i.e., all natural things, including objects and creatures, have a spiritual essence that can influence human events) belief systems.[86]

While many distinct religious groups live in Nepal, many Nepalis observe religious syncretism, or the blending of two of more religious belief systems, practicing religious traditions from Hinduism, Buddhism, and traditional folk practices.[94] Nepal is generally known for mutual respect, co-existence, and peace when it comes to religious identity.[95]

In recent years, however, religious demographics have been in flux and religious conflicts have been on the rise. This is partially linked to high numbers of caste minorities (e.g. Dalits) converting to Christianity because of a long history of caste-based discrimination.[82,96] Rising tensions have led to a shooting and an arson attack on a cathedral in 2017, and ongoing Hindu-Muslim clashes in the south of the country.[94] As a result of rising religious clashes, "minority religious leaders expressed concern about the rise of Hindu nationalism and its implications for religious harmony,"[94(p10)] according to a U.S. State Department report.

According to the 2011 census, 123 mother-tongue languages are spoken throughout the country, with the national language, Nepali, being spoken by only 44.6% of the population.[75] Historically, the Nepali language has been associated with power and prestige, whereas minority languages have been missing from educational and government settings.[97] This has left linguistic minorities on the margins.[97] There is currently a movement towards more linguistic inclusion in Nepal, and the Ministry of Education has introduced the Mother Tongue based Multilingual Education to address this issue.[98] More research and programming is needed regarding enforcement of the new approach; however, a more inclusive language model is expected to help preserve indigenous knowledge, culture and values and improve school performance.[98]

Governance Structure

In 2015, Nepal enacted a new constitution and has since begun the transition into a Federal Democratic Republic with three autonomous governance levels: national, provincial, and local.[77,99–101] Federalism allows power to be shared among several layers of government, and transfers decision-making authority to local governments, in which each has an elected assembly with authority in policymaking, financial decisions, and administrative matters.[100,101] According to UNESCO, "it is also expected that the federal model of government maintains the decentralized opportunistic behavior while bringing decision making closer to the people."[102(pVII)]

Under federalism, the country is divided into seven provinces and seventy-seven districts.[100] Overall, determining these divisions has been challenging, as outlined in a 2017 UNDP report: "The greatest challenge for the implementation of the constitutional scheme of federalism is about management of the multi-cultural, multi-lingual and multi-ethnic society. However, people are hopeful that it can be done through federalism,"[101(p24)] though how federalism will impact public health policy implementation is still uncertain.

1.4 Menstrual Health in Nepal

In Nepal, menstrual periods can be both a public health and personal safety issue. A recent study of 679 women and girls across nine districts found that nearly 90% follow at least one restriction during their menstrual cycles.[103] Restrictions and exclusions range from using a separate water source, sleeping in a separate room, avoiding the kitchen, to keeping distance from others, avoiding worship spaces, avoiding social gatherings, and sleeping in an animal shed, to name a few.[6,22,103,104] Following these restrictions puts women and girls at risk for poor health outcomes and can threaten their personal safety by increasing their vulnerability to rape and/or assault.[1,105,106]

The following section largely draws upon results from a recent UN Literature Review on Harmful Practices in Nepal[2] that explored *chhaupadi* and menstrual restrictions.[81]

Chhaupadi

In the mid- and far-western regions of Nepal, a practice called *chhaupadi* is widespread, which is generally considered the most extreme form of menstrual restrictions in the country.[22] *Chhaupadi* is a centuries-old, culturally and religiously-rooted practice,[11,72] in which Hindu women and girls are exiled during menstruation and excluded from community life.[40,107] Those who follow the practice sleep in small

[2] Sara Baumann conducted the literature review study and authored the report.

huts or animal sheds during menstruation and for the first 11 days following childbirth.[5,22,71,108,109] During this time, women and girls are considered impure,[1,110] a belief originating from Hindu religious mythology.[79,111]

The word *chhaupadi* stems from the *Raute* dialect in far-west Nepal,[5] and is comprised of two different root words. *Chhau* is defined as "untouchable or unclean" and *padi* refers to "being or becoming."[11] Thus, *chhaupadi* refers to the "state of being untouchable/unclean."[112] A colloquial term often used to describe menstruation is "*na chhune*," which translates to "no touching."[113]

The yearly *Rishi Panchami Fast*, a festival observed by women and girls who seek forgiveness for sins committed during menstruation, is linked to the origins of beliefs about the impurity of menstruation. According to the legend, Indra, the Hindu king of the gods, killed a Brahman and had to find a way to be purified of his sin. According to the story, his sin was divided into four parts, one of which fell into menstrual blood. Due to the sinful nature of menstrual blood, women are viewed as polluted and sinful during menstruation, linked to the sins of Indra.[113] Therefore, any objects touched by women and girls during menstruation are considered impure.[3,114–116] Once a year, menstruating women and girls purify themselves with water, prayer, and fasting during *Rishi Panchami* for the "sins" they committed while menstruating.[3]

Sleeping in a small shed outside of the home is one of the most tangible aspects of *chhaupadi* and draws considerable attention to the practice. The sheds, or *chhau goths*, are often unhygienic,[115] unsafe, and lack basic necessities such as water or sanitation facilities.[3,11] The location of the shed construction varies; in some cases they are built near the home (20-25 meters),[5] but in other cases they may be constructed up to a mile away from the village.[117] The *chhau goth* is typically one room constructed from wood, mud, straw, or stone,[116] with a small entryway and no windows;[11] the lack of ventilation in the shed puts those sleeping in them at risk for suffocation. Most sheds do not have locking doors and fail to protect women from intruders or attacks by wild animals, such as poisonous snakes. They are also far from an appropriate shelter in the harsh Himalayan climate.[5,11,71,112,117] In remote mountain regions where

chhaupadi is widespread, temperatures often fall below freezing and women are forced to sleep in these unclean and vulnerable conditions with little or no bedding or security.[118]

Throughout Nepal, *chhaupadi* takes on different forms in terms of the type of shed and the number of people sharing it. In some villages, women share the shed with livestock. In these sheds, menstruating women and girls sleep together alongside animals, such as cows, goats and buffalo (Figure 3).

Figure 3 Women and girls sometimes sleep in a small animal shed constructed below/attached to the home among goats, buffalo and cows, Kalikot district.

Other communities have constructed specific separate sheds for menstruating women (i.e. traditional *chhaupadi goths*) (Figure 4).

Figure 4 A separate, communal shed is often created for menstruating women and girls (traditional *chhaupadi goth*), Kanchanpur district.

Finally, others have constructed separate spaces for menstruating women and girls in the form of a small room built above an animal shed (Figure 5).[116,119]

Figure 5 A small room is built above the animal shed for menstruating women and girls to sleep, Kalikot district.

One study in Achham found that only 4% were exiled to traditional *goths* specifically constructed for menstruating women, whereas 82% were exiled to livestock sheds.[3] The study also found that 14% were not exiled to sleep in sheds, but rather to courtyards outside their homes.[3] When it comes to sharing the sheds, in parts of Dailekh and Achham, three or four families often share a common shed. However, in other districts such as Kalikot, many women stay in animal sheds connected to their homes, typically on the first floor under the main living area of the house. In these cases, women typically sleep alone or with other menstruating women from their household. The decision to build a separate shed for menstruating women often depends on the resources available; highly impoverished communities may not have enough expendable income to build separate sheds and hence women sleep among animals in already constructed sheds.[68]

Women and girls usually sleep in the shed for a minimum of four consecutive days,[3,115] but some stay up to seven days.[112,120] Some studies have reported that the length of separation depends on marital status and children.[79] For example, one source found that unmarried girls have to sleep in the shed for six days, married women having both a son and a daughter have to stay five days, and women who have only daughters have to stay in the shed for seven days.[114] At the end of their menstrual cycle, before returning home women must take a bath, wash their clothes and bedding, and many sip and sprinkle cow urine, which is considered holy, as a part a ritual cleansing practice to regain purity.[5,121]

The monthly banishment to the shed during menstruation is occasionally referred to as *minor chhau,* in contrast to *major chhau,* which refers to the banishment at menarche, which lasts between 10/11[115] to 14/15 days,[3,71] and the period after childbirth (up to 11 days).[5] During menarche, some Hindus practice a custom called *gupha basne (*staying in a cave), in which a young girl who gets her first period stays in a dark room for up to 12 days.[9]

In addition to the menstrual period, women are also considered impure after childbirth. Thus, women and their newborns often stay in exile in the sheds for 10–14 days post-delivery.[3,115] Usually, 11 days after birth, purification rituals are performed, women receive new clothes, and are then allowed to return home.[68] This practice raises concerns, as it can leave new mothers and infants at risk for negative

health outcomes. Treatable complications can escalate quickly when women are staying alone in sheds for many days.[3,116] For example, while sleeping in a shed with her mother, one baby developed a respiratory infection that resulted in death.[68] There are risks due to the elements and nature too. In one case, a mother reported leaving her newborn alone in a shed for a few minutes, and a jackal snatched her baby.[116] Young children also often sleep with their mothers in the sheds when their menstrual cycles begin again after child birth. According to one study, cold, cough, fever, diarrhea, and pneumonia were commonly reported problems among children under two years old who slept in the sheds with their mothers.[71] While evidence on experiences of *chhaupadi* post-childbirth is limited, and an accurate understanding of maternal and infant health consequences due to *chhaupadi* are missing from the literature, it is well-established that neonatal and maternal mortality are high in the far-western regions where *chhaupadi* is common.[3] A better understanding of linkages between these negative outcomes and *chhaupadi* is needed.

While women are isolated from their homes and from social activities during menstruation, they are still responsible for collecting firewood, as well as other heavy work like carrying stones and working on the land.[110,112,115,122,123] They are also responsible for washing their clothes during menstruation,[117] but often use a separate water source so as to not pollute the family or community water tap.[121] While it may appear that *chhaupadi* offers women an opportunity for rest during menstruation, it is not so straightforward, as they still have numerous other responsibilities that they must attend to during this time.[120]

Studies have found that certain key members play a role in preserving the *chhaupadi* practice. Mothers-in-law and older members of the household play a vital role,[71] along with elderly village members, faith healers and religious leaders.[11] Interestingly, one study found that fathers and brothers are becoming increasingly lenient about whether girls observe menstrual restrictions, and in some cases girls have even turned to their fathers for support. This highlights the importance of future studies and interventions that explore the most effective methods to engage men and boys on the issue.[124]

It should also be noted that not all experiences of *chhaupadi* are negative. In a study by NFCC in 2015, some girls in Bajura district reported that they liked staying in the *chhau goths*, as they had an

opportunity to rest and enjoy the company of their friends.[11] Additionally, not all women and girls feel unsafe when sleeping in *chhau goths*, likely because *chhaupadi* as a practice and the shed used for sleeping take on many different forms, as discussed above.[11,125]

Additional Menstrual Restrictions

Though sleeping in the shed is generally thought to be the most extreme form of menstrual restrictions,[103] across Nepal, women and girls follow many other discriminatory practices during menstruation. These include being banned from entering the kitchen,[9,126] and not being allowed to bathe or wash clothes in communal water taps due to the fear that a menstruating woman's polluted state will cause the well to dry up.[110,114,116,119,121] In some villages, separate water taps, called *chhaupadi dhara* are built for menstruating women.[110,112,114] Additionally, women are unable to visit temples,[9,114,119,126] cannot attend religious functions,[127] and if there is a road shared with a temple, menstruating woman often must avoid the path altogether.[114] They cannot touch fruit trees[126] due to a belief that fruits will fall before they are ripe or the fruits/tree will die if touched by a menstruating woman.[110,121,127] Some women have reported not being able to enter the courtyard of their house, [115,121] being banned from touching male relatives,[9] and some cannot touch anyone at all. Women have also reported being banned from consuming dairy products such as butter, milk, and yogurt,[122] as well as other nutritious foods.[71,117] One study exploring menstrual restrictions across nine districts in Nepal found that the majority of participants do not engage in religious activities (89%), more than half do not touch the kitchen (60%), and many also do not touch the water source (24%), do not touch males (27%), do not touch plants or animals (27%) and sleep separately (34%). Only 9% of the sample expressed that there were no rules or restrictions during menstruation.[103]

Beliefs for following menstrual restrictions are deeply held. If a woman does not adhere to these practices, it is believed that there could be any number of negative consequences on her, her family or community.[110,114,121] Many believe that women who do not follow menstrual restrictions could become sick or die, her bones could break, or she could become infertile.[110] Some have expressed that if a

menstruating women touches a pregnant woman, the child will be miscarried or be born with malformations.[117] It is also thought that a natural disaster, such as an earthquake or epidemic, could occur.[110] Illiteracy and patriarchal and superstitious beliefs, as well as community endorsement perpetuate the practice.

Menstruation and Concepts of Pollution

The aforementioned menstrual practices ingrained in the lives of Nepali women and girls of reproductive age are followed due to the underlying Hindu belief that menstruation pollutes.[3,9,79,113] While menstruating, Hindu women and girls are often viewed as untouchable and unclean, and are separated from many communal spaces and events.[113] After all, terms often used for menstruation in Nepali directly translate to "no touching" (*na chhune*), or "moving away" (*para sarne*).[113] Such notions of pollution and uncleanliness are not unique to Nepal and have been witnessed throughout history in numerous different religious and cultural contexts. In her seminal writings on cultural concepts of dirt and pollution, in particular her book *Purity and Danger: An analysis of concepts of pollution and taboo*, anthropologist Mary Douglas describes dirt as disorder: "Dirt offends against order. Eliminating it is not a negative movement, but a positive effort to organize the environment."[128(p2)] In Nepal, when particular rituals and rites during menstruation are followed, it is believed by many that the "dirty" or "polluted" can be managed and in doing so, social order can be maintained. Creating such order serves as a way to protect people and communities from danger or negative consequences, such as natural disasters or disease, which can arise from polluted objects and events according to this belief system.[79,128]

Maintaining order is also an issue of power, particularly in the exceedingly hierarchical social structure of Nepal. Strict rules during menstruation help to reinforce notions of caste order in society, with the purest caste groups (Brahmans and Chhetris) situated at the top.[79] To maintain their high status of a "pure" caste group, following menstrual rituals helps to protect their powerful position.

Though menstrual practices and beliefs vary widely across the globe, nearly all world religions specifically address menstruation. In Christianity, scriptures imply that menstruation is a sign of

"humanity's grand fall from grace."[40(p5)] According to the Jewish code, women are considered unclean during menstruation and for seven days after in a period known as *Niddah*; to regain purity they undergo a ritual bath.[40] Ritual cleansing to regain purity is also prevalent in Nepal where Hindu women sip and sprinkle their bodies with cow urine before returning to their homes after their menstrual cycles.[11,125,129] In Buddhism, menstruation leads to the loss of spiritual energy, and in Islam, women should not touch the holy text or enter the mosque. These rituals contrast with those in other religions, such as Sikhism, where the menstrual cycle is viewed positively, and women carry out their regular spiritual practices during menstruation.[40]

Health Consequences of Menstrual Restrictions

Menstrual restrictions leave women and girls vulnerable to physical and psychosocial adversities.[110,120] *Chhaupadi* specifically forces women and girls to live in an unsafe environment, where they are at risk for certain negative health outcomes, psychosocial stress and shame, violence, injuries and/or rape.[6] Mounting evidence reveals that *chhaupadi* and other menstrual restrictions leave women at risk for poisonous snake bites or another animal attacks,[3] hypothermia,[3] dehydration,[112] pneumonia,[130] suffocation from lighting fires in the sheds with no ventilation,[119] uterine prolapse,[115] increased rates of anemia and emaciation, infections, rape,[115] and in some cases, death.[5,6,22,131] In one study in Achham, three girls reported experiencing physical abuse from staying in *chhaupadi goths*.[3] In another study, *chhaupadi* was associated with reproductive health problems, including burning urination, abnormal discharge, itching in genital region, pain and foul-smelling menstruation, which were all significantly higher among women who practiced *chhaupadi*.[6] Diarrhea and dehydration, hypothermia, and reproductive and urinary tract infections were identified as common health problems among menstruating young women practicing *chhaupadi* in Achham.[3] Though some suggest that *chhaupadi* is responsible for higher rates of uterine prolapse,[122] perpetuated by the expectation for women to continue doing heavy work and carrying weighty loads immediately after childbirth,[5] rigorous studies are needed to better understand this relationship. In some cases, women and girls are deprived of nutritious food during menstruation, which

may lead to malnutrition and higher rates of anemia.[11,111,117] Though anecdotal evidence suggests that more than a dozen women and girls die every year practicing *chhaupadi*,[132] consistent and accurate data on morbidity and mortality related to discriminatory menstrual practices in Nepal are unknown as events often go unreported.[110,133,134]

Women and girls are frequently psychologically affected during their stay in the sheds, which offer little in terms of security and protection and leave women and girls living in a perpetual state of fear,[115,135] lonliness,[3] stress,[71] and humiliation.[111] Others reported feeling isolated and ignored[71] with low self-esteem.[5] One study in Achham with 107 adolescent girls found that among those sleeping in sheds, 31.4% had experienced sadness or depression and 20% experienced fear of being abused while sleeping in the sheds.[111] Future studies are needed understand the magnitude and severity of this issue across other districts of Nepal where *chhaupadi* is prevalent.

Negative effects of menstrual practices and restrictions in Nepal have also been linked to health care utilization by women.[71] For example, if women and girls encounter health issues during menstruation, some studies suggest that they are expected to wait until their menstruation is over before seeking medical care.[3] The reason for this is the belief that nobody should touch a menstruating women, even if she becomes ill.[1] One study also found that women avoided the health post because there was a temple nearby,[110] and another found that women avoided antenatal checkups for the same reason.[71]

Education and Menstrual Restrictions

According to the Nepal Multiple Indicator Cluster Survey (2014), in the mid-western mountains, 11.3% reported missing school/work during their periods.[9] It is believed that the Hindu goddess of knowledge and education, *Saraswoti*, will become angry if a girl or woman reads, writes or touches books during menstruation.[3] Though missing school/work was also a problem in the western mountains (11%), it was lower in other districts.[136] This evidence is supported by the findings of a study in Achham, which found that the majority of participants were still allowed to attend school and read books while menstruating,[3] and another study that found only 6.8% were not allowed to regularly attend school during

menstruation.[111] This evidence suggests that the practice of *chhaupadi* and other menstrual practices may not be keeping girls from attending school in Nepal at rates as high as previously thought, or the beliefs about attending school during menstruation may be shifting. Of those missing school, one study found that the main reasons for missing school during menstruation were pain, discomfort and leakage.[137]

Prevalence and Demographics of *Chhaupadi* and Menstrual Restrictions

The prevalence of *chhaupadi* is as high as 71.2% in the mid-western mountains among women between the ages of 15 and 49, as reported in a 2014 government survey (Figure 6).[104] Additionally, 15.5% of women and girls practice *chhaupadi* in the far-western hills, 15.1% practice in the far-western mountains, and nearly 10% practice in the far-western *tarai* (lowland) region.[104] When it comes to other menstrual restrictions, 89% of girls throughout the country reported experiencing some form of restriction or exclusion during menstruation.[138] Similarly, another study across nine districts found that only 9% do not follow any menstrual restrictions.[103]

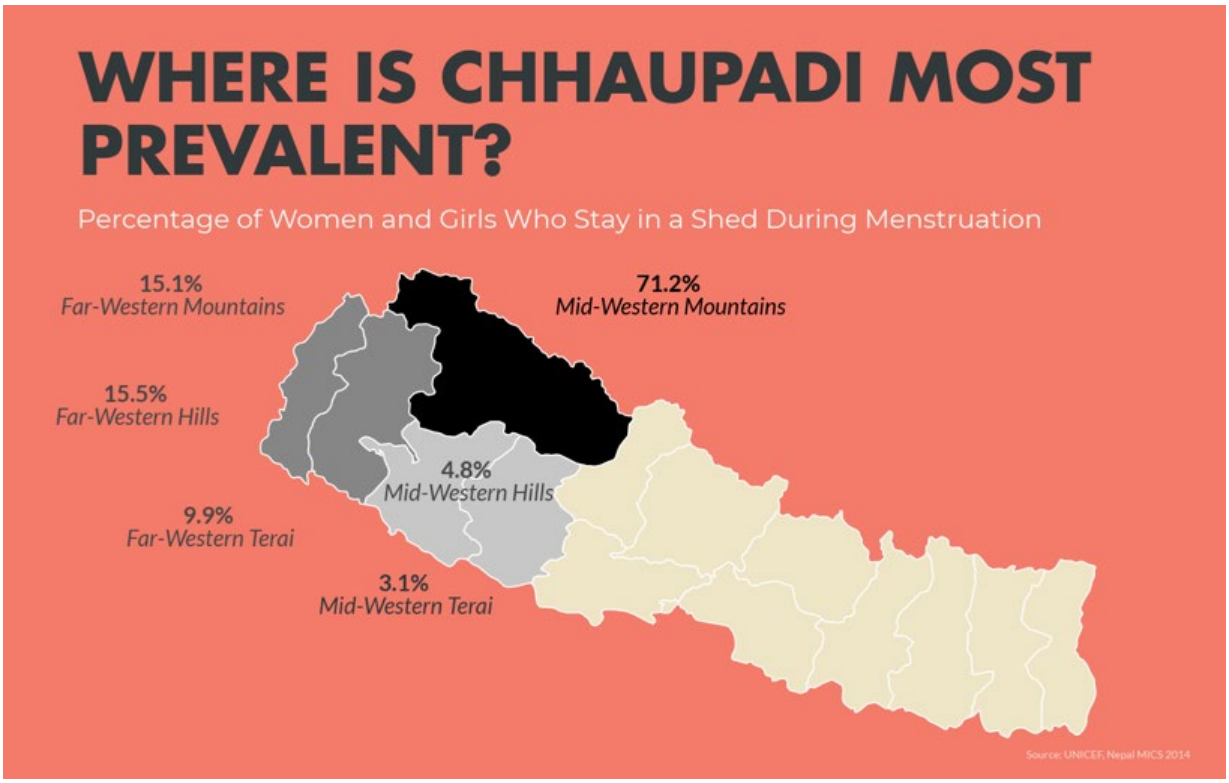

Figure 6 Map of *Chhaupadi* Prevalence in Nepal.
(Figure created by Sara Baumann using data from UNICEF Nepal MICS, 2014[104])

Chhaupadi is largely practiced in the mid- and far-western hills and mountains of Nepal,[3,5,11,68,135] where overall development and gender equality are the lowest in the country.[5] In these regions, livelihood opportunities are limited, food security is low, and infrastructure is poor.[5] Menstrual restrictions, however, are prevalent across all of Nepal.[104] Discriminatory menstrual practices are also common in the capital, where nearly 43% of women and girls between the ages of 15-49 reported avoiding social gatherings during menstruation, and 13.5% reported staying in a separate room of the house during their menstrual period.[104]

Hindu Brahmans, Chhetris (high castes) and Dalits (low caste) are the caste groups that typically follow *chhaupadi*.[139] Janajatis (indigenous ethnic groups), do not usually follow the practice, and they follow fewer menstrual restrictions as compared to Brahman, Chhetri and Newars.[140] However, a study across nine districts of Nepal found that Janajatis have the poorest menstrual practices (based on a score comprised of menstrual practice questions such as absorbent materials used, number of times changing

absorbent materials, disposal of absorbent materials, bathing, and handwashing) compared to Brahman, Chhetri, Tarai/Madheshi/Other, Dalit and Muslim women.[103] These findings highlight the importance of designing programs and messages that address the unique menstrual health needs of indigenous groups, even though they adopt fewer restrictions.[103] Another study also found that menstrual restrictions were more severe in locations where Hindu castes dominate (e.g. Mugu and Achham districts), whereas menstrual restrictions were more flexible in diversely populated communities or those heavily populated by indigenous ethnic groups.[141]

Though non-Hindu women and girls do not typically practice *chhaupadi*, many still follow menstrual restrictions. Several studies highlight that women from Buddhist ethnic groups practice some menstrual restrictions, though fewer than Hindu groups,[22,142,143] and Muslim women are often forbidden from religious activities such as praying, fasting or touching the Koran, Islam's holy text.[138]

Menstrual Policy

The Government of Nepal has taken steps to address *chhaupadi* in legislation. In 2005, Nepal's supreme court banned *chhaupadi,* though efforts to enforce it have been limited.[3,5,22,115,118,122,131,144] The supreme court ruling also identified the Department of Women and Children under the Ministry of Women, Children and Social Welfare as the focal agency for all *chhaupadi* related programs.[11] In 2008, the Ministry of Women, Children, and Social Welfare circulated strategies for eliminating the practice with the *Chhaupadi Pratha* Elimination Directive,[5,11] which called for the elimination of practices that perpetuate an inequitable society. In 2010, the National Plan of Action against Gender Based Violence in Nepal recognized *chhaupadi* as a harmful practice and a form of violence against women.[145] Despite these policy-level initiatives, enforcement of policies is lacking.[11,134] The practice continues, heavily powered by myths such as needing to avoid certain foods and sleep in a shed while menstruating, based on fear that something bad will happen to their family or crops if they do not follow such practices.[146]

In August 2017 (with implementation starting in August 2018) the Nepal Parliament passed Criminal Code 2074, which criminalized *chhaupadi* with a fine of 3,000 rupees (approximately $30)[3] and/or a three-month jail sentence for anyone forcing a woman to follow the practice.[3,114,151,116,119,134,144,147–150] The code also states that women should not be kept in a shed during the post-natal period, nor should they be subject to any other discriminatory behavior.[148] Lawmakers also expressed that even if a woman herself chooses to practice *chhaupadi*, she will not be allowed to sleep in a separate house; she will only be allowed to stay in a separate room inside her house.[150]

While this legislation is widely viewed as a positive step toward ensuring safety and well-being for Nepali women and girls,[135] there are a number of concerns and challenges with the new code. Strategies for enforcement are missing,[116,144] as well as a clear definition of *chhaupadi* and "other discriminatory behavior" that are cited in the code.[152] Some suggest that legal measures aimed at prohibiting the practice and the fear of punishment will not be enough to persuade people to give up the practice. The stigma associated with breaking deeply rooted social norms and the fear of ostracization is predicted by some to be stronger than the fear of breaking the law.[122] There are also concerns about the lack of mechanisms for reporting cases of *chhaupadi*. Now that legal provisions are in place, there is an urgent need to develop a clear definition of *chhaupadi,* inform the public about the new code, especially those in *chhaupadi*-practicing districts, and design appropriate reporting mechanisms.

Similar to other harmful practices in Nepal, including caste-based discrimination, accusations of witchcraft and persecution, and child marriage, the Government of Nepal has taken legislative action to criminalize them with jail time and fines.[81] However, a disconnect between policy and practice is common, and enforcement of the *chhaupadi* criminalization code is expected to face similar challenges as seen with the criminalization of other harmful practices in the country.

In terms of awareness at the community level, a study conducted in the Karnali region (mid-western Nepal) found that nearly 60% of the people surveyed were not aware that *chhaupadi* is illegal.[153]

[3] The average monthly household income in Nepal is 30,121 NPR ($269).[295]

Another study conducted in Achham, Bajura, and Kailali in seven Village Development Committees (VDCs)[4] found similar results. Generally, people were unaware of the supreme court *chhaupadi* ruling or government directive against *chhaupadi*.[11]

In contrast to the criminalization approach, one detailed assessment of *chhaupadi* suggests that those addressing *chhaupadi* should consider a harm reduction approach.[11] The report highlights that demolishing sheds is not the solution, but rather efforts are needed to engage communities in dialog about the natural process of menstruation and address deeply held beliefs about the impurity of women. The study notes that "as external forces, we can only create the environment for change, we cannot make the change. This proposed strategy is, therefore, designed to create an environment for change, building on the de-stigmatization of menstruation followed by a gradual and sustainable process of change."[11(p10)] A harm reduction approach could help to minimize the negative effects of *chhaupadi*, while maintaining social cohesion in communities where *chhaupadi* has been an important part of cultures for centuries.[11] Amatya et al. echo the need for harm reduction in their 2018 study, stating that government bans require time to implement, and the practice is not predicted to end in the short term.[3] What is needed in the meantime until *chhaupadi* is eradicated are "temporary measures to promote the health and safety of Nepalese women and girls practicing *chhaupadi*. Simple interventions such as putting screens on windows and doorknobs/locks on doors could prevent the unfortunate incidents of physical abuse, rape and death due to animal bites."[3(p14)]

1.5 Theoretical Framework

The Social Ecological Framework (SEF) is a useful model for exploring the structures, systems, people, and policy environments that affect women's and girl's menstrual experiences, and inevitably

[4] Under the previous government structure, VDCs were the village-level local government bodies that functioned as an administrative unit under the Ministry of Federal Affairs and Local Development.[296] Under federalism, this structure has been replaced by municipalities and village councils (*gaunpalikas*).[297,298]

their health outcomes.[154–156] In order to better understand the range of factors on a variety of levels that may affect menstrual health, from individual beliefs to policy interventions, the SEF helps to guide analysis of a number of factors that can influence menstrual health practices and beliefs in Nepal (Table 1).

Table 1 Menstrual Health Factors at Multiple Levels of the Social Ecological Framework.

Levels of the SEF	Factors
Individual	- Caste/ethnicity - Socioeconomic status - Level of education - Religious identity - Individual knowledge, attitudes, and beliefs about menstruation - Menstrual disorder/abnormality diagnosis (e.g. endometriosis, dysmenorrhea)
Interpersonal	- Family menstrual practices (e.g. mother, aunt, grandmother) - Peer menstrual practices
Community	- Social and cultural norms related to gender, reproduction, fertility, purity - Menstrual traditions
Organizational	- Menstrual curriculum provided in schools - Menstrual information provided through the health system - Religious institution traditions
Policy	- *Chhaupadi* ban - *Chhaupadi* criminalization code - Menstrual education policies - Women's rights policies

Individual

Menstrual health is affected by individual-level factors, which includes menstrual knowledge, attitudes, and practices. The literature points to knowledge of menstruation and self-efficacy regarding menstrual management as individual-level factors that must be considered for improving menstrual health.[157] Other individual-level factors that affect menstrual health outcomes, and hence should be considered in menstrual studies, include caste/ethnicity, religion, literacy, financial resources, and socioeconomic status (SES).[155]

Interpersonal

Interpersonal factors can also influence menstrual health and include relationships with social networks that may influence one's perception of menstruation and practices. Family members and peers are often a source of menstrual knowledge,[158] which can influence one's menstrual behaviors and health outcomes. Additionally, certain menstrual practices may prevail out of fear of social rejection at the interpersonal level from family and friends and may lead to the perpetuation of harmful practices.

Community

Gender and social norms can perpetuate menstrual practices and beliefs. For example, menstruation is widely viewed as an impure event across Nepal, and negative social norms about menstruation can lead women and girls to view menstruation as something to keep hidden. They may avoid asking questions about menstruation, which may perpetuate feelings of fear or anxiety and the spread of misinformation. Cultural norms around reproduction, purity, and fertility may also influence women's and girls' menstrual practices.

Organizational

Organizational factors are ones that influence menstrual practices and beliefs as a result of decisions and actions made by schools, as well as health and religious organizations and institutions. Decisions regarding reproductive health education and the messages included regarding menstruation in the national school curriculum is an organizational factor to consider. Provision of water and sanitation facilities, if there are separate facilities for girls, and how they are maintained are also organizational factors. Health care and religious institutions also have a role to play in the dissemination of information about menstruation and battling menstrual myths and taboos, and hence the role of these organizations should be considered in designing appropriate interventions.

Policy

Local, national, and global policies also influence menstrual health outcomes.[155] For example, in Nepal, protective policies that identify *chhaupadi* as a form of violence against women is a policy level factor. For many years these polices were not enforced, producing a climate where harmful menstrual practices could endure. With the new legislation on *chhaupadi*, specifically the criminalization code, an opportunity exists for policy to influence menstrual health outcomes by creating an environment in which women are protected by the law. Global policies and efforts that seek to improve menstrual health outcomes by urging governments and sectors to address menstrual health can also be considered, such as the UNESCO puberty education policy.[45] Alternatively, others have investigated whether governments have included menstruation in education-specific policies. An analysis of education policy documents in 21 low and middle income countries found a lack of MHM within high-level policy education sector documents, with two out of the 38 total policies, plans, and strategies reviewed including MHM explicitly.[36] This suggests that further political and financial commitment to addressing menstruation related challenges is required.[36]

It is useful to consider multiple social ecological dimensions when examining menstrual health, as each level affects menstrual health differently. For example, if individually targeted efforts are conducted (e.g. education sessions), but an enabling policy environment to apply this acquired knowledge is missing (e.g. women are still forced to practice harmful traditions), the individual efforts are not likely to result in sustainable change. Instead, interventions and policies should address several levels of the SEF for greatest impact and sustainability.[159]

Though the SEF is useful for examining menstrual health and beliefs in Nepal, there are limitations. This model does not incorporate influences from the natural or built environment (e.g., challenges associated with the diverse and restrictive topography of Nepal, or necessary WASH hardware that is required for women and girls to put lessons learned from school curriculum into practice), nor are historical influences included in this model (e.g., the decade long Maoist insurgency that has influenced norms and beliefs).

