Understanding Intimate Partner Violence as a Social Determinant of Child Morbidity in Rural Malawi

(Thesis format: Manuscript based)

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August 2019

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A thesis submitted to McGill University in partial fulfilment of the requirements of the degree of Doctor of Philosophy in Social Work

Abstract

Understanding and addressing risk factors of IPV and their associated health outcomes in vulnerable populations has been identified by the World Health Organization as an utmost important issue to better understand and address. In Malawi, IPV against women is both pervasive and widely condoned. While there are studies addressing the issue of IPV against women (including pregnant, HIV-affected, and disabled women), there is limited literature examining the determinants of IPV against mothers of children under the age of five or addressing the issue of how IPV against mothers affects child health. This is an important gap in the literature, and correctly, identifying and addressing underlying risk factors for poor maternal and child health outcomes can help to focus the attention of policymakers and program planners on the appropriate issues.

The aim of this dissertation is twofold: first, it will explore both the magnitude and underlying risk factors for IPV against mothers; second, it will examine the issue of whether IPV against mothers undermines child wellbeing in rural Malawi. Gender order and ecological models are the broader conceptual lenses that have guided this study. Drawing from these theories, I acknowledge that cultural norms accord more power to men than women, that there are gender role expectations specific to each group, and that the transgression of prescribed social roles may exacerbate interpersonal conflict.

I have employed a non-experimental cross-sectional research design method to investigate the relationship between IPV and child health outcomes. Data was collected from 538 mother/child dyads in a hospital-based setting in rural Malawi. The results of my research suggest that IPV against mothers in Dowa district is a significant public health problem. The study found that 75%, 49%, 44% and 73% of the mothers reported

having experienced controlling, psychological, physical, and sexual violence. Based on ecological framework, the key predisposing factors for IPV tended to operate at the interpersonal level that included male partner alcohol abuse as well as having multiple sexual partners. At the community level, time spent fetching water was significantly associated with mothers' exposure to spousal violence. In terms of effects on children, the study found that apart from child age and low levels of education, maternal exposure to IPV was associated with child malaria infection. Finally, the study found that out of the three measures of child undernutrition, only child stunting was associated with IPV against mothers.

The study suggests that in addition to currently available strategies, prevention of IPV against mothers should also consider to address issues of alcohol abuse and extra marital affairs amongst men because they are strongly associated with the problem. In addition, community advocacy should focus on demystifying the culturally idealized traits associated with dominant masculinity that appear to valorize marital rape and the control of women. Finally, the study suggests that IPV screening should be part of the integrated maternal, newborn, and child health package being implemented in Dowa district by the Malawi government to fully promote child health.

Résumé

Comprendre et traiter les facteurs de risque de la violence conjugale et leurs effets sur la santé au sein des populations vulnérables est considéré par l'Organisation Mondiale de la Santé comme un problème social de la plus haute importance. Au Malawi, la violence envers les femmes par leurs partenaires conjugaux est omniprésente et tolérée. Bien que plusieurs études aient examiné la question de la violence conjugale envers les femmes (incluant les femmes enceintes, les personnes affectées par le VIH et les femmes handicapées), il y a, à ce jour, peu d'études s'étant penché sur les déterminants de la violence conjugale chez les mères d'enfants de moins de cinq ans ou comment la violence vécue par les mères peut affecter la santé de l'enfant. Ceci est une importante lacune, considérant que comprendre et traiter les facteurs de risque liés à une mauvaise santé des mères et des enfants permettrait aux décideurs et planificateurs de programmes de mieux identifier des cibles d'intervention.

Le but de cette thèse est double: premièrement, explorer l'ampleur et les facteurs sous-jacents de la violence conjugale vécue par les mères. Deuxièmement, examiner si cette violence contre les mères nuit au bien-être des enfants dans les zones rurales du Malawi. Les études du genre et les modèles écologiques sont les cadres conceptuels qui ont guidé cette étude. Inspiré de ces théories, je reconnais que les normes culturelles accordent plus de pouvoir aux hommes qu'aux femmes, qu'il existe des attentes spécifiques pour chaque groupe, et que la transgression des rôles sociaux normatifs peut envenimer les conflits interpersonnels. La méthode que j'ai employée pour étudier la relation entre la violence conjugale et les résultats pour la santé des enfants est basée sur une analyse transversale. Les données ont été recueillies auprès de 538 dyades mères / enfants dans un établissement hospitalier en milieu rural au Malawi. Les résultats de ma

recherche suggèrent que la violence conjugale contre les mères dans le district de Dowa est un problème de santé publique important. Statistiquement, l'étude a révélé que 75%, 49%, 44% et 73% des mères avaient été victimes de violence de contrôle, psychologique, physique et sexuelle, respectivement. À la lumière du modèle écologique, les facteurs prédisposant à la violence conjugale se situent principalement au niveau interpersonnel, tel que l'abus d'alcool du partenaire masculin et le fait que celui-ci ait plusieurs partenaires sexuels. Au niveau communautaire, le temps alloué à aller chercher de l'eau par la mère est significativement associé de la violence conjugale. Pour ce qui est des effets sur les enfants, l'étude suggère que, mis à part le faible niveau d'éducation et l'âge de l'enfant, l'exposition maternelle à la violence conjugale était associée à l'infection paludique des enfants. Enfin, l'étude a révélé que parmi les trois mesures de malnutrition chez les enfants, seul le retard de croissance chez les enfants était associé à la violence conjugale vécue par les mères.

L'étude suggère que la prévention de la violence conjugale à l'endroit des mères, en plus des stratégies actuellement disponibles, devrait viser la réduction de l'abus d'alcool et des relations extra conjugales chez les partenaires masculins. En outre, des actions sociales pour démystifier les traits dominants culturellement idéalisés de la masculinité qui semblent valoriser le viol conjugal et le contrôle des femmes sont essentielles pour réduire la violence perpétrée envers celles-ci. Enfin, l'étude suggère que le dépistage de la violence conjugale devrait faire partie des protocoles de santé pour les mères, en périnatalité et en petite enfance mis en place dans le district de Dowa par le gouvernement du Malawi afin de réellement promouvoir la santé des enfants.

Acknowledgement

This doctoral dissertation would not have been possible without the guidance and support of McGill School of Social Work professors, friends, and colleagues. First, I would like to thank my supervisor, Dr. Delphine Collin-Vezina, for providing both intellectual and emotional support in the course of this project. I would also like to extend my gratitude to my committee members, Dr. Heather MacIntosh and Dr. Claudia Mitchel, for their insightful comments throughout the writing of this dissertation.

Further, I would like to thank Dr. Liam Riley, Dr. Mohammad Khan, Lyn Morland, Katrina Cherney, and Mireille De La Sablonniere-Griffin for the support and advice they extended to me throughout my studies. They never seemed to tire of my requests for the clarification of concepts in the process of writing this dissertation. I would also like to express my gratitude to all the mothers and hospital staff who took part in this study as respondents or as gatekeepers. I am especially grateful to the Health Surveillance assistants and hospital administrators at the Chankhungu, Mvera, and Thonje health centres in Dowa District.

Finally, I would like to extend my gratitude to my lovely wife Florence Mwayiwatha, and my "philosopher queens and king" Maureen, Deborah, Thandizo, and Emmanuel Chilanga, Junior. You inspired me to work hard in order to improve the wellbeing of children in our communities.

Preface

Statement of originality

This dissertation includes three manuscripts that have not been published through any other platforms. This paper therefore constitutes original material that will contribute to the advancement of the discourse of maternal and child wellbeing in social work and public health. To my knowledge, this is the first study that has examined the link between IPV and child health outcomes for mothers of children under the age of five living in rural areas of Dowa District in Malawi.

Contribution of Authors

I, Emmanuel Chilanga, conceptualized the topic, designed the study, collected and analyzed data, and wrote the three above-mentioned manuscripts included in the results section, as well as the dissertation in its entirety. As my supervisor, Dr. Delphine Collin-Vezina offered extensive constructive feedback and was my main mentor at all the stages of this dissertation, from topic conceptualization to dissertation writing. Dr. Heather MacIntosh was my internal committee member and Dr. Claudia Mitchell was my external committee member. They both critically reviewed my work and provided advice regarding revision.

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Abbreviations

AOR:	Adjusted odds ratios
CCAP:	Church of Central African Presbyterian
CI:	Confidence interval
EPDS:	Edinburgh depression scale
GBV:	Gender based violence
HDDS:	Household Dietary Diversity Score
HFIAP:	Household Food Insecurity Access Prevalence
ITN:	Insecticide treated nets
IPV:	Intimate partner violence
MDHS:	Malawi demographic and health survey
MAHFP:	Months of Adequate Household Food Provisioning
MUAC:	Mid-upper arm circumference
NMCP:	National Malaria Control Programme
NSO:	National Statistics office
SSA:	Sub Sahara Africa
US$:	United States dollar
VAW:	Violence against women
WHO:	World Health Organization

Chapter 1

Introduction to the thesis

The main goal of this chapter is to situate my dissertation in the general research area of intimate partner violence (IPV) against women, and identify a gap in previous studies requiring further inquiry. To achieve this goal, I will first provide an overview of the concept of IPV based on the current literature. Second, I will turn my discussion to the problem of IPV against women in Malawi and provide reasons for the importance of research on this topic. In addition, this chapter will outline the study's objectives and conclude with a review of the literature in order to contextualize the topic within the current discourse in this area of inquiry.

Background to the study

IPV is a global social problem with far-reaching consequences for the health of victims and their immediate family members (Stöckl et al., 2013). The World Health Organization (WHO) has stated that the problem of IPV is pervasive and cuts across culture, social-economic status, geographical location, and religious affiliation (Hattery, 2009). The concept of IPV is a subcategory of the broader concept of domestic violence, and comprises incidents or patterns involving threatening, coercive, or controlling behaviour, as well violence or abuse between adults, regardless of sexuality or gender, who either a) are or have been in an intimate relationship or b) are family members (Jing et al., 2019). Scholars have divided IPV into four main categories: psychological, sexual, physical, and controlling behaviour. Psychological violence involves the perpetrator using both verbal and non-verbal communication with an intent to harm the victim emotionally. Sexual violence refers to any sexual act performed on an individual without his or her consent, and also includes any abusive sexual contact or non-contact acts such as sexual harassment (García-Moreno, Zimmerman, et al., 2015). Physical IPV includes any act that involves the unlawful infliction of physical harm, whether minor or grave in

nature. Controlling behaviour includes such acts as restricting a person from accessing financial resources or seeking medical care, as well as stalking and excluding an individual from the public sphere (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006).

The concept of IPV is gender neutral, but studies have shown that, globally, women bear a significantly heavier burden in this area than do men (Devries et al., 2013; Krahé, 2018). Sadly, it is widely acknowledged that male intimate partners or ex-partners are the main perpetrators of IPV. The phenomenon of IPV against women is a structural issue rooted in the unequal power relationship between women and men in most societies (Reed, Raj, Miller, & Silverman, 2010). Therefore, the problem of IPV against women falls squarely under the umbrella term of gender-based violence (GBV) against women. There are diverse forms of GBV against women, including female genital mutilation (Khosla, Banerjee, Chou, Say, & Fried, 2017), honor killings (Mayeda, Vijaykumar, & Chesney-Lind, 2018), property grabbing (that is, depriving women of matrimonial property after a husband's death) (Matheson & Heinze, 2019), and intimate partner violence (García-Moreno, Zimmerman, et al., 2015). In this dissertation, my focus is on IPV against mothers in Malawi rural communities. I have adopted the global definition of IPV to refer to any behaviour by a current or previous intimate partner that causes sexual, physical, or psychological harm, including sexual coercion, physical aggression, and controlling behaviour (García-Moreno, Zimmerman, et al., 2015).

Risk factors for IPV victimization

The bulk of the existing studies on this topic have documented risk factors associated with women's exposure to interpersonal violence in an intimate relationship (Antai & Adaji, 2012; Costa et al., 2015; Greene, Kane, & Tol, 2017; Koenig, Stephenson, Ahmed, Jejeebhoy, & Campbell, 2006). Social ecological theory provides a useful framework for understanding the

interaction of diverse predisposing factors for IPV against women at multiple levels (Raneri & Wiemann, 2007). The primary risk factors at the individual and distal levels include early exposure to violence, poverty, young age, hegemonic cultural norms, and low educational attainment. Life course scholars, that is, those who study the effects of socially defined events and roles over time, suggest that parents who themselves grew up witnessing interparental conflict are more likely to internalize IPV and become victims or perpetrators of abuse (Cervantes & Sherman, 2019). The literature emerging from this discourse has found that programs with the aim of protecting children from exposure to interpersonal spousal violence can drastically reduce the intergenerational transfer of violence.

At both the individual and community levels, a lower socioeconomic status is recognized as a predisposing factor for women's experience of partner abuse (Voith, 2019). Poor women are less likely to have the financial means to escape an abusive relationship (Gillum, 2019). Studies have also shown that women and men who subscribe to hegemonic gender norms that justify men "disciplining" their wives are more likely to experience and perpetrate partner abuse. It is challenging for women experiencing violence to obtain support when community members and law enforcers perceive such violence as culturally acceptable (Kimuna & Djamba, 2008; Rani, Bonu, & Diop-Sidibe, 2004).

The literature also shows that male partners' alcohol abuse and the ease of access to alcohol at the community level is associated with men's perpetration of IPV (Cunradi, 2010; Voith, 2017). A California-based study by Cunradi, Mair, Ponicki, & Remer (2012) used data from hospital emergency departments and found that communities with a high density of bars were significantly associated with a high number of IPV-related emergency visits. The findings of this study may entail rising cases of physical violence in the study area. In another study by

Snowden (2016) the total alcohol outlet density in an area was also significantly correlated with IPV against women. These studies suggest that community structures can either exacerbate or undermine the manifestation of individual and interpersonal IPV risk factors.

Currently, there is limited research specifically focused on risk factors for IPV against mothers of children under five in SSA African countries including Malawi (Michele R. Decker et al., 2014; Oduro, Swartz, & Arnot, 2012; Zacarias, Macassa, Svanström, Soares, & Antai, 2012), as so far studies have focused on women in the general population. Unfortunately, these risk factors do not conclusively speak to the specific issues faced by women who are caring for children. There might be particular risk factors associated with spousal abuse in this population that can inform more-tailored policies and programs.

The problem

According to the 2019 Global finance report, with a per capita GDP of $516.80 in 2018, Malawi is the fourth poorest country in the world, and approximately 60% of its citizen live below the poverty line (Ventura, 2019). The current life expectancy for adults is 61.2 years, ranking it 197th in the world. Although Malawi is not a war-ravaged country, its economic status is equivalent to that of conflict-heavy countries like the Democratic Republic of Congo, the Central African Republic, and Burundi (Ventura, 2019). Studies suggest that gender inequality is a key driver of poverty and poverty-related disease in Malawi (Chirwa, 2008; Zuckerman & Garrett, 2003). In keeping with this line of research, studies focusing on violence against women (VAW) started taking a centre stage in 2004. A literature review of 74 documents by (Mellish, Settergren, & Sapuwa, 2015) explains that the baseline study of VAW in Malawi was conducted in 2004. The initial studies of VAW examined GBV against women and girls (Moore, Awusabo-Asare, Madise, John-Langba, & Kumi-Kyereme, 2007), women with disabilities, and women

living with HIV (Kathewera-Banda et al., 2005; Kvam & Braathen, 2008). Similar studies have explored the impact of GBV on girls' educational attainment (Bisika, Ntata, & Konyani, 2009), and on individual health outcomes (Harling, Msisha, & Subramanian, 2010).

The aforementioned studies conducted in Malawi found that GBV against women and girls is a public health problem warranting further inquiry (Bazargan-Hejazi, Medeiros, Mohammadi, Lin, & Dalal, 2013). However, there is limited research that specifically focuses on understanding the health impacts of IPV against women in Malawi, and the research that does exist is inconsistent or conflicting. One study found that women who experienced intimate partner sexual violence were more likely to suffer from incontinence than their counterparts who did not (Peterman & Johnson, 2009), and there is conflicting research regarding whether IPV against women is a risk factor for HIV in Malawi. A qualitative study by Kathewera-Banda et al. (2005) supports the idea that IPV against women is a risk factor for HIV, while a quantitative study by Harling et al., (2010) did not find any association.

Globally, there are inconsistent narratives regarding whether and to what extent IPV against women negatively impacts health outcomes for children (Ferdos & Rahman, 2017; Shaukat, Iqbal, & Khan, 2018; Silverman et al., 2009; Yount, DiGirolamo, & Ramakrishnan, 2011). That being said, there is literature suggesting that IPV exposure during pregnancy undermines neonatal outcomes through various pathways that will be highlighted in the coming sections (Berhanie, Gebregziabher, Berihu, Gerezgiher, & Kidane, 2019; Sigalla et al., 2017). Other studies affirm that IPV against women predisposes children to various negative health outcomes such as undernutrition and diarrhoeal infections (Bintabara & Kibusi, 2018; Chai et al., 2016; Karamagi, Tumwine, Tylleskar, & Heggenhougen, 2007; Osifo, Sigbeku, Fawole, & Adejimi, 2016; Ziaei, Naved, & Ekström, 2014).

Although Malawi has some of the highest rates of child undernutrition and malaria in the world (Kalembo, Kendall, Ali, & Chimwaza, 2019; Kandala, Magadi, & Madise, 2006; Kazembe, Muula, Appleton, & Kleinschmidt, 2007), few studies have investigated the association of IPV against women and child health outcomes. Two pioneering studies (Chai et al., 2016; Kaur, 2019; Rao et al., 2017) provide narrow examinations of the association of IPV against women and child/foetal health. The first study limits its findings to nutritional outcomes at the national level, and the second examines the negative effects of IPV against pregnant women (Hall et al., 2016). Both studies suggest that IPV against women is a risk factor for certain poor health outcomes for children in Malawi. It remains unclear whether IPV against women is associated with child malaria infection or whether there is a link between IPV and child nutritional outcomes. Therefore, it would be of interest to continue exploring the relationship between IPV against women and health outcomes, as important information gaps remain.

Justification

There is a dearth of literature on the association between IPV against women and negative health outcomes for children in Malawi. The few studies that have been conducted (Chai et al., 2016; Kaur, 2019; Rao et al., 2017) are limited to child nutritional and neonatal health outcomes. None of these studies has focused on malaria infection, which is one of the main child killers in Malawi (Mahase, 2019). In addition, all three studies mentioned above used secondary data pulled from national databases that were not specifically aimed at exploring the link between IPV and child health outcomes. Although these results give a snapshot of the relationship between IPV and child health outcomes for women in the general population, they fail to speak for vulnerable mothers in remote areas of central Malawi.

To my knowledge, no formal localized study in central Malawi has attempted to explore the link between IPV against mothers and child health outcomes, which is in part why I have chosen this topic as the focus of my dissertation. I acknowledge that a number of nutritional and epidemiological scholars have generated knowledge on risk factors associated with child undernutrition and child malaria infection in central Malawi (Chiutsi-Phiri et al., 2017; Escamilla et al., 2017; Geresomo, Mbuthia, Matofari, & Mwangwela, 2017; Ruel-Bergeron et al., 2019). However, all of these investigations disregarded the issue of IPV against women as one of the underlying social risk factors for poor child health.

As the preceding discussion shows, there is gap in the literature concerning the association between IPV against mothers and child morbidity outcomes in central Malawi. Hence, there is an urgent need for researchers to fill this knowledge gap. I have focused my dissertation on addressing this issue in anticipation that its findings will further contribute to our understanding of underlying factors associated with poor child health outcomes in central Malawi.