1.6 Menstrual Health Interventions and Studies in Nepal

A number of menstrual health interventions have been implemented by NGOs and international non-governmental organizations (INGOs) in Nepal, including education/awareness raising programs, capacity building, school curricula development, sanitary pad production and distribution, and water supply and sanitation.[22]

The most common menstrual health interventions in Nepal are education and awareness-raising programs.[22] For example, Save the Children developed a Girls' and Boys' Puberty Book for the Nepal context modeled after Marni Sommer's successful puberty book from Tanzania called Grow and Know, which targets school-going youth.[160] Other organizations have used methods such as discussions, videos or games to provide information about menstruation and reproductive health, and have targeted women's groups, female community health volunteers, mothers, community leaders, and men.[22] However, according to a scoping review of current programs in Nepal, these programs are mostly limited to earthquake-affected districts, or the far- and mid-western and *tarai* (lowland) districts, leaving many districts with no MHM programming.[22]

The government has responded to the need for systematically reaching all school-going girls with menstrual education by including menstruation information and *chhaupadi* in the national school curriculum. Menstruation is included in textbooks for grades six to nine (approximately ages 12-15); however, advocates argue that this information should be introduced earlier for girls to be equipped with resources and information before reaching puberty. Social mobilisers in a WaterAid program also reported that they lack child-friendly tools and age-appropriate information for younger girls that would assist with educating about menstruation before menarche.[161]

Specifically for *chhaupadi*, the practice is discussed within the school curriculum only in grade nine (age 15) with merely a brief statement about the harmful nature of the practice.[22] Therefore, an opportunity exists to expand the school curriculum to introduce girls to these topics earlier and provide comprehensive information and effective teacher training. To respond to this need for improved menstrual

health curriculum, NFCC, WaterAid, Save the Children and GIZ supported drafting the "Integrating Menstrual Hygiene Management into School Health Programs" Manual with the Family Health Division of the Ministry of Health and the Ministry of Education.[22]

According to a scoping review of interventions by menstrual health organizations in Nepal, 28.6% are working to improve sanitation facilities to make them MHM-friendly.[22] These interventions focus on equipping facilities with dustbins, lockable doors, providing access to water for washing, putting a maintenance plan in place, and ensuring separate facilities for girls.[22] Fewer organizations (7%) are focusing on sanitary pad production and distribution.[22]

In terms of targeting *chhaupadi* and promoting positive behavior change, many organizations are implementing MHM programs that target a variety of audiences; however, these efforts require collaboration with water supply and sanitation efforts in order for girls to have the resources to practice the healthy behaviors they learn in trainings.

Though anecdotal evidence is available about *chhaupadi*, there is a dearth of rigorous studies on the practice, and very few known studies have explored the *chhaupadi* practice in depth. Of all the organizations working on MHM in Nepal, only 14% are conducting research. Many of the studies are limited to small sample sizes and conducted in only certain parts of the country.

1.7 Opportunities for Menstrual Heath Research in Nepal

Rigorous studies are required for informing evidence-based menstrual health policymaking and programming in Nepal. Based on a review of the relevant literature, future menstrual health studies can do the following:

- Investigate the root causes of menstrual taboos and harmful practices (e.g. *chhaupadi*), as they remain a persistent challenge in menstrual health interventions. Rigorous studies are required to

explore root causes and the effectiveness of interventions in promoting sustainable behavior change.[22]

- Ensure that the stories and experiences of women and girls are centered in research about menstrual health and hygiene.[22]
- Study the role of caste/ethnicity and religion in menstrual practices and beliefs in the diverse context of Nepal and how to incorporate the unique needs of different caste/ethnic groups into menstrual health programming and policies.[103]
- Explore the role of families, community members, and religious leaders in promoting positive menstrual health practices, and how to best involve them.[22] In particular, the role of men and boys in menstrual health needs to be further investigated.[124]
- Examine the impact of the new *chhaupadi* criminalization code on practicing communities. As this is the first attempt in history to criminalize the practice by the government, understanding how the code will be enforced, the training that will be provided to law enforcement, what communities understand about the new code, and how they feel about the criminalization is imperative.
- Explore menstrual practices, beliefs, and associated health outcomes in urban settings, such as the capital Kathmandu, where some evidence suggests that menstrual restrictions prevail.[10] A deeper understanding of the current practices, the importance of these practices for women, and their impacts on educational outcomes, work productivity, and household decision making are needed.[162]
- There is a dearth of information about the practice of *chhaupadi* after childbirth.[3] While it is known that some women are isolated for a period of time after giving birth, evidence of the health implications for mothers and infants are limited, and research on the appropriate public health interventions needs to be explored with communities.

- Women and girls with disabilities and out of school girls are largely missing from the menstrual health literature.[163,164] More research is needed to better understand their unique needs and the most effective approaches to improve their menstrual health experiences.

Overall, evidence on effective approaches for addressing menstrual health concerns in Nepal is limited, especially for addressing *chhaupadi*. These research gaps span all levels of the SEF, and hence a multi-level and interdisciplinary approach is required for studying these issues. It is recommended that future studies begin to explore some of these gaps in knowledge about menstrual health with the goal of informing future policies and interventions to ensure that negative health outcomes associated with poor menstrual practices in Nepal ultimately end.

1.8 Visual Methods Background

Visual methods, such as photography and film, have been widely used by ethnographers and sociologists; however, their use within other disciplines has been less common, with varying degrees of acceptability.[165] Visual anthropology as a field began to take form as early as 1922, but did not emerge as a sub-discipline of anthropology until the 1970s.[166] The field was largely influenced by the work of Robert Flaherty and Bronislaw Malinowski, who independently released work in 1922 that captured a new genre of anthropology.[167] Flaherty focused on the use of cinema, and Malinowski on scientific written ethnography, but both focused on visualizing knowledge.[168]

Malinowski's written ethnography *Argonauts of the Western Pacific* successfully created a visual quality in scientific ethnography, and his model of intensive fieldwork – where the field worker becomes "a visionary, (or) a seer"[168(p45)] – is the methodological basis for ethnographic work as we know it today. Flaherty's film, *Nanook of the North*, illustrates many of Malinowski's anthropological ideas and was released in the same year.[167] Though the film is fictional, Flaherty was able to capture a way of life that

was dying, while creating a sense of emotional commonality between the audience and the protagonists in the film.[168] Today, Flaherty is widely known as the father of ethnographic film.

Other pioneer scholars who applied film in their research included Margaret Mead, Jean Rouch, Tim Asch, Napoleon Chagnon, Sarah Elder, Leonard Kamerling, David MacDougall, and Sarah Pink, though they all applied film in their areas of study in distinct ways. For example, Mead's project *Trance and Dance in Bali* from the 1930s, in partnership with Gregory Bateson, explored schizophrenia and trance using narration to guide the viewer through the trance event. Jean Rouch in the 1960s used an approach called *cinema verité* (translates to "film truth"), with which he aimed to capture realistic attributes of time and space, letting the camera fall into the background.[169]

In 1975, *The Ax Fight* by Tim Asch and Napoleon Chagnon moved beyond the linear storytelling style of their predecessors.[170] Asch takes the viewer on a journey through a case study in the four-part film in a Yanomamo village in Southern Venezuela, where his analysis process and making sense of the actions are uncovered on film. The film reveals the importance of the knowledge generation process and points out that initial interpretations can be incorrect.[169] Showing the analysis process on film highlights the challenges that anthropologists, other researchers, and viewers face with comprehending events, and emphasizes the importance of considering the context and history. It also reveals the power of editing, and how knowledge is constructed.

Other scholars have adopted a more collaborative approach, such as Sarah Elder and Leonard Kamerling in their project *The Drums of Winter*, which explored Yup'ik Eskimo dance and community using participatory filmmaking to create a feature-length documentary in 1998.[171] Elder explains that in the project they aimed to "work as a team with the village to find out what was most important to document and preserve that time in history, and work as a team, the village, the residents and us, and put the whole thing together and come up with something that was really valuable."[171(p96)] The primary audience was the village, and the film was screened to the community before bringing it to the wider public and international audiences.[171]

David MacDougall's work builds upon others in the field but takes distinct turns from the work of Rouch and Mead. In contrast to Rouch's approach, MacDougall embraces a linear development of understanding approach that is highly reflexive.[172] He uses observational cinema and develops relationships with the participants and watches their actions unfold over time, which is in direct contrast to Mead's approach for exploring Balinese trance in 1939.[173,174] Instead of using a narrator like Mead, MacDougall lets the images unfold on screen, where the images are left to the interpretation of the viewer. MacDougall has been an important scholar in contemporary visual anthropology, and he continues to push the boundaries of film in academic work and highlights the benefits that the visual brings to the field: "Words are superior in their capacity of showing us the rules of the social and cultural institutions by which people live,"[175(p259)] but images have the power to address "subtle issues of social agency, body practice, and the role of the senses and emotions in social life."[169(p283)]

In contemporary visual anthropology, Sarah Pink has been influential in the field, using methodologies such as video tours, among other techniques, in which she invites participants to move through their environments and reflect on how they engage with their surroundings.[176] Much of her work adopts an applied approach where she aims to use her films to inform interventions and policy and influence public opinion, government, policymakers, and clinicians. Pink also discusses the benefits of visual work in reflection for both participants and researchers; it encourages participants to reflect upon their situations through the process of creating films which can be just as important as the footage itself and allows researchers to return to their research encounters for further reflection:[176]

> Video is a key element of short-term ethnography, it enables researchers to invite participants to perform, remember, reflect on and create recorded representations of the ways in which they experience and engage with their everyday environments. It moreover offers a route through which researchers may return to their research experiences and encounters and invites both co-researchers and target audiences to engage with them.[176(p412)]

The research conducted by these scholars reveals that film/video methods present a unique opportunity for generating knowledge. Film/video can capture concepts and ideas that go beyond what would be expressed in a typical interview, and beyond what a researcher may even think to ask. Pink explains, "these activities are not the kind of things [participants] usually speak about, or what would necessarily seem important to mention in an interview."[176(p423)] For these reasons, developing alternative ways of capturing and communicating knowledge, beyond traditional interviews, focus groups, and participant observation is essential.[176] The work of these authors have demonstrated that film/video has the power to reveal complexities and ambiguities of reality and can be a critical tool in studying behaviors and beliefs in various contexts. This dissertation is deeply influenced by the influential work conducted by these visual scholars, in particular Asch, Pink and MacDougall.

Despite the clear strengths of film/video methods in research, there is still a need for exploration of how they can be useful in public health. Some public health studies have used visual methods to explore homelessness, poverty among street children, autism, and learning disabilities.[177] The journal *Global Public Health* released a special double issue focusing on participatory visual methodologies in 2016, which included participatory video, Photovoice (i.e., participants use cameras to take photographs related to a prompt or research question, and the photos are used for discussion and for influencing programming and policy[178]), and community mapping, among others.[179] Numerous submissions were received, demonstrating considerable interest in the growing field of participatory visual research in public health. This special issue, among other sources, highlights examples of the strength of visual methods in revealing important details about human behavior and its applicability as a research tool.

2.0 Is Film as a Research Tool the Future of Public Health?: A Review of Study Designs, Opportunities and Challenges

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2.1 Abstract

Among public health researchers, there is a growing interest in film methods due to their ability to highlight subtleties in practices, capture emotions, engage hard to reach populations, and advocate for social change. Still, little is known about strengths and challenges associated with using film methods in public health. This review synthesizes peer-reviewed, public health research studies that apply film methods, and describes opportunities and challenges. Of the 3,431 identified articles, 20 met the inclusion criteria. Fifteen film methods were identified that offer numerous methodological strengths, including the ability to provide rich descriptions, capture emic perspectives, increase comfort in participation, empower participants, and be used for advocacy. Future studies may explore engaging participants throughout the entire research process and using visuals created in the study to communicate findings. Keeping in mind their unique challenges, film methods are long overdue in public health and provide unique opportunities to capture sensory data.

2.2 Introduction

Several disciplines including sociology,[180] education,[181] criminology, and psychology[182] have successfully incorporated visual methods into research studies. Though visual methods are widely used within anthropology and sociology,[165] their use in public health research is relatively limited. However,

some public health researchers are beginning to recognize the benefits of embracing creative visual methods, such as photography, film, video diaries and drawings,[183] to study abstract concepts and contexts,[183] highlight subtleties in agency and practices, capture emotions,[169,175] engage hard to reach populations,[184,185] raise awareness, and advocate for social change.[186,187] Sensory data, or data that includes sound,[188] environmental context,[175] and body language and expressions,[165,189] is not often captured with conventional public health research methods (e.g. surveys).[176,183] While it is widely recognized that health decisions and outcomes are influenced by social, cultural, and environmental factors, research methods for capturing contextual details and nuances are limited. This highlights a missed opportunity to use film, which can narrow in on cultural and social understandings to gain a deeper, holistic understanding of health and illness, and to capture details that may have been overlooked in previous studies.[190] For these reasons, developing alternative ways of capturing and communicating knowledge, beyond traditional interviews, focus groups, and participant observation is essential.[176] This is an opportune time to explore opportunities for applying film methods in public health, given their long history in other disciplines, and the rise in user-friendly technology that make such methods even more accessible.[191–193]

One of the most popular visual methods in public health, Photovoice, emerged as a research method in the mid-1990s[178,194] and embraces a community-based participatory research approach.[195,196] The method engages participants in photography to capture their own photographs that reflect their emic experiences.[178,197] The photographs are then used in reflection and dialog with participants, resulting in community-driven data and photographs that can be used as powerful tools to reach policymakers.[178,198] Photovoice is known for "marking an important turn in engaging communities in a deeper examination of social conditions and structural inequities for advancing the health of communities through participatory action."[199(p1019)] The method has since been adopted globally to study a wide range of social and health issues from cancer decision making,[196] to autism,[200] and has been applied in many populations, from youth[195] to elderly populations.[201]

While this growth in using visual tools within public health research is notable, little is known about the strengths and challenges associated with using film methods specifically, that expand beyond a visual moment captured on camera, into movements, gestures, and sounds. In their introduction to the 2016 special double issue in *Global Public Health* on participatory visual methodologies, authors Mitchell and Sommer highlight the "power of the visual to represent what is not easily put into words"[179(p521)] and note that they had not anticipated the "groundswell of interest"[179(p522)] they received in response to the associated call for paper submissions. The articles in that double issue address the strengths of visual methods in revealing important details about human behavior and their applicability as a research tool,[179] yet notably only a few focused on the role of film specifically. The purpose of this scoping review is to identify and synthesize existing published peer-reviewed studies that have used film methods in public health research. Doing so will allow public health researchers with an interest in exploring complex and sensitive topics with creative and sensory methods to build upon the work of others in the field. The authors believe that this review of the current literature will provide a strong foundation for others aiming to design research studies that capture nuanced understandings of health behaviors and beliefs. Note that the broader term "film" is used to refer to works of either film or video, where filmmaking refers to the art of storytelling with moving images, music, and words.

2.3 Methodology

Scoping reviews are commonly used to explore and clarify definitions, and to understand the conceptual boundaries of a topic or field.[202–205] This study was designed using the established scoping studies framework and review[202–204,206] and followed the PRISMA extension for scoping reviews checklist for reporting results.[207] Search results were imported into DistillerSR, a systematic review management software, which was used throughout the entire review process.

A study protocol was developed and reviewed by the study team, including a health sciences librarian (Folb) and methods expert (Burke). The protocol outlined eligibility criteria for inclusion, study definitions, search criteria, and data management and analysis plans. Inclusion criteria were the following: must include primary data collection; explore a public health issue; include a visual component in the research process and be published between 2008-2018 in the peer-reviewed literature in English. Exclusion criteria were the following: not considered research studies; public health is not the primary research interest; primary focus on medical technology and clinical advances (e.g., medical imaging); scoping reviews, systematic reviews, or commentary articles; and film methods as interventions as opposed to data collection tools (e.g., screening an educational film). Film methods were defined as those using film or video in the research study design. Public health was defined as relating to disease outcomes, encounters with the health system, preventative measures, and/or health-related behaviors and behavior change. Since no human subjects were included in this study, the authors did not seek approval from a human subjects ethical review board.

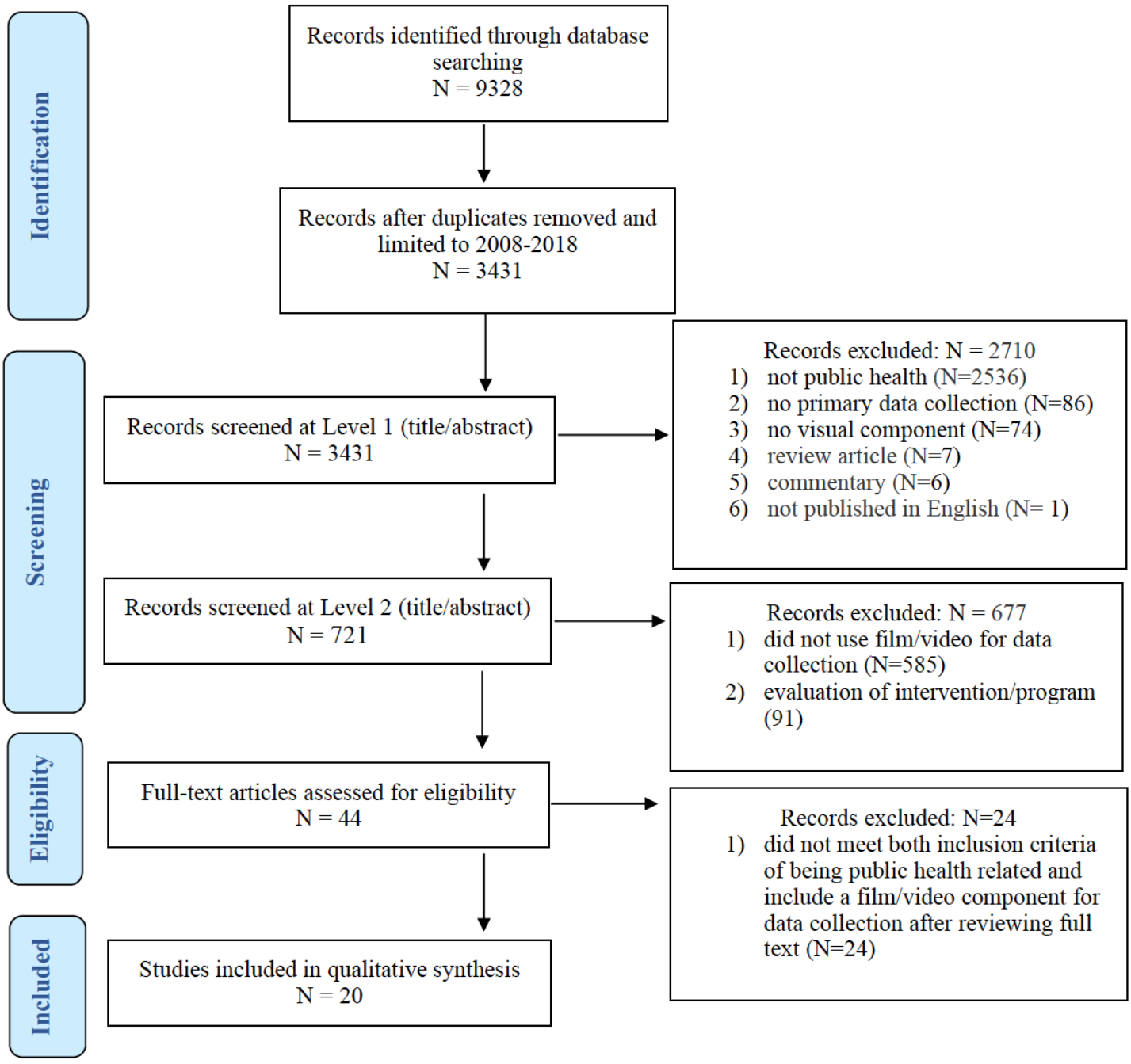
A broad search of synonyms for visual research methods was developed by the team librarian in Scopus (Elsevier Science). The search was adapted for PubMed (National Library of Medicine), Web of Science Core Collection (Clarivate Analytics), CINAHL (EBSCOhost), Academic Search Premier (EBSCOhost) and CABI Global Health (Ovid). A total of 9,328 citations were retrieved, duplicates were removed in EndNote, and the search included studies published between 2008-2018 (Figure 8).

Next, an inclusion/exclusion form was created and piloted in DistillerSR. For Level 1 screening, article titles and abstracts were distributed between three reviewers. 721 articles advanced to Level 2 screening, where the study team narrowed the search to articles using film methods only. At this stage, two reviewers independently reviewed each abstract and discrepancies were remedied. Forty-four articles advanced to Level 3, where full-text articles were reviewed by two independent reviewers to ensure articles met the inclusion criteria. The final 20 articles were split between the two reviewers for data extraction related to the research questions (Figure 7). The lead author reviewed data extraction forms for completeness and accuracy.

1. Title
2. Author
3. Year
4. Country of study
5. Public health topic
6. Sample size
7. Sample population
8. Type of method used
9. Steps in applying the method
10. Steps in analyzing the data
11. Strengths of the method
12. Challenges associated with the method

Figure 7 Data Extraction Fields, Film Methods in Public Health Research, 2019.

Content analysis was completed to describe the range of film methods, implementation details, population, and challenges and strengths uncovered. The narrative is supported by a table providing a summary of each film method. The data synthesis was managed using a Microsoft Excel spreadsheet and was reviewed by the team for consensus.



Note. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Figure 8 Prisma Flow Diagram, Film Research Methods in Public Health, 2019.

2.4 Results

Study Characteristics and Film Methods

The most common public health topic studied using film methods was adolescent health (40%), followed by mental health (20%), environment and neighborhood effects on health (15%), asthma (10%), and immigrant and refugee health (10%) (Table 2). Notably, 25% of the studies explored sensitive public health topics such as sexual assault, HIV/AIDS, and leprosy stigma. Study populations ranged from youth to elderly and included both men and women. Of the fifteen film research methods identified, Videovoice, Video diaries, Video Intervention/Prevention Assessment (VIA) and Autovideography were most common. Many projects lasted between eight to 12 weeks (25%), but there were also several shorter projects lasting between one to six weeks (25%).

Forty percent of the studies included a film screening, where the films created were shown to those outside of the study. In one example, films were screened with teachers, municipality representatives, nonprofit organization representatives, parents of the participants, and girls from a nearby village.[193] Another study team screened the films at a fundraising event,[208] and a third study screened films with community leaders and policymakers before releasing them on YouTube (Table 2).[187]

Data Analysis Approaches used for Film Methods

Over one-third of studies (35%) supplemented film data with other forms of data (e.g., discussions, drawings) for triangulation. For example, Catalani and colleagues used participants' environmental footage, in-depth interviews, and discussion sessions, which "allowed (researchers) to confirm or disconfirm our findings."[187(p22)] Film screenings were also important in the triangulation process. For example, reactions to film screenings provided a source of validity checking, where participants watched the films to ensure their stories were being portrayed accurately.[187] Other studies solicited audience responses from film producers/participants to understand reactions to their own productions.[193]

Three of the studies (15%) included participants/creators in the analysis process, whether through interviews, group discussions, or describing key themes in the films.[187,209,210] Grounded theory was used for guiding analysis in 20% of the studies; NVivo and Atlas.ti were commonly used data management softwares, 30%, and 20% respectively.

Presentation of Film Methods and Results

Nearly all studies (95%) presented results via a narrative with key themes and illustrative quotes. Results sections of articles included various details about the films, including the length of the films (i.e. range, average length), filmmaking locations, mode of filming (e.g. participant held the camera aimed at his/her face), quality of the films (e.g. raw, unrehearsed), and participants' perceived comfort level with camera. A few manuscripts included a range of support material to describe the results such as a script,[210] storyboards,[193] still film frames with associated quotes,[211] photographs of the recording process,[193] and tables for describing participant demographics.[212]

Film Methods Strengths

Provide Rich Descriptions

Film methods facilitated capturing uniquely detailed descriptions of behavior, environment, interactions, sound, space, and movement (Table 3). In one study, the authors described the power of film to capture what interviews alone could not: "Videography is unique in its ability to capture voluminous details and nuances of interactions, events, and settings in real time—all of which can be reviewed multiple times to enable in-depth analysis unmatched by field notes, audio files, or transcripts alone."[213(p419)]

Capture Emic Perspectives

Authors that used Autovideography described the data as largely participant generated,[208] and Videovoice was used to capture insider perspectives aimed to prioritize public health issues.[187] Authors of

a video diary study expressed that the method encouraged intimacy with the participants where the camera was a tool for participants to express themselves in ways that they could not do directly with people.[214]

Increase the Level of Comfort in Participation

In a Videovoice study, the use of media with its emphasis on storytelling and multimedia communication was attributed to facilitating the engagement of community partners.[187] The authors explained that some community partners may have been less comfortable with text or numeric data, but multimedia approaches helped to facilitate and encourage engagement.[187] Similarly, in a study using video-elicitation, participation was greater than what researchers experienced in previous studies using interviews alone.[211]

Empower Participants

In one study, authors discussed the strength of VIA to empower patients to express themselves: "Applying this method reduces the power dynamic between the patient and clinician by giving participants control of clinically relevant information."[215(p9)] In another study, authors expressed that they observed confidence, capacity to handle equipment, and communication skills improve.[216] Advocacy empowerment, where participants felt significantly more empowered to act and effect change within their community during the film project period, was also found.[217]

Can be Used as Advocacy Tools

Multimedia products created during the study could be disseminated beyond traditional academic publications to reach audiences of diverse educational backgrounds and those with little experience with academic research.[187] Additionally, another added benefit of participant-generated film projects is their authenticity, as they were created directly by participants.[208]

Film Methods Challenges

Ethical Concerns

Three studies (15%) discussed the importance of film ethics, where issues of protection, privacy, and ownership needed to be carefully considered (Table 4). Film is powerful in its ability to share visuals and voices directly from participants; however, protection of participants from unnecessary risk, including embarrassment and potential negative effects of showing personal images and voices in public must be addressed in study designs. In one study, participants interested in screening their footage in public completed a secondary consent process to give permission to screen their film outside of the study team, where participants decided which parts of their films could be used for advocacy and educational purposes.[208] Similarly, another study used layers of consent, where participants could choose to be filmed, but were not required to display their work publicly.[218] Additional ethical considerations arose around the sensitive nature of content captured. In one study focusing on sexual violence, re-traumatization from the filmmaking process needed to be carefully considered when preparing participants.[193]

In contrast, a different type of ethical dilemma can arise if participants desire to be named and recognized for their work. Moletsane et al. explain, "ethical considerations include the need for anonymity of the participants. However, with visual methodologies, there is also a strong need to acknowledge the authors of the texts, particularly in the case of women."[210(p327)] In one study, participants agreed upon a group name to be acknowledged at the screening, giving them recognition for their work, while also protecting individual identities.[193] Similarly, Treffry-Goatley et al. noted that confidentiality was a challenge when it came to screening films publicly, but they were able to find a solution: "Rather than having individuals present their own work, we asked them to nominate a spokesperson to present the productions on the group's behalf."[193(p58)] At the screening, researchers clarified that the visual material was created as a group and did not represent the views of any one participant.[193] Thus, the researchers were able to protect individuals from negative reactions, while also giving them a platform to share their opinions and voices.

Social Desirability Bias

Like many research methodologies, social desirability bias was raised as a limitation. Though participants appeared to speak openly and honestly in films, authors acknowledged that responses may have been influenced by knowing their films could be viewed by others.[187] Similarly, others expressed that "informants may present themselves in accordance with what is expected of them, but also how they want to be perceived in relation to those expectations."[219(p218)] Authors worked to address this through triangulation techniques, such as involving various stakeholders at different stages of the research process, and verifying findings during film screenings with community members.

Time

Challenges related to time were often raised, whether for implementing training, data collection or keeping the participants engaged. Another study discussed the time-intensive process of film data analysis, but compare it to similar challenges faced with qualitative studies.[211] Keeping participants interested throughout film production can also be challenging, as one study described the multimedia aspects as a draw for participants, but "engendering interest and continued involvement in the program proved to be the most challenging issue."[220(p231)]

Equipment

In one study, three participants did not make films beyond the initial film produced with the research assistant due to technical challenges with recording.[208] In another study with leprosy patients, the authors and participants had different challenges: "For those whose hands were impaired, it was challenging to learn to operate the devices…There was a need for more than the anticipated number of sessions to acquire the basic skills…ultimately all participants could use the equipment."[216(p677)]

2.5 Discussion

This study is the first known systematic scoping review to explore and summarize existing research addressing the use of film methods in public health research. The results provide a foundation for researchers to build upon as they explore the relevance and use of film methods in study designs. The scoping review revealed a variety of film methods and a range in terms of populations, public health topics, and sample size.

The study findings related to the benefits of film methods are consistent with existing reviews of other visual methods used in public health research. For example, a systematic review of Photovoice studies similarly found that the method was successful in empowering and engaging marginalized communities in an action-oriented manner.[201] Film methods, similar to Photovoice, also offer strengths such as the opportunity to use the products created in advocacy efforts.[187,208,210,211,216,220,221] The findings from this review echo the strengths found in a review of creative, arts-based methodologies, including participant engagement, reflection, the ability to collect spatial experiences, and multisensory data,[222] while also revealing a number of gaps and opportunities that require further exploration.

This review of film methods revealed that ethical considerations are a key area that requires substantial attention when designing film research studies. Developing ethics protocols and working closely with institutional review boards to determine best approaches for navigating this new area of film in public health research are processes that must not be overlooked. Each study has its own unique challenges, but it is recommended that decisions regarding anonymity and ownership be discussed directly with participants, keeping in mind the unique social and cultural contexts when it comes to privacy. Furthermore, it is recommended that the consent process be an ongoing discussion throughout the research study, recognizing that feelings regarding involvement can change over time. Checking back in with participants after a public screening is also an area that can be further explored, to better understand how a public screening affects how participants feel about the topic being studied, and to ensure participants consent to future screenings.

Interestingly, only three[193,210,211] out of the 20 studies used a visual product created during the study to support the study findings, such as visuals from the study or screen shots from films. This highlights a missed opportunity to harness the power of visuals to communicate study findings. For example, authors of a visual storytelling study highlight the power of images to communicate findings: "In presenting the images, we as researchers become less of a conduit between raw data and final interpretations because audience members can quickly become engaged in viewing, assessing, and analyzing the data themselves."[223(p1685)] Future studies should consider how powerful imagery created by participants can best support the communication of findings, especially with the rise of academic journals that provide opportunities to support text with supplementary visuals online.

Considering the fact that filmmaking is naturally collaborative, it was also unexpected to find only three studies that engaged participants throughout the research process. Engagement ranged, from Autovideography that hands the camera over to participants with little direction, to other approaches that provided participants with guiding questions and prompts, such as VIA. Though different approaches may be appropriate for exploring different research questions, a review of Photovoice studies found the strongest studies were those that incorporated participants throughout all phases of the study.[201] This is consistent with findings from community-based participatory research (CBPR) that notes numerous benefits of engaging participants in all steps of the research process, including increasing the validity and quality of the research and enhancing the usefulness of the results.[12,187] Future studies should continue to explore appropriate ways to engage participants throughout the research study process, such as in the analysis stage and dissemination of the films.

This scoping review uncovered valuable information about the use of film methods in public health, yet there are select limitations are worth noting. It includes peer-reviewed studies published only in English from the past decade and grey literature was excluded. However, to mitigate the risk of overlooking studies published outside the aforementioned databases, we ran multiple exploratory searches to identify keywords, synonyms, authors, and journals in which visual public health studies are typically published. Though a detailed definition of public health was refined with piloting, it is possible the study

team may have overlooked studies that appeared to be medical or unrelated to public health based on titles and abstracts. However, given the multiple rounds of pilot searches and independent reviewers, we are confident that this review captures the scope of empirical research articles that applied film methods in public health.

2.6 Conclusion

The use of film research methods has been relatively limited in public health, but their benefits, keeping in mind their unique challenges, suggest that more widespread use of such methods is long overdue. Future research studies using film must closely consider ethical challenges. Further investigation of missed opportunities is also needed, including engaging participants throughout the entire research process and incorporating visuals created by participants into manuscripts and developing supplementary visual materials to effectively communicate research findings.

2.7 Acknowledgements

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2.8 Tables and Figures

Table 2 Overview of Film/Video Studies and Steps for Implementation and Analysis, 2019.