1.2 Research objectives

The purpose of this dissertation is to examine the issue of whether IPV against women is one of the risk factors for child morbidity in rural Malawi. More specifically, my study first examined the prevalence and risk factors for IPV against mothers of children under the age of five. Second, I examined whether IPV against mothers of children under five is a risk factor for child undernutrition and malaria.

1.3 Research questions

I used the following research questions to explore the association between IPV against women and undernutrition/malaria among children under the age of five.

1. What is the prevalence of different forms of IPV against mothers of children under the age of five in rural central Malawi?
2. What are the risk factors for IPV against mothers of children under the age of five in rural areas of central Malawi?
3. What are common diseases among children under the age of five associated with IPV against women in rural areas of central Malawi?
4. What are the consequences of IPV against mothers on the health outcomes for children?

1.4 Study hypothesis

In this study, I proposed to test three hypotheses that I framed based on current local knowledge and academic understanding regarding the problem of IPV against women and a possible link to child health outcomes.

1. Mothers married to men who are health risk-takers (e.g. they consume alcohol, have extramarital affairs, or smoke) are more likely to experience IPV than mothers married to non-health risk takers. This hypothesis comes from literature showing that men who abuse alcohol and drugs, and/or lead a sexually risky lifestyle are more likely to perpetrate IPV than their counterparts (Conroy et al., 2018a; Leonard & Quigley, 2017).
2. Mothers who have experienced IPV are more likely to have undernourished children than mothers who do not. The rationale for this assumption comes from studies showing that victim of IPV are less likely to be in a strong bargaining position regarding household resources (Richards et al., 2013). Since mothers are generally the primary childcare-givers in Malawi, an inability to control household resources has the potential for undermining child health.
3. The children of mothers who are victims of IPV are more likely to suffer from malaria infection compared to children of mothers who do not experience abuse. The rationale for

this assumption stems from the literature and my personal experience as a Malawian who has lived in the study area. Anopheles mosquito bites are an endemic problem in Malawi. Conflicts between partners may force women to seek safety in neighbouring communities. In such circumstances, the mother and a child are more likely not to use a mosquito net (Hayes, 2017).

1.5 Literature review

1.5.1 Introduction

Since the 20th century, the topic of IPV against women has attracted the attention of scholars from various disciplines including sociology, criminology, epidemiology, anthropology, and social work (Dobash & Dobash, 1979). The goal has been to understand the concept of IPV, its etiology, and epidemiology, and to identify best practices to address the problem. The following section of this chapter will highlight current knowledge in the literature concerning IPV against women in multiple geographical spaces.

1.5.2 Global epidemiology of IPV against women

Scholars have investigated the prevalence of different forms of IPV against women across the globe over time. The results show that, on average, 40% of women in the world have experienced at least one form of violence that was perpetrated by an intimate partner (Bamiwuye & Odimegwu, 2014; Devries et al., 2013; Roman & Frantz, 2013; Stöckl et al., 2013). These studies have illustrated that there is an uneven distribution of IPV prevalence rates across the globe. Current statistics suggest that women in central SSA (65%), South Asia (42%), and Andean Latin America (40%) have suffered proportionally higher rates of lifetime IPV than women in North America (21%), Western Europe (19%) and Eastern Asia (16%) (Devries et al., 2013). These findings point to the fact that each region is unique, and has specific IPV issues that need to be

understood in context (Goodman, Smyth, Borges, & Singer, 2009; Kiss et al., 2012; West, 2016). Taking SSA as a case study, the common discourse in the literature is that most of the customary laws and cultural norms in the region favor and sustain patriarchal societies. In turn, many social institutions including the family offer authority to men while relegating women to an inferior status, which becomes a recipe for violence (Adisa, Abdulraheem, & Isiaka, 2019; Bowman, 2003).

In SSA, the understanding of IPV against women is still very limited, because prior to the 1980s, the phenomenon was considered a private domestic matter (Uthman, Lawoko, & Moradi, 2009). More recently, the topic has attracted the attention of researchers and the region has seen a proliferation of IPV literature. Since the field of IPV is broad, a closer look at the literature shows that most scholars are focusing their attention on understanding the epidemiology of IPV against women in the general population (Bamiwuye & Odimegwu, 2014; Devries et al., 2013; Roman & Frantz, 2013; Stöckl et al., 2013). For instance, current literature from 28 Demographic and Health Surveys (DHS) in SSA suggests that approximately 41% of women aged 15 to 49 were victims of IPV (MoHSS, 2014; NSO, 2017; ZIMSTAT, 2016). These findings agree with results from various regional studies that used WHO multi-country measures. For example, in a meta-analysis of 141 studies conducted from 1999 to 2010, Devries et al. (2013) found that 44% of women in SSA experienced IPV at least once in their lifetime. In the same meta-analysis, the authors observed that there was spatial variation in the distribution of IPV against women within SSA region. Women who reside in Central and West African regions have higher rates of IPV (54-65%) compared to women in Southern and Eastern Africa (35%). Since these studies have highlighted the rate of IPV against women at the regional level, the proceeding paragraphs will focus on Malawi, where I conducted my research.

1.5.3 Rate and risk factors for IPV against women in Malawi

As mentioned earlier, the issue of GBV is an emerging academic topic in Malawi (Mellish et al., 2015). The literature shows that the first rigorous study in Malawi was a 2004 Malawi Demographic and Health Survey (MDHS), which was followed by similar studies in 2010 and 2016. By 2015, only six studies that focused on the rate of GBV at the national level were available. During the same period, only 23 documents discussed GBV against women. Currently, the Malawi government has released the 2016 MDHS report, which contains results pertaining to IPV against women (NSO, 2017). The report suggests that the prevalence of IPV against women is escalating in Malawi. For instance, the study indicates that IPV against women in the form of physical and psychological abuse has risen from 22% in 2010 to 26% in 2016. It should be noted that the rise might be attributed to ongoing awareness campaigns regarding the importance of disclosing domestic violence in Malawi.

An analysis of current published peer reviewed papers in Malawi drawn from various sources reveals a general consensus that the problem of IPV cuts across region, age, religion, and education (Bazargan-Hejazi, Medeiros, Mohammadi, Lin, & Dalal, 2013; Chikhungu, Amos, Kandala, & Palikadavath, 2019; Fan et al., 2016; VanderEnde et al., 2016). The cited studies not only examined the prevalence of IPV against women, but also its risk factors. In a retrospective study conducted in 2013 with young men aged 18 to 24, VanderEnde et al., 2016 found that men who experienced abuse in their childhood were 2.5 times more likely to perpetrate sexual violence against their spouses.

In terms of analytical methods, Chikhungu et al. (2019) triangulated the 2016 MDHS report findings to ascertain the risk factors associated with IPV against women. By using cluster and multinomial regression analysis techniques, the authors affirmed that IPV against women is

a problem of public interest. Specifically, they found that women who were married to partners who consumed alcohol were three times more likely to experience domestic violence. In addition, women in polygamous marriages had a 76% chance of experiencing intimate abuse, which was greater than women in monogamous marriages. Other notable risk factors were women's affiliated ethnic background in Malawi, as well as women's educational level and employment status. It is also important to note that earlier national representative studies in Malawi point out that employed women and women whose husbands consumed alcohol were at a greater risk of domestic abuse (Mandal & Hindin, 2013). Although the discourse of gender-based violence is still in its infancy in Malawi, scholars agree that IPV against women is a public interest issue needing further inquiry (Conroy, 2014; Mkandawire-Valhmu et al., 2016). Continued research on this subject will help to advance our understanding in terms of not only epidemiological issues, but also etiology, health consequences, and social work best practices.

The available studies conclusively support the narrative that hegemonic masculinity norms are the root cause of IPV against women in Malawi. Many Malawian traditions have set role expectations for both men and women. A woman is expected to keep house and be responsible for taking care of the husband and children (Farnworth, Stirling, Chinyophiro, Namakhoma, & Morahan, 2018; Kerr, Chilanga, Nyantakyi-Frimpong, Luginaah, & Lupafya, 2016). The community role expectation for men is that they are the household breadwinners and decision-makers, and will represent the family in the public sphere. These role differentiations based on gender are known to undermine women's autonomy in terms of decision-making as well as access to productive (economic oriented) and reproductive (consumption oriented resources. These structural expectations render women vulnerable to gender-based violence

when they transgress the set boundaries (Mudege, Chevo, Nyekanyeka, Kapalasa, & Demo, 2016; Muriaas, Wang, Benstead, Dulani, & Rakner, 2018).

In summary, the reviewed literature affirms that, like in many SSA countries, IPV against women in Malawi is an endemic problem and therefore a public interest issue. While acknowledging that age, alcohol consumption, and educational attainment are known risk factors for IPV against women, there is overwhelming evidence to support the notion that a patriarchal system is the fundamental risk factor for IPV. The concerted efforts of scholars, health practitioners, and local stakeholders are still needed to understand and intervene in this social problem.

1.5.4 Health consequences of IPV against pregnant mothers

A number of scholars across the globe have investigated the consequences of IPV on women's health. Studies have found that, in addition to physical injury, IPV also renders women prone to a range of psychological, sexual, and reproductive health issues (Fanslow, 2017). While acknowledging that there are numerous health consequences of IPV against women, the focus of this section will be on pregnant women and their children, and this information will inform my entire dissertation.

A group of leading scholars has dedicated its research efforts to understanding the negative effects of IPV on pregnant women (Ferdos, Rahman, Jesmin, Rahman, & Sasagawa, 2018; Sarkar, 2008; Shah & Shah, 2010). Scholars have managed to put the issue of IPV undermining healthy pregnancy outcomes into the spotlight. For instance, a study in Bangladesh found that women who experienced sexual abuse were more likely to suffer from medical, obstetric, and pregnancy complications compared to women who were not victimized (Ferdos et al., 2018).

Many systematic reviews have supported the claim that IPV exposure is a health risk to pregnant women. A review by Nesari, Olson, Vandermeer, Slater, & Olson (2018) found that a maternal history of abuse during pregnancy was associated with preterm delivery and low birth weight. Similarly, in Vietnam a review of the literature found that IPV exposure during pregnancy was associated with premature labour and low birthweight (Do et al., 2019). Although, there is no existing review of the literature in Malawi, a local study found that maternal exposure to IPV was associated with spontaneous abortion and stillbirth (Rao et al., 2017).

Scholars have put forward various narratives to understand the observed association between a maternal history of intimate abuse and poor pregnancy health outcomes. First, biological studies indicate that repeated exposure to IPV before or during pregnancy significantly contributes to the raising of allostatic load, which acts as a body stressor. Eventually, the immune system is weakened, leaving the victim's reproductive system vulnerable (Juster, McEwen, & Lupien, 2010; Sarkar, 2008). Second, epidemiological studies show that pregnant women who experience sexual IPV are more likely to contract sexually transmitted diseases that increase the chances of preterm labour (Decker et al., 2008; Jewkes, Dunkle, Nduna, & Shai, 2010). Finally, behavioral scientists have found that women who experience IPV before or during pregnancy are more likely to skip prenatal visits and indulge in risky behavior that can compromise pregnancy outcomes (Jamieson, 2018; Koski, Stephenson, & Koenig, 2011).

Despite the fact that a good number of reviewed studies were cross-sectional in design, which raises questions of study robustness, this dissertation has found that there is consistency in their findings. Some authors have underscored that there is a temporal biological gradient between maternal exposure to multiple forms of abuse during pregnancy and poor health

outcomes (Nesari et al., 2018). However, a handful of researchers dispute that there is an association between maternal exposure to IPV and pregnancy outcomes. For instance, a case-control study in Norway found that there was no significant difference regarding low birthweight between babies of abused and non-abused women (Grimstad, Schei, Backe, & Jacobsen, 1997). Similar results were observed in a cross-sectional study conducted in Ethiopia, where IPV exposure was not associated with low birthweight, stillbirth, or preterm birth (Laelago, Belachew, & Tamrat, 2017). In sum, research focusing on the health impacts of IPV against pregnant women and their babies is inconclusive and warrants further inquiry.

1.5.5 Impact of IPV on child breastfeeding

Studies show that breastmilk is an ideal primary food for the healthy growth of children in both developed and developing countries (Cerulli, Chin, Talbot, & Chaudron, 2010; Mezzavilla, Ferreira, Curioni, Lindsay, & Hasselmann, 2018). WHO recommend that mothers should initiate breastfeeding within the first hour after childbirth, exclusively breastfeed the child in the first six months, and supplement breastmilk with other foods until the child is at least two years old (World Health Organization, 2018). The literature shows that IPV against women has the potential to impair the quality of childcare practices, including breastfeeding, during critical years of a child's life (Victora, de Onis, Hallal, Blössner, & Shrimpton, 2010). However, the literature shows contradictory results regarding the association between IPV against mothers and breastfeeding. A population-based study in India found that only severe forms of IPV against mothers were associated with lower odds of exclusive breastfeeding among infants aged zero to six months (Metheny & Stephenson, 2019). A prior longitudinal study in rural India suggests that there is no association between maternal exposure to physical violence and exclusive breastfeeding (Shroff et al., 2011).

In Africa, the literature also presents contradictory findings regarding an association between IPV against women and breastfeeding practices (Misch & Yount, 2014). In Zimbabwe, Zambia, Kenya, and Tanzania (Madsen et al., 2019), IPV against mothers was associated with a high likelihood of late initiation of breastfeeding. In Ghana and Kenya, IPV was associated with lower odds of exclusive breastfeeding. Surprisingly, in Tanzania, and Zambia, IPV sexual violence was associated with higher odds of exclusive breastfeeding. In Malawi, a national representative study found that maternal exposure to IPV was a risk factor for low levels of exclusive breastfeeding, and late initiation of breastfeeding (Walters, Rakotomanana, Komakech, & Stoecker, 2019). These findings suggest that the variable of child breastfeeding patterns should be included in the analysis of the relationship between IPV against women and child health outcomes in the African continent.

1.5.6 Health consequences of IPV on health outcomes for children under the age of five

A group of researchers from various disciplines is exploring issues beyond understanding the effects of IPV on pregnancy outcomes (Yount et al., 2011). Child health and growth not only depends on maternal prenatal wellbeing, but also into the first thousand days of the child's life (Georgiadis & Penny, 2017). Nutritional studies in developing countries have shown that adequate childcare during infancy and early childhood period can reverse negative effects of poor utero child development outcomes (Adhvaryu, Nyshadham, Molina, & Tamayo, 2018; Bundy et al., 2017; Crookston et al., 2013). The following section will therefore examine studies that focus on the negative effects of IPV against mothers of children under the age of five. The goal is to understand current debates in this field and establish common child health outcomes associated with the phenomenon.

1.5.7 IPV and child nutrition

Current child welfare scholarship focuses on understanding the indirect effects of IPV against women on child nutritional outcomes (Artz et al., 2014; Yount, DiGirolamo, & Ramakrishnan, 2011; Ziaei, Naved, & Ekström, 2014). The context for this is that in many developing countries, there is little progress towards addressing child undernutrition despite substantial investment from local and international stakeholders. Child undernutrition refers to lack of proper nutrition due to inadequate consumption of food and other direct and indirect causes (Development Initiatives, 2018, 2018). The 2018 WHO Global Nutrition Report has shown that 22.2% (150.8 million) of children in the world are stunted, meaning that they are too short for their age , and 7.5% (50.5 million) are "wasted" meaning that they are too thin for their height (Development Initiatives, 2018, 2018). The report paints a grim picture for African countries, in many of which child undernutrition in form of stunting is actually rising.

Scholars believe that IPV against women has a cumulative effect that disrupts utilization of household and community resources and exacerbates poor child nutrition (Miller-Graff & Scheid, 2019; Yount et al., 2011). Based on this hypothesis, a handful of studies have tested this assumption in selected developing countries. In India, a study by Ackerson & Subramanian, (2008) used the Indian National Family Health Survey to find out whether there is any association between IPV against women and child undernutrition. The study found that IPV against mothers was associated only with child underweight and anemia. In the same subcontinent, scholars (Rahman et al., 2012; Silverman et al., 2009) analyzed the 2004 and 2007 Bangladesh nationally representative Demographic Health Surveys to test this hypothesis. The results suggest that women who experienced any form of IPV were more likely to have stunted children than women who did not experience abuse (OR, 1.84; 95% CI, 1.53–2.22). The authors speculated that a plausible interpretation of this finding could be the controlling behavior of male

partners through withdrawal of resources. Even though the aforementioned studies have linked IPV against women to different kinds of child poor nutritional outcomes, they have failed to adequately address whether intimate abuse is a risk factor for poor child nutrition in general. Research should therefore continue to address unresolved issues regarding why IPV may result in different kinds of child poor nutritional outcomes.

In Africa, national representative studies conducted in Liberia (Sobkoviak, Yount, & Halim, 2012) and other countries like Malawi (Chai et al., 2016; Rico, Fenn, Abramsky, & Watts, 2011) have observed that only maternal lifetime exposure to sexual, and physical violence is a significant predictor of child stunting. Surprisingly, the researchers found that the link between IPV and child stunting was stronger in urban settings than in rural ones. Obviously, these studies found that household poverty and low levels of maternal education were mediating factors regarding IPV and child stunting. I can speculate that household poverty and maternal education exacerbate household food insecurity which is an immediate precursor of child stunting (Engle et al., 2000). The reason for why children of mothers who experience IPV in an urban setting are more vulnerable to undernutrition than rural children remains unknown. This area requires further investigation.

To date, only two studies examine the link between IPV against women and child nutritional outcomes in Malawi (Chai et al., 2016; Rico et al., 2011). These studies were part of the aforementioned cross-country analysis that pulled demographic health surveys from more than 42 countries. I have presented the studies' findings in the preceding paragraph. Because the focus of these studies was to understand the relationship between IPV and child nutritional outcomes at a global scale, the findings do not necessarily speak to specific communities in Malawi. My study has addressed this gap.

1.5.8 Intimate partner violence and child morbidity

Studies that focus on the negative effects of maternal exposure to IPV on child disease have received limited attention. A study in Nicaragua and Kenya found that maternal exposure to IPV is a risk factor for child mortality (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008). A study in Malawi and Honduras observed that IPV against mothers was marginally associated with child mortality (Asling-Monemi, Peña, Ellsberg, & Persson, 2003; Rico et al., 2011). These findings have prompted a handful of scholars to examine whether IPV against mothers is associated with child diseases that prove fatal.

Population-based studies in Uganda, Bangladesh, Nepal, and India (Ferdousy & Matin, 2015; Hossain et al., 2019; Karamagi, Tumwine, Tylleskar, & Heggenhougen, 2007) have found that maternal exposure to IPV is associated with different forms of child morbidity. In South Asia, IPV against women was associated with child acute respiratory infection (OR, 1.57; 95 % CI 1.48–1.67) and diarrhea (OR, 1.56; 95 % CI 1.44–1.69) (Ferdousy & Matin, 2015; Silverman et al., 2009). In Uganda, IPV against women was associated with child illness (cough, fever, diarrhea, and fast breathing). After disaggregating the illnesses, IPV against women was only significantly associated with child diarrhea. A study in Tanzania applied a stratified multilevel modelling method to determine whether a child's age is a mediating factor regarding the effects of IPV on child morbidity in terms of diarrhea, cough, and fever (Bintabara & Kibusi, 2018). The findings show that post-neonatal and older children were at an increased risk of morbidity when their mothers experienced abuse.