Film/Video Method	Author(s), (Year), Country	Study Setting, Participants, and Sample Size	Public Health Topic(s)	Steps for Implementing Method and Length of Engagement	Steps for Analysis
Videovoice - Participatory research and advocacy technique that trains lay community members in videography and outreach	Catalani, Veneziale, Campbell, Herbst, Butler, Springgate, and Minkler (2012), United States	- Central City neighborhood of New Orleans, post hurricane Katrina. - n=10 (28 to 78 years, 70% male, 80% African American, annual household income < $2,000 - < $50,000, education high school - graduate school)	Evironment and neighborhood effects on health	- Training - Weeklong training and orientation on Videovoice, project objectives and timeline, community health concerns, ethics and safety in video production, and video equipment operation. - Partners systematically collected footage and attended weekly discussion and training sessions for 12 weeks. - Participants collected environmental footage, then conducted 37 videotaped in-depth interviews with community participants. - Participants analyzed, transcribed, and edited footage and attended weekly discussion and training sessions. - Films were screened and post-screening questionnaires were completed. - Final film was divided into several short, issue-based films and shared online via YouTube. - Film and extras on the making of the film were distributed via DVD. Partners also shared the DVD with targeted community leaders and policymakers in recognition of their influence in the highlighted issues. - Total length: 13 weeks	- Participatory analysis was used. Engaged community and academic partners in a three-stage process: selecting, contextualizing, and codifying (Wang & Burris, 1997). Selecting involved choosing those clips of footage that most accurately reflected community needs and assets; contextualizing involved engaging in critical discussion using the SHOWeD technique, and participants' own questions, to uncover the meaning of video footage; and codifying involved identifying those issues, themes, and theories that emerge in the footage and SHOWeD discussions. This iterative approach informed purposeful selection of additional interviews and environmental footage, with the objective of reaching saturation and testing rival hypotheses. - Community assessment findings were based on the triangulation of several kinds of data: participants' environmental footage, in-depth interviews, and discussion sessions.
Videovoice	Warren, Knight, Holl, Gupta (2014), United States	- Communities in Cook County Illinois were randomly selected using the National Children's Study (NCS). Communities predominantly inhabited by ethnic minority populations were selected based on (a) having a high population of Latinos, (b) a high concentration of children living in poverty, (c) requested NCS materials in languages other than English, (d) lacked identifiable outreach opportunities, and (e) had low attendance at community events. - Two target communities were composed of mostly Spanish-speaking residents of Mexican descent, two were primarily African American and had the highest percentage of children living in poverty, and two were ethnically diverse, but lacked identifiable avenues for outreach. - n=6 (100% female, ethnically and linguistically representative of the local populations, five were mothers, and all had extensive life and work experience within their respective communities)	Child and adolescent health and development; Environment and neighborhood effects on health	- Training - Six weekly two-hour training sessions, covering research ethics, interviewing techniques, and videography. - Participants conducted videotaped interviews with key stakeholders in their respective communities. - Footage was reviewed at subsequent training sessions, using a three-part participatory visual analysis used by C. E. Catalani et al. (2012) and originally detailed by Wang and Burris (1997). Participants selected <5 minute excerpts from their interview footage that most accurately reflected community needs related to the study. - Participants shared details that they felt were necessary to situate the footage in its particular community context. - Participants codified qualitative themes relating to NCS community outreach and engagement through collective discussions. - Footage was compiled into promotional videos, based on storyboards created through an iterative process of participatory editing. - Videos were finalized and approved by each participant and disseminated online and at community events. - Pre/post questionnaires were administered at the first and last Videovoice training sessions to all participants. - Participants videotaped "debriefings" after each session. These debriefings were posted each week on the Videovoice project blog. - Total length: 6 weeks	- The pre/post training session questionnaires were analyzed quantitatively using paired-sample t tests to compare participants' pre- and post- test scores. - Videovoice training sessions were recorded and transcribed. These, along with the videos from the field, were coded qualitatively for themes. - In addition, participants recorded two videotaped "debriefings" after each session. These debriefings were posted each week on the Videovoice project blog.
Videovoice	Warren, Dyer, Blumenstock, and Gupta (2016), United States	- Back of the Yards community on the southwest side of Chicago, Illinois. A public elementary school was selected based on previous work identifying this community as having elevated asthma prevalence rates relative to surrounding areas. - Participants were 7th and 8th grade students with both an asthma diagnosis of any severity and asthma medications (e.g. Albuterol, Fluticasone) on file. - n=10 (ages ranged from 12 to 14 years, 11 Mexican American and 1 African American)	Asthma; Adolescent health	- Participants were loaned a Samsung Galaxy Player 5.0, an internet-enabled mobile device that permitted capture of high-resolution photo and video. Nonessential functions on the device were blocked. - The first phase (four weeks) focused on using Photovoice/Videovoice methods to explore the local community and how a variety of factors at the individual, school, home, and neighborhood levels can impact asthma management. During this phase, most sessions incorporated educational asthma materials, and weekly homework assignments entailed students using their devices to capture footage that engaged with the following questions: (1) What is your neighborhood community like? (2) What is your school community like? (3) What are things in your neighborhood or school community that make your asthma worse? (4) What are things in your neighborhood or school community that make your asthma better? Students were encouraged to interview their classmates, family members, and other community members about their perceptions regarding asthma and what can be done to reduce triggers and improve support for children with asthma. - All sessions that involved the review and critique of participant footage utilized the SHOWED method of root cause questioning, wherein students are posed the following questions about each piece of footage: (1) What do you See here? (2) What is really Happening here? (3) How does this relate to Our lives? (4) Why does this concern, situation, strength exist? (5) How can we become Empowered through our new understanding? (6) What can we Do? - The second phase (five weeks) taught students the basics of health communication and audiovisual production and involved the creation of four student-filmed educational videos. These videos were produced via an iterative process of students reviewing their footage from participatory assignments to identify important themes, storyboarding PSAs based on those themes, identifying additional footage needed to complete the PSA, and collecting this footage. A draft PSA was created by the study coordinator between sessions and presented to the class for review, at which point another round of iterative editing began until all students were satisfied with the resulting video. - Students also expressed a desire to create educational posters about asthma to hang in the school entryway. Therefore, during four sessions, materials were provided for students to create these posters, copies of which were also submitted to the U.S. Environmental Protection Agency Region Five Asthma Awareness Poster Contest. - The third phase (four weeks) involved the dissemination of student-produced videos, posters, and research findings around the school and broader community via a series of student-led presentations. - Four student-produced videos were shown, and opportunities were provided for parents to ask questions of the study team, which included a pediatrician. Students also used tablet computers to share their videos with additional parents and community members as they congregated each morning in front of the school prior to the first bell. - Total length: 12 weeks	- Statistical analysis was completed for scales and surveys. - Video footage was not explicitly analyzed in this paper.
Video Diaries - Form of visual ethnography where the informant gets instructions, but chooses where and when documenting is carried out to provide a full description of social life	Lundstrom, Ekborg, and Ideland (2012), Sweden	- Students were recruited from five different programs of study in upper secondary school, and from five different schools. - n= 7(ages ranged from 17 to 19 years, 4 girls and 3 boys)	Vaccination; Adolescent health; Health decision-making	- Participants were given a video player and an mp3 player. One student wanted to take photos instead of videos and was instructed to do so. Furthermore, participants could write diary entries instead of filming if they wanted. - The informants were requested to document situations in which they consider science knowledge to be of importance in their daily life outside school. Additionally, all seven teenagers were asked for to comment on their decision about the vaccination against the new influenza. - All informants made their diaries during the weeks the vaccination program was ongoing. The teenagers made their diaries in one to three weeks, and all of them had made their decision about the vaccination when they finished their diaries. - Videos were transcribed and one to four weeks later, semi-structured interviews were conducted by one of the authors. During the interviews, part of their video diary was viewed and some of the material was discussed with the participants. Questions asked were about their vaccination decision and what they thought about their decision afterwards. There were also questions about what they thought about science and their education. The interviews lasted 20–40 min and were recorded and transcribed in Swedish and translated for this article. Follow-up interviews helped to achieve a two-way conversation about the issues discussed in the video diaries and gave the researcher an opportunity to understand more about the information given by the informants. - Total length: 7 weeks	- Video diaries were analyzed for key phrases to describe the student's views, which were then grouped into themes.

Table 2 Continued

Video Diaries	Norton, Thomas, Lomax, and Dudley-Brown (2012), United States	- Participants were to have a physician's diagnosis of Crohn's Disease (CD), have self-reported moderate to severe CD, be under the care of a specialist, be taking medication to treat CD, and agreed to film a video diary and participate in a focus group. - Biologic-experienced participants (23) were those currently receiving biologic therapy for their CD, and biologic-naïve participants (21) were those who had never been treated with a biologic therapy for their CD. Patients who had failed or discontinued prior biologic therapy for any reason were excluded. - n=44 (ages ranged from 18 to 75 years, 50% women and 50% male)	Crohn's disease; Quality of life	- Participants were provided Flip VideoTM cameras with instructions to create 30-minute video diaries that depicted a day in their life as a patient with CD. Participants were asked to submit an accompanying monologue describing their experiences. -Small, in-person group discussions were held at central locations in Chicago, Illinois; New York, New York; and Dallas, Texas. Twelve groups were split by prior biologic therapy usage (experienced versus naïve) and sex, with three to four participants per group. Each group discussion was two hours long and was led by a moderator. Group interviews were highly exploratory in nature. - Twelve focus groups were conducted, with three to four participants composing each group. - Total length: 8 weeks	- Data from the videos and group interviews were summarized qualitatively by grouping similar answers and quotations.
Video Diaries	Edinburgh, Garcia, and Saewyc (2013), United States	- Hmong (an Asian ethnic tribal group from the mountainous regions of Southeast Asia) adolescent girls who had run away from home, been sexually assaulted, and were treated at an urban children's hospital in the Midwestern U.S. with a large Hmong population. - Exclusion criteria: (a) incarcerated; (b) were placed in foster-care; and (c) did not speak English. - n=11 (ages ranged from 13 and 16 years, 100% female, all participants were enrolled in the Runaway Intervention Program)	Adolescent health; Sexual assault, exploitation, and violence; Immigrant and refugee health	- Video diaries were completed by each adolescent girl during the first three months of their enrollment in the Runaway Intervention Program using digital video recorders loaned to them by the study team. - The diaries were recorded in their home in a space chosen by the teen, or in a private room in the clinic. - The teens were provided with open-ended questions to respond to and were asked to reflect on what was going on in their life, or what was important to them that day. Example questions include: "Tell me about your mood today," "What keeps you from leaving home?" and "What are you feeling before you leave home?". - Total length: Not reported	- All video data were reviewed multiple times in their entirety by at least one member of the research team. - Spoken words in the video diaries were transcribed verbatim. - The data were imported into Atlas.ti. - The analysis followed a coding process outlined by Sandelowski, Docherty, and Emden (1997), which systematically labels data descriptively, and then organizes the codes into groups, or categories, that reflect commonalities. Because the participants were provided a set of questions, the responses typically fell into descriptive categories that coincided with the question being answered (quasi-deductive process). The participants did not always answer every question, so care was taken to ensure that the descriptive categories reflected what participants shared in response to the questions they addressed. - The research team corroborated the coding structure, assignment of codes to verbatim text, and the selection of the descriptive categories.
Video Intervention/Prevention Assessment (VIA) - Participants' experiences and expressions are shown and told by them while living their day-to-day lives	Chung, Sherman, Goodman, Bickham, and Rich (2013), United States	- Adolescent girls with obesity and with normal-weight were recruited from adolescent primary care and obesity specialty clinics at a large children's hospital in the northeastern United States from 2007 to 2009. - Exclusion criteria: (a) genetic, metabolic, or other medical conditions that predisposed to becoming over-weight; (b) restrictive eating disorders; (c) cognitive or physical impairments that precluded completion of questionnaires and an audiovisual narrative; and (d) primary languages other than English. - n=14 (ages ranged from 12 to 20 years, 100% female, African American (n = 11), White (n = 2), and Hispanic (n = 1), all lived in urban neighborhoods similar to the broader clinic population)	Obesity; Adolescent health	- Participants were asked to teach their clinicians about their experiences by documenting their lives on video, revealing issues they faced, how they responded to them, and what they thought. Researchers encouraged participants to show and tell anything that revealed the realities of their lives and that might affect their weight and health. - Next, participants were given standardized suggestions of cross-comparable information to record, including details of their physical and psychosocial environments, interviews of family members and friends, and personal monologues relating experiences, thoughts, and emotions that might affect their weight, health, or psychological status. - Total length: 2 weeks	- Following the tenets of grounded theory, authors identified key themes regarding the participants' health and well-being based on what they recorded and said. - Authors standardized the VIA logging process to maintain the richness of the original data in as many dimensions as possible (Rich et al., 2005; Rich & Patashnick, 2002). Through logging, they organized the textual documentation of the data using discrete identification of each frame of the audio-visual narrative to allow for correlation. They detailed and carefully structured the logs, including descriptions of what was seen, what was heard, and the perspective of the narrative in each moment (who was holding the camera). Two different loggers logged each visual narrative to optimize reliability. -Authors logged and coded the audiovisual data using linked Transana 2.41 (Wisconsin Center for Education Research, 2009) and NVivo 8.0 (QSR International, 2007) qualitative analysis software. - In NVivo, authors coded emerging themes as "free nodes," which were defined, modified, and refined iteratively. After coding, they built conceptual relationships between nodes and structured free nodes into conceptual "trees" of related themes. They used NVivo to metastructure the data, finding areas in which themes overlapped through the use of Boolean searches for intersections of nodes. A second coder independently coded 30% of the data and compared these results with the primary coder's results to establish the validity of code assignments.
Video Intervention/Prevention Assessment (VIA)	Akre, Light, Sherman, Polvinen, and Rich (2015), United States	- Individuals with spina bifida (SB); all levels of SB and abilities were eligible; mobility of included participants ranged from using crutches and leg braces to wheelchairs - n= 14 (ages ranged from 13-28 years, 7 females, and 7 males)	Sexual health; Adolescent health	- Participants were loaned a video camcorder for a period of eight to 12 weeks and trained to shoot VIA visual narratives. Participants were encouraged to record any and all aspects of their lives that they wanted to share, with the knowledge that the videos would be used to educate the medical community about their experience living with SB. - Participants were provided with written prompts, including (a) Daily Talk Suggestions – ideas to help them get started (e.g. Tell us what happened today); (b) Interview Questions – general and medical questions for family members or friends (e.g. What is spina bifida?); (c) General Suggestions – important experiences and aspects of their lives with SB (e.g. Record a doctor's appointment). Participants were free to use all or none of these prompts. Only one prompt in the Daily Talk Suggestions was directly related to our subject: "Talk about a friend or girlfriend/boyfriend". - Field Coordinators made regular visits to participants' homes to make sure the cameras were working properly, to pick up fully recorded tapes and distribute new ones, and to perform interviews with participants. - Total length: 12 weeks	- VIA visual narratives were analyzed using grounded theory (Glaser, 1992) to develop, structure, examine, and code an array of prevalent themes from an emic point of view. - Videos were screened two to four, objective scenes recorded, dialogue transcribed verbatim, and notes/memos made on contextual and subjective aspects observed by the coder. - Data was managed using NVivo, a qualitative analysis software to manage visual data.
Autovideography - Turns cameras over directly to participants and invites them to make recordings in their natural settings without the presence of any researcher	Linz, Hanrahan, DeCesaris, Petros, and Solomon (2016), United States	- Individuals with a self-reported diagnosis of Severe Mental Illness (SMI), who had graduated from a 12-week recovery education program participated. The psychiatric diagnoses among both groups were: major depression, psychotic disorder, obsessive- compulsive disorder, bipolar disorder, and posttraumatic stress disorder. - Exclusion criteria: (a) incapable of providing informed consent by agency staff members; and (b) if the participant had not completed enough modules to receive a certificate of completion. - Participants were recruited and randomized by a computerized random number generator to either the intervention group (loaned video cameras) or control group (usual treatment). - n=12 (video intervention group only) (participants were 18 years or older, 36% male and 64% female, 29% Caucasian, 57% African American, and 2% other, 100% of participants were un-employed with a mean monthly income of $759)	Severe Mental Illness	- Participants were loaned inexpensive video cameras, trained in their use by a research assistant, and provided a handbook of technical information. - Participants were asked to create videos to "tell us about your recovery" and informed that they could shoot up to eight hours of video over a four-week period. Additional consent forms were provided to participants so that they could choose to interview and record others. - During Weeks one and three, research assistants called participants to discuss their experience with the video process. - After two weeks of filming, participants met with research assistants to discuss their progress and experience, review technical instructions, and receive a new memory card if needed. - At the end of four weeks, participants again met with the research assistants to view and discuss the content of the completed videos. - A secondary consent form was signed regarding the future uses of the produced videos. Participants were given the option to decide which, if any, of the produced segments could be used for educational or advocacy purposes. Third-party consents were also reviewed and collected. Participants were given the option of keeping a copy of their videos. - Videos produced by participants were edited and compiled to specific topics of Who I Am, What Recovery Means to Me, Barriers to Recovery, and Facilitators of Recovery. These edited video snippets were shown at the annual fundraising event for the mental health organization partner Mental Health Association of Southeastern Pennsylvania (MHASP), in which all participants were invited to attend. The videos were well received, and participants were able to see the fruits of their labors reaching an audience. - Total length: 4 weeks	- Videos were transcribed by two members of the research team and reviewed for accuracy by a third team member. - The transcripts were reviewed and checked against the original videos for accuracy, emotional tone, and analysis of verbal and non-verbal data by two qualitative analysts with the use of NVivo software version 10. - Patterns were identified and codes developed, recoded, and collapsed to develop categories of greater abstraction (Wiest, 2012). Reflective memos were written to support reflexivity and identify bias. Extensive analytic memos provided an audit trail for the logical thread of data analysis. - The qualitative analytic team met on one occasion to compare and agree on codes and thematic analysis. - Subsequently, a codebook was developed by one of the qualitative analysts from the meeting consensus and sent electronically to all researchers for further discussion and final agreement.

Table 2 Continued

Autovideography	Petros, Solomon, Linz, DeCesaris, and Hanrahan (2016), United States	- Eligible participants successfully completed a 12-week recovery and education course for Serious Mental Illness. - n= 12 (limited to 6 for analysis) (participants were 18 years or older)	Mental health; Severe Mental Illness	- Participants were randomly assigned to control and experimental conditions. The 12 adults in the experimental condition were loaned inexpensive video cameras along with technological training on their use with the invitation to "Tell us about your recovery" through autovideography. - Researchers worked with participants to create films over a four-week period of time, with a booster meeting after the second week to provide technical assistance and develop strategies to overcome any barriers to filming. - Videos and cameras were collected after the fourth week. - Total length: 4 weeks	- All videos were transcribed by two members of the research team and reviewed for accuracy by a third member. - Researchers used NVivo 9 and 10 software packages to manage and analyze data. - Authors initiated thematic analysis by reviewing transcripts and attempting to bracket out previous knowledge of recovery in an inductive approach to understand participants' experiences as they were lived. - Two researchers independently coded all transcripts to identify breadth of descriptors of the phenomenon in a process called horizontalization. The research team met to review results of initial coding and decide on further analytical strategies, ultimately resulting in a decision to incorporate deductive strategies based on an existing recovery framework. - Three members of the research team met four times in-person and through online channels to complete the final codebook that was unanimously adopted to deductively analyze and organize data into clusters of meaning. - One member analyzed all transcripts again using the master codebook. - The same researcher then analyzed videos employing the process of indexing to identify key events and segments of videos to enable researchers to return to identified video clips and review sub-events. - Twenty percent of transcripts were randomly selected and double coded to assess inter-coder reliability and strengthen perspectival triangulation, where discrepancies were resolved by consensus. Memos were developed throughout the process of analysis and were discussed in person and shared via an online secure server with all researchers having access.
Participatory Video-making - Participants are involved in constructing their own videos with researchers facilitating and assisting with video-making where necessary	Moletsane, Mitchell, De Lange, Stuart, Buthelezi, and Taylor (2009), South Africa	- Producers included parents and community health workers in a rural KwaZulu-Natal province. - The participants in the larger project (screening of the film) included approximately 80 high school students, teachers, community health care workers, and several parents from two rural schools. - n=7 (ages ranged from early 20s to early 40s, 6 women and 1 man)	HIV /AIDS	- Video workshops were organized in two schools to train participants. These workshops involved 30–35 participants in each school, organized into small groups of five to six participants. Producers helped the small groups create the rough cut of their video by working the equipment and guiding their discussion. The participants were involved in constructing their own videos, from story-boarding to the video production, with researchers facilitating and assisting with video-making technical skills where necessary. - Each small group had one video camera, a tripod, and chart paper for brainstorming activities. Each small group was facilitated by a member of the research team or a member of a local youth group with whom the study team had previously worked. Given the time constraints – participants only had a few hours to produce a complete rough cut of the video – and the need to ensure that the groups could use their mother tongue, isiZulu, a hands-on approach was essential. - The first phase involved a brainstorming session in which each group identified the various challenges they individually and collectively faced in their everyday lives in communities and the school. - The second phase involved group members democratically voting on a topic they would like to make a video on, by placing a sticky dot next to an issue they viewed as important and worth making a video of. Based on the number of votes, each group identified, by consensus, an issue for their video. - In the third phase the groups embarked upon a short intensive practice session, helped by the facilitators, on storyboarding and using a video camera to explore and express issues of concern in their everyday lives. The groups varied in the degree of planning that they were able to do – with their efforts ranging from a very tightly orchestrated piece by both groups of community health care workers (including a musical soundtrack) to productions that might be described as more organic in approach. - Because of time and location constraints, the video had to be shot in and around the school, and by mid-afternoon every group had to have their final cut ready to screen in front of the whole group. This was important for several reasons. As part of the process of developing an understanding of what the issues were and of identifying possible solutions for them, first, we wanted all the groups to be able to 'see for themselves' and talk about and debate what each group had produced. - Thus, in the fourth phase, the groups shot their three-minute videos. - Total length: One day	- Authors used textual analysis to look at three levels of textuality: the primary text, the production text, and audience text. Adapting Fiske's (1989) notion of audience texts to include the producers themselves as audience of their own videos, authors solicited and studied audience responses to the video documentary as research data. - In so doing authors looked at several layers of textuality: first, the primary text or the video documentary itself; second, the production text which includes both a consideration of what the producers had to say about their production along with the production strategies invoked by the participants; and finally, and to a more limited extent, the audience text. At this stage, the documentaries were not so much final products in, and of, themselves but various entry points into identifying common challenges these individuals and groups face, and possible solutions for them. - The video was regarded as the primary text and the researchers looked at the primary theme of the videos. - The production texts (what the video-makers and actors have to say before, during and after the production) are particularly significant in contributing to the self-reflexive stage and seeing participatory methodologies such as video documentaries as a strategy for social change. As part of the production texts in this analysis, authors highlighted what the process of 'working with the video footage' looks like by audio- and video-taping the interactions among participants in the small groups and in the combined groups, as well as between the researchers and the participants before, during, and after the video productions.
Filming first person narratives - Participants were trained to develop skills to interview and film each other, and to photograph artefacts, transcribe interviews and contribute to the editing of a final film	Sagan (2012), England	- Participants, each of whom had a long-term history of mental illness and had also been involved in artistic activity for a number of years, were recruited mainly through community arts organizations, word of mouth and the community arts team at the South London and Maudsley Hospital. - Each participant acknowledged a difficult past, with trauma, abuse, substance abuse, homelessness and poverty. Each had also been the recipient of medical intervention, either through hospitalization, medication and/or talking therapies. - n= 17 (average age was 35 years)	Mental health	- Participants were trained to interview and film each other, and to photograph artifacts, transcribe interviews and contribute to the editing of a final film. - Each person chose for her/himself the level of involvement in which they were comfortable. Such flexibility was also important as ill-health, depression, relapse and self-doubt sometimes stole through the team, casting shadows and delays which reminded us all of the nature of mental illness and the havoc it can wreak on creativity, sociability, continuity and routine. - Over the course of approximately eight months, interviews were taken, edited, transcribed and montaged in a film. - Individuals in the research were either filmed or audio-recorded and had the option of having their art works photographed or filmed. Partly for this reason, most interviewees opted to be interviewed in their own homes. - The film was screened at public events and is a testimony to the role of art in the lives of individuals who have experienced enduring mental health problems. - Total length: 32 weeks	- Video narratives were transcribed verbatim and loaded into NVivo software, along with the audiovisual recordings and photographs of work, in order to enable a more complete analysis. - From the transcriptions, the audiovisual recordings and images of the artworks spoken of, selections of the narrative strands are presented in the results section as different themes.
Photovoice and Public Service Announcement Videos (PSAs) - Photovoice is a well-documented method that provides participants with cameras and brief photography training to record and reflect on the topic of interest. This study built upon Photovoice with a PSA video exercise	Gupta, Lau, Springston, Warren, Mears, Dunford, Sharp, and Holl (2013), United States	- Students with asthma in grades 8-12 in an inner-city Chicago high school with high asthma rates and poor asthma morbidity were eligible to participate. Eleven of the 15 students stored emergency asthma medication at the school health center; six students stored daily controller medication at the school health center. - n= 15 (ages ranged from 13 to 18 years, 73% female, 80% African American and 20% Hispanic)	Asthma	- Two initial sessions were held to introduce students to the research team, research goals, the overall program plan, and fundamentals of ethnographic research. - In subsequent sessions, students were given basic training from a photography instructor along with a digital camera, a journal, and a photography log notebook, as well as daily photography and journaling assignments. - Over the remaining weeks, students framed their day-to-day lives through journal entries and photographs to identify and discuss answers to the following research questions: (a) What is your community? (b) What things in your community affect your health? (c) What things in your community hurt or help your asthma? (d) What are the most significant barriers to your asthma management? (e) How can you improve or control your asthma? - Participants reviewed and analyzed their photographs throughout the program and shared their findings with the group sessions. During these sessions, instructors facilitated discussions where participants were asked to describe what they saw in a photograph, to discuss what the photo made them think, and, finally, what it made them feel. Additionally, the photographer was asked to name their photograph and provide a narrative of its contents. This process was designed to help participants and instructors develop an awareness of individual and collective answers to each of the research questions. - After participants agreed on answers to each research question, they critiqued examples of PSAs and were introduced to fundamental elements of PSA development. Video production specialists worked with students to incorporate their photographs into two PSAs using an iterative, student-directed process. This process began with students brainstorming potential narrative structures for each video, filling in blank boxes, which constituted a timeline for each PSA, with their pictures and commentary. - Each week, the videographer would synthesize students' footage and storyboard suggestions into a pair of draft PSAs and bring them back to the students the following week for refinement until students were satisfied. - On completion of the videos, a celebratory event was held at the partner school, which brought together more than 200 peers and community members to publicly premiere the videos. - Total length: 10 weeks	- Two research assistants independently reviewed the students' journal entries and photographs to draft preliminary coding schemes. - Initial drafts were reconciled to form a final coding scheme. - The principal investigator and a third research assistant then independently coded the qualitative data using the agreed-on codes. Differences were reconciled between the principal investigator and the third research assistant, and relative frequencies of codes were calculated to determine common themes in factors identified.

Table 2 Continued

Video-elicitation - The process of watching videos with participants to facilitate discussion on a topic	Vieira, O'Rourke, Merck, and Hunter (2013), Canada	- One long-term care facility in Western Canada was selected because of its size, location and interest in participating in the study. The facility had 224 continuing-care beds, including private and semi-private rooms. - Participants included volunteer residents (n=6), health care providers (n= 6) and family members (n=4). Inclusion criteria for residents were: ability to speak and understand English; age of 65 years or older; capacity to legally consent to participation; and sufficient cognitive ability to understand our study goals and the interview questions (i.e. cognitively intact or minimally cognitively impaired residents based on care provider clinical judgement). - n=16 (resident participants were 65 years or older)	Risk and fall reduction; Aging	- Before starting the video sessions, the first author visited the long-term care facility on four separate occasions to observe the environment, practices, and resident transfer procedures, to take field notes, to get to know the staff members and management team, and to establish a collaborative relationship with the stakeholders. - The study idea was presented during management team meetings, staff meetings and family council meetings. The care manager contacted residents who met the inclusion criteria and briefly explained the study objectives and procedures. The first author met with each potential participant to further explain the study. - An individual, 40-minute digitally recorded interview, or video-elicitation session, was conducted by the first author with each resident to establish a rapport, discuss mobility issues, falls' history, and identify which transfer would be most relevant to record based on the resident's opinion and experience with mobility difficulty. - The selected transfer was recorded using a digital video-camera during the resident's usual daily activities. - At the end of the video-elicitation session, the researcher asked the resident to suggest one family member and one health care provider who might be interested in participating in the study. - The first author conducted separate video-elicitation sessions with each of the participating residents, health care providers and family members. During the video elicitation sessions, the videos were reviewed to facilitate discussion of mobility issues, transfer-related falls, and ways to prevent falls. The participants watched the videos multiple times with the researcher. - A semi-structured interview was conducted during each video elicitation session based on guiding questions related to the frequency and risks for falls during that transfer, and ways to prevent transfer-related falls. A final question asked the resident to describe a previous transfer-related fall, if they had experienced one. All interviews were audio recorded. - Field notes to capture observations and contextual matters were written after each interview, video-recording, and video- elicitation session. They included pertinent information such as staffing levels, team interactions, workload, time and number of occupied beds on the unit. - Total length: Not mentioned	- A research assistant transcribed audio from interviews and video-elicitation sessions. - Related field notes were entered at the beginning of the transcripts. - Atlas.ti software was used to organize the data during our iterative analysis of the video and textual data. - For each case, two team members independently listened to the audio-files while reading the transcripts to correct any inaccuracies and to glean information about tone of voice and other verbal cues. Analysts also watched the transfer videos to gain further contextual information. - The transcripts were coded in phases, where 1-3 were coded first by conducting an initial review of the interviews and videos, followed by an initial analysis of the transcripts based on the guiding questions to evaluate their content, meaning, and to generate codes. Initial codes and code clusters were revised, codes were defined, and a draft codebook was created. - As a check for rigor, a third team member independently coded transcripts from the first two cases and participated in constructing the code book. - Meetings were held to discuss and reorganize the tables and codes, and to arrive at consensus on the content of the code book. - Using the final code book, the team synthesized the initial codes into higher level codes. Clusters of codes were classified under themes. Several meetings were held with the full research team to discuss and develop the final thematic framework.
Reflecting on Student-Produced Videos - Practices were videotaped by students, then were screened and discussed as a group led by the authors	Vega, Gutiérrez, Rodriguez, and De Iturbe (2015), Mexico	- n=12 (all participants were 14 years old, 7 male and 5 female students)	Inhalant abuse; Adolescent health	- Seven sociality practices videotaped by students were selected. - Students talked about the videos while in discussion groups, led by the authors. - One year later, four discussion groups were made with the students in the videos. - Participants were explained the rules for the discussion (not insulting others, referring to the participants using pronouns and waiting for their turn to speak) and were informed of the fact that the reunion would be monitored by a researcher who would lead the discussion posing questions and improvising queries upon what is said by the participants and encouraging verbal interaction among them. They were asked to view the video in which they had taken part and asked to respond to the question, "What do you think about what is shown on the video?". After the discussion, they were asked whether they agreed or not, which encouraged dialogue and a rich group discussion where participants expressed their experiences, perspectives, emotions and beliefs, about the events and images on the video; sometimes participants agreed and others they disagreed. During the following focal groups queries were made specifically about their sociality practices, the effects they had experienced and their opinions about the researchers' interpretations. - Transcripts of the audio recordings were completed and stored along with the video and audio recordings in a computer file and were assigned code numbers unrelated to schools or names. - Total length: approximately 1 year	- To analyze the videos, photo elicitation visual methodology was used. - This method suggests the use of drawn, photographic, film or videotape images to be interpreted by their creators, actors, witnesses or by others that may be of interest for the research, on in-depth interviews and/or in discussion groups attempting to explore the meanings of the images, what is going on within them as well as that which is not shown in them. - Data was analyzed using Atlas.ti V 7 software, which comprised: videos, audio recordings and transcripts of discussion groups, field notes as well as the researchers' interpretations. - While Atlas.ti is designed to create knowledge inductively, according to grounded theory, it was partially followed, since the categorization was both inductive and deductive.
Content Analysis of Patient Produced Video Diaries - Participants were given a camcorder to make a film about their experiences. Content analysis was completed of individual video diaries	Gibson, Hibbins, Grew, Morgan, Pearce, Stark, and Fern (2016), England	- JTV Cancer Support (JTV; https://jtvcancersupport.com/) is an online community for young people with cancer where patients are approached around the time of their diagnosis and invited to participate in the project where they are offered a camcorder, which they keep and use to make a film about their experiences. At the time of this study, the site included over 1620 films and was a rich source of naturally occurring 'data' on patients' perspectives. - Authors selected 'video diaries' for analysis because of their longitudinal nature that would allow researchers to follow young people over time. - n=18 (ages ranged from 11–25 years, 7 males and 11 females)	Cancer; Coping mechanisms	- Films were complete and published in the online database at the time of data collection. The study team selected video diaries to conduct a content analysis. - Total length: Not reported	- Each video diary was analyzed using qualitative content analysis. - Narrative materials were broken down into smaller units of content on the proforma to capture the essence of the patient's narrative (coding and noting). A proforma was developed by paired researchers independently viewing two films each directly from the website. Discussion was followed by refinement of the proforma. Two researchers independently watched each video at least twice. - Data analysis and interpretation proceeded in tandem. Through a process of dialogue significant statements were identified and further transformed into mind maps (abstracting and comparing). The team returned to the website to re-watch videos as required (checking and refinement). Patterns and meanings implicit within patient's stories were explored further, mind maps were further refined and expanded: supportive salient quotes were highlighted on each mind map. Themes were identified, organized and clustered into typologies (generalizing).
Video elicitation interviews - Counseling sessions are video taped and the video recording of the interaction is shown to the participants is used as an elicitation tool	Mirza, Harrisona, Chang, Salo, and Birman (2016), United States	- Male Iraqi and Bhutanese refugees were invited to participate if they self-disclosed a previous or current substance use problem during focus groups in a previous study, or information indicating a high risk of substance use. Substance use was defined as repeated use of alcohol, drugs or medication that interferes with health, daily life activities and/or responsibilities at home or work. Clients may have participated in substance use before or after arriving in the US. - n=6 (ages ranged from 34 to 59 years, though three did not report their ages, 100% male, three Iraqi and three Bhutanese refugees, two Bhutanese clients reported primary school education and one reported secondary school, one Iraqi client reported primary school education, one reported technical school, and one reported a university degree, Bhutanese clients each arrived in the US three to four years prior to	Mental health; Intercultural communication in mental health care; Immigrant and refugee health	- Clients engaged in an interpreter-mediated counseling session. Two standard assessments were conducted during the counseling sessions. Counseling sessions were videotaped and observed in real time through a one-way mirror. Researchers recorded field notes following a structured observation guide that included remarks on nonverbal gestures, overall power dynamic, rapport between dyads, duration of participants' speech, simultaneous communication events, and contextual information. - Clients, interpreters and the clinician engaged in separate post-session video elicitation interviews immediately after the counseling sessions to dissect the communication experiences during the preceding counseling session. The first two authors met to compare field notes and agree upon key communication events during the session. Researchers then separately interviewed the clinician, interpreter and client. During these interviews, researchers replayed video from key moments in the session and asked interviewees about their experiences. Participants were asked what they wanted to convey, whether they felt understood, and their emotions during the communication incident. - Total length: Not reported	- Data analysis was completed by the first two authors, beginning with an independent review of field notes and transcripts. During this process, preliminary themes emerged from the structured categories used for writing field notes. - To gain deeper insights into emerging themes, researchers rewatched videos of each counseling session and created a summary of each session. Summaries of counseling sessions, field notes, and post-session interview transcripts were uploaded into Atlas.ti software (Muhr & Friese, 2004). Using a grounded theory approach (Strauss & Corbin, 1990), each researcher separately categorized textual data into preliminary codes through a process of open coding. Preliminary codes were compared and researchers decided to organize codes into facilitators of and barriers to successful communication for each participant: clinician, client and interpreter. For example, "use of visual aids", a communication facilitator, could be assigned to any of the three participants depending on whether they used visual aids to help communicate ideas or clear misunderstandings. A code book was developed to track the coding process and ensure consistency across the two researchers. Each researcher then revisited the textual data, codes were compared and refined as needed, and disagreements were resolved by consensus. - The above process was followed by axial coding where the first author combined codes into broader themes. Thematic categories were organized into a visual schematic that was shared with the research team. Revisions were made upon consideration of feedback from the team.