Despite the fact that malaria is one of main diseases causing child deaths in SSA, killing one child every two minutes, there is no study to date exploring a possible link with domestic violence in the region (Palombi & Moramarco, 2018). The literature shows that child malaria

prevention education in regions including Malawi focuses on the use of insecticide-treated nets, immunization, and access to anti-malaria drugs (Jakubowski, Stearns, Kruk, Angeles, & Thirumurthy, 2017; Ng et al., 2017; Stebbins, Emch, & Meshnick, 2018). Although these interventions are necessary, issues of VAW in the context of malaria prevention have not yet received much attention. This dissertation has taken on the challenge of assessing whether IPV against women is a predisposing factor for child malaria in malaria-prone areas of central Malawi.

1.6 Contextualizing the dissertation within the field of Social work

The current International Federation of Social workers (IFSW) define Social work as:

> A practice-based profession and an academic discipline that promotes social change and development, social cohesion, and the empowerment and liberation of people. Principles of social justice, human rights, collective responsibility and respect for diversities are central to social work. Underpinned by theories of social work, social sciences, humanities and indigenous knowledge, social work engages people and structures to address life challenges and enhance wellbeing (Ornellas, Spolander, & Engelbrecht, 2018).

Building upon this definition, I understand that the phenomenon of IPV against women is a long-standing serious human rights abuse in Malawi. In addition, studies have explicitly suggested that women who experience IPV are more likely to suffer from poor mental, physical and reproductive health outcomes. As a graduate Social Worker, I am compelled to facilitate in addressing the challenges that mothers in Malawi encounter that include IPV. I have employed theories from Social work, nutrition and humanities to understand the problem of IPV against mothers in rural Malawi. My study engaged community members in Malawi to reflect on risk factors that undermine maternal and child wellbeing. Therefore, this research is a form of critical social work

and grounded in conscious raising activism attempting to broaden the attention of stakeholders on the risk factors of child poor health outcome through gender lens (Stephen A., 2019).

1.7 Chapter summary

Chapter 1 situated the dissertation in the domain of VAW with a particular focus on IPV against women. I have established that IPV against women is a problem of public importance in Malawi. Current data show that at least 41% of the women reported experiencing this social problem. Existing studies in Malawi have focused on the prevalence and risk factors for IPV among women in the general population, among young women, HIV-affected mothers, and among disabled women. No study in rural Malawi has focused on the prevalence and determinants of IPV against mothers of children under the age of five. The literature shows that Malawian mothers are their children's primary caregivers and it is known from past studies in other countries that IPV undermines childcare practices. A lack of knowledge about this issue can undermine IPV prevention efforts and programs that aim to improve child wellbeing. I focused this dissertation on addressing this gap by examining risk factors for IPV against mothers and subsequent intergenerational health outcomes.

Chapter 2

2. Theoretical framework

2.1 Introduction

This chapter presents the theoretical viewpoints that I have used alongside the discussions of their relevance to my study of IPV against mothers and child poor health outcomes. Gender order and ecological frameworks are the two broader theoretical frameworks that have directed this dissertation. By gender order, I mean the social systems that shape societal norms, behaviours, and roles according to gender categories (Pilcher & Whelehan, 2004). Within the discussion of gender order, I will focus on hegemonic masculinities. These are prescribed forms of masculinity that have the potential to subjugate women (Connell, 2013; Jewkes et al., 2015). Further, within the discussion of gender order, the chapter will discuss a feminist view of the root cause(s) of IPV against women in society.

In the second section of this chapter, I will discuss two theories that conceptualize the interrelationship between social and structural systems that can undermine the wellbeing of women and children in the context of violence. Specifically, I will present the ecological theory in the context of how scholars have used this theory in the study of IPV against women. I will then discuss the applicability of ecological theory to this topic. Finally, the chapter will highlight UNICEF Care for Nutrition conceptual framework in the context of childcare practices.

2.2 Gender order

According to Connell (2014), the concept of gender order refers to the way in which societies are organized in accordance to the roles, contribution, responsibilities, and activities of men and women in society. The concept asserts that gender power order dictates and sustains gendered power relations between men and women. This theory informs an understanding of gender power order in a particular society as shaping the performative roles of both women and

men. Each society has a unique set of expectations that both men and women are encouraged to fulfill (Connell & Messerschmidt, 2005). The concept of gender order as an analytical framework is indispensable to my research. Studies show that gender norms in both productive activities, such as agriculture, and reproductive activities, such as childcare, privilege men over women in Malawi (Riley & Dodson, 2016). In the following paragraphs, I will illustrate the ways in which gender order is a good match for the study of IPV against women and poor child health outcomes in Malawi.

2.3 Gender order and justification of IPV

Despite concerted efforts to reduce IPV against women, studies show that cultural norms, discourses, and practices in Malawi are used to justify the practice of men "chastising" their spouses through the use of physical violence (Gaynor & Cronin, 2019). In line with this belief, research indicates that 16% of Malawians believe that men have the prerogative to "discipline" their wives through physical abuse (Sardinha & Catalán, 2018; Uthman, Lawoko, & Moradi, 2009). This situation is due at least in part to a gender order in Malawian culture that has socialized women as relegated to the domestic realm, while men are expected to act as the head of the family. The underperformance of expected feminine roles, such as failing to prepare food, arguing with the husband, neglecting the children, and going out without telling the husband, are accepted as warranting the perpetration of physical violence against women. This study hypothesizes that women in rural Malawi who underperform their prescribed social roles are more likely to be victims of IPV. Therefore, the inclusion of variables related to the justification of corporal punishment in matrimonial relationships was necessary, as their inclusion increases the potential for understanding the likelihood of abuse.

2.4 Gender order and maternal access to resources

In Malawi, like in many countries in Africa, gender order dictates that women should be submissive to their spouses (Ensor & Cooper, 2004). Submissiveness is a performative concept, and women in Malawi portray it in various ways. For example, a study by Mudege, Mdege, Abidin, & Bhatasara (2017) observes that many women in Malawi felt inappropriate attending agricultural training for fear of being perceived as trying to take on a "head of household" role. This fear is due to stereotyped community expectations. Similarly, a study in central Malawi found that a significant number of newly-diagnosed HIV-positive pregnant women did not have autonomy to initiate antiretroviral therapy without their husbands' consent (Kim et al., 2016). Maternal subscription to these negative gender norms is detrimental to the health of women and their children. Literature has affirmed that mothers who are able to access and control resources and make informed decisions are more likely to have healthy children (Richards et al., 2013). Unfortunately, gender order in Malawi do not allow women to take on these challenges. Therefore, based on a gender order framework, I have grounded my dissertation in the belief that mothers who experienced IPV are more likely to underutilize household resources to the disadvantage of the child.

2.5 Hegemonic masculinities

The theory of hegemonic masculinities proposes that, over time, societies support and legitimatize particular dominant forms of masculinities that subordinate women and other marginalized groups (Connell, 2013; Jewkes et al., 2015). Studies show that each society has a particular set of standards that qualifies the concept of masculinity. Regardless of time and place, the manifestation of physical strength, courage, aggression, and toughness are dominant characteristics of hegemonic masculinities across the globe (Donaldson, 1993). To sustain the

status quo, social structures reproduce hegemonic masculinities through formal and informal socialization.

Studies show that sexual prowess is a dominant hegemonic masculinity attribute in Malawi (Izugbara & Undie, 2008). Men and boys are socialized to participate in life-risk behaviors such as having multiple sexual partners without using protection, polygamy, and transactional sex (Jere et al., 2017; Tran et al., 2018). The ongoing discussion about HIV and AIDS in Malawi has to some extent, empowered women to challenge the dominant notion of male sexual prowess. Consequently, negotiations for safer sex in a relationship is known to be a risk factor for IPV against women (Chimbiri, 2007; Poulin, Dovel, & Watkins, 2016). Based on this, my assumption is that mothers who reported that their partners had extramarital affairs were at an increased risk of experiencing violence compared to other mothers.

2.6 Feminist perspective

Feminist theory is one of the conceptual frameworks for understanding gender order in a society. According to this theory, a patriarchal system "is a male dominated society" and "the main driver of IPV against women" (Smith, 1990). To understand IPV against women, scholarly analysis should therefore take gender and power into account. Gender in this context refers to values, norms, and behaviors that specific cultures assign to a particular biological sex (Connell, 2013). In the literature, feminists agree with family violence theories who dispute the claim that "wife battering" is a result of the husband's pathology or deviance behavior (Dowgwillo, Ménard, Krueger, & Pincus, 2016). Based on the work of Dobash & Dobash (1979), VAW is deemed to be a manifestation of men's socially-structured supremacy over women. The literature indicates that the legacy of patriarchal culture is perpetuated through socialization. In the case of Malawi, the social structure provides a conducive environment for men to abuse women. Notable feminist

scholars such as Yllo & Bograd (1988) have demonstrated that household gender inequality and the social institution of traditional marriage trigger and reinforce IPV against women.

In this dissertation, I applied a feminist conceptual lens to the issue of IPV against women to better understand how gender inequality is linked to IPV against women in Central Malawi (DeKeseredy & Hall-Sanchez, 2018). Grown from this area, I acknowledge that culturally, there is systemic subordinated of women that limit their urgency in household decision-making. Specifically, I delved into an understanding of the nature of gender inequality that can amplify poor child health. Focus was on examining the characteristics of social roles that both men and women occupy in the family. Drawn from feminist perspective, this study drew most of its knowledge from women's perspective (standpoint) and carries with it intersectionality of being mothers, wives and housekeepers just to mention a few. Therefore, the commonly used themes in feminism such as oppression, sexual objectification, patriarchy as perceived by the mothers with its relationship with child health is the product of this study (Maas, McCauley, Bonomi, & Leija, 2018), and discrimination are linked to narratives of IPV against women.

2.7 Ecological perspective

I have taken into account the notion that gender order does not take place in isolation, but rather in the context of a society encompassing multifaceted social structures (Coll-Seck et al., 2019). Therefore, I adopted an ecological model as my overarching framework to conceptualize determinants of IPV against women and its consequent poor child health outcomes. The ecological model started to take a center stage in the 1970s. It is one of the multilevel conceptual frameworks developed and applied in the study of VAW in the context of intimate relationships (Dutton, 2011). The theory was originally proposed by Urie Bronfenbrenner (1977) and later adopted by Belsky (1980) in the study of child abuse and neglect. Since then, numerous scholars have used the theory

to understand domestic violence in different parts of the world (Akhter & Wilson, 2016; Carlson, 1984; Dutton, 1994; Flake, 2005; McLeroy, Bibeau, Steckler, & Glanz, 1988).

Scholars across SSA have used the ecological model to understand the problem of IPV against women (Glass et al., 2018; Solanke, Bisiriyu, & Oyedokun, 2018). For instance, Gashaw, Schei, & Magnus, (2018) were guided by a socioecological framework in their exploration of factors associated with IPV against pregnant mothers. Their findings indicate that risk factors for violence were operating at interpersonal, community, and national levels. Women in societies that condoned VAW were more likely to experience IPV compared to women in communities that did not condone violence. Other key risk factors included participants' educational attainment, social isolation, and lack of social support.

In my dissertation, I have disaggregated risk variables for IPV against mothers according to individual, interpersonal, and community levels where they operate. I categorized the variables of maternal education, age, gender, and HIV status as operating at individual level. At the relational level, I included variables such as men's alcohol consumption and male partners' extramarital affairs. Variables operating at the community and societal levels such as easy access to water, availability of health facilities, and types of community norms, were also included.

2.8 UNICEF Care for Nutrition framework

My study was driven by UNICEF's Care for Nutrition framework (Engle, Bentley, & Pelto, 2000; Engle, Menon, & Haddad, 1999). The model acknowledges that child growth, development, and survival depend on more than the availability of food and the absence of disease. Certain social factors, referred to as social determinants of health, are equally important to children's growth and development (Braveman & Gottlieb, 2014). Notable social factors include the behaviours and practices of caregivers who provide healthcare, stimulation, food, and emotional support (Engle et

al., 2000). Like the ecological model, UNICEF's Care for Nutrition framework operates on the assumption that by investing in social structures (*highlighted in figure 1*), children's health can significantly improve.

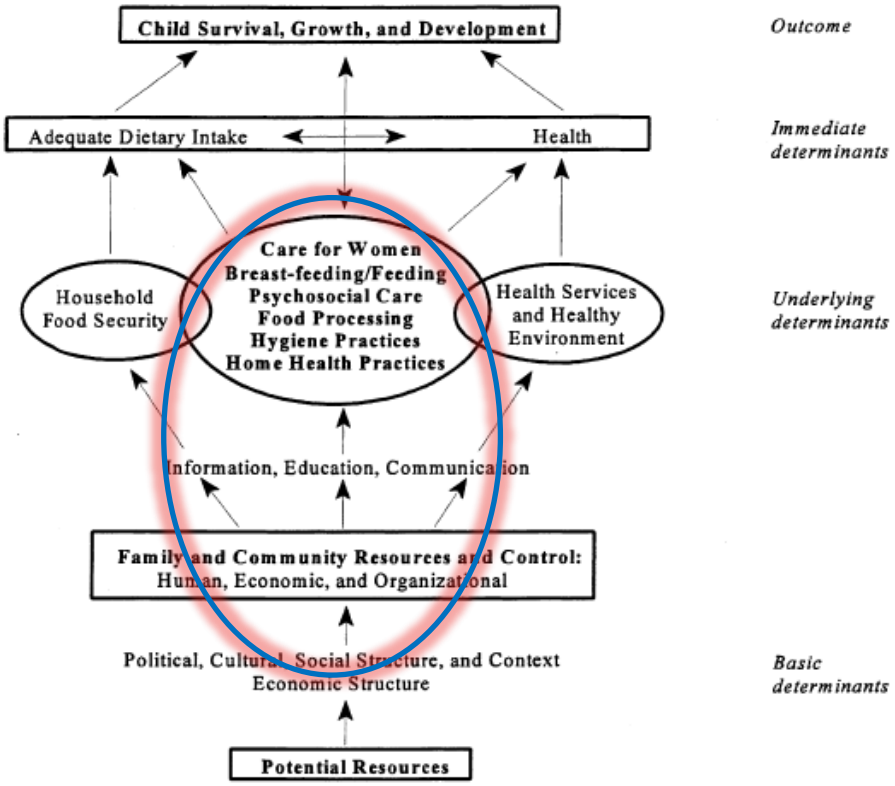


Figure 1. UNICEF's Care for Nutrition framework: Adapted from (Engle et al., 2000)

Studies have overwhelmingly found that in developing countries, mothers rather than father are children's primary caregivers (Lee & Tang, 2015). For mothers to maximize healthy childcare practices, they need resources including their own good physical and mental health, time, autonomy, control of resources, a reasonable workload, and social support from family members and the broader community. Studies indicate that IPV against mothers weakens these facilitating conditions for effective childcare (Friedemann & Buckwalter, 2014). For instance, where mothers do not have autonomy to decide how to utilize household resources, this can directly affect child

health. Victimized mothers cannot negotiate with their partners for an egalitarian division of domestic work that can translate to mothers investing more time in childcare activities. It therefore makes sense to apply UNICEF's Care for Nutrition conceptual framework to understand the pathways by which IPV against women undermines child wellbeing in Malawi.

2.9 Summary

In chapter two, I have described the theories that have helped to guide my understanding of the research questions. Gender order and ecological frameworks are the two broader theoretical frameworks that have directed this dissertation. Within gender order, I have paid particular attention to hegemonic masculinities. These are prescribed dominant forms of masculinity that have the potential to subjugate women. In addition, I have highlighted the feminist perspective that a male-dominated society is the root cause of IPV against women.

In the second part of my theoretical framework, I discussed the interrelationship of social systems that can potentially enhance or undermine the wellbeing of women and children. First, I discussed about the origins of ecological theory. I also examined how scholars have used the theory in different context to study IPV against women in SSA. This framework helped me to identify variables that predispose mothers to interpersonal abuse. I finished the chapter by presenting the UNICEF Care for Nutrition framework. This framework is similar to the ecological model, as it posits that child health is a product of immediate and underlying factors that operate at different levels of society.

Chapter 3

3. Methodology

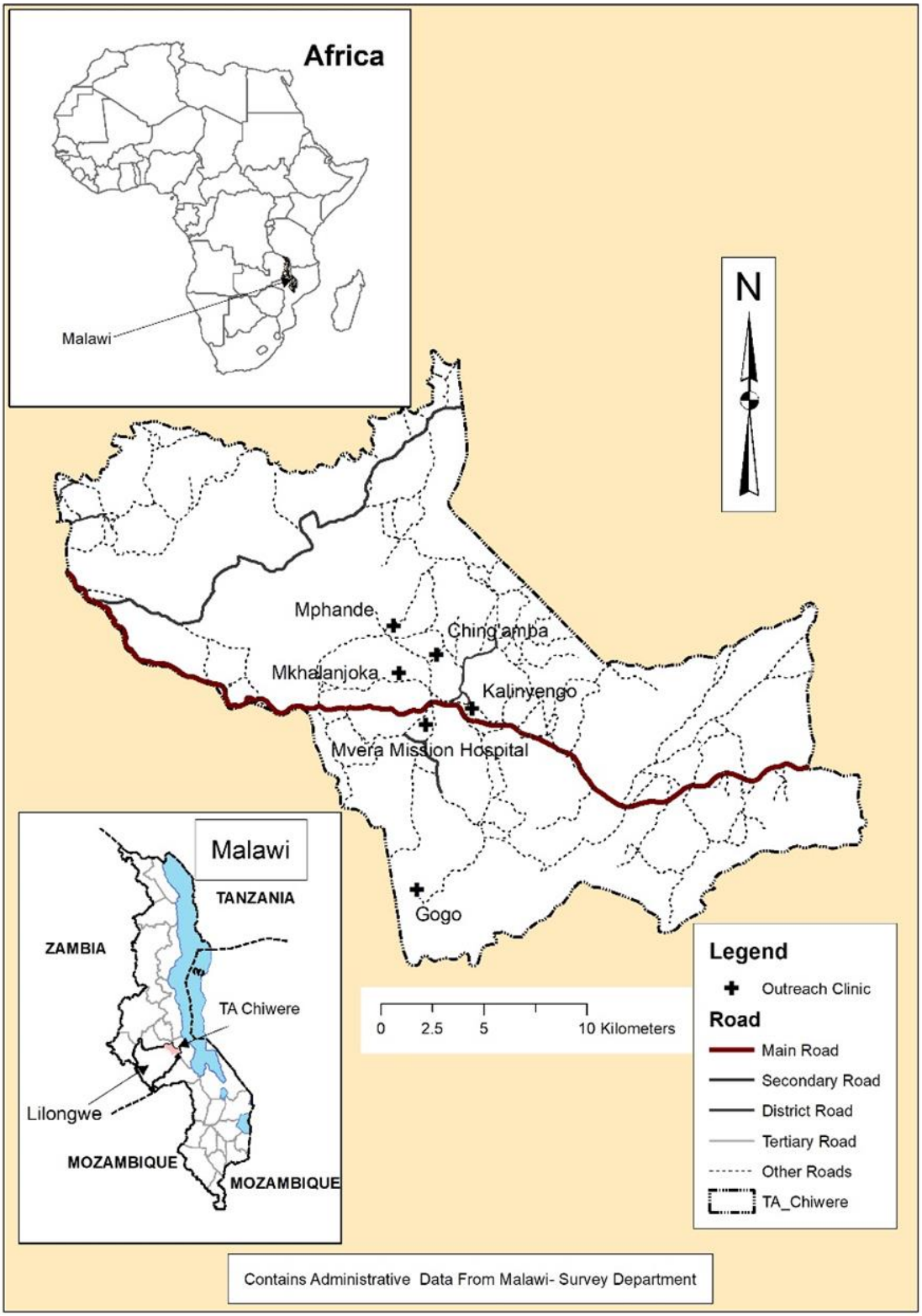
3.1 Introduction

This chapter discusses the methodology that I used in this dissertation. I first introduce the research setting, followed by a description of the methodology, data collection and analysis. The final section discusses the ethical considerations before concluding the chapter.