Table 2 Continued

Participatory Video - A three stage technique - Stage A is concerned with the interaction between participants (video makers), Stage B is concerned with expression, reflection and building agency, during which participants share and reflect on their experiences and concerns, and Stage C is concerned with exercising this agency and beyond.	Peters, Zweekhorst, Van Brakel, Bunders, and Irwanto (2016), Indonesia	- Cirebon District is located in Indonesia on the north coast of West Java, bordering Central Java. It has a relatively high number of new leprosy cases each year and more leprosy-related stigma than in other districts, and no other initiatives to address this. Videos took place in Kedawung sub-district, Astana Japura and Lemang Abang. - Criteria for participation were sufficient proficiency in Bahasa Indonesia, commitment to the process, and living relatively near each other. - n=12 (participants represented a mix of age, sex, marital status, employment and level of impairment)	Stigma; Leprosy	- The study included two participatory video stages and was developed using 'Insights into Participatory Video: Handbook for the Field' by Lunch and Lunch as a guideline. - The first stage included eight people with varying impairments, and the second stage included four people with a leprosy related impairment. Two videos were produced (group videos) - The participants were taught about filming and video production. When their filming skills were sufficient, they selected important themes for the final video and created storyboards, including material from testimonies and interviews. The final video was edited by a research assistant with input from the participants. - Evaluation meetings to discuss the strengths, challenges and possible solutions were held with the research assistants after each video process. - The study drew on six qualitative methods: (i) semi-structured interviews with the participants before and after the process; (ii) informal discussions with participants during the process; (iii) (participant) observation, with a focus on the participants, the process and areas for improvement; (iv) photos and videos of the process; (v) notes of the initial and evaluation meetings with the research assistants and (vi) written reflections by the research assistants on challenges and opportunities, among other topics. - The interviews were recorded, transcribed verbatim or comprehensively summarized with important quotes translated into English. - In total, 91 events (which included presentations of videos, comics, testimonies, and/or interactive presentations) were organized in the district. - Total length: 24 weeks (two stages of filmmaking)	- The interviews were recorded, transcribed verbatim or comprehensively summarized with important quotes translated into English. - NVivo was used for data management and analysis.
Video-recorded go-alongs and video-recorded film-elicitation sessions - Go-along itineraries were chosen by the patients and were accompanied by a friend, a member of the family or a member of the research team. For the video-elicitation sessions, patients were shown the videos of their walks and asked to freely comment on them.	Söderström, Söderström, Codeluppi, Empson, Conus (2017), Switzerland	- Ten patients were recruited from a specialized early psychosis program for psychotic disorders in the city of Lausanne, Switzerland. The urban region of Lausanne is Switzerland's fifth largest, with a population of 335,000 inhabitants in 2014. - Patients are routinely assessed every six months over a treatment period of 36 months. Only those patients with diagnoses of schizophrenia or non-affective psychoses participated in the present study after providing written consent to a research protocol that was approved by the local Ethics Committee. - Exclusion criteria: (a) those whose psychosis was induced by illicit substances; (b) those with an IQ below 70; and (c) those suffering from severe neurological problems. Semi-structured interviews with 10 other patients based on non-recorded go-alongs and participant observation over a three month period in a community care service in the city of a Lausanne, Switzerland. - n=36 (ages ranged from 18 to 35 years)	Stress; Environment and neighborhood effects on health; Mental health	- Video-recorded go-alongs were completed, where itineraries were chosen by the patients who were accompanied by a friend, a member of the family or, if nobody else was available, by a member of the research team. -The video recordings were used for guiding the discussion during the film-elicitation section - During the video-recorded film-elicitation sessions, patients were shown the videos of their walks and asked to freely comment on them. - A semi-structured interview followed immediately in order to discuss aspects that had not been spontaneously addressed during the video elicitation. It involved questions regarding routine urban practices, stress, comfort, and social interaction in urban milieus as experienced during the go-along; while more general questions concerning patients' successive places of residence were asked in the concluding part of the interviews. Questions were open and related to ordinary urban situations (for instance: "What are you doing when you encounter a crowded place?"), avoiding technical terms present in academic studies, such as "stress" or "social interaction". - These video-elicitation sessions took place at the outpatient clinic, one to four weeks after the walks and involved a psychiatrist and a geographer who led the interviews with the patients. These video-elicitation sessions were themselves video-recorded and analyzed within an interdisciplinary workshop that included the psychiatrists and geographers on the team. - Total length: 12 weeks	- All video-elicitation interviews were transcribed and thematically coded. - Thematic coding was done on the basis of three elements: (a) themes that resulted from a previous preparatory interview-based study with a group of patients involved in the same program (Söderström, 2016), (b) themes that emerged from the analysis of the interview transcripts and (c) themes that emerged from the previously mentioned interdisciplinary workshop where interpretations of recorded interviews were shared between geographers and psychiatrists. - Following procedures of thematic interview analysis in human geography (e.g. Dunn, 2005), coded interview transcripts were then extracted and grouped by a geographer on the team in thematic documents in order to successively analyze convergences and divergences between interviewers' statements. - Considering the recording of the go-alongs is a time-consuming and labor-intensive procedure, it was limited to ten patients. However, ten further interviews during and after non-video-recorded go-alongs were conducted to increase the sample of participants. They were transcribed, coded and analyzed following the same procedure. - Finally, following ethnographic data collection procedures in human geography (Crang & Cook, 2000), participant observation by one of the authors was conducted through regular note-taking and photography. Notes from the participant observation were also thematically coded to enrich and contrast the results of the interviews.
Digital storytelling - In structured workshops, participants create short video narratives that are illustrated with photographs, drawings, music, and text. ***Cell- phlms*** - A form of participatory video of which participants use cell phones or tablets like iPads to create short films. They involve participants in planning, performing, and recording productions that address an aspect of the issue being investigated.	Treffry-Goatley, Wiebesiek, De Lange, and Moletsane (2017), South Africa	- Participants completed a workshop as part of larger ongoing work in a six-year, international, and interdisciplinary project entitled, "Networks for Change and Wellbeing: Girl-Led 'From the Ground Up' Policy Making in Addressing Sexual Violence in Canada and South Africa". - The workshop was held in Khethani, a settlement established in the late 1990s, made up of low-cost government and informal housing that lies adjacent to the small farming town of Winterton in South Africa. Families living in Khethani face a myriad of challenges, including high rates of unemployment, poverty, inad-equate health care that has led to high rates of HIV infection and tuberculosis, illiteracy, poor infrastructure, crime, and sexual violence. - n=21 (ages ranged from 15 to 19 years)	Sexual Violence; Adolescent health	- A workshop was held to explore to visual methodologies, cellphilms and digital story creations. An entry-level tablet computer that functions in much the same way as smartphones was provided for filming. - The participants learned how to use the tablets as sound recorders, still cameras, video cameras, and video editors using WeVideo, the free software program we had installed on the tablets. - In creating their digital productions, they were also taught additional skills including script writing, storyboarding, basic photography, and drawing. - Before starting the cellphilm production, the study team introduced the participants to the no-editing-required (NER) approach, which allows for the creation of multiple scenes without the use of complicated editing software. - Participants were also introduced to key ethical issues that they needed to consider when they were creating this visual data such as the importance of acquiring permission before taking a photograph of another person, the potential dangers to children of photographing them. - In small groups, the participants were given 30 minutes to develop their narratives and another 30 to devise a rough story- board, act out their scenes, and film them. By the end of the first day of the workshop, the group had created five cellphilms. - The second part of the workshop introduced the digital story telling (DST) process as well as the screening of a number of examples of digital stories to give participants ideas of what these might look like. We modified the traditional DST process by creating group rather than individual narratives. Again, in their small groups, the participants developed a story that they shared with the larger group during an interactive feedback session. The groups then created storyboards in which they used visuals to illustrate their stories. - After a tutorial on drawing and photography, the group members completed their drawings and took photographs for their stories. This was followed by another tutorial on how to use the editing software, WeVideo, on importing their photographs and drawings, and on arranging them in sequence. Then, each group went into a quiet room and, with the assistance of one of the facilitators, made an audio recording of the story using this software. Finally, the groups selected and recorded a song to sing or hum in the background of their digital story. By the end of the fourth day, the 21 participants had produced five digital stories. - On the final day of the workshop, we screened the digital stories and cellphilms individually, following each production with a group discussion. After the screening, each participant was asked to sign two release forms, one for their cellphilm and the second for their digital story. The forms asked participants to select either yes or no in response to questions about where, when, and how their visual products could be shared or screened. - The cellphilms and digital stories were shared at a public screening. Researchers invited a number of local stakeholders to this event, including teachers,	N/A

Table 3 Methodological Strengths of Included Studies, 2019.

First Author	Strengths																	
	Empowerment	*Advocacy Tool*	*Rich Data*	*Sensory Data*	*New Skills*	*Equitable Participation*	*Comfort*	*Emic Perspectives*	*Authentic*	*Encourages Reflection*	*Enjoyable*	*Engaging*	*Beyond What an Interview Would Capture*	*Stigma Reduction*	*Increase Knowledge*	*Improve Well-being*	*Build Trust with Hard to Reach Communities*
Akre	*x*		*x*				*x*	*x*									
Catalani		*x*	*x*	*x*	*x*	*x*	*x*	*x*					*x*				
Chung			*x*														
Edinburgh	*none discussed*																
Gibson	*x*		*x*				*x*	*x*	*x*	*x*			*x*				
Gupta	*x*	*x*			*x*		*x*	*x*			*x*	*x*					
Linz		*x*	*x*				*x*	*x*	*x*	*x*			*x*	*x*			
Lundstrom			*x*										*x*				
Mirza	*none discussed*																
Moletsane		*x*			*x*		*x*			*x*							
Norton	*none discussed*																
Peters	*x*	*x*			*x*						*x*			*x*			
Petros			*x*	*x*				*x*					*x*				
Sagan	*x*						*x*								*x*		
Söderström	*none discussed*																
Treffry-Goatley	*x*						*x*				*x*						
Vega	*none discussed*																
Vieira		*x*								*x*		*x*	*x*	*x*			
Warren (2016)	*x*	*x*	*x*				*x*									*x*	*x*
Warren (2014)		*x*			*x*					*x*							

Table 4 Methodological Challenges of Included Studies, 2019.

First Author	Challenges																	
	Ethical Concerns	*Time*	*Data is Limited*	*Community Screenings*	*Social Desirability Bias*	*Results Not Generalizable*	*Recruitment*	*Maintaining Interest*	*Space Availability*	*Technical Challenges*	*Distilling Large Amounts of Data*	*Authorship*	*Maintaining Privacy*	*Films Unrelated to Research Question*	*Retraumatization*	*Cost*	*Language Barrier*
Akre			x														
Catalani	x	x		x	x												
Chung						x											
Edinburgh						x											
Gibson		x					x										
Gupta		x						x	x								
Linz										x							
Lundstrom	x				x						x						
Mirza	*none discussed*																
Moletsane	x	x										x					
Norton						x											
Peters	x	x	x								x		x				
Petros			x								x			x			
Sagan	x		x														
Söderström		x				x											
Treffry-Goatley	x		x							x					x		
Vega	*none discussed*																
Vieira		x			x	x											
Warren (2016)		x				x										x	
Warren (2014)	x	x				x										x	x

3.0 Collaborative Filmmaking: A Participatory, Visual Research Method

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3.1 Abstract

Film as a visual method provides a unique opportunity for engendering knowledge, but few studies have applied film in public health. In this article, Collaborative Filmmaking as a public health research method is introduced, the six steps for implementation are described, and an illustrative example from applying the method in Nepal is presented. Collaborative Filmmaking is an embodied, visual and participatory research method in which participants are trained to create, analyze, and screen films to answer a research question. While ethical challenges require careful planning, Collaborative Filmmaking is particularly useful for exploring sensitive health topics and providing nuanced insight into practices, relationships, and spaces not typically captured using existing methods. Building upon the trajectory of other arts and community-based methods, Collaborative Filmmaking is a community-engaged research method that is effective in gathering granular details about health in the form of sensory data, which can also be used for advocacy.

3.2 Introduction

Health behaviors are influenced by a variety of complex factors.[224] While it is well established that physical, social, and cultural factors influence health behaviors,[159,225] studying and measuring these complex factors can be challenging. Qualitative methods have supported evidence generation for answering questions of why and how health behaviors occur, but there is still a need for research methods to extend beyond text-based approaches to embodied ones that centrally situate the body within the research process.[188] Methods are needed that engage participants in telling the complex stories of their health by engaging the body in the research process.

Visual Research Methods

Visual methods present a unique opportunity for generating knowledge and have been widely used by ethnographers and sociologists, dating back to the early 1920s.[167,226] In public health specifically, Photovoice has been a popular visual method used to engage participants in the research process using participatory photography and discussion.[227] Other examples of creative, visual methods used in public health include Visual Voices[228] that applies drawing, painting and writing, and Body-Map Storytelling, which uses art techniques to visualize aspects of people's bodies and lives.[229] These visual methods have the capacity to capture sensory knowledge, configurations of physical spaces, sounds, movement, and body language and expressions, as well as rich details of social, cultural and contextual factors that may not be fully captured with conventional data collection tools.[165,230]

Film/video (referred to as film henceforth) specifically can be used to capture "unsurpassed richness of detail of subtle bodily gestures, small nonlinguistic signs, and shifting facial expressions."[169(p291)] Film has the power to reveal complexities and ambiguities of reality that are critical for understanding behaviors and beliefs. Additionally, adopting a participatory approach to filmmaking allows for collaboration in generating knowledge that is empowering for participants, and enables marginalized groups to speak for themselves.[185,231] Beyond film's benefit strictly as a data collection tool,

visuals resulting from the research process can also be used to illuminate themes, raise awareness and encourage social change.[185,187] Finally, given the rise of affordable, user-friendly technology, film methods are now accessible and easier to apply in a wide range of settings.

Though the benefits of visual methods are well-established, their use across disciplines has been less common, with varying degrees of acceptability.[165] According to a scoping review of film methods used in public health research (see Aim 1), a number of different approaches were identified that successfully applied filmmaking research methods in generating health-related knowledge. These studies have used film techniques to explore asthma,[217,220] adolescent health,[215,232] vaccination,[219] and mental health,[213,233] among others. Videovoice, Video Diaries and Video Intervention/Prevention Assessment were the most common used methods in public health research. While there are numerous strengths associated with applying film methods in public health research, including the ability to provide rich descriptions, capture emic perspectives, increase level of comfort in participation, empower participants, and be used as advocacy tools, several gaps in knowledge remain and need to be explored in future studies. Specifically, limited research has been conducted using film methods in low-resource settings,[185] and even fewer studies have adopted collaborative approaches throughout all phases of research. Finally, using film often leads to powerful visual data that can be used to communicate research findings, however, many studies using film still report results using a narrative focus. More research is needed to understand the most effective ways to incorporate visual outputs (e.g., films, photographs, scripts, storyboards) created as a part of filmmaking, into research outputs and advocacy.

Community-Based Participatory Research

Globally, there is increasing acknowledgement of the benefits of working collaboratively with communities in conducting health research.[228,234,235] Engaging communities leads to research that is culturally relevant, where the study goals, research methods, and results are informed by local experts familiar with social, religious, and community norms.[12] Community-based Participatory Research (CBPR) is an approach that equitably involves community members, partners, organizations and

researchers in all aspects of the research process.[236–239] While the extent of engagement and the methods applied vary, a collaborative approach allows for the integration of unique experiences of participants to benefit the research process. Additionally, a CBPR approach seeks to facilitate empowerment within the community itself to improve health. As public health research shifts towards a deeper engagement with communities, CBPR encourages researchers to consider the ways in which participants can benefit the research study, such as how local knowledge can contribute to the research process.[234]

The review of established film and video-based methods found that a few established methods such as Video Intervention Assessment (VIA), a method that augments medical information with video diaries created by patients,[240] and Videovoice, a method that puts video cameras into the hands of participants,[187] are participatory in nature (see Aim 1). However, there are still opportunities to expand this work to make them even more collaborative, especially in the data analysis phase.

In this manuscript, we 1) introduce Collaborative Filmmaking as a public health research method and offer detailed steps for implementation, 2) present an illustrative example from a case study of menstrual practices in far-west Nepal to demonstrate how the method was applied, and 3) comment on feasibility, lessons learned and implications for future research based on findings from a focus group discussion. A detailed analysis of the outcomes (i.e. menstrual practices and motivations in far-west Nepal) are reported elsewhere (see Aim 3).

3.3 Collaborative Filmmaking Research Method

Building upon existing visual methods research and on the principles of CBPR, authors Baumann and Burke developed Collaborative Filmmaking as a visual research method to explore public health issues. It embraces a participatory approach for collecting, analyzing, and disseminating findings using digital filmmaking techniques (see Table 6 for associated steps). The method engaged community producers (CPs) who were trained to create, analyze, and screen short documentary films to answer a

research question. The participatory nature of the research method allowed participants to provide real-time feedback on the footage, and provided contextual details for understanding the visuals, sounds, actions, words, and gestures captured on film. Finally, the participant-produced documentary films were used as advocacy tools at community, national, and international levels.

Collaborative Filmmaking builds upon processes and lessons learned from existing visual research methods including Photovoice,[178] Video Intervention Assessment (VIA),[240] and Videovoice[187] by engaging participants as partners throughout the study including data collection, analysis and dissemination. While Videovoice and VIA both use discussions with participants to triangulate findings, the technique used in Collaborative Filmmaking differs in that it includes both individual analysis and group discussion sessions (Figure 9). We posited that some participants may feel more comfortable discussing their films individually, but also recognized the benefits of a group discussion for making sense of the findings as a whole, so that participants could share reactions to the different films and discuss solutions together. Additionally, while with Videovoice discussions take place regarding video segments of two-five minutes from participant films;[187] Collaborative Filmmaking is distinct as it engages participants in analyzing their full films.

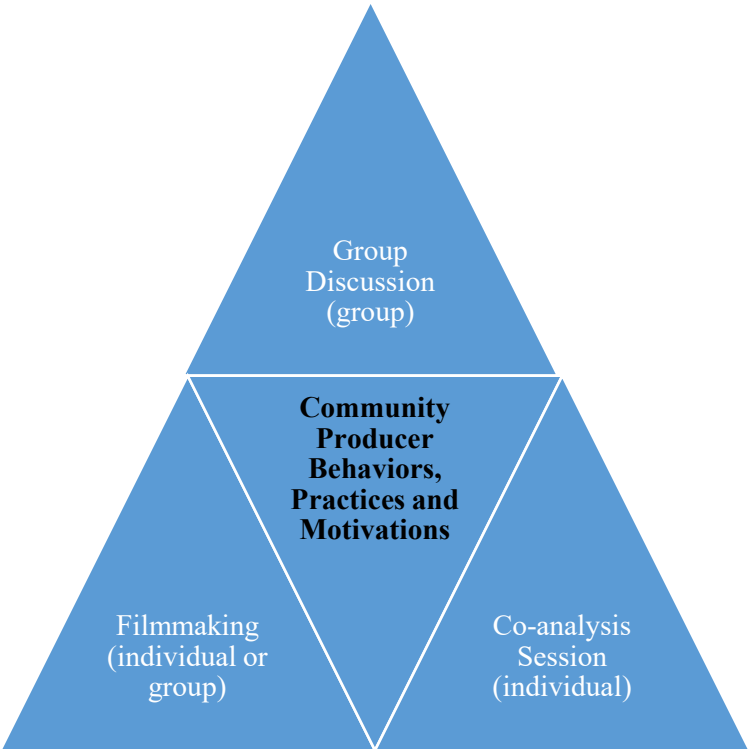

Figure 9 Collaborative Filmmaking Triangulation Technique.

Case Study

This case study using Collaborative Filmmaking was conducted as part of an ongoing community-academic research partnership between researchers at the University of Pittsburgh, and community practitioners in Nepal from the non-governmental organization Nepal Fertility Care Center (NFCC). The University of Pittsburgh is a U.S.-based academic institution. NFCC is involved in programming, training, and research on menstrual health and rights, and reproductive health in Nepal. Since menstrual health is a shared interest and a particularly complex topic in Nepal, we collectively decided to focus on this topic for our case study.

A nuanced understanding of menstrual practices and how they differ by caste/ethnic and religious backgrounds in the diverse context of Nepal is missing from the academic literature yet is important for informing interventions and policy designs. In Nepal, 89% of women and girls have reported practicing at

least one restriction or exclusion during menstruation according to a comparative study of 204 girls in four districts,[138] and another study of 679 participants across nine districts found that only 9% do not follow menstrual restrictions.[103] Restrictions include using separate water sources, avoiding kitchens, distancing themselves from others, avoiding worship spaces, and/or sleeping in an animal shed in a practice called *chhaupadi*, to name a few.[6,22,104,136] These menstrual practices can be hazardous to the health and wellbeing of women and girls.[6] Certain menstrual practices put women and girls at risk for gender based violence,[11,50,241] and can lead to experiences of stigma,[32,52,242] shame,[51,52] and anxiety.[15,25,53]

Based on the recommendation of NFCC, Kanchanpur district was selected as the study site due to its diversity in terms of caste/ethnicity and religion. Kanchanpur district is located in far-west Nepal, in the country's southern, lowland *tarai* region. The selection of the specific village was guided by the Department of Women and Children, under the Ministry of Women, Children and Senior Citizen of the Government of Nepal, which oversees programming and policies related to women's development in Nepal.[243] Data collection was carried out during May-June 2017 when schools were in recess. The Principal Investigator (PI) and research assistant/translator (RA) were based in the field throughout the 21-day data collection period.

Participants were eligible for the study if they reached menarche and experienced monthly menstrual cycles. Seven girl participants between the ages of 16-18 years were recruited with support of a local non-governmental organization, who used snowball sampling to ensure maximum diversity in terms of caste/ethnicity and religion. The sample size of seven was based on the diversity of the population (i.e. at least two participants from each religious group of the village was desired) and the resources available for the study. Additionally, since group discussions are a key component of the research method, the research team aimed to keep the number of participants capped at an appropriate size for group discussions based on standards in the literature.[244,245] Similar sized samples were also used in other studies that applied film methods in public health (see Aim 1).[210,219,221] Given the small size of the village, the participants were acquaintances or friends and attended the same school.

Parental written consent and youth written assent were obtained for all participants before commencing research activities. An additional form was signed by participants and their parents if they agreed to allow their footage to be screened publicly and associated images to be published in related papers and reports, exhibitions, and presentations. During the workshop, participants were also trained on ethics and the importance of respecting the privacy of community members and were advised to avoid filming others. Participants were compensated $70, and the study team assisted participants in opening savings bank accounts to make the deposit. The compensation amount and payment process were guided by NFCC based on their prior research experience in Nepal. Ethics approval was obtained from the University of Pittsburgh (IRB#:MOD17030267-01) and Nepal Health Research Council (Reg.no 97/2017).

Two GoPro HERO4 Session cameras were selected for ease of use, durability, long battery life, and safety and ethical considerations. Participants were likely to have no experience using video cameras, thus easy to operate cameras with minimal functions were selected. Since data collection was being conducted during monsoon season, waterproof cameras were required. In remote areas of Nepal access to electricity is limited, so the study team selected a camera with a long battery life and large storage capacity. In addition to logistical issues, the team also selected this camera model considering the sensitive nature of the research question as well as the potential curiosity of onlookers; the study team had to ensure that participant footage was protected and unable to be reviewed by others if the camera was misplaced or stolen. The selected camera does not have a viewing screen, rather the footage must be offloaded to a laptop using a specific cable, which was kept with the research team. While this type of camera limits of the participant's ability to view their footage in real time while shooting, we balanced this decision with ethical concerns about protecting participants.

The multiple types of data generated by using Collaborative Filmmaking as part of the case study included participant produced films, co-analysis transcripts, a group discussion transcript, a transcript from a group discussion on the Collaborative Filmmaking method, notes and drawings from the training workshop (i.e., brainstorming sessions on menstrual practices, storyboards), and researcher field journals

(Table 5). Using multiple forms of data led the study team to develop a holistic understanding of the research topic. For example, transcripts from co-analysis sessions were rich with follow up questions and details describing footage, whereas the films were useful for understanding the visual context of practices (e.g., sound, visuals of the environment), capturing movements, and understanding use of time and space. Using both of these data types together throughout the research process helped clarify questions and build understanding.

Maintaining field journals for both the PI, an international researcher and documentary filmmaker, and the RA, a Nepali researcher, was particularly important for positionality. Each team member came to the project with a unique background, which influenced how the data was viewed and how each team member made sense of the findings based on social, cultural, and religious backgrounds.[246] To encourage ongoing self-reflection, a key element of reflexivity in the research process,[247] the PI and RA each maintained her own field journal, and debriefed at the end of each day.

Table 5 Data Sources and Type of Data Collected from Collaborative Filmmaking.

	Data Type		
Data Sources	**Visual**	**Written**	**Sound**
Storyboards	x		
Brainstorming session notes		x	
Films	x	x	x
Co-analysis discussions		x	
Group screening discussion		x	
Group discussion on method		x	
Researcher field journals		x	

3.4 Collaborative Filmmaking Steps: Maya's Menstrual Health Film as an Example

The seven girl participants from Kanchanpur, Nepal came from four castes (Brahman, Chhetri, Dalit, Janajati,) and two religious backgrounds (Christian, Hindu). In total, over 103 minutes of footage were collected. Films ranged from approximately four minutes, to over 20 minutes. Participants were free to use any of the techniques they learned in the filmmaking workshop and had complete creative direction

over the filmmaking process. The following text and supporting images describe the Collaborative Filmmaking process (see Table 6 for details) and for illustrative purposes we present a case example from one participant named Maya (pseudonym), who is 16 years old, Hindu, and Dalit (low caste). An expanded presentation of the menstrual practice and motivations results is available elsewhere (see Aim 3).

Table 6 Steps for Implementing the Collaborative Filmmaking Research Method.

Steps	Objectives	Menstrual Health in Nepal Example
Pre-Production Step 1: Introduction, Orientation, and Training	- Introduce Collaborative Filmmaking - Train participants as Community Producers (CPs) - Introduce the research question - Provide ethical training - Complete informed consent/assent	Held a two-day community-based workshop to meet pre-production objectives, which included: - Brainstorming exercise to gather initial reactions to research question: *What are the menstrual practices in your family?* - Role Play Filmmaking Activity, in which each participant played the role of filmmaker and actor to familiarize themselves with camera operation and being on camera - Storyboard Creation, in which participants mapped out the shots and dialog to answer the research question, which was used as a guide for filming - Filmmaking Tips Presentation, which highlighted answers to frequently asked questions (e.g., how to keep the camera stable, how to frame subjects) - Filmmaking practice, in which participants went into the village in small groups to film one of their menstrual practices as a trial run - Video Diary Exercise, in which participants practiced sharing their thoughts on camera regarding how they feel about filmmaking and the research project - Film Critique, in which participants screened their practice films to the group and discussed ways to improve them - Ethical training, in which the facilitators discussed ethical principles (e.g. avoid filming people's faces, tips for filming while respecting privacy) - Informed consent, in which the facilitators met with participants and parents/guardians to explain the study
Production Step 2: Filmmaking/Data Collection	- CPs create films to answer the research question	- CPs were given cameras to create their own films - Friends and family members assisted the CPs in filming where applicable - CPs each created two films highlighting daily practices 1) when menstruating, and 2) when not menstruating

Table 6 Continued

		- CPs created a video diary at the end of each film reflecting on their experience using the Collaborative Filmmaking method
Post-Production Step 3: Film assembly and Preparation for Co-analysis	- Prepare the footage for co-analysis sessions by assembling the footage and subtitling the films - Prepare probing/clarifying questions	- PI transferred footage from cameras to encrypted external hard drive - PI assembled footage into one video file - PI and RA subtitled the films - PI and RA created a list of probing/clarifying questions related to issues that required further explanation - PI exported the film for co-analysis sessions
Analysis Step 4a: Co-analysis	- Analyze the content of each film with CP to allow for participant-centric language and themes driven by participants	- PI and RA met with each CP in their homes to watch the films and discuss each segment of the film, which lasted between 45 minutes and 2.5 hours - PI, RA and CP watched each segment of the film, and discussed the images, sounds, dialog, actions, and space as used in the film using the SHOWeD technique and probes/clarifying questions which were audio-recorded - CPs were given the opportunity to make changes to their films
Analysis Step 4b: Group Screening and Discussions	- Give CPs an opportunity to watch all the films in a safe environment and discuss the research question as a group - Give CPs the opportunity to reflect on their experience using the Collaborative Filmmaking method	- PI and RA arranged a private room in a home centrally located in the village for the group screening and discussions - The participants sat in a circle to watch the films, and each film was followed by a short discussion about the menstrual practices using the SHOWeD technique - The group screening and discussion lasted 2.5 hours and was audio-recorded - The following day, another group discussion was held to discuss CP's experiences using the Collaborative Filmmaking method, how it could be improved, and how the method could be used in future studies
Screening Step 5: Community Screening (optional based on participant interest)	- Provide an opportunity for CPs to share their films in the community and initiate discussions and raise awareness about the research question	- PI and RA met with each CP individually to ask if they would like to share their film in the community. Six of the seven participants expressed that they wanted to share their film publicly, and the seventh also decided to share her film in the end

Table 6 Continued

		- PI and RA arranged a central location for the community film screening, which was located in the back room of a small shop in the village - The CPs decided who they wanted to invite and the format of the event, which included the following: - 1) Film screening - 2) Awards ceremony - 3) Speeches from CPs, representative from the Women and Child Development Office, and family members **Note: Since the community screening event is voluntary and depends on the decision of the CPs, the event may take different forms in future research studies*
Synthesize Findings Step 6: Synthesizing Findings for Wider Dissemination	- Identify key themes in the data as expressed by the CPs - Write up the results in the form of a narrative in order to compliment the raw footage created by the participants - Utilize visuals created by the participants (as permission allows) to support the findings	- A team of three coders reviewed the films and transcripts from the videos and co-analysis sessions for key themes related to the two research questions: 1) What are your menstrual practices, and 2) what are the associated motivations for your menstrual practices? Example Codes: - Menstrual Practices: keeping distance, ritual cleansing, touching - Motivations: Negative consequences, family tradition, social pressure - Results were written in the form of a narrative using illustrative quotes and screen captures from the films as an academic article

Step 1 – Introduction, Orientation, and Training

During the two-day workshop, participants were trained in Collaborative Filmmaking, introduced to the research question, and discussed ethical issues that may arise while filming. They completed several activities to familiarize themselves with the filmmaking process and increase their comfort holding the camera and speaking in front of the camera (Figure 10). The study team conducted film critiques and taught basic filmmaking techniques, such as holding the camera and recording, through interactive games and exercises. The filmmaking workshop activities were developed largely based on participatory video trainings developed by Nick and Chris Lunch.[248] A representative from the Women and Child Development Office was present at the first day of the workshop. All sessions were conducted in Nepali with a trained facilitator.