3.1 Research setting

I conducted this study in Malawi, a small landlocked country of about 118,484 km² in Southern Africa. Malawi shares borders with Tanzania to the north, Mozambique to the southeast, and Zambia to the west. There are three political administrative regions: Southern, Central and Northern regions. Lilongwe is the national administrative region and is located in the Central region. The current population of Malawi is about 17,563,749 million people (NSO, 2018). Eighty-five percent of the population depends on agriculture for their livelihood (NSO, 2017). I conducted this research in Dowa district, one of the nine administrative districts in the Central region approximately 60 kilometers east of Lilongwe city (Figure 1 and 2) between May and September 2018. I purposively selected Dowa because of persistent media reports of increased murder cases that emanate from marital problems (Malawi 24 Reporter, 2016).

Figure 2: Location of the study area



3.2 Research design

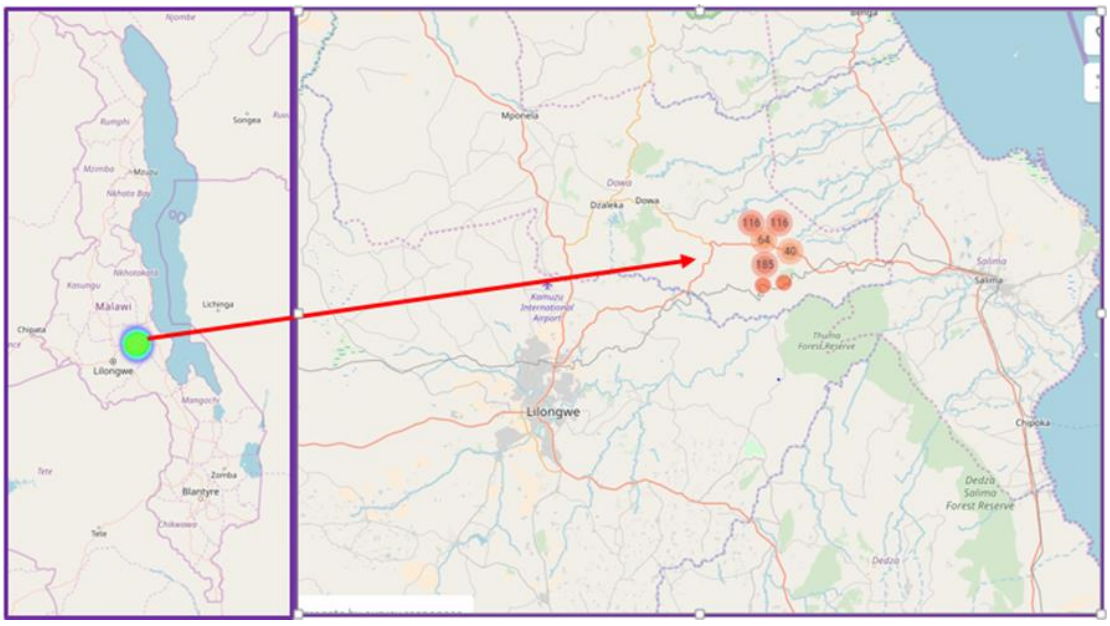
My dissertation was inspired by a broader, collaborative project on the discourse of child welfare in Malawi (Kerr et al., 2016, Chilanga, 2013, Chilanga et al., 2017; Riley & Chilanga, 2018). This independent doctoral research project allowed me to extend previous studies to a new geographical area for which there is limited data. I employed a primary quantitative research method, which involve a systematic investigation of the phenomenon by gathering numerical data and performing statistical analyses (Walliman, 2010). Primary quantitative research method is widely used in social science research to collect data directly from participants. There are multiple types of primary quantitative research that include survey, correlational, causal-comparative and experimental research (Norris, Plonsky, Ross, & Schoonen, 2015). My study utilized a survey research technique that involve administering a questionnaire to randomly selected research participants.

3.3 Research participants and sampling procedure

Mothers who had at least a child under five years of age and presented their children to a postnatal primary healthcare clinic for a regular monthly check-up service, qualified as eligible participants. It is important to note that in Malawi, mothers are obliged to make sure that their health, and that of their children, are monitored by a health professional every month (McCollum et al., 2012). This study used a multi-stage cluster sampling technique to select representative research participants (Remler & Ryzin, 2014). Geographically, I applied a simple random sampling procedure to select six out of eight outreach clinics under Mvera hospital in central Malawi. The selected outreach clinics were Mkhalanjoka, Gogo, Mvera, Kalinyengo, Mphande, and Ching'amba. During the time of the study, Mvera hospital was serving a population of 27,719, of which 4,820 under-five year old child/mother dyads were clients of postnatal health services in the selected outreach clinics. A Raosoft online software program was used to calculate a sample

size (McCrum-Gardner, 2010). The margin of error was set at 5%, with 95% confidence level, and a response distribution of 50%. The minimum sample size suggested was 356 under-five child/mother dyads. I increased the sample size to 538 dyads with an aim of strengthening the study's reliability and reducing the margin of error from 5% to 4%. A systematic sampling technique was used to select 538 out of 4,820 under-five child/mother dyads from postnatal registers by selecting every ninth pair starting with a randomly selected pair.

Figure 3: GPS map showing number of selected participants



I did not advertise for volunteers to participate in the study through public media or posters for fear of attracting the attention of some men who may have prevented their partners from participating. The randomly selected mothers were contacted through antenatal clinics when they attended monthly health assessments with their children. Female health workers were key people in the recruitment and the administration of the questionnaire. In a private clinic consultation room, health workers were asking selected mothers if they were interested in participating in this study. The health workers who were my research assistants only introduced the study to mothers

who initially agreed to participate. The introduction included issues such as the importance of the research, their unique contribution, and liberty to withdraw. By design, the survey was administered to mothers in the consultation room to protect the confidentiality of the mother.

3.4 Data collection

As mentioned above, the study used two data collection methods. The following sections will elaborate each of the two methods.

3.4.1 Survey questionnaire

The WHO multi-country study of VAW questionnaire was adapted to collect the quantitative data (See Appendix 4) (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008). The VAW questionnaire comprises four section and included questions and definitions of various validated social sciences measuring instruments. The questionnaire included a demographic section whereby data related to participants' age, marital status; forms of livelihoods, and family background were collected. The second section screened for maternal postpartum depression using the validated Edinburgh depression scale (EPDS). The survey questionnaire also included a section on household food security in order to explore the link between maternal history of IPV and nutritional outcomes of the children. Food insecurity is one of the pressing issues in Malawi and is a significant contributor to high prevalence of child malnutrition (NSO, 2017). I combined three FAO screening tools to measure household food security. These were the Household Food Insecurity Access Prevalence (HFIAP), Household Dietary Diversity Score (HDDS), and Months of Adequate Household Food Provisioning (MAHFP). These tools probe mothers' experience of deprivation, level of dietary diversity and seasonal deprivation (Headey & Ecker, 2013; P. Webb et al., 2006).

Figure 4 and 5: Anthropometric data collection

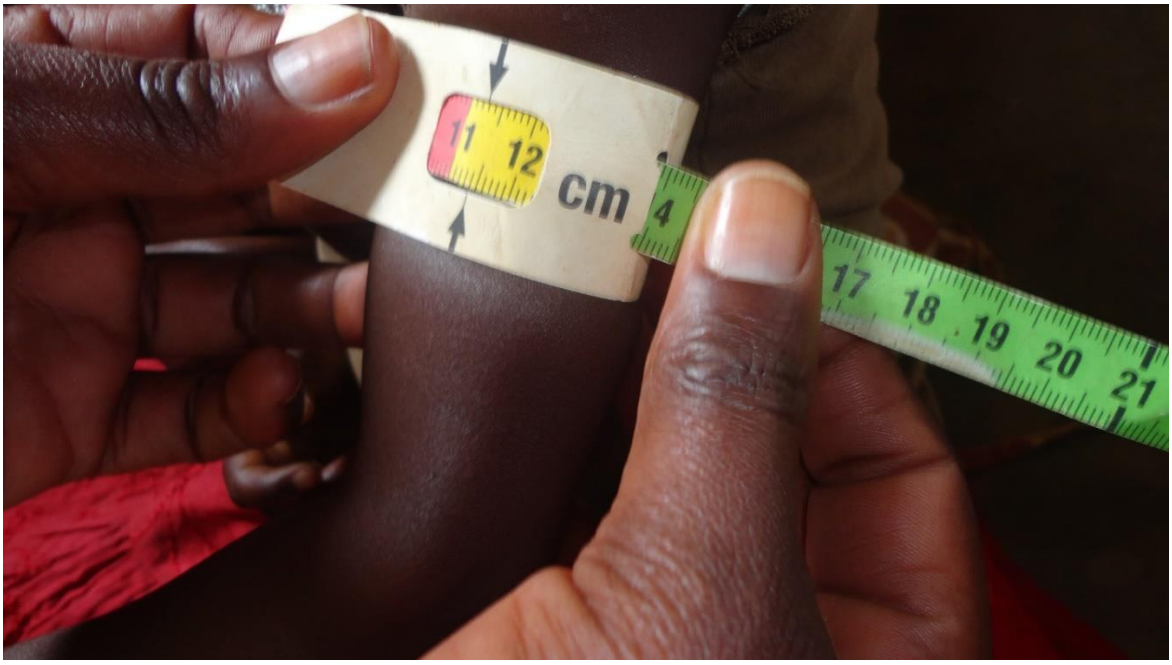


Figure 4: Mid-upper arm circumference (MUAC) measurement[1]

Figure 5: Measuring the weight of the mother and a child

[1] Interpretation of color bands: Green means a child is not malnourished, yellow a child is at risk of malnutrition, red severely malnourished

Finally, the survey questionnaire collected nutritional status and health data of children under five during a regular monthly postnatal healthcare clinic. Health Surveillance Assistants (HSA), who are trained primary health caregivers in Malawi, conduct these monthly outreach programs (Jensen et al., 2015). Every month they record anthropometric data of every child under five years of age including height/length and weight. In this study, HSA were responsible for measuring children's anthropometric indicators and children's health within their regular outreach schedules (Kambala et al., 2015; Mazalale et al., 2015). Figures 4 and 5 above illustrate anthropometric data collection procedures.

3.4.2 Collection of data using the questionnaire

The questionnaire was completed using android tablets. The digital version of the survey questionnaire was uploaded using ODK collect, an android application package which is used to administer surveys and manage the data. It is a useful package as it provides data validation while still in the field. The data was uploaded to and stored in an encrypted online database and was later downloaded from this online database to complete statistical analyses (Hashemi et al., 2017). The survey was administered by HSA with support from medical personnel.

3.4.3 Quantitative data analysis

I downloaded the survey data from the online database into an excel file to clean the data set. Later, the excel file was imported into SPSS version 23 software for data management. I developed a composite index of the four different forms of IPV against women in the study. The forms of partner abuse were controlling behaviour, emotional, physical and sexual violence. I conducted a univariate and multivariate logistic regression analyses for the selected independent and dependent variables. I described the categorization of dependent and independent variables in the methodology section of each of the three manuscripts in results section below. I opted for

logistic regression because the technique allows me to control for confounding variables that could undermine the results.

3.7 Ethical consideration

This research was approved by the Office of Research Ethics at McGill University in Canada (REB file #: 503-0518, See Appendix 1) and University of Livingstonia research committee in Malawi (UNILIA-REC # 4/18) (Appendix 2). Written approval was also provided by the office of the District commissioner and the District health officer in Dowa district. In addition, consent was sought from hospital gatekeepers such as medical directors and hospital in-charge. Finally, informed consent was sought verbally from each research participant before initiating the interviews. Participants were informed that they had a right to accept or decline to participate in the research, to respond or to refuse to respond to any question.

All research resources such as Android phones, notebooks, and digital voice recorders were kept in a secure, lockable cabinet in the office in Malawi and at the Centre for Research on Children and Families at McGill University. The research assistants, who signed the confidentiality agreement, and myself were the only persons who accessed the research equipment and data. Lastly, to ensure confidentiality, pseudonyms will be used in all subsequent manuscripts when quoting or expressing the views of the research participants. I will develop a separate comprehensive journal manuscript to detail both procedural and relational ethics in the study of IPV against mothers in rural Malawi.

3.8 Summary

This chapter outlined that a sequential quantitative-qualitative mixed-method research design was used. Quantitative design was the core component while qualitative design was used to fill the gaps. The core component was a stand-alone research project and was rigorously implemented through random selection of research participants, administration of a validated survey questionnaire, use of logistic regression standard technique in data analysis, and presentation. The interpretation of quantitative results was informed by the qualitative data hence the point of integration in this dissertation. I sought informed consent from research participants.

McGill University and University of Livingstonia were the academic institutions that granted ethics approval.

Chapter 4

Findings of the study (manuscript I)

4.0 Introduction

Chapter 4 present the first manuscript that gives details of the prevalence and determinants of IPV against mothers in central Malawi. The manuscript has been prepared with an intention of submitting to the Journal of Violence Against Women upon completion of the dissertation.

Study I: Prevalence and determinants of intimate partner violence against mothers of children under five years of age in Dowa, Central Malawi

4.1 Abstract

Background: Intimate partner violence (IPV) against women is a pervasive and significant public health problem. The phenomenon is linked to adverse health effects for women and children. Mothers of young children in rural areas of Malawi can be particularly at risk because of gender-based power imbalances. The objectives of this study were to examine the prevalence and risk factors of IPV perpetrated by the current partner against mothers of children under five years of age in rural areas in Malawi.

Methods: A multistage cross-sectional study design was used. A sample of 538 mothers of young children was randomly selected from postnatal clinics in Dowa district. The WHO's Violence against women instrument was used to collect data. Logistic regressions were used to determine risk factors that were associated with IPV against mothers.

Results: The prevalence of IPV controlling behavior, psychological, physical, and sexual violence were 74.7%, 49.4%, 43.7%, and 73.2% respectively. In multivariate analyses, mothers whose partners had extra marital affairs were more likely to experience controlling behavior (*AOR*: 4.97, 95% *CI*: 2.59-8.55, *P*<0.001), psychological (*AOR*: 2.14, 95% *CI*: 1.486-3.472, *P*<0.000), and physical (*AOR*: 2.29, 95% *CI*: 1.48-3.94, *P*<0.000) violence than mothers whose partners did not have extra marital affairs. Mothers whose partners consume alcohol were more likely to experience sexual violence (*AOR*: 2.00, 95% *CI*: 1.17-3.41, *P*<0.001) than mothers whose partners did not drink. In addition, mothers who spent more than 30 minutes drawing water were at greater risk of experiencing controlling behavior (*AOR*: 2.03, 95% *CI*: 1.023-2.640, *P*<0.001), physical (*AOR*: 1.59, 95% *CI*: 1.02-2.32, *P*<0.01) and sexual violence (*AOR*: 2.27, 95%, *CI*: 1.33-3.39, *P*<0.01) than mothers who spent less than 30 minutes.

Conclusion: This study found a significantly higher prevalence of IPV against mothers of children under 5 years of age in rural areas compared to the national prevalence in Malawi. Programs aimed at reducing the partners' risk behaviors identified in this study are recommended. Public health programs that support increased household access to clean and safe water are also recommended to help reduce IPV against mothers of young children.

Keywords: Intimate partner violence; mothers; prevalence; risk factors; Malawi

4.2 Introduction

Intimate partner violence (IPV) against women is a pervasive and significant worldwide public health problem (Devries et al., 2013d). The term IPV refers to any form of physical, sexual, psychological (emotional), and economic abuse that occurs between former, current, or dating partners (Heyman, Slep, & Foran, 2015). Globally, about 35% of women have experienced either sexual and/or physical violence perpetrated by an intimate partner (Devries et al., 2013). The

burden of IPV against women in Sub Sahara Africa (SSA) is high. Approximately 45.6% of the women in this African region have experienced at least one form of IPV in their lifetime (McCloskey, Boonzaier, Steinbrenner, & Hunter, 2016). In Malawi, a 2016 demographic survey indicated that 42% of women experienced at least one form of IPV at some point in their lives (NSO, 2017). It was also found that 33% of the victims experienced IPV in the 12 months prior to the research.

In SSA, IPV has been linked to numerous negative health outcomes for women (Sugg, 2015). For instance, a study in Malawi found that IPV against women was a risk factor for still-birth, abortion, and premature delivery (Rao et al., 2017). In Ghana, IPV against women was associated with physical injuries, increased risk of contracting HIV, and depression (Sedziafa, Tenkorang, & Owusu, 2016). Studies in SSA have also established that IPV against mothers has a negative effect on child well-being. In a longitudinal study conducted in Tanzania, maternal exposure to sexual and physical IPV was associated with child stunting and delayed motor skills and cognitive development (Neamah et al., 2018). Another study in Tanzania found that IPV against mothers was a risk factor for child morbidity (Bintabara & Kibusi, 2018). Given these serious effects on maternal and child health, continued research into IPV against women in SSA is critically important and that the engagement of the fields of public health and social work is needed to continue to build knowledge and an effective response in this area.

Conceptually, ecological theory is used to understand the determinants of IPV against women that operate at different levels (Heise, 1998). This theory stipulates that individual characteristics of violent behavior are not exclusively determined by pathological factors. Rather, they are nested within the broader context of culture and policies that reinforce specific values and behaviors. By using ecological lenses, IPV research in SSA has documented that at personal level,

men and women who experienced abuse in childhood, consume alcohol, accept male dominance, and have lower educational levels are more likely to perpetrate or experience IPV respectively (McCloskey et al., 2016; VanderEnde et al., 2016). At the community and macro levels, poverty, hegemonic masculine norms, and weak law enforcement have been identified as significant risk factors for violence against women (McCloskey et al., 2016).

A growing body of research in developing countries including Malawi has examined the prevalence of IPV by focusing on samples of women in the general population (Alangea et al., 2018; Cau, 2017), during pregnancy (Halim et al., 2017), and during the postpartum period (Shamu, Zarowsky, Shefer, Temmerman, & Abrahams, 2014). These studies have shown that maternal experience of IPV is a predisposing risk factor for child morbidity. A pioneering study in India suggests that children of mothers who experienced IPV in the past 12 months prior to the study were 1.37, and 1.65 times more likely to suffer from acute respiratory infection (ARI), and diarrhea respectively (Silverman et al., 2009). Lately, a study in South Asia confirmed that IPV against mothers increases the health risk of ARI, fever, and diarrhea among under-five children (Ferdousy & Matin, 2015). In SSA, a study that was conducted in Tanzania found that children who were in post-natal and early childhood periods were at an increased risk of morbidity when their mothers were exposed to IPV (Bintabara & Kibusi, 2018).

In Malawi, morbidity in children under the age of five is a significant public health problem that exacerbates child mortality (Lungu, Biesma, Chirwa, & Darker, 2018). Although various interventions such as universal child health care coverage and farm subsidies have been implemented, child morbidity is still unacceptably high (NSO, 2017). Regarding undernutrition, current statistics suggest that 37% of the under five-years-old children are too short for their age (stunting), 3% are too thin for their height (wasting), and 12% are too thin for their age

(underweight) (NSO, 2017). In addition, a high proportion of Malawian children are still suffering from infectious diseases that can be prevented through basic hygiene practices, such as provisioning of safe complementary foods and liquids that are needed along with the breast milk (Lungu et al., 2018).

UNICEF's care for nutrition framework underscores that poor care for women significantly diminishes their capacity for taking care of their children's health and emotional needs. A literature review by Engle, Bentley, & Pelto (2000) highlights that there is an array of care practices for women that facilitate proper child nutrition and general well-being. These include reducing their workload and desisting from abusing pregnant and lactating women. Some studies in SSA have shown that protecting women from IPV has the potential to enhance their role as the primary caregiver for children. For example, a study in Ghana found that women who received both psychological and physical support from their partners were more likely to provide their children with high dietary diversity, completed immunizations, and adequate personal hygiene practices than mothers who were illtreated by their partners (Nti & Lartey, 2008). Two explanations are made for the association between IPV against women and child poor health outcomes. It is argued that IPV against mothers undermines their autonomy to implement better childcare practices due to their partners' controlling behavior. Some studies postulate that IPV and lack of social support exacerbate maternal stress which can, in the long run, reduce a mother's capacity to provide care for her child (Surkan, Patel, & Rahman, 2016).

Limited research has focused on the prevalence and determinants of IPV against mothers of under-five year old children by the current husband or partner in rural areas of Malawi. This gap in the research literature merits attention given that IPV against mothers has been shown to increase poor health outcomes in both mothers and their children in developing countries. To our

knowledge, no research has specifically examined the prevalence and risk factors of IPV against mothers of children under five years of age perpetrated by the current partner in rural areas of Dowa district in Malawi.

4.4 Objective

This study aims to determine the prevalence and identified risk factors for IPV among mothers of under-five children living in rural areas of Dowa district. This project is grounded in UNICEF's "care for nutrition" conceptual framework that can be used to understand a milieu of risk factors that aggravate child undernutrition, diarrhea, and malaria in rural areas of Dowa district, Malawi (Engle, Menon, & Haddad, 1999). According to this framework, child poor health is a product of immediate, underlying, and basic risk factors that operate at individual, household, and societal levels.

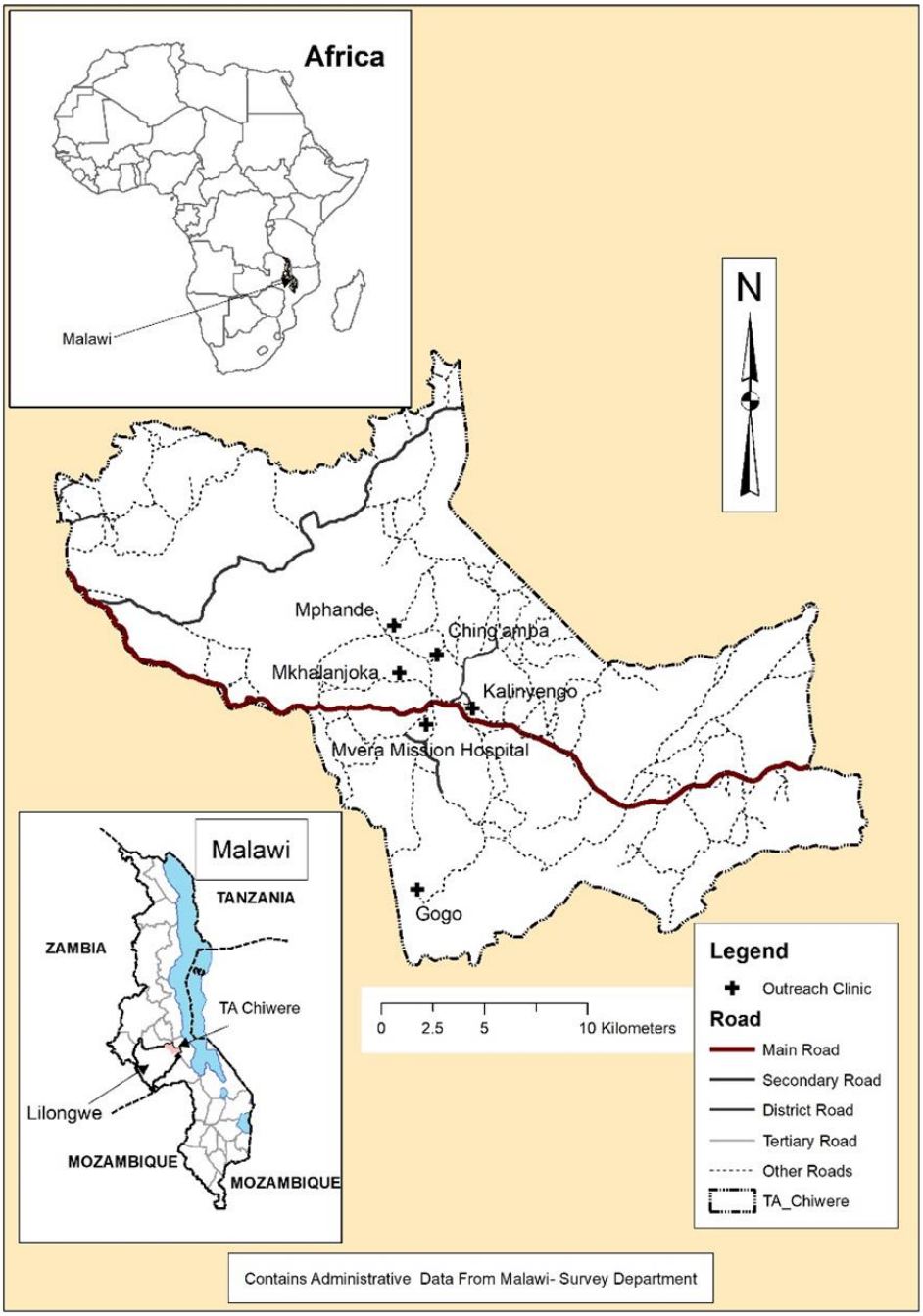
4.5 Methods

4.5.1 Study setting

The study was conducted in Malawi, a small landlocked country of about 118,484 km² in Southern Africa, bordered by Tanzania to the north, Mozambique to the South east, and Zambia to the west. The current population of Malawi is about 17,563,749 million people (NSO, 2018).

Eighty-five percent of the population depends on agriculture for their livelihood (NSO, 2017). This research was specifically conducted in rural agricultural areas approximately five to ten kilometers around Mvera mission hospital in Dowa district (Figure 1) between the months of May and September 2018. We purposively selected Dowa which is one of the nine administrative districts in central Malawi because of media reports that show increased cases of homicide that emanated from domestic violence and marital problems (Malawi 24 Reporter, 2016).

Figure 1: Location of the study area



4.5.2 Study sample

This descriptive cross-sectional study used a multi-stage cluster sampling technique to select representative research participants (Remler & Ryzin, 2014). Among the eight-outreach clinics under Mvera hospital, six were randomly selected. The selected outreach clinics were

Mkhalanjoka, Gogo, Mvera, Kalinyengo, Mphande, and Ching'amba. During the time of the study, Mvera hospital was serving a population of 27,719 people. Out of the total population, there were 4,820 under-five year old child/mother dyads that were clients of postnatal health services in the selected six outreach clinics. A Raosoft online software program was used to calculate a sample size (McCrum-Gardner, 2010).The margin of error was set at 5%, with 95% confidence level, and a response distribution of 50%. The minimum sample size was found to be 356 under five-years-old child/mother dyads. We chose to increase our sample size to 538 dyads with an aim of strengthening the study's reliability and reducing the margin of error from 5% to 4%. A systematic sampling technique was used to select 538 out of 4,820 under-five child/mother dyads from postnatal registers by selecting every ninth pair starting with a randomly selected pair.

4.5.3 Participant recruitment

Selected mothers were contacted through their antenatal clinic when attending their regular monthly health assessment with their youngest under-five child. In a private clinic consultation room, the health worker asked the mother if she would be interested in taking part in this study. If she consented, a health worker research assistant administered the questionnaire orally in the consultation room. In this way, we protected the confidentiality of the mother and ensured that no one present was aware that the mother took part in this study. Only five mothers declined to participate in the study, citing immediate family or business reasons. We replaced the five respondents by randomly selecting the names of mothers not chosen during initial sampling stage.

4.6 Measures

4.6.1 Outcome variables

The primary outcome variable for this study was prevalence of IPV against mothers of children under five years of age perpetrated by the current partner. We acknowledge that the definition of IPV is a multidimensional concept (Hegarty, Sheehan, & Schonfeld, 1999) but in this

study we operationalized the term by focusing on IPV against mothers of under five year old children that was perpetrated by the current male sexual partner. We assessed the mother's exposure to IPV using a WHO violence against women multi-country questionnaire instrument on women's health and life experiences that had been validated and used in Malawi (Fan et al., 2016; VanderEnde et al., 2016). The questionnaire contains 18 items that make up four sub-scales measuring different forms of IPV: physical, emotional, controlling behavior, and sexual abuse. Maternal exposure to each form of IPV was defined as the mother giving a positive answer to any one of the questions within each subscale. For instance, if a respondent answered "Yes" to any of the six items under controlling behavior, we counted that such a mother was a victim of controlling violence. We followed the standard definition of IPV exposure used in prior studies with this instrument. We considered a respondent to have been exposed to psychological abuse if she reported that she had ever been belittled, insulted, hurt or scared by her current husband. A mother was considered a victim of physical violence if she acknowledged exposure to one of the following situations: she was ever punched, slapped, kicked, pushed, choked, or threatened with a weapon by her current husband. Finally, we considered that a mother experienced sexual violence if she answered "Yes" to any of the following questions: If her husband ever physically forced her to have sexual intercourse, forced her to have sexual intercourse when she did not want it, and was forced to perform any sexual activity against her will. Maternal exposure during the previous year to each form of IPV except controlling behavior was also examined. Women were asked to consider their experiences of IPV starting with their engagement to their current partner, and within the past 12 months of their relationship.

4.6.2 Explanatory variables

Consistent with ecological theory, we included potential explanatory variables identified in previous studies as significant predictors of IPV against women in SSA (McCloskey et al.,

2016). These included the mother's age, education, religion, number of children, whether the woman's pregnancy with her youngest child was planned, whether she had a confidant, and her husband's health risk factors. The mother's age was categorized as 16-24, 25-34, and 35-49. Education level was based on Malawi education standards and categorized as no education, primary education, secondary education, and tertiary education. Maternal religion was categorized as Presbyterian, Catholic, Pentecostal or no religion. Number of children was coded as one, two, three, four, and five or more. The questions regarding pregnancy planning and whether the mother had a confidant were coded yes/no.

We included questions about the husband's health risk factors such as whether he consumed alcohol, smoked tobacco, or had extra marital affairs. Husband's family type was grouped as monogamous and polygamous with focus on polygyny. Monogamous family refers to a type of a family whereby a man has only one wife while polygyny refers to a family arrangement in which a man marries multiple women at one time (Okan Ibiloglu, Atli, & Ozkan, 2018). Literature has consistently shown that there is a positive relationship between polygyny and IPV in SSA region (Ilika, Okonkwo, & Adogu, 2002; Karamagi, Tumwine, Tylleskar, & Heggenhougen, 2006a; Tanimu, Yohanna, & Omeiza, 2016). Household poverty was measured using the Malawi standard: those not able to spend US $1.90/day on individual household needs were counted as living below the poverty level, those who spent that amount, or more were counted as above the poverty level. We also considered the age difference between wife and husband. We categorized the age difference as about the same age, husband is five years older than wife, husband is five years younger than wife, husband is 6-10 years older than wife, and husband is more than 10 years older than wife. Ethnicity of respondents was also included and grouped as Chewa, Tumbuka, Ngoni, and Yawo. Household level factors such as food security, and time taken

for the mother to fetch water were also included. Household food security was measured by a Household Food Insecurity Access Scale (HFIAS). We coded 0 = food secure, and 1 = food insecure household. We coalesced the four HFIAS (food secure, and mildly food insecure) to food secure, and (moderately, and severely food insecure) to food insecure households (Swindale & Bilinsky, 2006a). Household food access was measured by Household Dietary Diversity Scale (HDDS). We coded households as 0 = low dietary diversity, when the mother recalled that her household members had consumed ≤ 4 food groups in the past 24 hours, and as 1 = minimum dietary diversity, when a mother reported that her household members had consumed ≥ 5 food groups in the past 24 hours (Swindale & Bilinsky, 2006). We also inquired about household source of domestic water. We coded 1 = borehole (protected water), and 0 = river/wells (unprotected water). We also considered time that the mother took to fetch a pail of water. This was coded as 0 = < 30 minutes, and 1 = ≥ 30 minutes. Outreach clinic study sites were categorized as 1 = Mkhalanjoka, 2 = Gogo, 3 = Mphande, 4 = Ching'amba, 5 = Mvera, and 6 = Kalinyengo.

4.6.3 Survey administration

The survey was administered using Android tablets. The tablets were loaded with the digital version of the survey using *ODK Collect*. *ODK Collect* is an open source Android application used to administer surveys that can then collect and organize the survey data. This application allows for immediate data validation in the field. The study was administered by nine female health surveillance assistants who were trained in using the WHO protocol for conducting studies of IPV (Ellsberg & Heise, 2002; Ellsberg, Heise, Pena, Agurto, & Winkvist, 2001). The research training and pretesting of the survey questionnaire took five days. Trainers included a medical doctor, a clinical officer, and a PhD Social Work candidate, all of whom had expertise in child and maternal health and domestic violence. Due to the sensitivity of our research topic, the questionnaire was administered in a private consultation room at the outreach clinic during the

regular mother-child clinic visit, ensuring that others present were not aware that she was participating in a research study (Bender, 2017; Tarzia, Valpied, Koziol-McLain, Glass, & Hegarty, 2017). In the private consultation room, the interviewer asked mothers questions and the responses were entered in the tablet by the interviewers. This was done without the presence of other health workers and postnatal clients. This protocol was designed to maximize the privacy and safety of respondents. In four cases, the consultation room was deemed not private due to interruptions. In these cases, the interviewer agreed with the respondent on a neutral venue that was safe for both. The average duration of the interviews was 63 minutes with a minimum of 56 minutes and a maximum of two hours. The interviews were conducted in a local language Chichewa that was juxtaposed with English in ODK.

4.7. Research Ethics Review

Ethics approval to conduct this study was obtained from the McGill University Research Ethics Board in Canada (REB File #: 503-0518), and University of Livingstonia research committee in Malawi (UNILIA-REC-4/18). Written permission was also obtained from the authorities at Dowa district commissioner's office, Dowa district health office, Mvera clinic. We obtained oral permission from local health leaders in the six outreach clinics

4.8 Data analysis

A total of 538 systematically selected mothers with under-five children were interviewed. There were no missing data since the questionnaire was designed so that the interviewer could not scroll to the next page in the Android tablet until completing the question. Cronbach's α was used to assess the internal reliability of the items used to determine maternal exposure to each of the four forms of IPV. In line with the WHO questionnaire, controlling behavior had five items, psychological abuse had four items, physical abuse had six items, and sexual abuse had three items (see Table 2). We considered an α level of 0.70 or higher to be satisfactory (Nybergh, Taft, &

Krantz, 2013). The calculated Cronbach's α for controlling behavior was 0.81, psychological violence was 0.75, physical violence was 0.83, and sexual violence was 0.87.

Descriptive statistics were used to generate frequency tables of socio-demographic factors for mothers, children, and fathers. Univariate logistic regressions were performed to determine significant risk factors of mothers' exposure to IPV from the selected independent variables. Four separate multivariable logistic regression analyses were performed to explore predictors of controlling behavior, emotional violence, physical violence, and sexual abuse. The variables that were significant in univariate tests were entered in the multivariate logistic regression models using forward method.

Multicollinearity of independent variables was tested and a variance inflation factor (*VIF*) of 2.314 was obtained, demonstrating that the tested independent variables were not similar and our regression coefficients estimates were reliable (Daoud, 2017). The results of each of the multivariate analyses with 95% confidence interval (*CI*), including both crude (*CORs*) and adjusted odds ratios (*AORs*), are reported in Table 2. We considered a *p* value of <0.05 as statistically significant. We used the IBM Statistical Package of Social Sciences (SPSS) for Windows version 23.0 (IBM Corp., Armonk, NY, USA) to analyze the data.

4.9 Results

4.9.1. Descriptive statistics

A total of 538 mothers aged 16 to 49 years with children under five years of age consented to participate in our study. The description of the sample is presented in Table 1. The mean age of mothers was 27.64 years (*SD*= 7), their husbands' mean age was 32.46 years (*SD*= 8.23), while the mean age of children was 21.58 months (*SD* 14.4 months). Over half of the mothers (51%) were members of the Church of Central Africa Presbyterian (CCAP), 12% were Roman Catholic,

and 37% belonged to Pentecostal churches. A total of 168 mothers (31%) had only one child, 121 (23%) had two children, 106 (20%) had three children, 61 (11%) had four children, and 79 (15%) had five or more children. In terms of education, many mothers 370 (69%) had primary school education, 81(15%) had no formal education, and 87 (16%) had a secondary education. It was also found that 87 male partners (16.2%) were aged between 15-24 years, 245 (45.5%) were age 25-34 years, and 206 (38.3%) were between 35-49 years. We also found that 230 male partners, (43%) consumed alcohol, 119 (22%) had a polygamous family, 161 (30%) had extra marital affairs, and 138 (26%) were smokers. We also found that 314 households did not have ready access to portable water, 320 were food insecure, and at least 95% of the households lived below the poverty line.

Table 1: Socio-demographic characteristics of mothers, their partners, and children 2.

Mothers' characteristics	**Age (years)**	***N* = 538**	**Percentage**
	15-24	224	41.6
	25-34	209	38.8
	35-49	105	19.5
	Education		
	No education	81	15.1
	Primary	370	68.8
	Secondary	87	16.2
	Religion		
	CCAP	275	51.1
	Catholic	63	11.7
	Pentecostal churches	200	37.2

	Ethnic background		
	Chewa	524	97
	Other tribes	14	3
	Has no confidant	144	26.8
	Age comparison with partner		
	About the same age	290	53.9
	Partner five years older	152	28.4
	Partner five years Younger	5	0.9
	Partner 6-10 Years older	57	10.6
Children's characteristics	**Sex**		
	Female	263	48.9
	Male	275	51.1
	Age range		
	1-5	72	13.4
	6-11	90	16.7
	12-23	156	29
	24-59	220	40.9
Husbands' characteristics	**Age category**		
	15-24	87	16.2
	25-34	245	45.5
	35-49	206	38.3
	Educational level		
	No education	77	14.3

	Primary	303	56.3
	Secondary	154	28.7
	Smoke	138	26.0
	Polygamous	119	22
	Drink alcohol	230	43
	Infidelity	161	30
Household characteristics	**Poverty level (US$ 1.90/day)**		
	Below poverty line	515	95.7
	Above poverty line	23	4.3
	Food insecure	320	59.5
	Time taken to draw water (wife)		
	<30 minutes	314	58
	≥ 30 minutes	224	42
	Number of children		
	One	168	31.2
	Two	121	22.5
	Three	106	19.8
	Four	61	11.3
	Five or more	79	14.7

4.9.2 Prevalence of IPV against mothers of children under five

Table 2 below displays the prevalence of IPV against mothers perpetrated by their current partner. The prevalence of controlling behavior was 74.7%. It was found that 60.6% of mothers

had partners who did not allow them to talk to other men, and 49% of mothers reported that their partners had accused them of being unfaithful. Just over 50% of mothers were not permitted to socialize with their friends, while 40% were discouraged from being in contact with their relatives. We also found that 53.7% of mothers were being stalked by their partners.