For the first activity, the girls were given blank notecards and asked to individually generate a list of their own menstrual practices. Next, each girl discussed her practices with the group. In total, a list of 44 different monthly menstrual practices were shared. Then the facilitator provided background information about the organization, and conducted informational sessions about menstrual health, hygiene, and rights. In the afternoon, a camera operation training session was conducted, in which the girls took turns interviewing each other and practiced speaking in front of the camera. Finally, the girls were asked to create a film about one of their menstrual practices as an exercise in applying the techniques learned in the workshop, which was followed by a group film critique. After the session, the facilitators encouraged the participants to reflect on the feedback offered by their peers and let them decide for themselves if and how they would like to incorporate the feedback.

The following day, participants created storyboards to guide the creation of their films. Additionally, to compensate for the inability to view the footage while filming (i.e. no viewing screen), the study team held additional filmmaking practice sessions during the workshop on day two to ensure participants were able to practice framing subjects and settings without a viewing screen. Overall, no negative feedback was expressed about the inability about the use of cameras without a viewing screen.

Figure 10 Maya learned how to operate a camera for the first time during the workshop and practiced interviewing fellow participants.

Maya's Example: In Maya's first film exercise during the workshop, she spoke to the camera softly and did not show her face. After the filming exercise, her film was screened during the film critique, in which the girls were asked to provide feedback to each other. As a response to viewing Maya's film, some suggested that she speak louder to ensure clarity, and others suggested that she consider showing her face to make the film more personal. Maya decided to incorporate this feedback into her final film, in which she spoke louder with confidence and showed her face from time to time. Her storyboard helped her to plan her shots so she would have a clear direction of what to capture while filming (Figure 11).

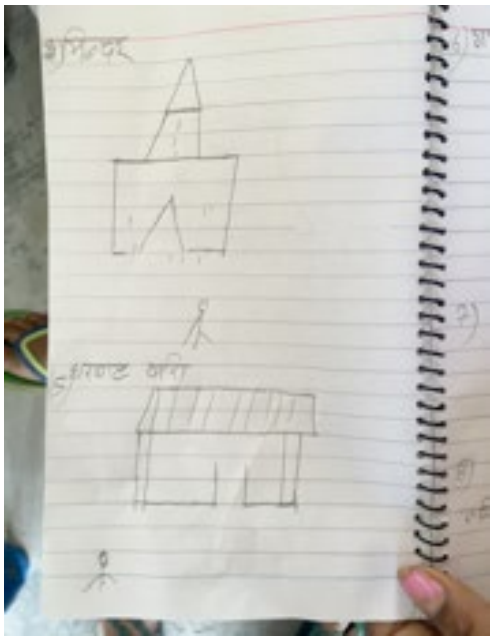

Figure 11 Maya created a storyboard during the workshop to guide her filmmaking, which included drawings of a temple and house.

Step 2 – Filmmaking/Data Collection

To capture menstrual practices as accurately as possible, the study team created a calendar to track the predicted dates of the girls' menstrual cycles and provided them with a camera on the first day of their period, or when they had specific menstrual practices to record (e.g. some girls also had practices to record on the fourth day of their menstrual cycle).

Each girl was given a small, durable camera to create two films highlighting her daily practices, 1) during menstruation, and 2) when not menstruating. Before filming, the study team asked each girl if she wanted the researchers to be present for data collection. Some participants wanted the researchers to stay nearby for the filming process to ask questions. Others expressed that they were comfortable creating their videos independently. In both cases, the researchers stayed in the village at the time of the filming to respond to difficulties if they emerged. Neither the PI nor the RA operated the camera in any way. If the girls required assistance with filming, they were advised to seek support from friends or family members to create their video under their own creative direction. It took girls between two hours and one day to create each film, depending on their vision and filmmaking style. Shooting times were influenced by how

far the girls had to travel to film their desired locations and the number of practices to record (e.g. Dalit girls had many practices to record, whereas the Janajati girl had fewer practices).

Maya's Example: Maya was provided a camera the day before she was expected to start her menstrual cycle. Since she had specific practices on the first and fourth day of her period, the researchers arranged for her to have a camera on both days. Her filming style was intimate and personal; her film was a "day in the life" documentary highlighting a typical day when she is menstruating. For the most part, she filmed the documentary herself, developing her story from a combination of long shots to highlight the environment, along with close-up shots of herself performing and explaining her practices. She appeared to be most comfortable when she was filming unaccompanied.

There were a few segments of her film in which she asked another study participant or a family member to film her as she performed her menstrual practices, such as the scene of her hanging her clothes to dry on the roadside near her home (Figure 12), or for the last shot of her film after performing her cleansing rituals (Figure 13).

Figure 12 Maya recruited another participant to film as she dried her clothes on the roadside during menstruation.

(Photograph used with permission from the participant)

Figure 13 Maya's family member filmed her as she walked back to her house after peforming cleansing rituals.

(Photograph used with permission from the participant)

For other parts of her film, she filmed herself. For example, as she walked to the river to bathe, she turned the camera toward a small hill and narrated to explain that she could not go near it because it touches the temple. Interestingly, discussions of maintaining distance from objects and spaces that neighbor holy sites were not discussed in the workshop, nor during the brainstorming exercise, or in the creation of her storyboard, which highlights the importance of the embodied filmmaking process for capturing this detail.

Additionally, Maya had practices to show during the night, so the camera was equipped with a small light, so she was able to film her practices inside the *chhaupadi* shed after dark (Figure 14).

Figure 14 With the help of a light on the camera, Maya filmed inside the shed at night where some women sleep while menstruating.

(Photograph used with permission from the participant)

Step 3 – Film Assembly and Preparation for Co-analysis

After filming was complete, the researchers picked up the equipment and footage from the participants and transferred the footage from the cameras to an encrypted external hard drive. The PI assembled the clips into one film file per participant, and with support from the RA, the films were subtitled in Final Cut Pro in preparation for co-analysis. For the most part, the researchers did not edit the footage because it was filmed in chronological order; however, if a shot was longer than two minutes without dialog, the footage was sped up to ease discussions of the footage without losing visual data. This decision was discussed with the girls, who agreed with the editing choice. During the assembly and subtitling process, the researchers also created a list of questions and probes, noting areas in the film that required clarification. Finally, the film was exported as a QuickTime file for easy screening and analyzing.

Step 4a – Co-analysis

Individually, each girl met with the PI and RA to conduct a co-analysis session, which lasted between 45 minutes and 2.5 hours. While the films alone were stimulating and provided abundant details about menstrual practices, the audio-recorded co-analysis sessions were essential for adding contextual

elements directly from the girls themselves. The co-sessions were completed in a private space in each of the girls' homes for convenience. The films were screened on a laptop, and the RA asked a standard set of questions for each segment of the film. Similar to Videovoice and Photovoice, Collaborative Filmmaking engaged participants in a discussion process of the participant-produced films using the SHOWeD technique.[187,221,249,250] SHOWeD is based on Freirean root-cause questioning,[198] during which facilitators asked five questions to understand each clip: What do you See here? 2) What is really Happening here? 3) How does this relate to Our lives? 4) Why does this condition exist? 5) What can we Do about it?[249] In addition to the SHOWeD technique, the researchers added a supplementary step that consisted of asking clarifying questions and probes during co-analysis, which captured details beyond what was brought up using the standardized SHOWeD questions. This allowed for flexibility to discuss areas of confusion or interest based on the films created. The PI took notes throughout the session, paying close attention to questions that caused confusion.

After the co-analysis session, the girls were given the opportunity to revise their films. Additionally, if they were not satisfied with the footage, they were given the opportunity to re-shoot, which occurred with one participant.

Maya's Example: Maya initially appeared nervous to participate in the co-analysis session, which was observed and recorded by the PI and RA in their field notes. Maya said she was worried that she would not know the answers to the questions. The study team explained to her that there were no right or wrong answers, and after a few minutes, Maya opened up and discussed her practices. As her film was lengthy (over 20 minutes), the team took a break in the middle of the co-analysis session, which lasted 1.5 hours in total.

Step 4b – Group Screening and Discussions

After completing co-analysis sessions with each of the girls individually, all the participants attended a group screening of the films followed by a discussion that lasted 2.5 hours (Figure 15). This was held at the home of one of the girls' family members. The group discussion aimed to explore the

variety of menstrual practices and beliefs in the village and gather group consensus about what can and should be done to improve menstrual experiences. The group discussion guide also followed the SHOWeD method. The discussion was facilitated by the RA, and the PI played the films, took observation notes, and operated the audio recorders. After the group discussed each film, the creator of the film was invited to share her thoughts and respond to questions that the group raised. Finally, the girls were invited to discuss any final modifications they wanted to make to their films.

Figure 15 All the girls participated in a group film screening and discussion about their menstrual practices and motivations.

The next day, a final group discussion was held to examine the girls' experiences using the Collaborative Filmmaking method, which lasted 45 minutes. The PI took observation notes and operated the audio-recording equipment. Reactions to the method were positive overall. The girls explained that they learned how to make films. Most of the girls discussed a transformation in their confidence throughout the project. One explained, *"before I used to feel scared and shy while talking, but now I have developed my speaking (skills). Now I can tell all the things that are in my heart without fear."* To improve the method in future studies, the girls suggested more time for training and practice in order to

further improve their filmmaking skills. When asked how Collaborative Filmmaking could be used in future projects, they noted that it would be useful for studying and addressing child marriage and child labor issues

Step 5 – Community, National and International Screenings

Next, each girl was asked individually if she wanted her footage to be included in a final film to be shared with the public, both in her community and at national and international levels (e.g., with government officials in Kathmandu, at international conferences, and raising awareness through the media). If so, a separate assent/consent form was signed. This was an important step to ensure that those who wanted to anonymously participate in the study and share their opinions only for research purposes were able to do so. But we also recognized that some of the girls would likely feel proud to share their films with others, and we wanted to ensure they were recognized. In the end, all seven girls chose to screen their films with the public.

Figure 16 The participants organized a community film screening of their films and invited friends, family, and neighbors to attend.

Given creative control over the community screening, the girls were asked who they wanted to invite and what kind of activities they wanted to conduct (Figure 16). This is a unique aspect of Collaborative Filmmaking that was developed based on CBPR principles of engaging participants throughout the research process, which includes decisions about dissemination. The community event consisted of the film screening, an awards ceremony, and short speeches from the representative from the Women and Child Development Office, two of the girls, and two of the family members who assisted during the study. Neighbors, family, a government official, and health post staff attended, including a few males. The study team assisted with organizing a space for the event (i.e. a large room in the back of a local shop), ensured the necessary equipment was in place to screen the film (i.e. a rented projector), and provided tea and snacks. The screening provided an opportunity to share the findings of the study with the community and ensure transparency about the study and associated processes.

Step 6 – Synthesizing Findings for Wider Dissemination

Each film was finalized based on the girls' feedback. Next, the audio-recordings of the co-analysis sessions and the group discussions were transcribed verbatim and translated by a team of three program officers of NFCC, who are fluent in both Nepali and English. Then all films were watched, and the co-analysis session transcripts were initially read by the PI and two independent coders (graduate students from the University of Pittsburgh). The Social Ecological Framework was used as the overarching model for exploring menstrual practices,[154–156] and inductive thematic coding based on a grounded theory approach guided the analysis of the videos and transcripts.[251] This approach is consistent with other exploratory visual analysis methods in public health research.[209,215,232,233] To develop the code book, themes were derived from the data, where each coder reviewed one film with the corresponding co-analysis transcript in order to generate an initial list of codes. The PI and coders met to discuss initial reactions and to share the draft lists of codes. After agreeing on the initial list, a code book was developed and maintained by the PI, to which new codes were added and issues with current codes clarified at weekly team meetings. Coders used a standardized Microsoft Excel template to assign codes and memos

to the remaining videos and transcripts. After all data sources were coded independently by each coder, discrepancies were identified and resolved using the PI as a tie breaker. Finally, themes were reviewed by NFCC to ensure that the contextual themes and language were culturally appropriate.

As a final step, the study team synthesized the findings for further dissemination. For the academic community, the results were coded thematically and written up in a narrative format with supporting images, links to films, and illustrative quotes for dissemination at academic conferences, film festivals, and academic journals. A short film that describes the research method in detail can be found here: https://vimeo.com/239271038. For a full archival version of the films created by the participants please visit: http://d-scholarship.pitt.edu/id/eprint/37201

3.5 Discussion

Collaborative Filmmaking is a participatory research method that can be used to engage community members as partners in research. The method provides participants with a set of film production skills to share their knowledge and beliefs using their own creative voices. The results of this case study illustrate that the method can be used to generate detailed, sensory knowledge about sensitive topics, and encourages dialogue and reflection among participants in an engaging and creative manner. This method fills an existing gap in visual, participatory research methods and the step-by-step instructions and illustrative example provide specific guidance for future public health research applications of Collaborative Filmmaking. The following discussion offers insights regarding the strengths and challenges of the method and concludes with reflections on opportunities for future studies.

Collaborative Filmmaking: Strengths

The use of Collaborative Filmmaking to study menstrual practices in Nepal provided insights into spaces, situations, and settings that may be otherwise overlooked with conventional, language, text and

discourse-dominated data collection tools.[252,253] Collaborative Filmmaking as a method brings the body back to the center of health research, shifts the voice to participants, offers numerous opportunities for triangulation and re-interpretation, provides nuanced and sensory descriptions, and results in products that naturally allow for advocacy.

One of the key contributions of using Collaborative Filmmaking in qualitative health research, is that this method helps to elucidate health as an embodied experience, or the "experiential sense of living in and through our bodies."[254(p50)] Many studies highlight the importance of putting the body at the center of health research,[255–257] but commonly, qualitative research tools produce data in the form of text, which potentially misses an opportunity to capture "experiential aspects of research participants' lives."[258(p172)] Thus, numerous scholars in the social sciences have been exploring embodied creative methodologies,[252] ranging from collage making[258] to memory books,[259] among others. In the same vein, Collaborative Filmmaking is considered an embodied methodology in which the body is central to storytelling and knowledge generation. Specifically, participants physically move between public and private spaces, and use their bodies to explain and reflect upon their experiences of menstruation.

Different from interviews, which limits participants to their memory to describe their practices and motivations, using cameras allow participants to capture of powerful spontaneous movements and encouraged reflection of such practices by reviewing these data during co-analysis and group discussions. One example of this could be seen in Maya's film when she captured a shot of a small hill and explained in her narration that she could not go near it because it touches the temple. Notably, she did not discuss this practice during the workshop when she was asked to create an exhaustive list of her menstrual practices. This suggests that the embodied experience of filming while moving through her menstrual practices provided an opportunity for reflection and a more holistic understanding of subtle movements that were not voiced or captured through discussions or brainstorming sessions alone. Cameras naturally capture the body's gestures and movements, as well as the sights and sounds experienced. These details provide clues about participants' cultural and sensory contexts. Collaborative Filmmaking centers the body and thereby produces more nuanced accounts of health.

Through partnership, participants construct their own understandings of their practices through film using their own languages and voices. The method shifts the voice from researcher centric to participant centric where the participants are fully in control of the way their experiences are told and shared. Numerous scholars in the social sciences have called for approaches that shift the voice from researcher to the silenced or marginalized.[260,261]

Using the method helped researchers to verify of information that surfaced in conversations with participants. Often what arose in discussions was supported by the films and vice versa, but other times the films revealed different realities from discussions. Co-analysis sessions gave the researchers an opportunity to ask additional details in private. In one case, a girl explained in private that it was important for her to present the illusion that her family follows restrictive practices, otherwise her neighbors would be upset, and they would be banned from using the water tap. This evidence of strong social pressure may have been overlooked if the study team limited the analysis to group discussions only. Filmmaking partnered with co-analysis and group discussions allowed us to develop a deeper level of understanding and provided contextual details beyond a traditional interview or group discussion. We believe it is the integration of both individual and group-oriented analysis of the films that results in a more comprehensive understanding of complex health related behaviors, practices and motivations. Triangulation using all three components (i.e., films, co-analysis sessions, and group discussions) is critical to implementing the Collaborative Filmmaking method.

Collaborative Filmmaking provided nuanced, spatial, and sensory descriptions related to time, space, relationships, sound, and experiences. One example from this case study is Maya's capturing of the *chhaupadi* shed on film, where some girls sleep during menstruation. While the dominant *chhaupadi* narrative in the literature and media is one of a shed separated from the community that is dilapidated and dark, Maya's film captured a different visual and spatial understanding. By analyzing her footage, the researchers were able to study exactly how far the shed was away from the closest home, how long it took the girls to walk to it, and better understand how many people were around the shed at night when girls are most vulnerable. What the film revealed was that the shed was actually situated within a few feet of a

neighbor's home and was well maintained compared to other descriptions in the literature. The footage challenged the dominant narrative of *chhaupadi* in the literature, and highlights that there are a range of experiences, practices and spaces that need to be revealed for a holistic understanding. Overall, the films provided nuanced, spatial and sensory data with granular-level details about the body and spaces encountered as participants performed menstrual rituals and practices.

When it comes to dissemination, creating films as a part of the data collection process allowed the data to continuously be re-interpreted by a variety of audiences. The films themselves were assembled by the study team but are presented as raw data in screenings. Therefore, those who have attended screenings have had the opportunity to engage with the content, discuss it, and come to their own conclusions about the messages shared in the films. Similarly, authors Drew, Duncan and Sawyer discuss the power of visual imagery to share research findings, so that the researchers themselves "become less of a conduit between raw data and final interpretations because audience members can quickly become engaged in viewing, assessing, and analyzing the data themselves."[223(p1685)]

Finally, Collaborative Filmmaking allowed for the creation of an end product in the form of a documentary film that could be used for advocacy purposes at the community and national levels. Other visual studies that have a filmmaking or visual component have also discussed the benefits of their use in advocacy and communicating research findings[208,216,220,262] as well as reaching diverse audiences, regardless of educational background.[187] In our study, the film produced was screened at the community level to raise awareness about menstrual practices and beliefs in the village, initiate dialog, encourage mutual understanding, and raise consciousness among community members. At the national level, the film was a powerful and unique tool for advocating for more programming to address a range of menstrual practices, driven by the first-person perspective of adolescent girls themselves that provided a profound look into the monthly experiences' girls face during menstruation.

These findings are consistent with findings from a post-hurricane Katrina Videovoice study in which researchers used the film to reach policy makers, health planners and community leaders.[187] In another study exploring asthma among youth in Chicago, community members were educated about the

high burden of asthma and what they can do to make their communities more asthma-friendly through the films created in the study.[217] Future Collaborative Filmmaking studies may consider systematically collecting audience reactions through post-screening surveys or interviews to measure changes in knowledge and attitudes, which was beyond the scope of this study.

Collaborative Filmmaking: Challenges

Though film is a powerful tool for capturing details that may have been overlooked with alternative research methods, potential challenges of the Collaborative Filmmaking method should be noted and carefully considered by those interested in using the method.

One of the greatest challenges associated with the method is related to the ethics of collecting visual data and associated informed consent processes. During development of the method, the researchers recognized the challenge of protecting the privacy of community members who were not directly engaged in the study, including family members or passersby during the filmmaking process, so intentionally included a discussion of associated filming techniques during the training workshop (e.g. filming from far away or tilting the camera down to avoid the face in order to protect the privacy of others).

It was also important to ensure that consent was an ongoing discussion throughout the project, so that participants were able to remove their videos, or segments from their films, at any point throughout the project. This approach is particularly important when studying stigmatized topics, in our case menstrual practices. The informed consent process in this study included a detailed description of the study design and filming parameters (i.e. workshop content, individual co-analysis session, group discussion and screening) and a discussion of potential risks, including feeling uncomfortable.

While in this study the researchers did not witness negative impacts of these discussions and films, it is still important to remain sensitive to the possibility that embodied and visual approaches may put participants in vulnerable situations. For example, a project may leave participants at risk for being excluded from the community after exposing their practices. Future studies may consider ways to follow

up with participants after the study to ensure that unintended harmful consequences are not perpetuated. Other researchers interested in using the Collaborative Filmmaking method are advised to carefully consider these types of ethical issues, to plan for them, and to prevent harm and miscommunication by using age and context-appropriate language in the consent process and throughout the study.

The use of film is an engaging way to include participants in the research process, but in some cases the use of cameras and the filming process may be considered a hinderance to participation. For example, if participants are not familiar with or well-trained in how to use the equipment, they may feel hesitant to participate. They also may be cautious about expressing themselves on camera, knowing that their visuals are going to be shared with the group. This can be overcome through comprehensive training with ample opportunities for feedback and practice. Additionally, allowing participants to remove their footage at any time throughout the research process is vital for ensuring comfort and privacy.

Furthermore, Collaborative Filmmaking is a time and resource intensive method. As the researchers encouraged participants to describe their menstrual practices in-depth, using their own style, voice and work at their own pace, a flexible research schedule had to be adopted. Giving participants plenty of time to film and opportunities to re-shoot if needed was a key component of the process. In this study, participants also had many other priorities and had to fit in filmmaking when they had time between other responsibilities (e.g., chores, cooking, or tending to animals). However, having extra time in the community and spending time with the families during the filmmaking process turned out to be a positive experience for the researchers, which helped generate a deeper understanding of the village context and overall beliefs of the families in which these practices were unfolding. Additionally, equipment and training costs can be high, but fortunately affordable, durable, and easy-to-use options are on the rise.

Future Considerations and Research

Collaborative Filmmaking requires further testing in different contexts with participants from a variety of backgrounds. Furthermore, film is not intended to reveal the "whole truth." Though it provides

the opportunity to reveal intimate aspects of people's daily lives and for the researcher to reflect on and scrutinize the details of the footage, it is not without bias. Participants make decisions about what they want to film, and inherent biases among the researchers and participants should be considered when analyzing the footage.

Based on the researchers' experience implementing Collaborative Filmmaking to study menstrual practices in Nepal, the following considerations are suggested for others interested in using the method. First, researchers should be aware of group dynamics. The relationship of and interactions between participants is important as they work closely together to create their films and analyze the results. In this case study, the participants were all familiar with each other before the study start. Though they had a variety of different practices and beliefs, the participants opened up freely with each other from early on in the study, likely because they were already acquaintances. Future studies using Collaborative Filmmaking should assess the level of familiarity between participants in order to design activities and trainings appropriately to encourage relationship-building and collaboration. In addition, establishing ground rules for group discussions, such as the importance of respecting diverse opinions and experiences and nurturing positive discussions, is particularly important when using the method to study sensitive topics that might increase participant vulnerabilities.

Additionally, researcher presence in the field every day during the filmmaking process was important for addressing potential issues with equipment, and ensuring participants were on track in addressing the research question. For example, in a few instances, participants were very excited about filmmaking, but ended up spending a lot of time filming things that did not necessarily address the research question. Since the researchers were in the village and checking in on the progress, they were able to remind the girls of the research question and direct them to their storyboards for guidance. It was challenging to navigate the fine line between staying on topic and giving participants freedom to explore filmmaking and tell their stories in their own ways. Researchers are encouraged to continuously check in with the participants and have ongoing discussions about the research question, which naturally encourages participants to think closely about what to include in their films.

Flexibility with regard to time is important when using the method. While some participants took the camera and started filming as soon as the researchers arrived on data collection days, others wanted time to plan their shots for the day and think of creative approaches to tell their story. As is the case with most field work, schedules need to be flexible when using this method in order to accommodate for different filmmaking styles. Additionally, almost all of the participants told the study team that they were nervous about the co-analysis sessions. Dedicating sufficient time to explain the nature of the co-analysis sessions, in order to reduce pressure, is suggested; as this was an unfamiliar approach for participants, additional sensitization was required. If films are longer than 20 minutes, it is also advised to split the co-analysis session into multiple days, as some participants grew fatigued by the end of the sessions, based on experience in this case study. Additionally, with longer videos, the use of the SHOWeD method can be burdensome, as the participants quickly become tired of being asked the same questions for different parts of their films.

Piloting the Collaborative Filmmaking method highlighted several areas suitable for future exploration. While the researchers did discuss participant experiences as a group and through video diaries, future research could seek to quantitatively assess the impact of participation in Collaborative Filmmaking studies on participant empowerment, self-efficacy, happiness and other aspects of emotional well-being. Additionally, future studies should also measure the impact of the films as an advocacy and awareness raising tool. This could be done by tracking changes in knowledge or opinions as a result of watching the participant films through a post-screening interview or survey. This type of approach has been successful in other studies using film. One example is the study by Brandt et al. in which documentary films about the formation of a farmer's market were created and a pre and post screening surveys were distributed to audience members to study the role that film could play in raising awareness on food-related issues in a food desert community.[263] Finally, future studies should explore the range of audiences and best approaches for screening the final documentary film. For example, in a study by Linz et al. that used Autovideography with individuals with severe mental illness, the authors discussed the

power of consumer-produced videos and the potential to use them in anti-stigma campaigns.[208] Ultimately decisions on how and where to use the films will depend on the research question, topic, and context.

3.6 Conclusion

Collaborative Filmmaking is a creative embodied method, and though these study findings suggest that unique ethical challenges are associated with the method, it can be particularly useful for exploring sensitive health topics and providing nuanced insights regarding practices, situations, and spaces not typically captured through the use of existing research methods. Building upon the trajectory of other arts and community-based methods, Collaborative Filmmaking is an engaging research tool that incorporates participants into the data collection, analysis and dissemination processes, which is powerful for gathering granular details about health practices and beliefs in the form of visual data.

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4.0 Beyond the *Chhaupadi* Shed: Exploring a Continuum of Menstrual Practices in Nepal using Collaborative Filmmaking

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4.1 Abstract

Throughout Nepal, there is a wide range of menstrual practices among women and girls, including substantial restrictions in daily activities that leave them vulnerable to negative health outcomes. This study applied a novel, participatory visual research method called Collaborative Filmmaking to acquire a nuanced understanding of various menstrual practices and explore potential differences by caste/ethnicity and religion. Seven adolescent girls received training in Collaborative Filmmaking to create, analyze, and screen short documentary films about their menstrual practices in a village in far-west Nepal. The films, co-analysis sessions, and group discussions highlighted an array of menstrual practices related to cleansing, cooking, eating and drinking, touching, worshipping, sleeping, and maintaining physical distance that fall along a continuum. The practices vary by caste/ethnic and religious background and are motivated by religious and spiritual beliefs, family tradition, negative consequences, and social pressure. In designing menstrual health interventions and policies, a range of

menstrual practices and motivations, as well as the unique needs of different caste/ethnic and religious groups must be considered to ensure context-specificity, particularly in the ethnically and religiously diverse Nepal.

4.2 Introduction

Nearly 90% of women and girls experience at least one restriction during menstruation, according to a comparative study of women and girls across nine districts in Nepal.[103] Menstrual restrictions include using a separate water source, avoiding the kitchen and places of worship, sleeping in an animal shed, or sleeping outside with no cover at all.[6,22,104] Such practices can leave women vulnerable to poisonous snake bites and negative health outcomes such as hypothermia, asphyxiation from lighting fires in the unventilated sheds to keep warm, anemia and emaciation, rape, or death.[5,6,22,103,131] Considering the vulnerabilities that women and girls face during menstruation, and given the broad range of castes and ethnicities and myriad of religious beliefs that prevail in Nepal, an in-depth study of the fundamental causes influencing menstrual practices, such as caste/ethnicity and religion, is critical.

In parts of mid- and far-western Nepal, a banned practice called *chhaupadi,* which is largely considered the most severe menstrual restriction, is widespread among Hindu women and girls.[22,40,104,107] *Chhaupadi* is a form of menstrual exile, where women and girls are considered impure, are isolated from community life, and sleep in small sheds during menstruation.[6,22,108,129,131,141] While the practice of *chhaupadi* itself does not necessarily cause illness,[6] it can leave women exposed to an unhygienic environment with limited access to water and sanitation facilities to change sanitary napkins, and vulnerable to attacks and harsh temperatures.[13–15]

Few recent studies have discussed other menstrual restrictions that extend beyond *chhaupadi*, for example avoiding prayer rooms or kitchens, which are common among women and girls in mid and far-west Nepal.[127,141,265] However, a nuanced understanding of how these restrictions and practices differ by

caste/ethnic and religious background is missing from the literature. Although research to better understand the practice *of chhaupadi* is on the rise, less is known about the other potentially harmful menstrual practices and restrictions that affect the health and well-being of women and girls in all parts of the country.

Fundamental Cause Theory

Fundamental Cause Theory (FCT) provides a guiding framework for exploring the relationship between caste/ethnicity and religion and menstrual practices in this study. Link and Phelan argue for the need to direct attention to fundamental social causes, or more distal foundations of disease such as socio-economic status, race, or social support, to have the greatest impact on health reform. In much of the existing research on menstrual health in Nepal, proximal causes like individual menstrual knowledge or shortage of resources to manage menstruation (e.g. access to latrines) are the focus of research and interventions. However, according to FCT, it is important to move beyond proximal causes to consider fundamental causes, because they involve one's access to resources, such as knowledge, money, power, prestige, and social connectedness, which can be used to avoid risks or promote health.[266–268] In this study, the authors explore the caste/ethnicity and religious background as fundamental social causes that perpetuate economic and social privilege,[269,270] as well as influence one's beliefs and motivations for certain menstrual practices.

Caste/Ethnicity and Religion in Nepal

According to the national 2012 census, there are 125 caste/ethnic groups in Nepal.[75] Caste/ethnicity is the term used in the National Demographic Health Survey[90] and Nepal National Census;[75] using these terms together allows for the inclusion of ethnicities that are not technically a part of the caste system, such as Muslims and indigenous ethnic groups. For example, indigenous groups (Janajati) such as Tharu and Tamang historically have not followed the hierarchical caste system;[83,271] however, during the 18th century unification of Nepal, those in power incorporated Janajati into the caste

system and placed them in the middle position.[86] As such, while the government recognizes Janajati under the caste system, Janajati themselves do not technically subscribe to the system and are considered a non-caste ethnic group rather than a caste group.[272]

In terms of population, Chhetri is the largest caste/ethnic group in Nepal, making up 16.6% of the total population, followed by Brahman-Hill (12.2%), Magar (7.1%), Tharu (6.6%), Tamang (5.8%), Newar (5.0%), and Kami (4.8%).[75] Brahman and Chhetri are considered high-caste groups, and non-caste indigenous groups who fall in the middle of the caste system according to Hindu tradition are Magar, Tharu, Tamang and Yadav. Muslims fall in the lower part of the caste system, just above Dalits (or Kami), who are the lowest group in the caste system.[272,273] One's caste is inherited at birth and determines status and social responsibilities.[79] In Nepal, the caste system has been used to limit lower caste groups from purchasing land, attending school, or being hired for leadership roles in government.[84,103] Though discrimination based on caste has been illegal since 1963,[79] inequalities in health and educational outcomes continue,[84–88,103] and the National Planning Commission has called for more studies that explore disparities associated with caste/ethnicity.[86]

Nepal is also religiously diverse, with the majority of the population following Hinduism (81.3%), followed by Buddhism (9.0%), Islam (4.4%), Kirat (indigenous religion with Hindu influence[94]) (3.1%), and Christianity (1.4%).[75] Higher mountain regions of Nepal have been influenced by Tibetan Buddhism, and the jungle areas are influenced by shamanistic (i.e., altered states of consciousness to interact with the spirit world) and animistic (i.e., all natural things, including objects and creatures, have a spiritual essence that can influence human events) belief systems.[86]

While many distinct religious groups live in Nepal, many Nepalis observe religious syncretism, or the blending of two of more religious belief systems, practicing religious traditions from Hinduism, Buddhism, and traditional folk practices.[94] Nepal is generally known for mutual respect, co-existence, and peace when it comes to religious identity.[95] In recent years, however, religious demographics have been in flux and religious conflicts have been on the rise. This is likely partially linked to high numbers of caste minorities (e.g. Dalits) converting to Christianity because of a long history of caste-based

discrimination.[82,96] Rising tensions have led to a shooting and an arson attack on a cathedral in 2017, and ongoing Hindu-Muslim clashes in the south of the country.[94] As a result of rising religious clashes, "minority religious leaders expressed concern about the rise of Hindu nationalism and its implications for religious harmony,"[94(p10)] according to a U.S. State Department report.

It appears that many are converting to Christianity for reasons related to health, discrimination and poverty.[96] For low caste persons who have faced a life of discrimination, many see conversion to Christianity as their only escape.[274] Those that convert are given Bibles, but also other resources such as rice, tents, and blankets, which is a large draw, especially in the aftermath and destruction of the 2015 earthquakes. According to anthropologist Diana Riboli, conversions after the earthquakes, often associated with well-funded missionaries, has led to increased conflict in some communities.[96]

Under the 2015 Nepal Constitution, converting persons from one religion to another is prohibited. In August 2017, parliament signed a criminal code where proselytizing was criminalized, which went into full effect in August 2018.[94] Under the code, converting or encouraging the conversion from one religion to another, or disturbing/jeopardizing the religion of others is punishable with up to five years imprisonment (reduced from six years) and a 50,000 rupee (approximately $500) fine.[94,275]

While previous research uncovered poorer health and educational outcomes among lower caste/ethnic groups,[86] most menstrual health interventions targeting women and girls in Nepal do not distinguish messages or programming by caste/ethnic group; as such, blanket interventions may not be effective for all caste/ethnic groups considering the great diversity of beliefs and behaviors among caste/ethnic groups.[85,86,103] For example, not all castes/ethnicities practice *chhaupadi,* but there are other practices that are followed which may be considered discriminatory and restrictive from public health and human rights perspectives. Examples include restrictions in accessing water taps,[103] sleeping in a separate bed or room,[140] and not entering the kitchen while menstruating.[127] These practices should not be overlooked in holistically addressing menstrual health and hygiene challenges in Nepal. Some evidence suggests that there are differences in menstrual restrictions between caste/ethnic groups; such as high-caste Brahmans and Chhetris adopting more menstrual restrictions, and Janajatis practicing fewer

menstrual restrictions.[22,140] A quantitative study among 679 women and girls aged 13-51 years from the most populous castes/ethnic groups of Nepal found caste/ethnicity to be a significant predictor of menstrual knowledge and practices, where Janajati have poorer menstrual knowledge and practices.[103] While it is well known that Hindus closely follow menstrual restrictions, including *chhaupadi*,[112,126] in the Buddhist tradition, menstruation is viewed as a natural bodily process, and while no general restrictions are placed on menstruating women, some Buddhist temples prohibit them to enter.[3] No known studies have explored menstrual practices among Christians in Nepal; this study aims to begin to explore this gap in knowledge. These findings suggest that more attention needs to be given to caste/ethnic differences when it comes to addressing poor menstrual health outcomes in Nepal.[103] FCT helps to explain why current interventions that largely target proximal causes (e.g. education, products, facilities) rather than fundamental ones (e.g. caste/ethnicity, religion, economic status) may be limited in terms of improving menstrual health outcomes for all. A stronger understanding of the nature of menstrual practices and beliefs across caste/ethnic groups and religious groups will allow researchers, practitioners, and policymakers to better understand the root causes of menstrual health disparities and design appropriate long-term solutions.

Study Aims

This research embraced a community-engaged approach to gather emic perspectives using Collaborative Filmmaking and had three specific aims: 1) describe menstrual practices among a caste/ethnically and religiously diverse group of adolescent girls in far-west Nepal, 2) explain motivations for following these menstrual practices, and 3) explore how caste/ethnicity and religion function as fundamental causes of menstrual practices and motivations.

4.3 Methodology

Collaborative Filmmaking Method

Collaborative Filmmaking is a participatory, visual research method for collecting and analyzing data, and disseminating findings using digital filmmaking.[276] Participants are collaborators throughout the research study and are trained to collect data through filmmaking, analyzing their own films, and disseminating the findings through a community screening. The six steps of Collaborative Filmmaking are as follows: 1) introduction, orientation, and training; 2) filmmaking/data collection; 3) film assembly and preparation for co-analysis sessions; 4) co-analysis sessions, and group discussions; 5) community screening (optional), and 6) synthesis of findings for wider dissemination (additional details regarding development and implementation of the method can be found elsewhere - see Aim 2).[276]

Community Partnership Approach

The study was conducted as a part of an ongoing partnership between the University of Pittsburgh Graduate School of Public Health, Department of Behavioral and Community Health Sciences, and the Nepal Fertility Care Center (NFCC).

Setting, Recruitment, and Data Analysis

In this study, Collaborative Filmmaking was implemented with seven girls aged 16-18 years in the lowland district of Kanchanpur, far-west Nepal. This district was selected due to diversity in caste/ethnicity and religion, and the presence of the traditional practice of *chhaupadi*.[104] Participants were recruited with the assistance NFCC and an additional community partner using snowball sampling within the village for maximum diversity. The study team ensured that all main caste/ethnic groups present in the village were represented. Overall, the participants came from four caste/ethnic groups (Dalit, Janajati, Chhetri, Brahman) and two religious backgrounds (Hindu and Christian). Participants were eligible for the study if they reached menarche and experienced monthly menstrual cycles. Parental written consent

and youth assent were obtained for all participants before commencing research activities, and participants were given pseudonyms. Ethics approval was obtained from the University of Pittsburgh (IRB#:MOD17030267-01) and Nepal Health Research Council (Reg.no 97/2017).

The data, which included collaborative films created by the participants, and transcriptions of co-analysis sessions and group discussions, were translated from Nepali to English by a team of three translators from NFCC. The PI and two coders watched all the films and reviewed the translations. Once the team members were familiar with the data, they each developed an initial list of codes to correspond with the key themes arising in the data. For example, when participants discussed restrictions in bathing, such as bathing in the river instead of at home during menstruation, this was coded as a "cleansing" practice. Afterward, the PI and coders discussed initial reactions and shared a draft list of codes that informed the development of a code book that was maintained by the PI throughout analysis. Once the code book was agreed upon, each coder applied the codes to all the films and transcripts independently based on grounded theory.[251] Throughout analysis, new codes were added, and issues with established codes were clarified at weekly team meetings. Coders used a standardized Microsoft Excel template to assign codes and memos to the films and transcripts. Discrepancies were identified and resolved using the PI as a tie breaker. Finally, codes were reviewed by NFCC to ensure that the contextual themes and language were culturally appropriate. In the presentation of the results, as well as in the films, pseudonyms have been used. A short film that describes the Collaborative Filmmaking research method in detail can be found here: https://vimeo.com/239271038.

4.4 Results

Menstrual Practices in Far-West Nepal

The array of menstrual practices among the adolescent girls in this study fell along on a continuum, ranging from few menstrual practices to strict purity and exclusion practices (Figure 17). The practices differed between caste/ethnic and religious groups represented in the sample.

CONTINUUM OF HINDU MENSTRUAL PRACTICES IN NEPAL

LESS RESTRICTIONS → MORE RESTRICTIONS (CHHAUPADI)

Cleansing	**- Bathe in separate place at home, away from main water tap; must ask for water to bathe**		**- Bathe and wash clothes at the river - Dry clothes on the roadside - Wear separate clothing - Clean chhaupadi shed using river mud**
	- Practice ritual cleansing with cow urine		
Cooking	- Touch outside of kitchen, but avoid entering or cooking	- Avoid touching kitchen, entering kitchen, and cooking	
Eating & Drinking	- Must ask for food and drinking water to be given		
Touching	- Avoid touching father or grandparents only	- Avoid touching others	
	- No restrictions in touching plants	- Avoid touching plants that bear fruit	- Avoid touching all plants
	- No restrictions in touching animal shed		- Avoid touching animal shed and animals
Worshipping	- Worship from afar, but cannot enter worship room at house	- Cannot worship, enter worship room at home, or go near temples	
	- No restrictions in avoiding hills/fields surrounding temples		- Avoid hills/fields surrounding temples
Sleeping	- Sleep inside the house, but often in a separate bed	- Sleep outside the house (on the porch)	- Sleep away from the house (in small chhaupadi shed)
Maintaining Physical Distance	- Avoid entering worship room and kitchen, but can go elsewhere in house and on property	- Avoid entering the house altogether, but can stay in courtyard	- Avoid entering the house and courtyard
	- Avoid coming close to community places of worship (temples)		
	- No restrictions in using family toilet		- Avoid using family toilet

*Note: Christian participants had no menstrual restrictions or specific practices followed during menstruation, hence their practices are not included in this table.

Figure 17 Continuum of Hindu Menstrual Practices in Nepal, 2019.

Cleansing

Discussions of cleansing practices during menstruation were raised by all girls in the study and took two distinct forms: 1) physical cleansing of clothes, bodies, houses, and spaces, and 2) ritual cleansing.

Day-to-day cleansing activities were usually altered during menstruation. For example, though all girls bathed during menstruation, all Hindu girls from all included caste/ethnic groups altered their bathing practices during menstruation. Three of the Hindu girls (Janajati, Chhetri, and Brahman) were allowed to bathe on their property but were required to maintain distance from the main water tap. Therefore, to bathe they had to request water from a family member or friend during menstruation. The two Hindu Dalit girls followed stricter practices, as they were not even allowed to enter the property around their house and had to travel to the river to bathe and wash their clothing and bedding (Figure 18): "(Menstruation) affects my life a bit because when I menstruate, I go to the river to take bath, which is far away" (Maya, Hindu Dalit, 18 years). In contrast, the two Christian girls (Dalit and Chhetri) did not change their bathing practices and were able to use the water tap at home during menstruation.

Figure 18 *Cleansing* – Physical cleansing of clothes, bodies, houses, and physical spaces – Filmmaker (Hindu Dalit) shows the muddy river where she bathes and washes her clothing and bedding during menstruation.

(Photo used with permission from the participant)

Washing clothes was another cleansing practice that often changed during menstruation. On the most extreme end of the continuum, two Hindu Dalit girls hung their clothes to dry on the roadside during menstruation as they were not allowed to go near their homes while menstruating. Three Hindu girls (Janajati, Chhetri, and Brahman) washed and dried their clothes at home during menstruation but had to ask for water from others, while the two Christian girls (Dalit and Chhetri) washed and dried their clothes at home as usual without restrictions.

For the two Hindu Dalit girls who slept in a small shed (*chhaupadi goth*) while menstruating (see Sleeping section for more details), cleansing of the shed was also discussed. In the films the girls showed the process of cleansing the shed on the fourth day of their period using mud from the river mixed with bullock dung, which was said to ward off snakes and insects, as well as remove impurities (Figure 19). The two Christian girls both cleaned their homes as usual during menstruation, though they had differing opinions about the work (Figure 20): "When we are menstruating, we do all the housework. I feel bad because we do not get any time to rest" (Asha, Christian Dalit, 18 years). However, the other expressed, "doing the housework and cleaning is not that hard so I don't feel bad" (Mala, Christian Chhetri, 18 years).

Figure 19 *Cleansing* – Cleansing the *chhaupadi goth* – Filmmaker (Hindu Dalit) cleans the shed on the last day of her period to purify it.

(Photograph used with permission from the participant)

Figure 20 *Cleansing* – Cleansing the house – Filmmaker (Christian Dalit) cleans her house as usual during menstruation.

(Photograph used with permission from the participant)

Ritual cleansing to rid oneself of impurities associated with menstruation was also commonly filmed and discussed. All of the Hindu girls practiced ritual cleansing by sprinkling and sipping cow urine to make themselves pure after their menstrual cycle was finished (Figure 21). "Our family members tell us that cows are a god and we should worship them. (Therefore) we will not be pure unless we drink their urine (after menstruation)" (Maya, Hindu Dalit, 18 years). Girls also discussed the importance of sprinkling cow urine on people and objects if they accidentally touched them while menstruating: "If I touch my mom while menstruating, she will become sick and she may die. (But if) I take a bath, sprinkle the cow urine and drink (it), then she will be ok" (Sunita, Hindu Chhetri, 18 years). If cow urine was unavailable, sprinkling water that has been touched by gold, such as an earring or ring, is an alternative for cleansing others. One Christian girl confirmed that this has happened to her: "If Hindus touch the inside of the house, they have a culture of spraying gold touched water and cow urine…they have also done this with us" (Mala, Christian Chhetri, 18 years). Similarly, if a menstruating woman accidentally touches a water tap, it is cleansed using cow urine. One Hindu girl shared an example from her village:

"While menstruating, someone accidentally touched that water tap and the water tap went dry. After putting cow urine (on it), water came again." (Sunita, Hindu Chhetri, 18 years).

Figure 21 *Cleansing* – Rituals to rid impurities – Filmmaker (Hindu Dalit) sprinkles and sips cow urine to purify herself on the last day of her period.

(Photo used with permission from the participant)

Cooking

None of the Hindu girls were allowed to enter the kitchen or cook while menstruating, whereas both Christian girls were allowed and encouraged to cook.

Some Hindu girls said it was nice to get a break from cooking: "For five days I don't cook. I think of it as a vacation" (Maya, Hindu Dalit, 18 years). However, while one girl is menstruating, the responsibility of cooking and bringing food to her falls on other non-menstruating women in the household, such as the mother or a sister, as all menstruating Hindu girls received food and drinking water from mothers, sisters, sisters-in-law, and female friends. One Christian girl explained that, in her opinion, it appears like her Hindu friends are getting a break but they still "do all the work when menstruating. They only avoid touching the kitchen, but they go to the forest and bring wood, and they do work in the field" (Mala, Christian Chhetri, 18 years).

The Hindu Dalit, Chhetri, and Brahman girls had the strictest cooking and kitchen use restrictions, whereas the Hindu Janajati girl had slightly more freedom. She was free to go near and even touch the outside walls of the kitchen, but she was not allowed to enter (Figure 22). When asked why she is not allowed to enter the kitchen she explained, "According to our religion and culture there is a stove (in the kitchen) and we believe that (the fire) is a god so we cannot touch the stove. (Because of this) we don't enter."

Figure 22 *Cooking* – Filmmaker (Hindu Janajati) can touch the outside walls of the kitchen but cannot enter while she is menstruating.

(Photograph used with permission from the participant)

Both Christian girls cooked during menstruation (Figure 23). When asked how this affects their lives, one said it can be a challenge: "During menstruation I have physical pain, but I have to cook food and sometimes I feel bad" (Mala, Christian Chhetri, 18 years). Similarly, the other Christian girl said, "sometimes I think my (Hindu) friend's rules are right (in that) at least they can rest during their period" (Asha, Christian Dalit, 18 years).

Figure 23 *Cooking* – Filmmaker (Christian Chhetri) cooks as usual while menstruating.
(Photograph used with permission from the participant)

Eating and Drinking

Since many girls were limited in their actions and movements during menstruation, they often had to ask for food and drinking water from others, such as friends and family members. All the Hindu girls had to receive food and drinking water from others, as they were not allowed to touch the water tap to get water or enter the kitchen to make meals (Figures 24 and 25). The films and discussions also revealed that Hindu Dalits received separate utensils during menstruation. One girl described the process: "In our culture, water (is given) from afar, food from afar, comb from afar, everything we ask for they give us from afar (during menstruation)" (Kinjal, Hindu Dalit, 16 years).

Figure 24 *Eating & Drinking* – Filmmaker (Hindu Chhetri) demonstrates how she asks for water from a friend during menstruation.

(Photograph used with permission from the participant)

Figure 25 *Eating & Drinking* – Filmmaker (Hindu Dalit) receives food and drinking water from her younger sister while she is menstruating.

(Photograph used with permission from the participant)

One Hindu Dalit showed and described her experience waiting for water: "I cannot use this (water tap) while menstruating. Even if I feel thirsty, I cannot use (it) myself. I need to ask someone to get water for me. If there is no one around I need to wait, sometimes for three to four hours for someone to come give me water" (Maya, Hindu Dalit, 18 years).

Touching

The girls discussed restrictions regarding touching people, plants, animals and related items during menstruation.

Avoiding touching family and friends was common, though the specific rules related to this practice varied. All of the Hindu girls avoided touching family and friends to some degree. In the most restrictive sense, the Hindu Dalit, Chhetri, and Brahman girls avoided touching all people during menstruation (Figure 26). One Hindu Chhetri girl explained how she avoided touching her mother: "I cannot touch my mother. If I do, she will become sick" (Sunita, Hindu Chhetri, 18 years). Another Hindu Brahman girl explained that this rule is relaxed at school during menstruation as many students have to share the same bench: "While going to school and college we touch our friends. We sit on the same bench, so we have to touch them. We cannot make a separate bench and sit, so we (just) don't touch our mom and dad" (Srijana, Hindu Brahman, 18 years). The Hindu Janajati girl had fewer restrictions when it came to touching others. She avoids touching others, but this is limited to not touching her father and grandparents. Unlike her Hindu Dalit, Chhetri, and Brahman friends, she discussed and showed herself touching friends saying, "when I am menstruating, I can engage with my friends and roam around with them (hugging her friend)" (Onsari, Hindu Janajati, 17 years). The Christian girls did not have any restrictions when it came to touching family and friends.

Figure 26 *Touching* – Filmmaker (Hindu, Chhetri) demonstrates how she is not allowed to touch others during menstruation.

(Photograph used with permission from the participant)

Menstrual restrictions on touching plants was an important menstrual practice woven throughout the films and discussions. Most of the Hindu girls explained that they could not touch plants while menstruating (Figure 27). “When I am menstruating, I do not touch plants. In our culture it is said that if we touch plants and trees that bear fruit, they will die. The fruit will become rotten, the leaves will fall, and sudden dehydration of the plants (will occur)” (Srijana, Hindu Brahman, 18 years). Of all the Hindu girls, only the Janajati girl was allowed to touch plants while menstruating: “I touch this tree when I am menstruating. I touch this jackfruit. I touch all the things here. I touch all the trees” (Onsari, Hindu Janajati, 17 years). She further explained that she was relieved that her practices are more relaxed than others: “It is nice because I can touch the plants and I can get fresh air and can sit anywhere so I feel happy.” Though her practices are less restrictive, she felt pressure to practice certain menstrual restrictions: “When I am alone, I don’t feel anything. But outside people say, ‘they don’t follow the practice, they touch the plants and all.’ (So) in front of them we have to pretend like we are also practicing.” Both of the Christian girls openly touched plants while menstruating.

Figure 27 *Touching* – Filmmaker (Hindu Brahman) shows the plants around her house that she is not allowed to touch while menstruating.

(Photograph used with permission from the participant)

Two Hindu Dalit girls were not allowed to touch the family animal shed. “After menstruating, it is said that (a woman) becomes untouchable. She is distinct from all. She cannot touch the shed because the cows will suffer…we do not touch the shed because cows are regarded as goddess Laxmi and when we touch those cows the milk becomes untouchable and the cows become sick” (Maya, Hindu Dalit, 18 years). This has implications for income as livestock, especially cows, are an important source of revenue. If cows were to become sick or die, it could drastically impact the head of the household’s ability to provide food and other vital resources. Restrictions were not limited to cows. One Hindu Dalit girl also mentioned that if a bullock is touched by a menstruating woman it would become sick. When asked if she ever witnessed these negative effects, she explained: “The cow will not give milk, (or) sometimes if it does give, it only gives one quarter of the milk that it usually gives. I have seen that” (Maya, Hindu Dalit, 18 years).

Worshipping

While all the Hindu girls had worship restrictions, the Christian girls attended church as usual during menstruation. Worship practices were shown and discussed at a variety of places including prayer rooms in homes, religious community spaces (i.e. temples and a church), and areas surrounding or near places of worship.

Inside their homes, all Hindu girls had a prayer room, though their restrictions during menstruation varied. Most of the Hindu girls (4/7) were not to allowed to enter their homes: “Today I am menstruating so I cannot go inside and worship. I cannot go inside because there is the kitchen and prayer room. God does not allow us to worship when we are menstruating so I cannot go inside. In our culture if we go inside it will be a sin” (Sunita, Hindu Chhetri, 18 years). In contrast, the Hindu Janajati girl had the fewest worship restrictions. Although she was not allowed to enter the prayer room, she was allowed to enter her home, and was the only Hindu who performed religious activities while menstruating. She explained while standing at the edge of the prayer room without entering: “We can worship from the inner heart, but we cannot go inside the temple. We do not need to follow as many (restrictions) as others.

We can do meditation and worship god, (the only thing is) I cannot touch the temple, but I feel happy to worship" (Onsari, Hindu Janajati, 17 years).

For all Hindu girls, directly avoiding community temples and shrines was vital (Figure 28). Additionally, two Hindu girls (Dalit and Brahman) explained that not only are temples to be avoided, but also other holy places (Figure 29) such as the physical spaces surrounding temples: (Standing 50m away from the temple and pointing across a field) "There is a temple. I cannot go there. Also, I cannot walk in this field because in our culture we worship in that temple so we cannot (in the field) when menstruating" (Srijana, Hindu Brahman, 18 years). She also explained that she had to avoid the field because of a Pepal tree: "We cannot go (in that field) because we believe that in that tree is Lord Bishnu" (Srijana, Hindu Brahman, 18 years). One Hindu Dalit girl explained in her film as she was walking near a hill, "There is a temple over there. We cannot touch this hill because the temple touches the hill. Therefore, we cannot touch the hill and temple" (Kinjal, Hindu Dalit, 16 years). The other three Hindu girls did not identify restrictions related to passing through these spaces or spaces touching holy sites.

Figure 28 *Worshipping* – Filmmaker (Hindu, Dalit) shows the distance she needs to maintain from the temple while menstruating.

(Photograph used with permission from the participant)

Figure 29 *Worshipping* – Filmmaker (Hindu Brahman) explains that she cannot enter this field while menstruating because there is a temple nearby.

(Photograph used with permission from the participant)

At the opposite end of the continuum, the two Christian girls were not only allowed to enter places of worship while menstruating, but they were expected to by other Christians. This is not always easy: "We do not have restrictions, so we go inside the church when we are menstruating. We feel awkward but we have to come. People ask us, 'You are menstruating, and you are going here and there?' We feel afraid because people talk about us if we are menstruating and going to church. What to do? We have to come" (Asha, Christian Dalit, 18 years).

Sleeping

Sleeping practices during menstruation varied widely among the participants. While all the Hindu participants altered their sleeping habits during menstruation in a range of ways, the Christian participants did not change this.

At night, the two Hindu Dalit girls slept in a small shed *(chhaupadi goth)* near a neighbor's home (Figure 30). One Hindu Dalit girl explained that sometimes many people crowd into the shed: "At times, ten to twelve people sleep here when menstruating. When we are menstruating, we sit here and all of us will go to the river to bathe. When we are not menstruating, we sleep in our houses" (Hindu Dalit, 16 years). Though the other Hindu Dalit girl expressed a preference for sleeping closer to home, or in a

separate room inside her house, she explained that in her case she does not suffer much: “There is a house near the shed (so) we don’t feel afraid or in danger when we sleep here. We sleep peacefully” (Maya, Hindu Dalit, 18 years). When asked what could be done to improve her menstrual experience she said, “It is a modern world. People have made *chhaupadi*. It would be good if people would (also) eliminate it. But our gods and goddesses will not allow it. Though we cannot (eliminate it), we can make a small house near our home to sleep in during menstruation. If we are nearer, we will not be afraid” (Maya, Hindu Dalit, 18 years).

Figure 30 *Sleeping* – Filmmaker (Hindu Dalit) films the small shed where she sleeps during menstruation.

(Photograph used with permission from the participant)

The two high caste Brahman and Chhetri Hindu girls were allowed to sleep close to their houses, but not inside. In their films, they both showed how they slept on small benches on their porches (Figure 31). “I sleep here when I am menstruating because I cannot go inside the house. Inside there are gods and there is a belief that we cannot touch them. I do not feel good sleeping outside. There are many insects that bite me. I feel scared that something will fall on my body. Our grandparents also said that at midnight there is a ghost that walks down the road. We feel so scared but what can we do? We have to sleep (here)” (Srijana, Hindu Brahman, 18 years).

Figure 31 *Sleeping* – Filmmaker (Hindu Chhetri) explains that she sleeps on a bench on the porch of her house during menstruation.

(Photograph used with permission from the participant)

In contrast with the experiences of the two Hindu Dalit girls who were allowed to sleep together in the shed, the Hindu Chhetri girl explained a different practice in her household. She sleeps on a bench outside the home during menstruation, and if her sisters are menstruating at the same time, they will sleep in the same place. However, unlike Hindu Dalits, if her mother is menstruating, she sleeps in a separate bed. "She says that if people on their period are in the same place, they will become even more impure. Therefore, she sleeps in a separate place and does not touch us (when we are all menstruating)" (Sunita, Hindu Chhetri, 18 years).

Sleeping practices of the Hindu Janajati girl were less restrictive. In her film, she said that she sometimes sleeps in a separate bed located in the entryway of her home when menstruating, but not always. In her co-analysis session, she discussed the pressure to maintain these practices in the community: "People here follow untouchability too much. If we say that we sleep in our usual bed when menstruating they will backstab us. They will say that we do not follow (untouchability rules) and they will not allow us to use their water tap" (Onsari, Hindu Janajati, 17 years).

Maintaining Physical Distance

Maintaining distance refers to keeping physical space between oneself and a place or object. This was commonly displayed throughout the films and discussed in co-analysis sessions, when girls explained that they had to maintain distance between themselves and their kitchens, toilets, water taps, prayer rooms, homes, and temples. For certain places (e.g. water taps, toilets), only a minimum distance needed to be maintained, but for other places such as temples and homes, some girls maintained a larger distance.

The most extreme example was demonstrated in the films created by the two Hindu Dalit girls, who maintained a large distance between themselves and their homes during menstruation (Figure 32). They were not allowed to enter the courtyard of their homes, or use anything within the periphery of their homes, such as a toilet or water tap. “We should stay outside. (My) mother and father say, ‘this is for you’, if I go inside the gods’ and goddesses’ negative power will attack me, so I don’t go inside” (Kinjal, Hindu Dalit, 16 years). One girl (Hindu Dalit) also explained how difficult it is to maintain distance from the home and kitchen during festivals, “During Tihar (religious festival of lights) everyone sits outside together and eats and enjoys, but (while menstruating) we sit separately at a different home and at that time, I feel bad. Because of my period they separate me. Everyone is eating together in the home and only I am sitting separately from the home and eating alone. (During this time) my eyes fill with tears” (Kinjal, Hindu Dalit, 16 years).

Figure 32 *Maintaining Physical Distance* – Filmmaker (Hindu Dalit) films her house from far away since she is not allowed to enter the courtyard while menstruating.

(Photograph used with permission from the participant)

The Hindu Chhetri and Brahman girls were allowed to stay in the courtyard and on the porch of their houses. They were not required to maintain physical distance from their homes, but they could not enter while menstruating.

The Hindu Janajati, as well as the Christian Dalit and Chhetri girls did not maintain physical distance between themselves and their homes during menstruation. The Hindu Janajati girl was free to enter her home except for the prayer room, whereas the Christian girls did not have any rules to follow regarding maintaining physical distance.

Another common practice was keeping distance from community places of worship. All Hindu girls maintained physical distance from temples and places of worship while menstruating, which appeared to be at least 100 feet. When asked how far they have to stay from the temple, one explained: "We cannot go too close to the temple, it is good if more distance is kept" (Maya, Hindu Dalit, 18 years).

Two Hindu girls (Brahman, Dalit) discussed maintaining distance from toilets in their films. One expressed that using the same toilet as her elders was a problem because she is polluted during her period. She also explained the potential negative effects of following this restriction: "I cannot go inside the toilet when I am menstruating. This has affected me because if we do not use the toilet then the environment

will be polluted. If the environment is polluted, then we may suffer from different types of diseases that can spread if (we are defecating) everywhere" (Srijana, Hindu Brahman, 18 years). Another Hindu Dalit girl had different reasons for avoiding the family toilet during her period: "I cannot go near the toilet since the water tap is near the toilet. There is also a fruit tree near the toilet so I cannot go to the toilet. (In the past), my mother used this toilet on the fourth day of her period. Due to this, the guava trees (touching the toilet) died. We used to eat them during the rainy season, and they were delicious. So how can we use toilet? (Also) there is a water tap and it is said that the pipe of the water tap and toilet are the same. (The guava trees) died and (the water tap) dried up" (Maya, Hindu Dalit, 18 years) (Figure 33). When asked about where she goes to the bathroom while menstruating, she explained that she can ask to use a neighbor's toilet if it is not near a water tap or fruit tree. Alternatively, she can go to the river. The other four girls (Hindu Dalit and Janajati, and Christian Dalit and Chhetri) were allowed to use the toilet as usual while menstruating.

Figure 33 *Maintaining Physical Distance* – Filmmaker (Hindu Dalit) shows her family toilet and explains she is not allowed to use it while menstruating because there is a guava tree and a water tap nearby.

(Photograph used with permission from the participant)

Motivations for Menstrual Practices in Far-West Nepal

The reasons for following the aforementioned menstrual practices included religious and spiritual beliefs, family tradition, negative consequences if they are not practiced, and social pressure. Many of these motivations also differed between caste/ethnic and religious groups represented in the sample.

Religious and Spiritual Beliefs

For all girls, religious and spiritual beliefs were a strong influence for menstrual practices. The Hindu girls often explained that they followed menstrual restrictions to avoid sinning or angering god: "(If we touch) the temple god will attack us…if there is a temple we can't go nearby" (Kinjal, Hindu Dalit, 16 years). Even the Hindu Janajati girl, who had relatively lenient menstrual restrictions, mentioned religious beliefs as a reason for following her practices: "We should not go inside (the house because) god is there, and if we go inside and touch (things) it is a sin" (Onsari, Hindu Janajati, 17 years).

Family Tradition

Some girls cited family tradition as the reason for their menstrual traditions: "It's from our grandparents, and mom and aunt. We have to follow what they say" (Srijana, Hindu Brahman, 18 years old). There appears to be a strong connection between current menstrual practices and family and ancestor customs, and the girls were expected to maintain tradition: "In our culture they say we have to preserve our old culture" (Srijana, Hindu Brahman, 18 years old). Others did not feel they have a right to break these traditions reflecting the strong power of family tradition: "We don't know the main reason (for the traditions) because they are practiced from earlier, (but our family says) 'who are you to break these traditions? You are a small child of ours. We have lived half of our lives and we have not broken the practices'" (Maya, Hindu Dalit, 18 years).

Fear of Negative Consequences

Fear of numerous negative consequences as a result of not following menstrual traditions was expressed by the participants. Some consequences were physical in nature, such as pain and sickness; girls discussed examples ranging from health problems for their mothers, headaches, shivering, and leg, teeth, and stomach pain. Other negative consequences included the water tap drying up, plants and livestock dying, cows and bullock becoming sick, and cows producing less milk.

Social Pressure

Girls discussed mounting social pressure to follow menstrual practices and uphold traditions in the community. The Hindu Janajati explained that her immediate family is not necessarily strict when it comes to menstrual traditions, but she still follows many of the ritual purity rules in front of others; if she does not show that she is following these traditions, she cannot access community resources such as the water tap. Social pressure is high, which encourages some families to adopt *chhaupadi* and other restrictions.

4.5 Discussion

Continuum of Menstrual Practices Among Hindus in Nepal

The results of this study highlight a range of menstrual practices in one caste/ethnically and religiously diverse village. Hindus from all four caste/ethnic groups followed different daily practices while menstruating, whereas Christians from two different caste/ethnic backgrounds did not have any restrictions while menstruating. Menstrual practices in far-west Nepal vary by caste/ethnic group and religion, and the practices followed among Hindus fall along a continuum, from less restrictive to more restrictive (Figure 17).

Christian girls of both Dalit and Chhetri castes did not adopt any specific menstrual practices and were permitted to engage in regular activities while menstruating. Notably, however, menstruation was not without challenges. The Christian girls said that on the one hand they were pressured from their families and other Christians to avoid menstrual restrictions and perform all household duties as usual, yet on the other hand were pressured by community members with different beliefs (e.g. Hindus) to adopt restrictions during menstruation. This highlights that Christian girls face different types of challenges during menstruation that should not be overlooked, which are associated with social pressure to follow purity practices, such as keeping distance from people and objects. Such challenges must be incorporated into menstrual health programming, where different beliefs and practices are incorporated, and challenges related to social pressure are addressed.

Future studies are required to explore social dynamics between religious groups when it comes to menstrual practices, and how these affect health outcomes. In line with the social-ecological framework,[277,278] a deeper understanding of religious-social dynamics and pressures at both the individual level, as well as social-environmental levels, will allow for programs and behavior change interventions for menstrual health to be designed most effectively.[225,279] The findings from this study suggest that not only do individual and family religious beliefs need to be considered in understanding menstrual behaviors, but also broader community beliefs and relationships and their influence on practices, motivations, and health.[278] Interestingly, menstrual practices among Christians in our study in Nepal slightly differ from findings in neighboring India; although Christians did not follow as many menstrual restrictions as Hindus and Muslims in India, 42.5% still reported avoiding religious functions during menstruation, which was not the case in Nepal.[280]

On the most lenient end of the menstrual practice continuum are Hindu Janajati practices. The girl in this study followed some rituals but had minimal restrictions, which included avoiding entering the kitchen and prayer room at home, and not touching elders. However, she was still able to use her own toilet and move freely throughout her village, and even touch plants and trees, which her Hindu Brahman and Chhetri friends were not allowed to do. This finding aligns with those from other studies in Nepal,

which suggests that Janajati practices are less restrictive than Brahmans and Chhetris, as they are not required to adhere to strict social practices to validate their social status.[103,141,143] Janajatis tend to follow fewer menstrual restrictions in Nepal and do not subscribe to the same purity and impurity traditions as high caste Hindus.[281] However, like Christians, while Janajati do not appear to have the most extreme or restrictive practices, they still face challenges during menstruation. A quantitative study that explored differences in menstrual knowledge, attitudes and practices by caste/ethnic background across nine districts of Nepal found that Janajatis had the poorest menstrual knowledge and practice outcomes compared to high caste Brahman/Chhetris.[103] This suggests that although Janajatis follow fewer menstrual restrictions, accurate menstrual knowledge and hygienic practices (e.g., materials used to absorb blood, frequency of changing materials, disposal practices, etc.) are poorest among this group, and targeted interventions addressing this gap are required.