Table 2: Prevalence of intimate partner violence against mothers of under-five children in Dowa rural, 2018

Forms of violence	***N* = 538**	**Percentage**
Controlling behavior		
Ever jealous or angry if you talk to a male person	326	(60.6)
Frequently accuses you of being unfaithful	264	(49.1)
Does not permit you to meet your female friends	270	(50.2)
Tries to limit your contact with your family	220	(40.9)
Insists on knowing where you are	289	(537)
Summary measure of controlling behavior	402	(74.7)
Psychological abuse		
Ever insulted you or made you feel bad	207	(38.5)
Humiliated you in front of others	191	(35.5)
Threatened to hurt you or someone you care	156	(29.0)
Did things to scare or intimidate you purposively	150	(28.0)
Summary measure of psychological violence	266	(49.4)
Physical violence		
Slapped	176	(32.7)
Pushed	149	(27.7)

Hit/punch	88	(16.4)
Kicked/dragged/beaten	134	(24.9)
Choked or burned you on purpose	37	(6.9)
Threatened or attacked you with weapon	39	(7.2)
Summary measure of physical violence	235	(43.7)
Sexual violence		
Pressured you to have sex through harassment, threats or tricks and succeeded	350	(65.0)
Physically forced you to have sexual intercourse with him when you did not want to	253	(47.0)
Force you with threats or in any other way to perform sexual acts you did not want to	230	(42.8)
Summary measure of sexual violence	394	(73.2)

In addition, 182 mothers (33%) reported experiencing at least one form of IPV within their first year of marriage, while 226 mothers (41%) reported that their partners started abusing them after they had been married between two and five years. Finally, 91 mothers (17%) indicated that their partners became abusive after they had been married six or more years.

The prevalence of psychological abuse against mothers of under-five children was 49.4%, with 38.5% reporting having been insulted by their partners and 35.5% were humiliated in public. In addition, 29% of mothers felt threatened by their partners' anger, while 28% reported that he had scared or intimidated them on purpose. The prevalence of physical IPV against mothers was 43.7%, including 32.7% of mothers who had been slapped, 27.7% who had been pushed and 16.4%

who had been punched. In addition, 24.9% of mothers were kicked or dragged or beaten, 6.9% were choked or burnt on purpose, and 7.2% were threatened or attacked using a weapon. Finally, the prevalence of sexual IPV by the current partner was 73.2%. Most women (65%) reported that their partner forced sexual relations with them through pressure, threats, harassment or tricks. Nearly half of the mothers reported that their partners had physically forced them to have sex without their consent. In addition, 42.8% of mothers reported that their partners forced them to perform sexual acts against their will. Our study also indicates that 47.8%, 38.5%, and 24.2% of mothers reported that they experienced psychological abuse, physical, and sexual violence respectively within 12 months prior to this research. In total, 164 mothers (30.5%) reported having experienced all four forms of violence throughout the duration of their engagement and marriage.

4.9.3 Predictors of IPV against mothers of children less than five years

The results of binary logistic regression (Table 3, Crude *OR*) showed that male partner behaviors and characteristics, such as beer consumption, smoking, polygamy, previous divorce, and age, were significant predictors of IPV against mothers. Having a confidant was the mothers' only characteristic that predicted less exposure to IPV. At the household level, a mother who spent more than 30 minutes fetching water was at risk of experiencing IPV. None of the children's characteristics were significant predictors of IPV against mothers. Likewise, the mothers' characteristics, including education, religious affiliation, age, membership in a village bank, and ethnic background, were not associated with their exposure to violence. Household characteristics, such as number of children, food security, poverty level, and farm size, were not significant predictors of any form of IPV against mothers.

Using multivariate regression analyses, we examined all the explanatory variables that were significant predictors of IPV at the univariate level. The results of the multivariate logistic

regression of controlling behaviors (Table 3, Model 1) showed that mothers whose partners had extra marital affairs were more likely to experience controlling behavior (*AOR*: 4.97, 95% *CI*: 2.59-8.55, *P*<0.001) than mothers whose partners were not involved in extra marital affairs.

The odds of experiencing controlling behavior was higher among mothers with partners who smoked tobacco (*AOR*: 1.91, 95% *CI*: 1.59-2.55, *P*<0.05) than among mothers whose partners did not. Mothers who spent more than 30 minutes each day fetching a single tin of water were at greater risk of experiencing IPV controlling behavior (AOR: 2.03, 95% CI: 1.023-2.640, P<0.001) than mothers who spent less than 30 minutes fetching water. Although women married to partners who consumed alcohol, smoked tobacco, and had been divorced were at increased risk of experiencing controlling behaviors in bivariate analyses, these results were not significant in the multivariate analyses.

For psychological violence, the results of multivariate analysis (Table 4 model 2) demonstrated that mothers who reported that their partners had extra marital affairs were 2.14 times more likely to experience psychological violence (*AOR*: 2.14, 95% *CI*: 1.486-3.472, *P*<0.001) than mothers whose partners had no extra marital affairs. For physical abuse, the multivariate analyses (Table 3, Model 3) indicate that mothers whose partners had extra marital affairs were at an increased risk for experiencing physical violence (*AOR*: 2.29, 95% *CI*: 1.48-3.94, P<0.001) than mothers whose partners did not have extra marital affairs.

Table 3: Crude and adjusted odds ratios (95% CI) for factors associated with IPV among mothers of under-five children

Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	Controlling behavior		Psychological violence		Physical violence		Sexual violence	
	Crude OR	*AOR*	*Crude OR*	*AOR*	*Crude OR*	*AOR*	*Crude OR*	*AOR*
Partner drinks beer								
No	1	1	1	1	1	1	1	1
Yes	1.73***	1.07	1.62***	1.16	1.52**	1.18	1.99***	2.00***
Partner smoke								
No	1	1	1	1	1	1	1	1
Yes	2.39***	1.91*	1.78***	1.17	1.78***	1.06	1.75*	1.07
Marriage type								
Monogamous	1	1	1	1	1	1	1	1
Polygamous	2.17***	1.56	1.829***	1.72	2.10***	106	1.32	1.31
Infidelity partner								
No	1	1	1	1	1	1	1	1
Yes	5.39***	4.97***	2.398***	2.14***	2.69***	2.29***	1.86***	1.49
Divorced before								

No	1	1	1	1	1	1	1	1
Yes	1.76*	1.81	1.861	1.639	1.71***	1.37	1.22	1.31
Age of partner								
15-24	1	1	1	1	1	1	1	1
25-34	0.58*	0.77	0.54*	0.70	0.52**	0.74	0.74	1.08
35-49	0.98	1.08	0.74	0.80	0.63**	0.66	0.61	0.64
Time to fetch water								
30 Minutes or less	1	1	1	1	1	1	1	1
More than 30 minutes	2.44***	2.03***	2.440***	1.45	1.85***	1.59**	2.61***	2.27***
Mother has confidant								
No	1	1	1	1	1	1	1	1
Yes	1.13	1.09	1.03	1.03	0.67*	0.69	1.13	1.18

*P <.05. **p <.01. ***p <.0001

Mothers who spent more than 30 minutes fetching water were more likely (*AOR*: 1.59, 95% *CI*: 1.02-2.32, *P*<0.01) to experience physical IPV than mothers who spent less than 30 minutes. Regarding predictors of sexual IPV (Table 3, Model 4), the multivariate analyses showed that mothers married to husbands who consumed alcohol were more likely to experience sexual violence (*AOR*: 2.00, 95% *CI*: 1.17-3.41, *P*<0.001) than mothers whose husbands abstained from alcohol. In addition, mothers who spent 30 minutes or more fetching water were at an increased risk of experiencing sexual IPV (*AOR*: 2.27, 95% *CI*: 1.33-3.39, *P*<0.01) than mothers who spent less time on this task.

5. 0 Discussion

The study described in this article examined the prevalence and determinants of IPV against mothers in order to contribute to the understanding of various social determinants of poor maternal and child health in Dowa district. The prevalence of controlling behavior (74.7%) found in this study was significantly higher than the prevalence of controlling IPV in the general population of women (24%) in Malawi found in previous studies (NSO, 2017). There are several possible explanations for the higher prevalence rate in our study. First, the nationally representative studies of IPV sampled women between 15 to 49 years, including women who had never married and those who were divorced or widowed (NSO, 2017), while our sample was more homogeneous, consisting of married women from the rural areas of one district of Malawi. In addition, since we asked about women's relationship with their current spouse, it is possible that they will have been better able to recall specific incidents and behaviors. Further, our study was administered by female community health workers who have served in the area for an average of nine to twenty years providing primary health care services, such as family planning, antenatal, and postnatal services. Therefore, it is possible that mothers would be more open with these community health workers, with whom many had developed personal relationships over time.

The prevalence of psychological IPV in our study was 38.5%, slightly higher than the findings of the nationally representative study of IPV against women, which found a psychological IPV prevalence of 30% (NSO, 2017). However, our findings were lower than those in the systematic review of studies of IPV in Ethiopia by (Semahegn & Mengistie, 2015), where 51.7% of women were found to have experienced psychological abuse. On the other hand, a study conducted among pregnant women in Rwanda found that 20.6% of participants had been victims of psychological abuse (Rurangirwa, Mogren, Ntaganira, & Krantz, 2017). Although the prevalence of psychological IPV in Dowa is within the range of many studies in SSA, it will be important to continue to explore regional and methodological differences to better understand these variations in prevalence among studies.

Our study found that 43.7% of mothers experienced physical violence by their current husband. This finding is slightly higher than the average prevalence of physical IPV found among the general population of women in SSA (Peterman, Bleck, & Palermo, 2015). However, studies in Guinea, Tanzania, and Gabon measured prevalence as 54%, 53%, and 46% respectively, higher than our findings (Cools & Kotsadam, 2017; Kapiga et al., 2017). The most common forms of physical IPV against mothers in our study were slapping (32%) and pushing (28%). This is in line with another study in SSA where women reported being slapped (23%) and punched (11.2%) by their partners (Devries et al., 2013d).

In our study, the prevalence of sexual IPV (73.2%) was significantly higher than the average prevalence of sexual IPV found in other studies of SSA (13.3%). The prevalence in our study was also significantly higher compared to studies conducted in Ghana (30%), Uganda (27%), and the Democratic Republic of Congo (26%), which are considered high in the SSA region (Devries et al., 2013). The difference between our results and those of other studies may be related

to sample selection. We specifically selected mothers who were in conjugal relationships and thus assumed to be sexually active. Culturally in Malawi, once a woman is married, she is generally expected to be submissive to her husband, particularly with regard to sex (Warria, 2018). Therefore, the high prevalence of sexual abuse in our study may reflect cultural beliefs that support sexual aggression by men and submission by women. It is interesting, however, that the women reported that their partners' behavior was in violation of their wishes and welfare, an indication that all wives do not fully accept these cultural norms, a finding which deserves further exploration.

In this study, we found that women with partners who had extra marital sexual affairs were at greater risk for experiencing controlling, psychological, and physical violence than women who reported that their partners did not had extra marital affairs. This finding is consistent with the literature in SSA that found that marital infidelity by men was a significant trigger of IPV against women (Abramsky et al., 2011; Conroy, 2014). Studies have shown that when women confront their partners after discovering their infidelity, some partners respond aggressively, which can escalate into emotional or physical violence (Karamagi, Tumwine, Tylleskar, & Heggenhougen, 2006).

This study supports previous research in SSA that suggests that alcohol consumption by male partners increases the odds of women experiencing IPV (Foran & O'Leary, 2008; Greene, Kane, & Tol, 2017). Recent studies have shown that, biologically, alcohol diminishes the judgment and perception of the drinker, and thus partners who are under the influence of alcohol are more likely to lose self-control and engage in violent behavior (Foran & O'Leary, 2008).

This study also found that mothers who were spending 30 minutes or more drawing water had a greater chance of experiencing controlling, physical, and sexual IPV. This finding is in line with a qualitative study conducted in Bangladesh where women who fetched water from distant

wells were more likely to experience IPV (Karim, Emmelin, Resurreccion, & Wamala, 2012). In Malawi, mothers are expected to fulfill multiple household roles such as preparing food and taking care of children (Chilanga, 2013; Kerr, Chilanga, Nyantakyi-Frimpong, Luginaah, & Lupafya, 2016). Since fetching water from distant wells takes time away from other tasks, the IPV may be interpreted within the village context as a male partner's right to reprimand his wife for not fulfilling her obligations. The issue of cultural norms with regard to IPV is one that deserves further attention (Yount, Roof, & Naved, 2018).

Finally, we found that mothers who were married to tobacco smokers had a higher risk of experiencing controlling IPV than mothers who were not married to smokers. Our findings agree with the results of a study in Bangladesh that found tobacco smoking among men linked to perpetration of IPV (Aklimunnessa, Khan, Kabir, & Mori, 2007). Similarly, in two nationally representative studies conducted in the United States, tobacco smoking was a significant mediating factor for men's perpetration of IPV (Crane, Pilver, & Weinberger, 2014; Lewis, Oberleitner, Morgan, Picciotto, & McKee, 2016). One potential explanation for the observed link between IPV against women and tobacco smoking by partners can be drawn from biology literature. Research has found that the nicotine in tobacco can undermine efforts to regulate smokers' emotions such as anger, hostility, impulsivity, and anxiety (Picciotto, Lewis, van Schalkwyk, & Mineur, 2015). Therefore, partners who were under the influence of nicotine could be more likely to show aggressive behavior than partners that were not under the influence of nicotine. Following the ecological model, there may well be additional cultural and social factors influencing the relationship between smoking and IPV. Regardless, further research is needed to understand the relationship between IPV, and smoking found in our study.

5.1 Conclusion and recommendations

This study has identified a high prevalence of IPV against mothers of children under five years of age in Dowa district, Malawi. In particular, at least three-quarters of the mothers in our sample reported that they had experienced controlling behavior and sexual violence from their current husband. In our study, most of the risk factors of IPV against mothers were found to be related to their husbands' health risk behaviors. These included alcohol consumption, tobacco smoking, polygamy, and infidelity. Of interest is that women who spent more time fetching water were more likely to experience violence perpetrated by husbands.

There are several recommendations that emerged from our study. First, we recommend that community programs aimed at reducing IPV against mothers in Dowa district not only provide needed services to mothers but take the larger context of traditional gender roles into account. In particular, the programs should also consider taking a prevention approach by developing interventions that address husbands' risk factors. In fact, we hold that the primary focus should be on transformative community approaches that can motivate husbands to change their social risk behaviors, particularly infidelity, polygamy, alcohol consumption, and tobacco smoking.

We also recommend that international, national, and district public health policy should prioritize potable water development projects in the study area. Such projects will not only improve access to safe water for families with young children, but our study indicates that it may also reduce the likelihood of IPV against mothers. We have found that time spent by mothers fetching water outside the home may interferes with other important responsibilities, such as child care, and believed this time away from other responsibilities triggered IPV. Caution should be taken from this recommendation, as we are not encouraging partners in this study area from secluding mothers from their social networks on pretense of enforcing social norms. Such act is a

violation of women's right to freedom of movement and is punishable by law (Danieli, Stamatopoulou, & Dias, 2018; Peters & Wolper, 1995).

5.2 Strengths and Limitations

This is the first local study to collect data on the prevalence and determinants of IPV against mothers of children under five years of age in rural areas of Dowa district in Malawi. A primary strength of the study is the use of the well-established WHO multi-country questionnaire previously used and validated in Malawi. Thus, the results of this study can be compared to those of other studies that use the same instrument. However, this study also had limitations. Since this is a cross-sectional study, we cannot establish a causal relationship between IPV against mothers and the risk factors associated with IPV. Further, despite our culturally relevant mixed-methods approach, we believe it likely that mothers under-reported their experiences of IPV for several reasons. First, as a retrospective study, mothers were asked to recall situations and behaviors that they had experienced in the past, and it is possible that recall bias could influence results, particularly the memory of incidents of IPV. Second, despite increased awareness regarding the detrimental effects of IPV against women in Dowa district, including laws in place intended to protect those experiencing it, IPV remains a sensitive issue. Due to legal repercussions for perpetrators, some respondents may have been afraid to disclose that they were abused in order not to bring harm to their husbands or to lose their husband's income and other support roles if they are convicted of IPV and imprisoned or fined. Although a higher percentage of mothers in Dowa district reported experiencing IPV in our study than previous studies in Malawi and SSA, we believe that IPV against mothers in the district continues to be under-reported by mothers for larger cultural, social, and economic reasons. As a crucial factor in the well-being of women and children in Dowa district, our study indicates that IPV should be addressed at several societal levels. In addition to direct protective services to mothers who are at risk, the risk behaviors

engaged in by husbands identified by this study should be addressed through social programming. Finally, there should be coordination between IPV prevention and public health policy, since our study suggests that potable water projects not only improve the health of the public but may also reduce the risk of IPV for mothers with young children.

Summary of chapter 4

In manuscript 1, I examined the prevalence and predisposing factors of IPV against mothers of children under five years in central Malawi. Four forms of violence against women (controlling behavior, psychological, physical and sexual) were the dependent variables. Findings of this study suggest that prevalence of IPV against mothers of children less than five years is a public health problem. The findings show that about 74%, 49%, 43%, and 73% of the mothers reported experienced controlling behavior, psychological, physical, and sexual abuse, respectively, by their current or most recent partner. The study suggest that women who were married to a partner who consumed alcohol and had extra marital affairs, were at an increased risk of experiencing IPV. In addition, the length of the time a mother spent at the water collection point was found to be risk factor for domestic violence.

The findings of this study support the assumptions of gender norms, hegemonic masculinities and ecological theories. For instance, the results show that independent variables that are linked to masculinity in the area, such as sexual prowess and alcohol consumption, were linked to IPV. Ecologically, the study has shown that scarcity of water in the area was also a contributing factor to violence.

Chapter 5

5.0 Findings of the study (manuscript II)

Introduction

Chapter 5 present the second manuscript that examined the correlation of IPV against mothers and child malarial infection in central Malawi. The manuscript has been prepared with an intention of submitting to BMC Malaria Journal upon completion of the dissertation.

Study II: Prevalence and determinants of malaria infection among children of local farmers in Central Malawi

5.1 Abstract

Background: Malaria is a leading cause of morbidity and mortality among children under five in Malawi. Children from rural areas of central Malawi have high burden of malaria morbidity compared to other regions. The goals of this study were to examine the prevalence and determinants of malaria infection among children in rural areas of Dowa district in central Malawi.

Methodology: A multistage cross-sectional study design was used to systematically sample 523 child-mother dyads from postnatal clinics. The main outcome was child positive malaria diagnostic test during postnatal clinic health assessment. Logistic regressions were used to determine risk factors associated with malaria among children aged 2 to 59 months.

Results: The prevalence of malaria amongst children under five years was 35.4%. The results of multivariable analyses show that children of mothers who experienced recent intimate partner violence (IPV) were more likely to be diagnosed with malaria (*AOR*: 1.88, 95% *CI*: 1.19-2.97; *P* = 0.007) than children of mothers who did not. Children of mothers who had no formal education were more likely to be diagnosed with malaria (*AOR*: 2.77, 95% *CI*: 1.24-6.19; *P* = 0.013) than children of mothers who attained secondary education. In addition, children in the age range of 2 to 5 months, and 6 to 11 months were less likely to be diagnosed with malaria (*AOR*:0.21, 95%

CI: 0.10-0.46; *P* = 0.000 and *AOR*:0.43; 95% CI: 0.22-0.85; *P* = 0.016, respectively) than children in the age range of 24 to 59 months.

Conclusion: The study found that the prevalence of malaria infection among children in the study area was comparable to that of national level. We propose that malaria control programs among children should also take into account mothers without formal education, mothers with children aged 24 to 59 months, and mothers that are experiencing IPV in the area.

Keywords: Malaria infection, prevalence, risk factors, under five children, rural Malawi

6.2 Introduction

Malaria is a mosquito-borne disease that kills a significant number of people in Africa every year (World Health Organization, 2018c). The pathology is mainly caused by *Plasmodium falciparum* parasite and is transmitted to human beings through female anopheles mosquito bites (Acharya, Garg, Kumar, Munjal, & Raja, 2017). In 2017, 61% of cases of malaria worldwide were in children under the age of five. Geographically, approximately 92% (200 million) of malaria cases in the world were diagnosed in Africa that claimed about 404,550 lives (WHO, 2018).

In Malawi, malaria is amongst the top three most significant public health problems. Nearly 4 million people are diagnosed with the infection every year (National Malaria Control Programme (NMCP) and ICF, 2018). Malawi contributes 2% of global malaria cases and is among the top 15 countries with a high malaria burden (WHO, 2018). Children under five years and pregnant women are at high risk of malaria morbidity as compared to other groups in Malawi (Zgambo, Mbakaya, & Kalembo, 2017). Since 2005, the Malawi government has been implementing comprehensive malaria control programs that target more than 85% of its population. The main strategy has been obstructing the malaria vector mosquitoes from biting people. This include promoting the use of insecticide treated nets (ITN), and indoor spraying of insecticides. These strategies are blended

with social behavioral change messages in order to increase community uptake and utilization (Nkoka, Chipeta, Chuang, Fergus, & Chuang, 2019).

Despite these investments, little progress has been made so far to reduce the burden of malaria in children under five in Malawi. Studies have shown that the prevalence of malaria among children detected by a gold standard microscopy technique was at 28% in 2012, it increased to 33% in 2014, and slightly dropped to 24% in 2017 (Mahende et al., 2016; National Malaria Control Programme (NMCP) and ICF, 2018). Malaria morbidity among children is not evenly distributed across Malawi. According to the national data collected through malaria Rapid Diagnostic Tests (RDTs) in 2017, the burden of child malaria is significantly higher in rural areas (40.6%) compared to urban areas (6%). In addition, the prevalence of malaria amongst children in Central Malawi was higher (39.7%) compared to children in Southern (36.4%) and Northern (19.4%) regions (NMCP & ICF, 2018). These studies suggest that geographical space plays a significant role in malaria prevalence among children. Therefore, there is a need to increase the scope of these studies that consider social and environmental risk factors of malaria to inform local policies and programs.

5.3 Study objectives and conceptual framework

The objectives of our study were to examine the prevalence and significant social and environmental risk factors associated with malaria infection among children 2 to 59 months old in rural central Malawi. The assumption was that apart from virulent malaria pathogen (plasmodium), there are some predisposing and enabling factors that operate at the host (children), and in the environment in order to cause the disease. Therefore, we chose the Triangle of Human Ecology model as a guiding conceptual framework to assess the risk factors of child malaria infection in rural areas of central Malawi (Scholthof, 2007); (Garchitorena A. et al., 2017).

The concept of Triangle of Human Ecology, also called the disease triangle - originates from the disease ecology framework. It provides a guiding principle for studying the environment in which the disease agents emerge (Meade & Emch, 2010). Some scholars in Sub Saharan Africa (SSA) have applied the model to study the drivers of malaria pathology in different spatial contexts. For example, (Messina et al., 2011) studied the risk factors of malaria in DRC Congo by examining the nexus of population, behaviour, and habitat. In Rwanda, the triangle of human ecology model was used to identify significant conditions that exacerbate malaria during community based malaria eradication program development (Ingabire et al., 2016). Therefore, we were compelled to apply the triangle of Human Ecology model as it provides a holistic conceptual lens to comprehend malaria predisposing and enabling factors in rural areas of Malawi.

5.4 Methods

5.4.1 Study setting

The study was implemented in six postnatal clinics in Dowa district of central Malawi, in Southern Africa, between the months of June and September of 2018 (Figure 1). Malawi has a population of about 17,563,749 people (NSO, 2018). In 2017, about 71% of the population were living in extreme poverty according to United Nations indicators (Phiri, 2017).

5.4.2 Study sample

A multi-stage descriptive cross-sectional study design was employed to select a representative sample of children aged 2 to 59 months and their mothers in Dowa district. We randomly selected six out of eight outreach clinics that were part of Mvera mission hospital. The selected clinics were Gogo, Ching'amba, Mkhalanjoka, Kalinyengo, Mvera, and Mphande which are approximately 5 to 10 kilometers from the Mvera mission hospital. During the study, Mvera mission hospital served a population of 27,719 people of which 5240 were mothers with a child under five years old. A total population of 4,527 mothers with children between 2 to 59 months

was identified in postnatal registers in the six randomly selected postnatal clinics. Our sample size was determined by a Raosoft sample size calculator (McCrum-Gardner, 2010). A margin error of 5% with 95% confidence level and 50% response distribution was set.

A minimum sample size of 355 was determined but we increased it to 523 in order to strengthen the study reliability by decreasing the margin of error to 4% from 5%. We used a systematic sampling strategy to select a sample of 523 children and their mothers from the postnatal registers. We randomly picked a name of first child-mother dyad and subsequently picked every ninth child-mother dyad.

5.4.3 Participant recruitment

We contacted selected mothers and their children in the six postnatal clinics during the regular monthly child health-screening program. The screening program is an initiative of the Malawi government to promote maternal and child health through a framework of continuum of care for mothers, newborns and children (Kerber et al., 2007). Community health workers who were assigned as research assistants were seeking informed consent from mothers to take part in the study. All interviews took place in the consultation room at each outreach postnatal clinic. Sociodemographic data was collected through a questionnaire that was administered orally. Child and mother's anthropometric and health status data were recorded from child and mother's health passports to the questionnaire after completing their health screening program (Tsega et al., 2016).

Figure 1: Location of the study area

5.5 Measures

5.5.1 Outcome variable

The main outcome variable of our study was malarial infection in children two to 59 months old. The term child malaria infection was operationalized as presence of malaria parasite in children's red blood cells as recorded in the child health passport (Koram & Molyneux, 2007). In all the postnatal clinics, Rapid Diagnostic Tests (RDTs) were used to assess the malaria parasitaemia in children. If the diagnostic test was positive, the child was coded as 1 = malaria infection, and 0 = otherwise.

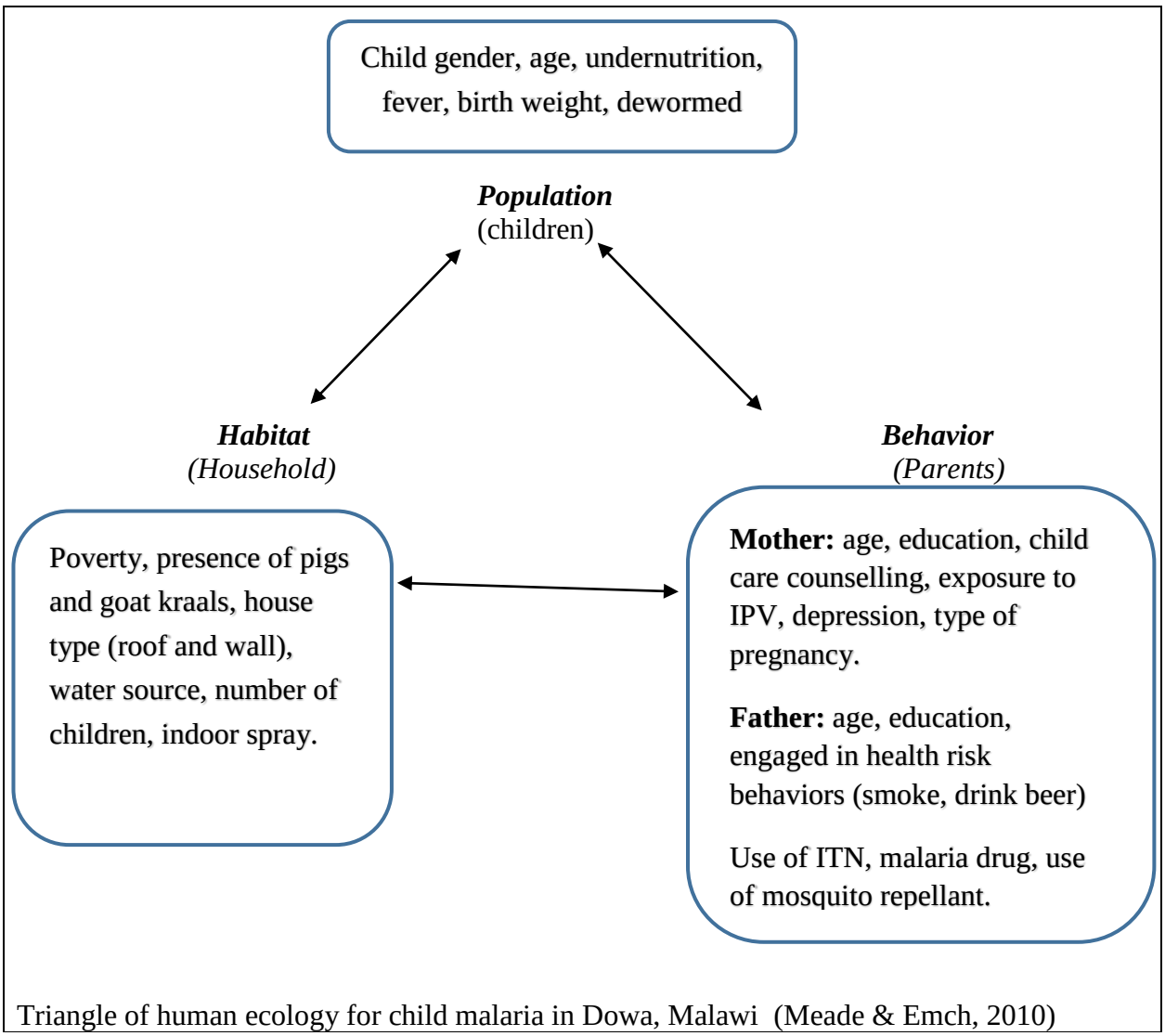
5.5.2 Explanatory variables

We selected potential covariates of child malaria infection in our model based on current literature in Malawi and other countries in SSA (Bassey & Izah, 2017; Carlucci et al., 2017; Hajison, Feresu, & Mwakikunga, 2018; Kateera et al., 2015; Kazembe & Mathanga, 2016; Zgambo, Mbakaya, & Kalembo, 2017). Informed by triangle of human ecology model (Figure 2), we grouped independent variables into three categories. These were the characteristics of children which was our study population, characteristics of parents that influence child care practices, and the characteristics of the household that represent child habitat.

Each covariant variable was coded as follows. Child gender was coded as 0 = female, and 1 = male. Age of children was coded as 1 = 2-5 months, 2 = 6-11 months, 3 = 12-23 months, and 4 = 24- 59 months. Childbirth weight was coded as 0 = normal birth weight (≥ 2.5Kgs), and 1 = low birth weight (< 2.5Kgs). We included variables capturing child history of other morbidities in the past 30 days as reported by the mother. These included: diarrheal episodes (coded as 0 = no, and 1 = yes), and Acute Respiratory Infection (ARI) (coded as 0 = no, and 1 = yes). Child nutrition status was determined through height-for-age, weight-for-height, and weight-for-age Z-score values. Child stunting, underweight, and wasting were categorized as those that were ≤ -2 standard

deviations of height-for-age, weight-for age, and weight-for-height Z-scores (Malawi Ministry of Health, 2017). Children who received deworming drugs in the past year were coded = 1, and those that did not receive the treatment was coded = 0.

Figure 6: Selected covariates of child malaria



Triangle of human ecology for child malaria in Dowa, Malawi (Meade & Emch, 2010)

We coded at least sixteen independent variables that were considered risk factors of child malaria in the behavioral apex of triangle of human ecology model. The age of the mother was coded as 1 = 15- 19, 2 = 20- 29, 3 = 30-39, 4 = 40- 49. Mother's education was categorized as 0 = no education,

1= primary school, and 2 = secondary school. We also asked mothers to explain whether the pregnancy of the studied child was planned = 0, or unplanned = 1. We assessed whether a mother was a victim of IPV perpetrated by the current or recent husband which was coded as 1 = yes, and 0 = no. We assessed cases of IPV by using a WHO multi-country study questionnaire on women's health and life experiences that was validated and used in Malawi (Fan et al., 2016b; VanderEnde et al., 2016b). The questionnaire contains 18 items that make up four sub-scales measuring different forms of IPV which are physical, emotional, controlling behavior, and sexual abuse. Maternal exposure to IPV was operationalized as any mother who reported that they experienced any form of IPV. Maternal depression was assessed by a Chichewa version of the WHO 20-item Self-Reporting Questionnaire (SRQ) which was validated in previous studies in Malawi (Stewart et al., 2009; Stewart, Umar, Tomenson, & Creed, 2013). A woman was considered positive to depression if she affirmed ten or more of the questions (1 = Yes), and negative if it was less than ten (0 = no).

Fathers' characteristics were also included in the behavioural component of the THE model. Education was coded as 0 = no formal education, 1 = primary, and 2 = secondary. Age was categorized as 1= 15-24, 2 = 25-34, and 3 = 35-49 years old. Fathers' health risk behaviours included alcohol consumption and smoking. Both were coded 0 = no, and 1 = yes. Household malaria predisposing and enabling factors in Malawi such use of ITN, household poverty, type of dwelling house, and availability of animals within the house were included. We asked mothers if the child had an ITN and whether the child slept under the net a night before the survey. The variable was coded as 1 = no, and 0 = yes. We also asked if the child used mosquito repellants or antimalarial drugs in the past two weeks which were coded as 1= no, and 0 = yes. Household poverty was defined based on the international poverty measure of US$ 1.90 a day (Prydz, 2016).

Households that had less than US$ 1.90 a day per person were regarded as poor (1 = yes), and those above US$ 1.90 a day were considered not poor (0 = no). Availability of animal kraals/sheds within one to ten meters from the dwelling house was considered a risk factor and was coded as (1 = yes) and (0 = otherwise) (Mayagaya et al., 2015). Grass/temporary thatched, and mud/temporary wall houses were categorised (1 = yes, and 0 = no) for permanent dwelling structures. We also consider the number of people who usually sleep in the house. This was coded as 1 = two to three, 2 = four to six, 3 = seven or more. We also asked mothers if their houses were sprayed with insecticides (1 = no, and 0 = yes). We did not include toilet type in our analysis because 99% of the mothers reported that they use an open pit latrine.

Survey enumerators were administering the survey on Android tablets using an Open Data Kit (ODK). We used a WHO protocol for conducting sensitive topic research because some of the questions in our study were focusing on domestic violence (Ellsberg & Heise, 2002; Ellsberg et al., 2001). Enumerator orientation and pretesting of the questionnaire was conducted for five days. A PhD candidate in Social Work, clinical officer, and an environmental health officer were responsible for training the enumerators. The research team including enumerators had professional training in community health, nutrition, and primary health care.

5.6 Research Ethics Review

Ethics approval to conduct this study was obtained from University of Livingstonia research ethics committee in Malawi (protocol number: UNILIA-REC-4/18), and the Research Ethics Board of McGill University in Canada (protocol number: REB File #: 503-0518). Written permission was also sought from the Dowa district commissioner's office, Dowa district health office, and the Mvera mission hospital management. We obtained oral consent from local health leaders and research participants in the study areas.

5.7 Data analysis

The Kolmogorov-Smirnov test was used to test the normality of the distribution of numerical variables. These include age, number of children, number of household members, and household food security. We constructed categorical variables from our numerical data because we found that our data was not normally distributed (Berger & Zhou, 2014). Risk factors for child malaria were calculated based on covariates included in the triangle of human ecology model. Bivariate logistic regressions were performed to examine significant predictors of child malaria. Significant predictors of child malaria at the bivariate level were included in the final multivariable logistic regression model using forward enter method.

We tested the multicollinearity of explanatory variables and obtained a variance inflation factor (VIF) of 5.143, which indicated independence among the explanatory variables. The results of the multivariable analysis have been reported as crude and adjusted odds ratios with a 95% confidence interval (*CI*). A *p* value of less than 0.05 was considered statistically significant in our study. The data was analyzed using an IBM Statistical Package of Social Sciences (SPSS) for Windows version 23.0 (IBM Corp., Armonk, NY, USA).

5. Results

5.1 Sociodemographic characteristics of study population

Sociodemographic and malaria infection data for all 523 selected children aged two to 59 months was obtained over four months (see Table 1). In terms of gender, 49.1% and 50.9% of the children were girls and boys respectively. In terms of age, 13.4% of the sample was aged 2-5 months, 17.2% was aged 6-11 months, 29.6% was aged 12-23 months, and 41.9% was aged 24-59 months. We observed that 14.3% of the selected children were born with low birth weight (birth weight of less than 2.5 Kgs). 27.2% of the mothers reported that their children did not sleep under mosquito nets a night before the survey. 67.1% of mothers reported that their children had signs

of fever 30 days preceding the survey. We found that 62.1% of the children were stunted, and 11.3% were underweight.

In terms of parental characteristics, we found that 15.3% of mothers had no formal education, 68.1% had primary education, and 16.6% had a secondary education. We found that 75% (n = 392) of mothers reported that they experienced IPV perpetrated by their current or recent partner in the past 12 months. Regarding age, 7.5% of mothers were between 15 -19, 57.3% were between 30 - 39, 29.6% were between 30 - 39, and 5.5% were between 40 - 49 years old respectively. We observed that 88.7% (n = 464) of mothers reported that they had received child care counselling during their pregnancy. About the attributes of fathers, the study found that 14.5% (n = 76) had no formal education, 56.2% (n = 296) had primary education, and 28.7% (n = 150) had a secondary education. Slightly less than half of the husbands (43%) were beer drinkers and a quarter (26%) were tobacco smokers.

The study found that 11.3% (n = 59) of the households had pigs and 22.4% (n = 117) had goats kraals/sheds close to their dwelling. Regarding house construction materials, 25.8% (n = 135) of the children were dwelling in brick walled houses, and only 12.8% (n = 67) were living in iron roofed houses.