The Chhetri and Brahman Hindu girls fell next along the continuum, as they adopted additional restrictions, including sleeping outside the home and not entering the home during their menstrual cycle. They were also prohibited from touching plants and all people. Finally, at the most restrictive end of the menstrual practice continuum were Hindu Dalit practices. In addition to the aforementioned restrictions faced by Janajati, Chhetri and Brahmans, Dalit girls had to sleep in a small shed far from their home, avoid the periphery of their homes, avoid toilets close to the home, and bathe and wash their clothes in the river.

Generally, these findings align with previous studies in Nepal that have explored menstrual practices and restrictions, concluding that avoiding religious spaces, limiting mobility, and avoiding the kitchen are common menstrual practices in Nepal.[6,22,127] Regarding which caste/ethnic groups follow the most restrictive menstrual practices, two other studies support the findings in this study, suggesting Dalits adopt the most restrictive menstrual practices. One mixed method study was conducted in Bajhang district and suggests that women belonging to Dalit castes are more vulnerable and face more troubles when it comes to menstruation.[1] Another qualitative study that was conducted in Achham also suggests that practices are more rigid among lower caste Dalits, but also among upper caste Thakuris.[110] One reason for

Dalits adopting stricter menstrual practices may stem from a phenomenon called Sanskritization. While the concept of Sanskritization was developed in India, it describes a form of social change in the caste system that may also apply to Nepal, where those falling in the lower part of the caste hierarchy (Dalits) seek upward mobility by emulating practices and rituals of those at higher levels of the caste system.[282]

Conversely, there is other evidence that suggests *chhaupadi* is practiced more strongly among high-caste Brahman and Chhetri castes,[7] stemming from the belief that higher caste groups "carry the onus to take upon more stringent forms of all purifying rituals including menstruation rituals to suppress the influence of various pollutants."[283(p84)] While the results from this study did demonstrate that Hindu Brahmans and Chhetris practice strict menstrual restrictions and ritual purification techniques, they did not practice the most restrictive menstrual practice of *chhaupadi* in this particular community. While the evidence appears mixed in terms of which caste/ethnic group practices the most restrictive practices, the literature does suggest that *chhaupadi* is followed by Hindus largely in the mid and far western regions,[3,5,11,68,135] and is especially prevalent among Brahmans, Chhetris and Dalits.[22] Who practices the tradition in its more restrictive form appears to depends on the context.

Another study found that menstrual restrictions were more severe in locations where Hindu castes dominate (e.g. Mugu and Achham districts). Whereas in settlements that were diverse or heavily populated by indigenous ethnic groups (Janajati), menstrual restrictions were flexible.[141] This evidence suggests that practices among caste/ethnic groups may also differ depending on the district and demographic composition of the community, which should be considered in future studies.

Implications of Menstrual Practices

Overall, physical cleansing of bodies, clothing, and spaces were menstrual practices followed for all participants in this study. Cleansing and bathing were important practices that were followed during menstruation; however, Hindu girls altered their practices by either traveling far from home to use a water source that they would not be at risk of polluting or asking for water from friends or family members due to beliefs surrounding impurity. Though the Hindu girls did not formally conduct housework during their

menstrual cycles, such as household cleaning, simple daily tasks were more burdensome during menstruation. For example, the two Hindu Dalit girls still had the responsibility to wash their clothes and bedding while menstruating, but since they were unable to use the water tap at home, the task of washing their clothes took considerably longer since they had to travel to the river. While at first glance it may appear that girls are getting a break from work during menstruation, from the results of this study it was clear that the Hindu Dalit girls still had to complete many duties and were still responsible for collecting wood and working in the fields. The restrictions they face may negatively influence educational outcomes (e.g., limits study time), and leave them vulnerable when traveling long distances alone during menstruation as some studies suggest (e.g., animal attacks, assault),[1,11,22,115] but further investigation is required.

Avoiding the kitchen during menstruation was practiced by all Hindu girls in this study, and similarly has been found in other studies on menstruation in Nepal.[9,22,127,141] Two of the Hindu girls expressed that it was nice to get a break from cooking; however, the films revealed that the burden of cooking and caring for the needs of a menstruating girl fell onto other girls and women in the household . This may be concerning if these girls miss school or are late for school from having to take on extra responsibilities in the home. Future studies are required to further explore the effects of taking on these extra responsibilities, as well as other indirect negative consequences. Interventions may explore approaches for sharing household responsibilities, such as incorporating men and boys to reduce the burden of household responsibilities on women only, especially during menstruation.

Though both Christian girls cooked as usual while menstruating, they both acknowledged the need for rest during their period due to physical pain. Another menstrual health study using ethnographic approaches in Nepal also found a range of challenges associated with physical pain among girls of menstruating age.[141] Overall, interventions targeting menstrual health should consider addressing physical pain associated with menstruation, in additional to behavior change and increasing menstrual knowledge.

While the menstrual practices and restrictions discussed in this study are specific to the context of Nepal, in several cultures around the world and throughout history, women and girls have experienced

menstrual seclusion with similarities to Nepal. Native Americans from the Tlingit tribe were forbidden from lying down or chewing their own food during their periods and had to stay in small grass huts. Ancient Persians isolated women to a certain part of the house where post-period they washed with bull's urine. Eskimos in Greenland lived in seclusion in specific huts where they were forbidden from eating.[284] In eastern Africa among the Nyakyusa and Ngonde (Tanzania and Malawi respectively), coming into contact with menstrual blood is seen as dangerous to a man, and thus women must follow restrictions related to cooking and serving food as her body is considered dirty.[285] Among the Akan culture in Ghana, women cannot cook for their husbands or eat food in a dwelling house for a man, and in previous generations, women slept in separate huts behind the house during menstruation.[286] In West New Guinea, when a girl experiences her first menstrual period, she stays in a simple hut constructed of wood and grass for two days and two nights during her first two menstrual cycles, accompanied by older female relatives.[287]

It is also important to note that not all experiences and traditions of seclusion are perceived negatively. In some cultures, menstrual seclusion is perceived as an opportunity for rest and time for developing solidary among women. For example, in Northwest Pakistan, Kalasha women gather in a communal space called a *bashali* during menstruation. Wynne Maggi explains that among Kalasha women, "menstruation and child birth inspire neither horror nor disgust. The *pragata* blood associated with reproduction is entirely women's business."[288(p118)] Instead of the *bashali* being a place of discomfort, fear, or powerlessness, it is described as a space that is central to women's culture and community and enhances agency. In these spaces women can rest, sing and dance, and escape from their restricted lives in the home and social pressures in the village.[288]

These examples of menstrual isolation and restrictions emphasize that they have been common for centuries in various contexts around the globe. Women experience a range of feelings associated with the practices, and similarities can be drawn between these practices and those prevalent in Nepal.

Caste/Ethnicity and Religion as Fundamental Causes of Menstrual Practices in Nepal

This study highlights the importance of both caste/ethnicity and religion as fundamental causes of menstrual practices; however, religious identity operates as a primary factor, and caste/ethnicity as a secondary factor. While caste/ethnicity was not explicitly stated as a reason for following certain menstrual practices, it was clear through watching the films that menstrual practices differed by caste/ethnic background. On the contrary, religion and spiritual beliefs were explicitly discussed as important factors that influenced girls' decisions and motivations to follow menstrual practices. Religion was a primary factor that impacted one's motivation to practice certain menstrual traditions, which was more instrumental than one's caste/ethnicity in influencing menstrual practices. This can be seen by examining the practices of the two Christian girls in this study. As Christians, neither of the girls followed menstrual restrictions. In this case, their identity as Christians were more influential their caste identities as a Dalit and Chhetri. Neither participant referred to their caste identity in impacting their menstrual practices, signifying that religion was the most important factor in motivating their practices. The situation for Hindus is slightly different. While Hindu religious beliefs were often stated as reasons for following menstrual practices, the practices among Hindus differed depending on one's caste/ethnicity (see Figure 1). Hinduism as a religious factor acted as a fundamental cause for following certain menstrual practices, and caste/ethnicity operated as a secondary factor that influenced the degree to which the practices were followed, from less strict to highly restrictive.

Two studies conducted in India and Nepal both found caste to be an important predictor of menstrual practices, where different caste groups had statistically different menstrual practices, which aligns with the qualitative findings of this study.[103,289] Thus, understanding different caste/ethnic belief systems, as well as religion, are key to understanding menstrual practices in Nepal. Unique challenges, practices and beliefs of those from different caste/ethnic backgrounds should be considered in the design of interventions targeting such a diverse group of women and girls in Nepal. Also, notably, whether women and girls follow Hinduism or Christianity, they are still pressured to follow certain practices, and they do not hold the power to make their own decisions about their practices and bodies. Girls from both

religious groups in this study were pressured to follow practices, either highly restrictive, or without restrictions. Both situations disempower girls from making their own decisions about what is right for their own bodies.

Moving Beyond the *Chhaupadi* Shed and Recommendations for Nepal

According to the Convention on the Elimination of Discrimination against Women (CEDAW), and Committee on the Rights of the Child (CRC), harmful practices are considered to be persistent behaviors that discriminate on the basis of sex, gender, age, caste/ethnicity, language, religion, and more, leading to violence, physical or emotional harm or suffering.[290] According to this definition, *chhaupadi* is considered a harmful practice as it often leaves women and girls vulnerable to violence, stress, injury and poorer health, educational and economic outcomes, and in some cases, death.[290,291] The practice includes multiple aspects of restricting women and girls from daily activities due the belief that menstruating women are impure, where sleeping in the animal shed is only one aspect of the practice.

Though attention to the harmful practice of *chhaupadi* is growing, bringing funding to menstrual health in Nepal, this study illustrates that sleeping in a shed is one aspect of a wider range of restrictions and challenges that women and girls face during menstruation. As seen in this study, girls who practice *chhaupadi* sleep in a shed during menstruation, which is a central piece in the *chhaupadi* narrative, but there are also numerous other restrictive and discriminatory practices that keep women and girls out of communal spaces, worship areas, and away from water sources and friends and family members that need to be considered as a part of the practice. Beyond the physical health vulnerabilities stemming from sleeping in a shed, there are psychosocial health concerns related to stigma, shame and anxiety that are linked to widespread seclusion during menstruation, which was also found in another ethnographic study on menstruation in Nepal.[141]

Additionally, in the context of the *chhaupadi* criminalization code that was passed in parliament in August 2017,[151] the research and menstrual health programming agenda must evolve. Under the new code, those following *chhaupadi* or forcing others to practice can face jail time and/or fines of up to 3000

rupees (approximately $30).[150] As the government begins to strategize for code enforcement, it is important for the practice of *chhaupadi* to be explicitly defined. Activists have raised concerns, that without a clear definition of *chhaupadi*, and without an understanding of which aspects of the practice are being criminalized, it will be challenging to enforce this new code aimed at curtailing the practice.[116] Based on the results of this study, defining *chhaupadi* as a physical practice related to sleeping in a shed during menstruation ignores other nuanced aspects of the practice. Holistically addressing *chhaupadi*-related concerns must include targeting deeply-rooted ideologies that view women as polluted, which inevitably affect women and girls' confidence and mental health. It involves deeper engagement with fundamental root causes of menstrual practices associated with caste/ethnicity and religion. Another qualitative study from Nepal also suggests that menstrual health and hygiene cannot be restricted to physical manifestations of certain practices, but must embrace understanding psychological burdens, shame, and embarrassment.[141]

Since menstrual restrictions vary depending on one's caste/ethnic and religious background, the authors suggest the menstrual health research agenda in Nepal adopt a wider approach, where *chhaupadi* is considered as one aspect of a broader continuum of menstrual restrictions. Interventions designed to improve menstrual health outcomes must consider the range of restrictions, traditions and beliefs that affect the rights, power, confidence, and self-esteem of menstruating women and girls in Nepal.

Additionally, community-driven solutions for harm reduction of *chhaupadi*-associated hazards should be considered. In a study conducted by NFCC/USAID in far-west Nepal, it was found that elimination of the shed alone is not enough to end the practice, but a comprehensive approach that addresses all forms of menstrual discrimination in and outside the home is required.[11] The authors recommended that efforts aimed at ending *chhaupadi* should adopt a phased, harm-reduction approach where the focus is to first shift the shed closer to the home from the field, and the next step will be to shift the practice from the shed to home, followed by the home to their own room.[11]

Menstrual restrictions are not isolated, nor do they happen by chance. It is the deeply-rooted patriarchal, social, cultural and religious norms preserved throughout centuries that view women, as well

as lower caste groups, as inferior that lead such practices to remain in practice today.[81] Ending harmful menstrual practices requires a systematic, multi-sectoral, and multi-level approach that targets social norms, and addresses fundamental causes of the practices, aimed at shifting attitudes and beliefs, and eventually, practices.[81]

This study provided rich, in-depth and nuanced details about the range of menstrual practices in one village and suggests future avenues for associated research and practice. However, some limitations are worth discussing. The sample was seven participants, and therefore the results are not generalizable. The visual and collaborative method provided a unique and engaging opportunity for participants to express themselves in ways that go beyond words; however, some participants may have been hesitant to express themselves on camera, knowing that their visuals were going to be shared. The study team aimed to overcome this through comprehensive training, with ample opportunities for troubleshooting, feedback, and practice, as well as the opportunity to remove their footage from the study at any point in time throughout the study.

Overall, this study provided a first glimpse into patterns of menstrual practices among girls of different caste/ethnic and religious backgrounds. Future studies are required to build upon this formative work to understand the prevalence of these practices and motivations, and if the continuum of menstrual practices described in this manuscript is applicable to other settings across Nepal.

4.6 Conclusion

Participants from four different caste/ethnic groups (Brahman, Chhetri, Janajati and Dalit) and two religious backgrounds (Hindu and Christian) practice a range of menstrual traditions in Nepal that fall along a continuum. In one village, menstrual practices and restrictions vary widely, and are motivated by a number of social and religious factors. Unique challenges, practices, and beliefs of those from different caste/ethnic backgrounds should be considered in the design of interventions targeting such a diverse

group of women and girls in Nepal. Notably, though *chhaupadi* has been central to menstrual health discourse in Nepal, girls who do not practice *chhaupadi*, such as Christians and Janajatis, still face challenges during menstruation that cannot be overlooked in the design of interventions, programs, and policies. The results of this study suggest that a deeper understanding of religious-social dynamics at individual and social-environmental levels is needed for sustainable behavior change. Future studies are needed to build upon these findings, specifically to explore practices and motivations among additional caste/ethnic and religious groups that were beyond the scope of this study, to understand indirect consequences of menstrual practices on other women in the household and explore the role that men and boys can have in addressing deeply-rooted menstrual beliefs related to purity and pollution. In designing menstrual health interventions and policies, a broader definition and understanding of *chhaupadi* is required that moves beyond the visible and tangible practice of sleeping in a shed. A comprehensive approach for addressing all menstrual restrictions is needed that targets deeply-rooted, discriminatory ideologies regarding women's impurity, which inevitably affects women and girls' health. Overall, a range of menstrual practices, motivations, and aspects of *chhaupadi* that differ by caste/ethnic and religious background, must be considered to ensure context-specificity and sustainable menstrual health improvements, particularly the diverse context of Nepal.

4.7 Acknowledgements

The authors acknowledge the significant inputs provided by Sara Baumann's dissertation committee members.

5.0 Dissertation Discussion

This dissertation contributes to visual methods and menstrual health literature by summarizing the range of studies that have applied film methods in public health research, presenting Collaborative Filmmaking as a community-engaged and embodied research method, and sharing the results from applying the method to explore nuances in menstrual practices and motivations in Nepal.

First, this dissertation built upon the visual methods literature by exploring specifically how film methods have been applied in public health research. A total of 15 film methods were identified and studied, which revealed that film methods in public health research offer numerous methodological strengths, such as the ability to provide rich descriptions, capture emic perspectives, increase comfort in participation, empower participants, and be used for advocacy. In future studies, researchers could consider engaging participants throughout the entire research process and using visuals created in the study to communicate findings. Keeping in mind their unique challenges, such as ethical considerations, the use of film methods is long overdue in public health, which provide unique opportunities to capture sensory data.

Second, a community-engaged, participatory visual research method called Collaborative Filmmaking was developed building upon the scoping review findings. Piloting the method in far-west Nepal highlighted that Collaborative Filmmaking provides a unique opportunity for engendering a nuanced understanding of health behaviors through sensory data. The participatory nature of the method allowed participants to provide real-time feedback on footage and contextual details for understanding the visuals, sounds, actions, words, and gestures captured on film; the participant-produced films can also be used as advocacy tools at community, national, and international levels. While unique ethical challenges associated with the method require careful planning, Collaborative Filmmaking can be particularly useful for exploring sensitive health topics and providing nuanced insights regarding social, religious, cultural and environmental contexts that deeply impact health.

Third, Collaborative Filmmaking was applied in far-west Nepal and the data were analyzed to better understand how menstrual practices and motivations differed among a diverse group of adolescent girls from various caste/ethnic and religious backgrounds. An array of menstrual practices was identified related to cleansing, cooking, eating and drinking, touching, worshipping, sleeping, and maintaining physical distance that can be understood on a continuum. The practices vary by caste/ethnic and religious background and are motivated by religious and spiritual beliefs, family tradition, negative consequences, and social pressure. In designing menstrual health interventions and policies, a range of menstrual practices and motivations, as well as the unique needs of different caste/ethnic and religious groups must be considered to ensure context specificity, particularly in ethnically and religiously diverse Nepal.

5.1 Future Directions for Research

The results of this dissertation highlight several opportunities for future research on Collaborative Filmmaking and menstrual health in Nepal.

Collaborative Filmmaking

Results from piloting Collaborative Filmmaking, consistent with other film and visual methods applied in public health, suggest that the method is beneficial for studying nuances in health behaviors and gathering multisensory data,[222] and for developing tools in the form of films that can be used for advocacy purposes.[187,208,210,211,216,220,221] However, several areas are suitable for future exploration.

First, while this dissertation explored participant experiences using Collaborative Filmmaking through an FGD to understand the effectiveness and appropriateness of the method, future research could seek to quantitatively measure impacts of the Collaborative Filmmaking process. For example, researchers may consider assessing the impact of participation in Collaborative Filmmaking on participant empowerment, self-efficacy, happiness and other aspects of emotional well-being. Future studies may

also consider measuring the impact of the films created as a result of Collaborative Filmmaking as an advocacy and awareness raising tool. This could be done by tracking changes in knowledge or opinions as a result of watching the participant films through an audience post-screening interview or survey.

Second, researchers could explore the range of audiences and best approaches for screening the final documentary film, which may take different forms depending on the research question and context. For example, how can films best be used for advocacy at the national level with policymakers addressing the public health issue? Or how can films be incorporated into community programming as awareness-raising tools? Are there opportunities for incorporating films into educational curricula? Such questions could be piloted in future Collaborative Filmmaking projects.

Third, future studies are needed to test the appropriateness of Collaborative Filmmaking for studying a range of health topics in different country contexts. While the scoping review conducted for Aim 1 found that film methods have been applied to study a range of health topics including asthma,[217,220] adolescent health,[215,232] vaccination,[219] and mental health,[213,233] a deeper understanding of how Collaborative Filmmaking can be applied to study other health topics and behaviors is still needed. While this dissertation found the method to be effective for studying health behaviors around menstruation in a diverse group, this method may be particularly well-suited for other contexts, such as with large indigenous populations. For example, in the context of Bolivia, intercultural approaches to addressing health issues are on the rise.[292] Collaborative Filmmaking could serve as a useful tool for engaging with indigenous communities to generate a deeper understanding of embodied experiences of health care negotiation in projects that incorporate indigenous traditions into biomedical health systems.[292] It could also visually and spatially capture the impacts of such intercultural healthcare approaches by providing a tool for community members to capture changes that have occurred in their lives, such as what was found in another Bolivian study in the form of stronger networks, community engagement and reproductive healthcare.[293]

Fourth, additional research is needed to explore the use of Collaborative Filmmaking with other gender and age groups. Results generated in Aim 1 highlighted that film methods have been applied with

youth[195] and elderly[201] and included both men and women. These results suggest that Collaborative Filmmaking may also be appropriate for different ages and populations but requires further testing with different gender and age groups to determine if the method needs to be altered for use across a range of populations.

Fifth, both the scoping review of film methods and piloting of Collaborative Filmmaking revealed that ethical considerations require substantial attention when designing and implementing visual research studies. Developing ethics protocols and working closely with institutional review boards to determine the best approaches for navigating this new area of film in public health research are processes that must not be overlooked. Additionally, while each study will have its own unique challenges, it is recommended that decisions regarding anonymity and ownership be discussed directly with participants, keeping in mind the unique social and cultural contexts when it comes to privacy. Future studies may consider checking back in with participants after a public screening to better understand how the experience affects the participant and how they feel about the particular topic being studied. Additionally, including a component to follow up with participants a significant time after the study is complete (six to 12 months) would be beneficial to better understand the potential unintended impacts of the Collaborative Filmmaking experience on participants and the community.

Sixth, an opportunity exists for expanding the use of Collaborative Filmmaking into program evaluation. Future studies are required to understand how Collaborative Filmmaking can best be applied to evaluate programs, but it is predicted that the method can provide a unique opportunity to help practitioners and donors to understand how participants and beneficiaries move through all aspects of programming. Collaborative Filmmaking offers an opportunity not only to better understand participant experiences for program improvement, such as identifying facilitators and barriers, but offers a powerful approach for sharing such stories with donors, the development community and a range of practitioners, as well as local governments.

Menstrual Health in Nepal

The results of this dissertation study suggest that a deeper understanding of religious-social dynamics at individual and social-environmental levels is needed for sustainable menstrual health behavior change in Nepal. While this dissertation revealed that menstrual practices fall along a continuum, ranging from no restrictions to highly restrictive practices (e.g. *chhaupadi*), future research is needed to build upon these findings by exploring practices and motivations among caste/ethnic and religious groups that were beyond the scope of this study.

First, additional studies are needed to explore menstrual behaviors, experiences and challenges among other religious and caste/ethnic groups, for example Buddhists, Muslims, Animists, and Newars. While these groups were not included in our study, the diverse range of menstrual experiences that this study uncovered suggests that women and girls from these groups may also face unique needs that need to be considered in menstrual health interventions. Additionally, this is the first known study to include Christian practices in the analysis of menstrual practices, and further research is needed to better understand menstrual practices and motivations among this group in Nepal. While the results of this dissertation suggest that Christians may face unique challenges during menstruation, such as peer and community pressure to follow certain menstrual restrictions, it must be noted that our study included only two Christians. A larger sample from different parts of the country is needed to develop a larger knowledge base regarding practices and beliefs in Nepal. Additionally, Janajati are underrepresented in research on menstruation in Nepal, though a recent research study found that Janajati have the poorest outcomes in terms of menstrual knowledge and practices.[103] Thus, it is important to include these understudied groups in future research.

Second, while at first glance it may appear that women and girls are getting a break from work during menstruation, this study revealed that Hindu girls still had to complete many duties such as collecting wood and working in the fields. The restrictions they face may negatively influence educational outcomes (e.g., lower grades due to limited study time during menstruation), and leave them vulnerable when traveling long distances alone during menstruation as some studies suggest (e.g., animal attacks,

assault),[1,11,22,115] but further investigation is required to better understand the scope of the burdens they face during menstruation, and how this impacts others members of the household. For example, are younger sisters missing school to cook for and take care of their older sisters when they are menstruating, and vice versa? Future studies are required to explore the effects of taking on these extra responsibilities, and other potential indirect negative consequences. Interventions may explore approaches for sharing household responsibilities, such as incorporating men and boys, to reduce the burden of household responsibilities on women only, especially during menstruation.

Third, while attention to the harmful practice of *chhaupadi* is growing, and as a result has contributed to putting Nepal menstrual health on the global health and development donor agenda, this study illustrates that sleeping in a shed is only one aspect of a wider range of restrictions and challenges. As seen in the Collaborative Filmmaking pilot study results, girls who practice *chhaupadi* sleep in a shed during menstruation, which is a central piece in the *chhaupadi* narrative, but numerous other restrictive and discriminatory practices keep women and girls out of communal spaces, worship areas, and away from water sources and friends and family members, which must be considered in a wider definition of the practice. Future studies are needed to systematically measure psychosocial health impacts such as stigma, shame and anxiety that may be associated with widespread seclusion during menstruation. This extends beyond sleeping in a shed, in which more research is required to explore the impacts of other discriminatory practices such as being banned from kitchens, water taps and places of worship on outcomes such as well-being, empowerment, and participation in school.

Fourth, since menstrual practices vary depending on one's caste/ethnic and religious background, the menstrual health research agenda in Nepal must adopt a wider approach. Interventions designed to improve menstrual health outcomes must consider the range of restrictions, traditions and beliefs that affect the rights, power, confidence, and self-esteem of menstruating women and girls in Nepal, and ensure that a diverse group of stakeholders is included in the design of menstrual health interventions to ensure that they are culturally appropriate and suitable to meeting the needs of all Nepalis (e.g.

incorporating local languages, range of cultural dresses and traditions in educational materials, discussing menstrual beliefs that are unique to a range of caste/ethnic groups).

5.2 Dissertation Conclusions

Menstrual health has gained global attention and is now widely recognized as a public health issue.[45] Numerous development outcomes including health, education, gender equality, empowerment, and rights are each affected by menstruation.[24,35,81] Today over 28 registered organizations are working on the issue in Nepal. A Menstrual Health Practitioners Alliance was established to coordinate efforts between the organizations, and in December 2018, a consultative workshop called MenstruAction was held with over 350 participants to strategize on the advancement of the menstrual health agenda throughout the country.[10,294] While these coordination efforts are noteworthy, the use of research evidence to inform effective approaches for addressing menstrual health challenges in Nepal remains limited. Specifically, knowledge regarding the unique practices, beliefs and needs of diverse groups across Nepal is largely missing from the scientific literature, as well as from media and global discourse of Nepal and menstruation. The results of this dissertation draw attention to the importance of more research on nuanced differences in menstrual experiences by caste/ethnic and religious backgrounds. Based on findings from the peer-reviewed literature, film offers a unique opportunity to explore public health issues, and based on piloting of the method, Collaborative Filmmaking is one novel, participatory approach that is appropriate for studying health behaviors and motivations.

The results of this dissertation suggest that a comprehensive approach for researching and designing evidence-based interventions that address target certain menstrual restrictions in Nepal is needed. The approach must target deeply-rooted ideologies regarding women's impurity that inevitably affect women and girls' health. Overall, a range of menstrual practices, motivations, and aspects of

chhaupadi must be considered to ensure context specificity and sustainable solutions for improving menstrual health for all.

Appendix A Scoping Review Search Terms Developed with HSLS Librarian

Scopus Search

(TITLE-ABS-KEY ("Collaborative mapping" OR "Community mapping" OR "Docent method" OR "Photo elicitation" OR "Photo novella" OR photonovella OR "Photo voice" OR photovoice OR sensecam OR "Video diaries" OR "Video diary" OR "Video elicitation" OR "Video intervention" OR videovoice OR "Visual voices")) OR ((TITLE-ABS-KEY ("applied visual anthropology" OR "auto photographic" OR autovideography OR "Body mapping" OR "collaborative video" OR "disposable cameras" OR "ethnographic photography" OR "free drawing" OR "free drawings" OR "image based research" OR mapmaking OR "photo interviewing" OR "video making" OR "videographic study" OR "visual anthropology" OR "visual epidemiology" OR "visual ethnography" OR "visual illness narratives" OR "visual methodologies" OR "visual methodology" OR "visual methods" OR "visual narrative" OR "visual narratives" OR "visual sociology" OR "visual storytelling")) AND (TITLE-ABS-KEY (cbpr OR collaboration* OR collaborative OR community OR informant* OR participant* OR participatory)))

Appendix B Level 1 Title/Abstract Screening Form with Sample Data

Refid: 1, There and Back Again: A Review of Residency and Return Migrations in Sharks, with Implications for Population Structure and Management.
Chapman DD, Feldheim KA, Papastamatiou Y, Hueter RE

The overexploitation of sharks has become a global environmental issue in need of a comprehensive and multifaceted management response. Tracking studies are beginning to elucidate how shark movements shape the internal dynamics and structure of populations, which determine the most appropriate scale of these management efforts.

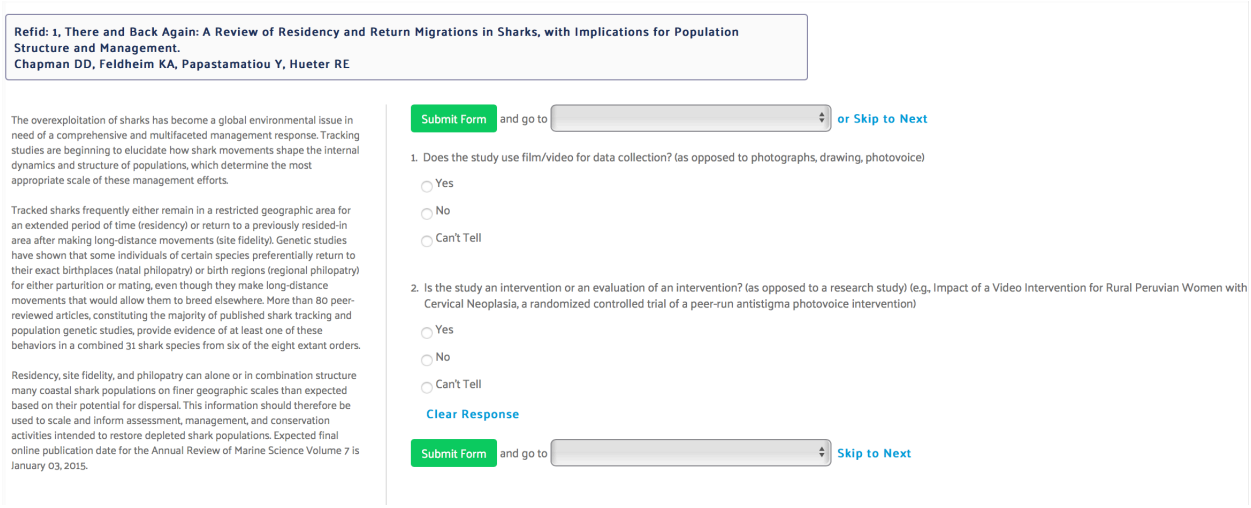
Tracked sharks frequently either remain in a restricted geographic area for an extended period of time (residency) or return to a previously resided-in area after making long-distance movements (site fidelity). Genetic studies have shown that some individuals of certain species preferentially return to their exact birthplaces (natal philopatry) or birth regions (regional philopatry) for either parturition or mating, even though they make long-distance movements that would allow them to breed elsewhere. More than 80 peer-reviewed articles, constituting the majority of published shark tracking and population genetic studies, provide evidence of at least one of these behaviors in a combined 31 shark species from six of the eight extant orders.

Residency, site fidelity, and philopatry can alone or in combination structure many coastal shark populations on finer geographic scales than expected based on their potential for dispersal. This information should therefore be used to scale and inform assessment, management, and conservation activities intended to restore depleted shark populations. Expected final online publication date for the Annual Review of Marine Science Volume 7 is January 03, 2015.

and go to

1. Is the **primary objective** of this study related to public health? ○ Yes ○ No ○ Can't Tell **Clear Response**	By public health we mean: • disease outcomes (e.g., malaria, HIV) • health systems or encounters with the health system • preventative measures (e.g., nutrition, family planning, water and sanitation) • health-related behaviors and behavior change (e.g., exercise, food habits, hand washing at critical times)
2. Does the study include a visual component? ○ Yes ○ No ○ Can't Tell **Clear Response**	By visual we mean the study includes any of the following: • Photographs • Videos • Film • Drawings • Maps (e.g., photovoice, visual voices, video voice, participatory filmmaking, community mapping, body mapping, etc.)
3. Does the study include primary data collection? ○ Yes ○ No ○ Can't Tell **Clear Response**	By primary data collection we mean: • Data was collected from original sources for this manuscript (as opposed to collecting from other data sets)
4. Is the manuscript commentary? ○ Yes ○ No ○ Can't Tell **Clear Response**	By commentary we mean: • An article that presents a new viewpoint or perspective on a topic • Does not involve primary data collection
5. Is the manuscript a review article? ○ Yes ○ No ○ Can't Tell **Clear Response**	By review article we mean: • An article that surveys and summarizes previously published studies, rather than reporting new facts or analysis
6. Is the study published in English? ○ Yes ○ No **Clear Response**	
7. Study unrelated, but save study for reading later? ○ Yes ○ No **Clear Response**	

Appendix C Level 2 Screening Form for Inclusion in Final Review with Sample Data



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Residency, site fidelity, and philopatry can alone or in combination structure many coastal shark populations on finer geographic scales than expected based on their potential for dispersal. This information should therefore be used to scale and inform assessment, management, and conservation activities intended to restore depleted shark populations. Expected final online publication date for the Annual Review of Marine Science Volume 7 is January 03, 2015.

Submit Form and go to [ ] or Skip to Next

1. Does the study use film/video for data collection? (as opposed to photographs, drawing, photovoice)
   - Yes
   - No
   - Can't Tell

2. Is the study an intervention or an evaluation of an intervention? (as opposed to a research study) (e.g., Impact of a Video Intervention for Rural Peruvian Women with Cervical Neoplasia, a randomized controlled trial of a peer-run antistigma photovoice intervention)
   - Yes
   - No
   - Can't Tell

Clear Response

Submit Form and go to [ ] Skip to Next

Appendix D Collaborative Filmmaking Workshop Agenda

University of Pittsburgh
Graduate School of Public Health

NFCC

Collaborative Filmmaking Workshop
May 15, 10am-4pm & May 16, 10am-2pm
Facilitators: Panchu Khadka and Sara Baumann

Date	Time	Activities	Facilitator/Presenter
Day 1	9:45-10:00	- Tea and biscuits	Panchu
	10:00-10:30	- Introduction to Study (Teachers, Gov't Officials) - Overview - Aims and Objectives of the Study - Scope and national level importance	Sara
	10:30-11:00	- Introduction of all Participants – Name Game - Conduct the Name Game sitting in a circle - Aims 1- Introduce participants - Aim 2- Introduce camera	Panchu and Sara
	11:00-11:30	- Introduction to Research Study in Nepali - Benefits of using filmmaking - Need for addressing Menstrual Health and Hygiene Management - Introduce the research question for this study - Explain the role of participants - View examples	Panchu
	11:30-11:45	- Introductory session on Menstruation	Panchu
	11:45-12:45	- Collaborative Activity on Research Question - Discuss practices based on the research question through participatory activity - Participants generate list of practices and work together to group them into categories - Facilitator concludes by summarizing the points raised by the participants	Panchu
	12:45-1:30	- Lunch Break	
	1:30-2:30	- Filmmaking Activity - Role Play	Panchu and Sara
	2:30-2:45	- Participant Break – Panchu and Sara to import footage for viewing –Tea and snacks for participants	Panchu and Sara
	2:45-3:00	- Role Play follow up discussion about their experience	Panchu and Sara

	3:00-4:00	- View footage and discuss footage as a group	Panchu and Sara
	4:00	- Conclude Day 1	
Day 2	9:45-10:00	- Tea and Biscuits	Panchu
	10:00-10:15	- Discussion/Review of Previous Day Learnings	Panchu
	10:15-11:15	- Filmmaking Activity- Creating Storyboards for their films and sharing as a group	Sara and Panchu
	11:15-12:00	- Filmmaking tips and techniques presentation	Panchu
	12:00-12:45	- Lunch	
	12:45-1:15	- Filmmaking Activity – Work in groups and everyone practices making a video diary	Panchu and Sara
	1:15-1:45	- View Video Diaries	Panchu and Sara
	1:45-2:00	- Review the tasks they are to do for the study: - Answer the research question using cameras - Follow their storyboard and add to it! - Film one day when menstruating and one day when they are not menstruating – share the film dates with each girl - Explain that we will be available in the village on their shooting days to assist with any problems (share tel. numbers) - Distribute cameras and checklists to first 2 participants	Panchu
	2:00	- Thank you – give prizes to participants	

Appendix E Collaborative Filmmaking Workshop Materials: Collaborative Activity on Research Question

Research question: "What are the typical menstrual practices followed in your family?"

Overview: Ask participants to elaborate on what comes to mind when thinking about the research question. An example may be given from your personal practice to start the conversation.
Steps:

- Provide them with index cards and ask them to list one activity per card regarding what they do during their menstruation period.
- Go around in a circle asking each participant to share her menstrual practices one by one until all the practices have been shared.
- Divide the participants into two different groups by counting off by numbers (e.g. 1 and 2).
- Divide the index cards between the groups and ask them to group the categories that make sense for them (e.g., bathing at the river and not using the water tap may be one category since they both have to do with water). Do not mention predefined categories, these should be generated by the participants themselves.
- Bring the two groups back together and discuss the categorizations created by both groups.
- Ask participants to stick the index cards on the wall in the groups they decided upon.
- Facilitator concludes by summarizing the points raised by the participants

Appendix F Collaborative Filmmaking Workshop Materials: Role Play

Role Play

Objective:

- To increase participants' camera operating skill
- To familiarize participants with the research questions
- To identify the challenges that may occur during the study

1. **Group Division**
   Form two groups of 3 members. If there is an odd number, the facilitators can join groups to ensure that all groups are comprised of three members. In the role play they will act as:
   - 1 girl - **Camera operator**
   - 2 girls - **Actors**
     - One acts as the **participant of the study**
     - The other will play the role of **supportive character** (such as a family member, friend or community member)

2. **Question and Topic**

   Explain the research question to the group: **"What are the typical menstrual practices in your family?"** The participants will use cameras to answer this question. Remind the girls of some of the answers that they brainstormed in the morning sessions when they conducted the activity about their practices (e.g., water, not touching kitchen, ask for food, etc.) Ask each group for take five minutes to decide what they would like to film for this activity and who will be the camera operator first and who will be the actors. Remind them that everyone will get a chance to play every role in this activity.

   After five minutes, give one camera to each group. Explain to them that they are free to film whatever comes to mind to answer the research question. They can film each other but be mindful not to film others who are not involved in this research study. If there are people are in the background, explain to the participants their options, such as asking them to move out of the frame, or turn so their back is showing and make sure their face is not identifiable. Give the participants 15 minutes to film.

   After 15 minutes, tell the girls to switch characters. *For example, if participants P1 was the **Camera Person**, P2 was **Participant of the study** and P3 was **Supportive Character** on the first role play, then P2 will be the **Camera Person**, P3 will **Participant of the study** and P1 will **Supportive Character** for the second role play*. Have them film for 15 minutes.

   Finally, have the group conduct the final role play for 15 minutes. At the end of the third role play, all the group members should have played all the characters.

3. **Collection of Video Footage**
   After the completion of three role play exercises, the research assistant will compile all the video footage in computer and check the footage. During this time, it is helpful to arrange a tea/snack break for 15 minutes.

4. **Discussion about the Video Footage**
   For the discussion, ask the following questions in the following order:

- **How was your experience filming?**

- **What part of the filmmaking process was easy for you to do?**

- **What part of the filmmaking process was challenging to do?**

Encourage participants to share their thoughts and feelings. A research assistant should note down the answers so that they can be addressed in the workshop discussions and activities on the following workshop day.

Next, show the video footage using a projector.

After viewing the footage, ask the participants the following questions:

- **What did you like about the footage?**

- **What did you not like about the footage captured?**

- **What do you think should be done differently next time to improve the videos?**

During the discussion remember to provide plenty of time for participants to think. Do not jump quickly from one question to another. Always remember that silence is also valuable. Ensure that each participant has a chance to speak.

Appendix G Collaborative Filmmaking Workshop Materials: Creating Storyboards

Adapted from *Insights into Participatory Video* [248]

Story Board Exercise

Supplies needed:

- Loose sheets of paper or notebooks
- Colored pencils
- One large piece of paper for the group with 6 boxes

1. Review the practices generated in the Collaborative Activity on Research Question. Ask the question: What are the menstrual practices in your family? Remind them that they can refer to the index cards posted on the wall if needed.
2. Ask each participant to think for themselves which practices are applicable in their own family. Then, ask them to think about how their experience may be different from other girls in the group. Express that it is great that we all have different practices and beliefs. Remind them that this study is about highlighting the differences and the commonalities, and that we should celebrate these things!
3. Express that they will now use a process called storyboarding to draw some ideas for the film that want to make.
4. First, work on an example as a group. Explain that there is not a right or wrong way to film, we want them to film that is most appropriate to tell their story- get creative!
5. For the group example, make a storyboard for the sample film created by the research team. Explain to them what a storyboard is: **A drawing of each of the shots that they want to include in their film. It is like drawing your film on paper.**
6. Show the sample film again, and ask the girls: 1) What was in the first shot of the film (review the film and show the beginning again if the girls do not remember)
7. Ask them about the second and third shot and so on, paying special attention to drawing the space (distance between people), the location (make it clear where each shot will take place) and go through the film together for about 5 minutes. *This part of the exercise should last 20 minutes*
8. Next, ask the girls to create a storyboard for their own film. Ask the girls to draw 4-6 boxes on their piece of paper.
9. Ask them, how would you film the question "What are typical menstrual practices in your family?" And have the girls draw a sketch in the first box. Tell them that the drawing can be very simple. This exercise should move along quickly- they are sketches and not a lot of detail is necessary. *Tell them they have 20 minutes to complete this task.*
10. At the end, have the girls review their drawings and make the following notes for each box:
    - Where will the shot will be filmed (i.e. kitchen, temple, outside the toilet, etc.)
    - What are you going to talk about in this shot?
    - How will you film it? (hand held or with head strap or set on a ledge? Or will you need a friend to help you?)
    - *This task should take 20 minutes*
11. Explain that the storyboard will be used as their guide for filming. However, explain that this is just a guide, and they are free to think of more ideas and practices to add to this list as they are filming.
12. Ask the girls to tape their drawings on the wall and walk around the room as a group to look at the drawings and have each participant describe her drawing for the group. *This task should take 10 minutes.*
13. Congratulate the participants!

Appendix H Collaborative Filmmaking Workshop Materials: Filmmaking Tips and Techniques Presentation

Filmmaking Techniques

- **Storyboard** – Now you have a storyboard that you can use to guide your film. Use this as a starting point and feel free to add new ideas as you go.
- **Journal-** Keep careful notes of the practices and locations that you film, so when you go back and film later during your menstruation/not menstruating you will know what to film.
- **Village Tour** – Establish your community and the context in which you live. Film parts of your community, home, etc. that are important to you.
- **House Tour** – Walk through your house with the camera and introduce us to important things about your home.
- **Video Diary-** At the end of your day, set up the camera in a quiet place where you can talk alone to the camera like a diary. You can talk about anything related to the project that is interesting to you, such as what you enjoyed about the project, how you feel, your menstruation practices and how they make you feel. You can talk about how the filmmaking practice has influenced your thoughts about menstruation too.

Filmmaking Tips

- Take your camera with you everywhere- you never know where you may find inspiration.
- Film your shot for at least 10 seconds (otherwise it will be too short for editing!)
- Think about how others will understand what you are filming- you can show something far away to capture the entire space and environment, and you can get close to show details. Using both techniques to tell your story is very useful! Do not be afraid to get close.
- Do not film others, they may not feel comfortable.
- Remember you can film yourself by placing the camera carefully on a ledge, pushing play, and then going through your practices.
- You can use the head strap if you do not want to hold the camera all the time.
- Remember that the camera records sound, and you can talk to the camera to tell us more about what you are filming and why you filmed it.
- Gather some wide/general shots of your village so we can see in general where you live! If there are interesting animals, practices or landscapes capture those because they will provide interesting context when we show your film outside of the village.
- The camera is waterproof- you can use it in the rain but please handle with care- and do not drop the camera.
- Make sure the lens is clear from water and fingerprints before shooting.
- Stability- it is nicer to watch a film when the camera is held steady. Take care to hold the camera as still as possible.
- The battery allows for 2 hours of filming, so think about what you want to film, and practice before you start to film. When you are finished with the shot remember to turn off the camera to preserve the battery.
- Remember to conduct your video diary at the end of the day- speaking into the camera discuss when you filmed or any of the feelings you have. Think about what will be in the background.

Appendix I Collaborative Filmmaking Workshop Materials: Video Diary Exercise

1. Split the participants into two groups- make sure the groups are different from the previous day
2. Give them each a camera and ask each person to record a short 1-2-minute video diary discussing their filmmaking exercise or thoughts on menstruation. Explain that this is a safe space and it is ok if they make a mistake because it is just a diary and they should be natural and speak freely in front of the camera. If they make a mistake, they can keep the camera on and just start again. Remind them that when they are recording their video diaries in their home, they should select a quiet space without any distractions. Give the girls 15 minutes to make their video diaries. Each girl should make their own video diary.
3. Review the footage as a group and answer any questions that the participants may have.

Appendix J Co-Analysis Discussion Guide for Collaborative Filmmaking

University of Pittsburgh

Graduate School of Public Health Pittsburgh, PA 15261
Department of Behavioral and Community Health Sciences

Welcome / Overview of Topic / and Ground Rules:
"Good afternoon and thank you for your time and participation in our session today. My name is _____and I will be asking you questions today to find out about your experiences during the Collaborative Filmmaking Project. With me today is _____, who will be helping me and taking notes during our discussion.

"My job is to ask questions and listen. We want to know more about your experience in the filmmaking project and to tell us more about what you decided to film. Feel free to ask questions at any time."

Permission for observer:
"I would like to get permission from you for _____ to be with us during our discussion. If not, it is ok but please let me know."

Ground rules for the session:
"There are NO right or wrong answers to any of the questions that I will ask you today. Please feel free to share your thoughts openly."

"Before we begin, let me tell you a few rules that will help things go smoothly today. I am going to be tape recording the session because we do not want to miss any of your comments. We would also like you to pick a nickname that you will use during this discussion. We will use your nickname instead of your real name to make sure no one outside of this group has access to your name or other personal information."

Reinforce risks to be reported:
"Have you completed the Youth Assent form?

You have also received your parent/guardian's permission with the signed Parental Consent Form. I would like to highlight one part of the form to be sure that you understand it fully.

In your Consent and Assent forms, there is a line under 'Risk and Discomforts' that says, "Because we are not asking about personal information or behaviors, none of the questions that we ask should make you feel uneasy. However, you DO NOT have to answer any questions that you do not wish to, and you are encouraged to use a nickname.

"If you have any questions please feel free to ask them now, if not let's begin with our discussion."

"Ok, let's begin. Today we will be talking about the footage that you captured during the Collaborative Filmmaking Project. We want to hear more about the footage you captured from your point of view.

"Let's look at your film footage (pull up film footage, which has been broken up into different segments for ease of discussion. For each segment discuss the following SHOWED method)

1. What do you **S**ee here?

2. What is really **H**appening here?

3. How does this relate to **O**ur lives?

4. **W**hy does this condition **E**xist?

5. What can we **D**o about it?

Continue discussion for all film segments.

At the end ask if the participant has any further comments or questions, then end the discussion by thanking them for their time.

Appendix K Focus Group Discussion Guide on Collaborative Filmmaking as a Research Tool

University of Pittsburgh

Graduate School of Public Health
Department of Behavioral and Community Health Sciences

Pittsburgh, PA 15261

Welcome / Overview of Topic / and Ground Rules:
"Good afternoon and thank you for your time and participation in our session today. My name is _____and I will be asking you questions today to find out about your experiences during the Collaborative Filmmaking Project. With me today is _____, who will be helping me and taking notes during our discussion.

"My job is to ask questions and listen. I will not be talking a lot, but I was for you to feel free to talk with one another. Everyone will have a chance to talk. We want to hear from all of you. If one of you is sharing a lot, I may ask you to let other talk as well. If you are not saying much, I may ask you what you think."

Permission for observer:
"I would like to get permission from you for _____ to be with us during our discussion. Is everyone ok with having another member of the team join us? If not, it is ok but please let me know."

Ground rules for the session:
"There are NO right or wrong answers to any of the questions that I will ask you today, only different points of view. Please feel free to share your thoughts even if they differ from what other members of the group have said."

"Before we begin, let me tell you a few rules that will help things go smoothly today. Please speak up, and only one person should talk at a time. I am going to be tape recording the session because we do not want to miss any of your comments. We would also like you to pick a nickname that you will use during this discussion. We will use your nickname instead of your real name to make sure no one outside of this group has access to your name or other personal information. We also ask that you do not tell people outside of this group what we talked about during the discussion. This information is to be kept private and should not be talked about with people that are not taking part in this research project."

Reinforce risks to be reported:

"Have all of you completed (HOLD UP FORM) the Youth Assent form?

Everyone has received their parent/guardian's permission with the signed Parental Consent Form and Youth Assent form. I would like to highlight one part of the form to be sure that you understand it fully.

In your Consent and Assent forms, there is a line under 'Risk and Discomforts' that says, "Because we are not asking about personal information or behaviors, none of the questions that we ask should make you feel uneasy. However, you DO NOT have to answer any questions that you do not wish to, and you are encouraged to use a nickname.

"If anyone has any questions please feel free to ask them now, if not let's begin with our discussion."

“Ok, let’s begin. Today we will be talking about what it was like to participate in the Collaborative Filmmaking Project.

PROJECT DESCRIPTION
Let’s start by having you describe the activities that you did as part of the Collaborative Filmmaking Project.

FAVORITE ACTIVITY
What was your favorite activity and why? [Probes: village tour, partner interview, visual diaries, one-on-one interviews for data analysis, initial filmmaking workshop]

LEAST FAVORITE ACTIVITY
What was your least favorite activity and why? [Probes: village tour, partner interview, visual diaries, one-on-one interviews for data analysis, initial filmmaking workshop]

MODIFICATIONS
What about the Collaborative Filmmaking Project could have been done differently? Why do you make that suggestion?

LEARNING
What did you learn from the project?

SHARING
Who did you tell about the project? [Probes: parents, friends, school-mates]

BRAINSTORMING
How could this Collaborative Filmmaking Project be used with other kids? What other topics would you like to see included?

CONCLUSION
Is there anything else that you would like to add?

ANSWER FINAL QUESTIONS
“Thanks!”

Appendix L Recruitment Letter for Collaborative Filmmaking Study

University of Pittsburgh

Graduate School of Public Health
Department of Behavioral and Community Health Sciences

Pittsburgh, PA 15261

Recruitment Script for Pilot Research Study: Using Collaborative Filmmaking in Public Health Research: A Pilot Study of Menstrual Hygiene Management in Nepal

A team of researchers - Sara Baumann and Dr. Jessica Burke from the University of Pittsburgh School of Public Health USA, and Pema Lhaki from Nepal Fertility Care Center - are conducting a pilot research study on using Collaborative Filmmaking in Public Health Research: A Pilot Study of Menstrual Hygiene Management in Nepal. The study will be conducted in XXX of XXX district.

This study is being conducted to gather information from youth about menstrual practices and beliefs in rural Nepal to better understand traditional practices and design community-informed interventions. We are also conducting this study to establish an approach for using a collaborative filmmaking method for collecting knowledge about traditional practices. This is an arts-based project. It uses creative thinking, filmmaking and talking together to learn about community-based issues.

We are recruiting 5-10 girls between the ages of 15-18 to participate in this research study for approximately three weeks during the months of May and June. Participants will be invited to participate in a 1.5-day filmmaking workshop where they will learn filmmaking, use small portable cameras to learn and practice new filmmaking skills. At the workshop participants will also discuss and provide inputs to the research question: What is a typical menstrual experience in your village?

Next, each participant will have access to a small video camera to collect footage about the research question for one week, and then participate in an interview and two focus group discussions about their experience. They will be compensated $23 for completing each phase of the study (for a total of 3 phases of the study – for a total compensation of $70 if they complete all phases of the study).

The results of the study will be important for informing future public health interventions in your village and will help to ensure that future projects address the variety of needs of adolescent girls in your village.

Appendix M Parental/Youth Consent Form for Collaborative Filmmaking

University of Pittsburgh

Graduate School of Public Health
Department of Behavioral and Community Health Sciences

Pittsburgh, PA 15261

Parental Consent/Youth Assent Form

Using Collaborative Filmmaking in Public Health Research: A Pilot Study of Menstrual Hygiene Management in Nepal

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Explanation of Research Study:

STUDY TEAM: The research team is being led by Sara Baumann from the University of Pittsburgh School of Public Health. Dr. Jessica Burke from the University of Pittsburgh. Pema Lhaki from Nepal Fertility Care Center is assisting researchers from the University of Pittsburgh for this study.

REASON FOR THE STUDY: This study is being done to talk with youth about menstrual practices and beliefs in rural Nepal. We are also conducting this study to try using a collaborative filmmaking method. This is an arts-based project. It uses creativity, filmmaking and talking together to learn about issues. The things that we learn during the project and through our discussions will help us to figure out if collaborative filmmaking is a good approach for future work in your community.

STUDY PLAN: If you and your child agree that she can take part in this project, please sign this consent form. This form documents permission. Your child will be asked to take part in one Filmmaking Workshop with 5-10 other youth. The workshop will take place during the weekend or outside of school hours, and it will be conducted in the village so that your children do not have to travel far to participate. The workshop will take place over the course of 1.5 days (6 hours on day one, and 4 hours on day two), and will be a fun and engaging session for your child. They will learn storytelling filmmaking and participate in games and exercises. Food will be provided.

After the workshop, your child will be asked to use a small video to collect film footage about menstruation. She will be given an easy to use video camera to record anything that she finds interesting related to the research question without directly filming people's faces. She will be asked to be creative and to use her new skills. She will have the camera for one week and be asked to record as much as she wishes during the one-week period.

After filming, she will be asked to participate in a 1-hour discussion with the research team to watch her film and discuss it. We will not be asking any questions about your child's private experience or ask your child to share her personal experiences about menstruation. Rather, we are asking her to discuss what women or girls in her village typically believe or typically practice.

Next, she will also be asked to participate in a 1-hour group discussion with the other participants about the footage they collected. Finally, the last activity will be a one-hour group discussion where all the youth come together to talk about their experience, where they will be able to share information about what they liked and how it can be improved for future projects. This will let us get important information

to see if collaborative filmmaking is a good method to be used for future projects in your village. The discussions will be audio recorded.

The film footage will be viewed by the study team and the other youth participants throughout the study. If you and your child agree, her footage will be combined with all the other participants' video footage for a final exhibition to be shared with the community. It is not required that your child participate in the final exhibition to participate in the rest of the study.

FILMING PARAMETERS: Your child will have the opportunity to film around the village and collect footage on anything related to menstrual experiences in the village. She can interview other participants in the study if she wishes with their permission; however, she will not be allowed to interview or film people outside of the study to protect the privacy of individuals in your village.

RISKS: Though we do not think that your child will feel uneasy, there is a chance that she may feel comfortable sharing certain things and that is ok. She is free to skip or not answer any question we ask. She will be asked to use a nickname to keep all the tape recordings private. Taking part in this study will not cost you or your child anything. Any information that we get will remain private. Your child can stop taking part at any time if she feels uncomfortable.

BENEFITS: No direct benefits.

COMPENSATION: Your child will receive a gift to thank her for her time. She will also get copies of some of the photographs that we take during the collaborative filmmaking sessions.

EQUIPMENT: After one week your child will be asked to return the camera and the footage in good, working condition to the study team. The study team will be in Daijee so if your child faces any issues during the study, we request that you contact the study team. In the case of damage, loss or theft, you are requested to contact the study team immediately, so we can engage the necessary authorities.

PRIVACY: We will keep all study information that we gather during the group discussions private.

The only people who will see the information gathered during the group discussions and interviews are key study staff. Since this session will be audio-taped, your child will give a "nick" name and will be called by this name during the whole session. All information will be kept in locked cabinets that only study staff will have access to. Your child's name will not be used when this study is made public. Permission will be collected from you and your child before any of her video footage is included in the final exhibit project.
If the researchers learn that your child or someone with whom they are involved is in danger of harm, they will need to inform the appropriate agencies.
Authorized representatives from the University of Pittsburgh Research Conduct and Compliance Office may review your data solely for the purpose of monitoring the conduct of this study.

VOLUNTEERING FOR THIS STUDY: Your child is not forced to join this or any research study. She will not be punished in any way for not volunteering in this study.

CONTACT INFORMATION: If you have questions about the study, you can call the PI at 981-362-7858.

_____

I authorize the study team to use candid individual and group photographs of my child during her participation in the study. These pictures will be helpful for teaching others about using the collaborative filmmaking method, but will not be linked to the footage or thoughts that my child shares:
□

VOLUNTARY CONSENT
All the above has been explained to me and all my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during this study, and that such future questions will be answered by the researchers listed on the first page of this form.
Any questions I have about my rights as a research participant will be answered by the Human Subjects Protection Advocate of the IRB Office, University of Pittsburgh (1-866-212-2668). By signing this form, I agree to participate in this research study. A copy of the consent form will be given to me.

_____
Printed name of child participant

Parental Consent for Minor Child
I understand that, as a minor (age less than 18 years), the above-named child is not permitted to participate in this research study without my consent. Therefore, by signing this form, I give my consent for his/her participation in this research study.

_____ _____
Parent's Name (Print) Relationship to Participant (Child)

_____ _____
Parent's Signature Date

Witness signature (if parent is illiterate) _____

CERTIFICATION of INFORMED CONSENT:
I certify that I have explained the nature and purpose of this research study to the above-named individual(s), and I have discussed the potential benefits and possible risks of study participation. Any questions the individual(s) have about this study have been answered, and we will always be available to address future questions as they arise.

_____ _____
Printed Name of Person Obtaining Consent Role in Research Study

_____ _____
Signature of Person Obtaining Consent Date

Assent of a Minor – For children (age 13 – 18 years old)

_____ _____

Participant's (Child's) Name (Print)

_____ _____

Participant's (Child's) Signature Date

Appendix N Collaborative Filmmaking Release Form for Background Subjects

University of Pittsburgh

Graduate School of Public Health
Department of Behavioral and Community Health Sciences

Pittsburgh, PA 15261

Collaborative Filmmaking Release Form for Background Subjects

I, _____(name of person in the video) give my permission to use my image in this video for use in the Collaborative Filmmaking in Public Health Pilot Study, being carried out by members of the University of Pittsburgh and Nepal Fertility Care Center (NFCC).

I authorize the study team to use my image in the video for project related papers and reports, exhibits and presentations. I understand that researchers, policy makers, students, and possibly people from my community will see my image in the video footage.

Signature: _____

Date: _____

If subject is a minor
Parental Consent:
Name (Printed): _____

Signature: _____

Date: _____

Appendix O Collaborative Filmmaking Codebook

Collaborative Filmmaking Study Codebook *Question 1: What are the traditional menstrual practices in your family?*				
Code	**Definition**	**When to use (inclusion)**	**When not to use (exclusion)**	**Examples**
Cleansing	- to rid of impurities by or as if by washing - free from dirt or pollution - free from moral corruption	- Refers to "washing", "cleaning", "cleansing" of clothing, bodies, house, objects or physical spaces; and/or - Refers to ritual or ceremonial cleansing to make "pure", such as drinking cow urine		*- We go to the river to wash clothes. We cannot wash more clothes in tap as we cannot pump for long time. And when we go to river, we wash clothes as well as take a bath. In this way, we got habituated.* *- Thus, we have to clean the goth…when we clean with mud, the structure will be maintained.* *- Today is my fourth day so I took a bath and now I am going to drink the cow urine to be pure. My mother will give me the cow urine and after that I will be free (to go around and touch friends).*
Keeping Distance (physically, not emotionally)	- to retain separation, spatial remoteness physically	- Refers to keeping physical distance or space between herself and a place or person		*- I am away from my home because I am menstruating. And we do not go to home. We stay in the courtyard of our house. … We stay away from home and we feel bored as we become alone.* *- When I am menstruating, I cannot go inside. Inside there is my puja (worship) room, so I cannot go inside when I am menstruating. (also coded as creating physical barriers as the doorway to the house acts as a distinct barrier)*
Touching	- to bring a bodily part into contact with especially to perceive through the tactile sense	- Says word "touch", "touching", or another variation of the word; and/or - Refers to coming/or not coming into contact with a person or thing (plants, toilet) in a tactile sense		*- I do not touch animal sheds during menstruation.* *- It is said the cows will not give milk if they are touched during menstruation. And the cows of that sheds will become sick. Some bullocks might be very nice and if touched, they become sick.*

		- Use when referring to toilets (they either touch or do not touch it)		*- When I am menstruating, I do not touch the plants. In our culture it is said if we touch the plants and trees that bear fruit they will die. So, we do not touch them when menstruating.* *- I am menstruating and I am showing the toilet because I don't use toilet while menstruating. It was fourth days of menstruation and my mother and I used toilet on that day. Due to this guava trees died. So, we don't use toilet.*
Creating physical barriers	- of or relating to something material that blocks or is intended to block passage - something immaterial that impedes or separates	- Use when they refer to a distinct physical line/boundary to cross, or entering the field NOTE: they do not necessarily have to stay far away (keep distance)	- Do not use if she has to stay far away from an object (e.g. temple – keeping distance is a better code for that), instead use when she can be close but there is a distinct boundary that cannot be crossed (e.g. doorway to the house, edge of the courtyard where she can be close, but cannot cross it)	*- "In your video you have shown the temple from far and is that the distance from temple while you stay in menstruating? Is that the close to that temple where you can stay when menstruating? Ya, there is one road we cannot go from that. Can you worship god from far while you are menstruating? Up to now I have not done when I am menstruating if I have to go then from there I can do."*
Creating non-physical barriers	- relates to blocking, but not in a physical sense - relates to blocking in a more philosophical, social, spatial, or structural sense	- When they refer to barriers from menstruation that are not physical, such as barriers to learning from not having resources, or a light		*- We have no light at night. We should go to goth. Sometimes sir will give more homework. We feel difficulty in writing. There will be heat of sun in courtyard. How can we write in such heat? So, we feel difficulties.*
Waiting	- to stay in place in expectation of	- When they express waiting for something, or when they do not get something immediately, but after some time		*- I haven't waited that long, if sometimes I had to wait, then I'll wait. We'll wait someone if they had gone in work for half an hour. We don't do any work. We eat, wash our clothes and dry them, go to school, go to college. Others will cook and give us. Our mother does a lot of work. I hadn't waited that long.*
Receiving	- to come into possession of	- When she expresses getting something from others like permission; and/or - When she comes into possession of something from others like a physical object or thing (water, food)		*- At first my sister poured water and I cleaned my utensils. Then she gave me food on that utensil, and I was about to eat that in this video.* *- In the morning, I ask my mother to pour water for me for cleaning my face after returning from goth. After being fresh, I go to college. After returning*

		- Use when she discusses being given something from others		*from college, I go to river to take bath and when I return, they give me food.*
Asking	- To make a request for something	- Use when she asks for permission to use; and/or - Asks for a physical object or thing (water, food, clothes)		*- If toilet in someone else house is at distance from his/her house, I ask permission to allow me to use the toilet* *- I am menstruating and I have shown how do I eat food while menstruating. … In this video, I was hungry, and I asked my sister to give me food.* *- When I am menstruating, I cannot touch the water tap so I am asking for water and drinking it*
Worshipping	- reverence offered to a divine being or supernatural power, or a form of religious practice with its creed and ritual	- Says words "worship", "prayer", "purity", "god", "goddess"; and/or - Refer to places of worship such as temple, church or puja *kotha* (worship area in the home)		*- It was my second day of menstruation. We do not touch that shed because cows are regarded as Goddess Laxmi and when we touch those cows, the milk becomes untouchable and the cows become sick. We too drink urine of cows (also coded as touching)* *- Cow is regarded as goddess Laxmi and when we menstruate, we feel afraid to step our foot and cross the rope which the cow is tied upon. Our family members also tell us that cows are god and we should worship them. We will not be pure unless we take their urine. So, we regard cows as Laxmi (goddess).* *- There is a temple. I cannot go there. I also cannot walk in this field because in our culture we worship in that temple so we cannot go there when we are menstruating (also coded as keeping distance)*
Cooking	Preparing food	- Use when they refer to preparing (or not preparing) food		*- "When menstruating I like one thing (which is) I don't need to do much work and I don't need to go the kitchen to cook food. I feel bored and I can stay in a separate place joyfully. I like that. I dislike that I myself cannot go to eat food and drink water. We cannot touch plants and must sleep in a separate place. We cannot go anywhere, and I don't like it."*
Giving	- freely transfer the possession of (something) to	- Use when talking about handing over (food or other items) to another person		*- We don't have any problem giving food to people when we are menstruating.*

	(someone); hand over to.			
Other		- Use when the practice does not fall into any of the above categories		
Question 2: Why do you follow these practices?				
Ancestors practiced/family tradition				*- You said that you cannot touch water tap and it is practiced from beginning. What is the main reason for this? We don't know main reason because it is practiced from earlier. They say that, "we haven't broken the rules of these practices made by our ancestors. Who are you to break? You are small child of ours. We have lived the half of our lives and we haven't broken the practices" We have only heard that. We don't know the main reason.*
Negative consequences (stems from impurity as a wider theme)				*- Plants will die* *- Cow will become sick* *- Water tap will dry up*
Religious/spiritual beliefs	*-requires purity*			*- "Today is my fourth day so I am going to take a bath, and after that I can touch my friends, but I cannot go inside the house. I can only go inside the house after the 8th day. Today I will be considered pure."* - "Our *family members also tell us that cows are god and we should worship them. We will not be pure unless we take their urine. So, we regard cows as Laxmi (goddess)."*
"Culture" (generic)		*-use when culture seems to refer to itself*	*-do not use when culture seems to refer to the religious 'culture'*	- "I pump the water from the tap when I am menstruating. I also wash the clothes here. We feel bad (about using the water tap) but this is our culture. We have to do it."
Social pressure				*-"That I have heard people saying that in field the person who is menstruating cannot go if she goes there than the vegetable will die, and they also say that yesterday she was going and these all vegetable are dying because she was touching and going there."*

Guilt		*-use when guilt is a motivator for an action/practice*		- *"You can touch but why you feel bad in touching?* Tree are at every place at temple, hills, road so while touching tree of temple we feel bad obviously. We don't follow but we should go I think so we feel bad."
Methods	*For items that need to be analyzed as methodological issues*			- "I am taking a video for the first time and I am feeling so happy. When I was carrying the camera for the first time, I was so nervous, but now I am not feeling nervous. I feel happy to carry the camera and make a video"

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