Table 4: Characteristics of children, mothers and fathers, and the environment

Mothers' characteristics	**Age (years)**	**N= 523**	**%**
	15-19	39	7.5
	20-29	299	57.3
	30-39	155	29.6
	40-49	29	5.5
	Education		
	No education	80	15.3
	Primary	356	68.1
	Secondary	87	16.6
	Received child care education		

	Yes	464	88.7
	No	59	11.3
	Exposed to IPV		
	Yes	392	75.0
	No	131	25
	Confidant		
	Yes	382	73.0
	No	141	27.0
Children's characteristics	**Nutrition status**		
	Stunted	325	62.1
	Not stunted	198	37.9
	Underweight	59	11.3
	Normal weight	57	10.6
	Fever		
	No	172	32.9
	Yes	351	67.1
	Malaria		
	No	338	62.6
	Yes	185	35.4
	Cough		
	Yes	213	40.7
	No	308	58.9
	Child birth weight		
	Normal	447	85.6
	Low birth weight	75	14.3
	Dewormed		
	Yes	240	45.9
	No	283	54.1
	Sleep under Net		
	Yes	380	72.8
	No	142	27.2
	Sex		
	Female	257	49.1
	Male	275	50.9
	Age		
	2-5	59	13.4
	6-11	90	17.2
	12-23	155	29.6
	24-59	219	41.9
Husbands' characteristics	**Age category**		
	15-24	85	16.3
	25-34	239	45.7
	35-49	199	38.0
	Educational level		
	No education	76	14.5

	Primary	296	56.2
	Secondary	150	28.7
Household characteristics	**Poverty level (US$ 1.90/day)**		
	Below poverty line	500	95.6
	Above poverty line	23	4.4
	Keep pigs around		
	Yes	59	11.3
	No	464	88.7
	Keep goats around		
	Yes	117	22.4
	No	406	77.6
	Number of children		
	1-2	283	54.4
	3-4	162	31.0
	5 and more	75	14.4
	Wall of house		
	Mud/sticks	387	74.1
	Bricks	135	25.8
	Roof of a house		
	Grass thatched	455	87.0
	Iron sheets	67	12.8

5.2 Prevalence and factors associated with child malaria in bivariate and multivariate analyses

The study found that 35% of children (n=185) were diagnosed with the malaria parasite within 48 hours prior to the research interview. There was no gender difference in malaria cases among the sampled children ($\chi 2$ = 0.00, *df* = 1 *p* = .987). Unadjusted logistic regressions (Table 2) indicate that children of mothers who had no formal education were more likely to be diagnosed with the malaria parasite than children of mothers with secondary school education (Crude odds ratio (*COR*): 2.92, 95% *CI*: 1.44-5.91, *P* = 0.003). Children who were in the age range of 2-5 and 6-11 months were less likely to be diagnosed with malaria as compared to children who were in the age range of 24- 59 months (*COR*: 0.14, 95% *CI*: 0.07-0.26, *P* = 0.000 and *COR*: 0.26, 95% *CI*: 0.16-0.44, *P* = 0.000, respectively). Children whose mothers experienced IPV in the form of controlling behavior in the past 12 months were more likely to be diagnosed with the malaria parasite than children whose mother did not (*COR*: 2.92, 95% *CI*: 1.44-5.91, *P* = 0.003). Children

who were consistently sleeping under mosquito nets were less likely to be diagnosed with the malaria parasite than children that were not regularly sleeping under the net (*COR*: 0.45, 95% *CI*: 0.30-0.75, *P* = 0.001). Children who did not receive deworming drugs were more likely to be diagnosed with the malaria parasite than children who were dewormed (*COR*: 2.61, 95% *CI*: 1.79-3.82, *P* = 0.000). Children whose mothers had female confidants were less likely to be diagnosed with malaria parasite than children whose mothers had no confidants (*COR*: 0.64, 95% *CI*: 0.43-0.99, *P* = 0.048). Children whose fathers were in the age range of 15-24 were less likely to suffer from malaria than children whose fathers were in the age range of 35-49 years (*COR*: 0.55, 95% *CI*: 0.33-0.91, *P* = 0.021). Finally, children whose mothers were in the age range of 30-39 years we less likely to suffer from malaria than children whose mothers were 40-49 years old (*COR*: 0.14, 95% *CI*: 0.07-0.26, *P* = 0.000).

Table 5: Crude and adjusted odds ratios (95% *CI*) for factors associated with child malaria in Dowa district

Variables		Crude *OR*	(95% *CI*)	*P-value*	Adjusted *OR*	(95% *CI*)	*P-value*
Education mother	No education	2.92	1.44-5.91	0.003	2.77	1.24-6.19	**0.013**
	Primary	1.12	0.69-1.80	0.656	1.07	0.62-1.87	0.806
	Secondary	1			1		
Children age (months)	2-5	0.14	0.07-0.26	0.000	0.21	0.10-0.46	**0.000**
	6-11	0.26	0.16-0.44	0.000	0.43	0.22-0.85	**0.016**
	12-23	0.64	0.40-1.02	0.063	0.91	0.52-1.57	0.136
	24-59	1			1		
Child dewormed	No	2.61	1.79-3.82	0.000	1.42	0.84-2.39	0.191
	Yes	1			1		
Child ITN use	Yes	0.47	0.30-0.75	0.001	0.72	0.43-1.20	0.200
	No	1			1		
Age husband	15-24	0.55	0.33-0.91	0.021	0.83	0.47-1.54	0.588
	25-34	1.09	0.73-1.63	0.678	1.24	0.78-1.96	0.362
	35-49	1			1		
IPVAM (control)	Yes	1.83	1.22-2.74	0.003	1.88	1.19-2.97	**0.007**
	No						
Confidant	Yes	0.64	0.43-0.99	0.48	0.70	0.43-1.12	0.136

	No	1					
Age Mother	15-19	0.37	0.12-1.19	0.096	0.39	0.11-1.48	0.168
	20-29	0.40	0.13-1.07	0.068	0.45	0.15-1.34	0.152
	30-39	0.31	0.11-0.86	0.025	0.29	0.10-0.90	**0.032**
	40-49	1					

Note: 1 is a reference category

In multivariable analysis (Table 2), the odds of children being diagnosed with malaria was higher amongst children whose mothers had no formal education than children whose mothers had a secondary education (*AOR*: 2.77, 95% *CI*: 1.24-6.19, *P* = 0.013). It was also found that children of mothers that experienced IPV in the form of controlling behavior in the past 12 months had higher odds of being diagnosed with the malaria parasite compared to children whose mothers did not experience IPV in the past year (*AOR*: 1.88, 95% *CI*: 1.19-2.97, *P* = 0.007). Children who were 2-5 and 6 -11 months old were less likely to suffer from malaria than children who were 24-59 months old (*AOR*: 0.21, 95% *CI*: 0.10-0.46, *P* = 0.000), and *AOR*: 0.43, 95% *CI*: 0.22-0.85, *P* = 0.016, respectively). Finally, children of mothers who were 30-39 years old were less likely to be diagnosed with the malaria parasite than children whose mothers were 40-49 years old (*AOR*: 0.29, 95% *CI*: 0.10-0.90, *P* = 0.032).

5. 3 Discussion

This study examined the prevalence of, and risk factors for, malaria infection among children 2-59 months old in order to contribute to the understanding of various social and environmental determinants associated with poor child health in rural areas of Dowa district in Malawi. The prevalence of child malaria in this study area was 35.4% that was equivalent to national malaria prevalence in 2017 (36%) (NMCP & ICF. 2018) but were slightly lower than malaria prevalence in central and rural Malawi 39.7% and 40.6% respectively. This difference may arise because of the different time of year that the two studies took place. Our study was conducted from June to September 2018, while the national study was conducted from April to June 2017. In Malawi,

because of seasonal rainfall patterns, stagnant water bodies are more common in the months of April and May as compared to June and September (Nicholson, Klotter, & Chavula, 2014). We anticipate that malaria vector mosquitoes had high favorable breeding environment in the earlier study, as compared to our study. A study in Kasungu district of Malawi supports our hypothesis. In 2013, the study found that monthly severe malaria admissions at Kasungu hospital pediatric wards ranged from 300 in January, to 165 in April, and 90 in June, and was lowest in August with 50 cases (Chung et al., 2016).

This study found that mothers' exposure to IPV controlling behavior was a significant determinant of malaria infection in children under five years of age. Our study support the findings of a study in South Asia where they found that IPV against women was a predisposing factor for child cough, malaria, and diarrhea (Ferdousy & Matin, 2015). In Tanzania, a nationally representative study also found that children of mothers who were exposed to any form of IPV were at high risk of suffering from fever, cough, and diarrhea (Bintabara & Kibusi, 2018). Two explanations can be offered for the observed association between IPV controlling behavior and child malaria. Firstly, we anticipate that husbands' controlling behavior constrained mothers' capacity to implement preventative measures suggested by childcare counselors, including regularly sleeping under the mosquito net. We also posit that mothers who were experiencing IPV were more likely to be depressed which may have compromised their capacity to take care of children (Engle, Bentley, & Pelto, 2000).

In addition, this study found that children of mothers who had no formal education were more likely to suffer from malaria compared to children whose mothers had a secondary education. This reflects findings from a regional study in SSA which found that households where children of mothers who had attained a sixth grade education or higher had lower odds of suffering from

malaria (*OR* = 0.73), as compared to children from mothers with lower educational attainment (Siri, 2014). Our finding can be explained by a study in Malawi which found that mothers with higher education achievement were more knowledgeable about malaria prevention and signs, and were therefore more proactive and reactive with regard to prevention than mothers with low education (Oyekale, 2015).

Finally, this study found that children who were more than two years old had high odds of being diagnosed with malaria infection than younger children. This is consistent with other studies which reported that malaria prevalence increases with child age (Roberts & Matthews, 2016; Zgambo et al., 2017). This may be because younger children in Malawi share the same bed with their mothers and are more likely to be covered properly with a blanket or mosquito net than older children. This suggestion is supported by studies in Uganda and other parts of Africa where children who were sharing the same bed with the mother were more likely to sleep under a mosquito net compared to children who were not sharing the bed with the mother (Eisele, Keating, Littrell, Larsen, & Macintyre, 2009; Mugisha & Arinaitwe, 2003). Another explanation is that majority of children in Malawi are weaned from breastfeeding at the age of two. Consequently, they have less caregiver attention and increased risk of exposure to malaria vectors (Milali, Sikulu-Lord, & Govella, 2017).

5.4 Implications for practice

The results of our study demonstrate that malaria infection among children under five is an important public health problem in rural areas of Dowa district. To address the problem, we suggest that in addition to the available interventions, health planners should also consider developing malaria control programs that accommodate mothers without formal education. For example, the community based peer to peer malaria education model has been an effective tool for

behavior change in selected rural areas of Southern Malawi, and may be applicable (Malenga et al., 2017; van den Berg et al., 2018).

We also suggest that malaria control programs in the study areas should incorporate interventions that address IPV against mothers of young children. The current malaria proactive programs in Dowa district are gendered as they mainly target mothers by providing them with insecticide treated mosquito nets and administration of antimalarial drugs during pregnancy. There is a need to involve fathers in all programs that address child malaria. One such intervention may be a community-based participatory child malaria program that involves both men and women, as this has been found to improve fathers' participation in childcare activities in similar context (Kerr et al., 2016).

Finally, health professionals should consider engaging parents to find health promotion strategies that can reduce the risk of malaria among children 2 to 5 years. The interventions should consider the developmental stage of children, geographical space, and time of the day and night that predisposes these children to malarial vectors. For example, application of mosquito repellents can protect children from mosquito bites both indoors and outdoors. However, because current evidence on the effectiveness of repellents in the prevention of malaria in developing contexts is inconclusive, more research is needed before this intervention is adopted (Mittal, Sreehari, Razdan, Dash, & Ansari, 2011; Wilson, Chen-Hussey, Logan, & Lindsay, 2014; Win Han Oo et al., 2018).

5.5 Strength and limitations of the study

The main strength of this study is that it is based on a systematic sampling technique with a 100% response rate. Therefore, the findings can be generalized to all children 2 to 59 months old who accessed primary health care services in the eight postnatal clinics in Mvera hospital network in Dowa district of Malawi. Nevertheless, this study has some limitations. First, we conducted the

study during the dry season, a period that mosquito-breeding sites are significantly reduced compared to wet season. Therefore, our findings did not take into consideration seasonal variation of malaria prevalence. We suggest that a longitudinal study should be done in order to provide a broader picture of malaria infection prevalence and risk factors in the study area. This study also used a cross-sectional design as such no causal inference can be made regarding the identified determinants and child malaria infection. Despite these limitations, our study has identified potential risk factors of malaria infection among children under five years in rural areas of Dowa district that can inform local programs.

5.6 Conclusion

The current study shows that the prevalence of malaria infection among children aged 2- 59 months in rural areas of Dowa district was at 35.4% which was equivalent to the prevalence of the phenomenon at the national level in 2017. Informed by the triangle of human ecology model, the two significant predictors of child malaria infection at the child population apex were failure to deworm the children, and age range between 24 to 59 months. In the behavior apex, the risk factors of child malaria were maternal exposure to IPV and lack of formal education of the parents. In the multivariate analysis, there were no significant covariates of child malaria associated with habitat. The results of our study suggest that apart from intensifying the distribution of treated mosquito nets, child malaria programs in central Malawi should also invest in interventions that address IPV against mothers of children less than five years old.

Insight from qualitative study (Chapter 5; manuscript II)

The findings of the manuscript 2 was surprising to me as an emerging researcher who is interested in improving child wellbeing through advancement of positive masculine gender norms in rural Malawi. How can IPV against women predict malaria outcomes for children? This question troubled me. Unfortunately, there is no literature that delve on this relationship to interpret the findings. Fortunately, in depth interviews with gatekeepers highlighted the misconception in the area regarding the relevance of mosquito nets. The belief is that it contains family planning chemicals that aim at sterilizing men in order to reduce population in Malawi. Although mosquito net in Malawi targets children and mothers, gender insensitive policies in hospitals disregarded the fact that couples share the same mat/bed. Since men are decision makers in the study communities, it is alleged that they were frustrating the use of mosquito nets in the homes. This controlling behavior, a form of IPV, exposes the children to the risk of contracting malaria.

The second explanation for the association between child malaria infection and IPV can be drawn from the attributes of hegemonic masculinities. Participants claim that a section of men discourages the use of mosquito nets because they do not provide adequate bedding space for them to enjoy sex. Since the mosquito net was a threat to a man's exercise of his sexual competency, it was taken out of sexual arena to the disadvantage of the child. The aforementioned explanations will contribute to the malaria discourse in Malawi where dominant masculine gender norms of sexuality are not included in malaria prevention initiatives.

Chapter 6

6.0 Findings of the study (manuscript III)

Introduction

Chapter 6 present the third manuscript that assessed the association between IPV against mothers and child nutritional outcome in central Malawi. The manuscript has been prepared with an intention of submitting to BMC Journal of Health, Population and Nutrition upon completion of the dissertation.

Study III: Prevalence and determinants of child undernutrition in rural areas of Dowa district in central Malawi

6.1 Abstract

Background: Child undernutrition is a public health problem in Malawi. The country failed to reduce its prevalence to 14%, according to the 2015 United Nations Millennium Development goals' target. Child undernutrition is more prevalent in rural areas and there is limited data to inform rural-specific programs. The aims of this study are to examine the prevalence and risk factors of undernutrition among 0-59 months-old children in Dowa district, central Malawi.

Methods: A cross-sectional study design was used. A total of 538 child-mother dyads were systematically selected from postnatal clinics. Anthropometric assessment techniques and socio-demographic questionnaires were used to collect data. Child Z-scores for anthropometric data were calculated using World Health Organization's (WHO) anthro v3.2.2. Chi-squares and logistic regressions were used to determine correlates and risk factors of child undernutrition.

Results: The rates of stunting, underweight, and wasting were 41.7%, 11.3%, and 3.2%, respectively. In multivariable logistic regression models, children that used unclean water and children of mothers that experienced intimate partner violence (IPV) were more likely to be stunted

than children who drank clean water and whose mothers did not experience IPV, (*OR*=1.72, *CI*: 1.13-2.61) and (*OR*=1.505, *CI*: 1.001-2.261) respectively. Children that were not dewormed, born at a low weight, and from food insecure families were more likely to be underweight than children that were dewormed, born at a normal weight, and from food secure families, (*OR*= 2.14, CI: 1.18-3.89), (*OR*= 2.41, *CI*: 1.23-4.71), and (*OR*= 1.89, *CI*: 1.01-3.51) respectively. Children from households near a water supply had a low risk of wasting than children from families that were far from a water supply, (*OR*= 0.18, CI: 0.41-0.79) respectively.

Conclusion: Only the prevalence of child stunting is greater in rural Dowa compared to the national level. Furthermore, programs that can promote greater water access, child deworming, food security, and reduce IPV occurrences can improve child nutrition and reduce child stunting in the study areas.

Key words: child undernutrition, stunting, underweight, wasting, rural Malawi

6.2 Introduction

Child undernutrition is a pathological state mainly caused by an insufficient consumption of energy and nutrient-dense foods and frequent exposure to infectious diseases (de Onis & Blössner, 2003; Ge & Chang, 2001). The phenomenon compromises a child's growth and functioning and consequently reduces their human productivity in adulthood. Globally, undernutrition among children under five years old in the inform of stunting, underweight, and wasting is a public health problem that underpins related development challenges in the Global South. In 2017, approximately 22.2% and 7.5% of children worldwide were stunted and wasted respectively (World Health Organization, 2018b). The burden of child undernutrition is pervasive in Malawi despite the country adopting strategic plans such as a national nutrition policy and farm subsidies (Malawi Ministry of Health, 2018). The country failed to reduce the number of

underweight children to 14% by 2015, which was a 2015 United Nations (UN) Millennium Development goal. Current statistics in Malawi show that 37% of the under five-years-old children are too short for their age (stunting), 3% are too thin for their height (wasting), and 12% are too thin for their age (underweight) (NSO, 2017).

The Government of Malawi has renewed its commitment to avert child undernutrition by signing the United Nations' 2030 Development Agenda. Accordingly, therapeutic and preventative child nutritional programs have become available in clinical and community centers, including in rural areas (Stobaugh et al., 2017). Children in rural areas of Malawi are at a higher risk of undernutrition compared to children in urban areas. In particular, the prevalence of stunted children is higher in the rural central region compared to the southern and northern regions (NSO, 2017). Therefore, child nutrition surveillance programs in rural central Malawi are indispensable that can facilitate planning and evaluate local nutritional programs. Our study contributes to the literature on child undernutrition and nutritional program development by examining the prevalence and risk factors of child undernutrition in the rural agrarian communities of Dowa district in central Malawi. Furthermore, our findings can potentially inform the development of child nutrition sensitive policies and interventions in Dowa district.

6.3 Conceptual framework

Our study is guided by the UN Children's Fund's (UNICEF) "care for nutrition" conceptual framework (Engle, Bentley, & Pelto, 2000). The model maintains that child undernutrition in developing countries is caused by a nexus of biological and social factors that operate at three levels. At a personal level, insufficient food intake and exposure to infectious diseases are core risk factors that cause child undernutrition. Household food insecurity (HFI), low dietary diversity, unhygienic environments, inadequate access to basic health services, and poor care for children

and women are underlying factors that exacerbate this phenomenon. The third risk factors for child undernutrition operate at a macro level as well. They include cultural and political ideologies, national resource control, and economic mismanagement (Engle, Menon, & Haddad, 1999).

Drawing upon UNICEF's "care for nutrition" framework, studies in Malawi suggest that notable risk factors for child undernutrition are child morbidity, child age, and low birth weight (Doctor & Nkhana-Salimu, 2017). Common maternal underlying factors of child undernutrition include low education, young age at conception, and low body weight (Ntenda & Chuang, 2018). At the household level, underlying factors of child undernutrition include low expenditure on food, low household income, and poor market access. At the community level, being in matrilineal lineage societies and drinking unclean water increase the risk of child undernutrition (Chikhungu, Madise, & Padmadas, 2014). The studies suggest that risk factors of child undernutrition in Malawi vary across geographical location. Therefore, there is a need for research in Malawi's various regions; to date; Dowa District in Central Malawi has received little attention from researchers. This article addresses the regional gap and contributes to the broader picture of the determinants of child undernutrition in rural agrarian areas of Malawi, with relevance to similar contexts elsewhere in sub-Saharan Africa.

6.4 Methods

6.4.1 Study location

The study was conducted in Malawi, a small landlocked country of about 118,484 km² in Sub Sahara Africa. Malawi is bordered by Mozambique to the South and East, Zambia to the West, and Tanzania to the North. The current population of Malawi is about 17,563,749 million people and nearly 85% depend on agriculture for their livelihood (NSO, 2018). Our research was conducted in six outreach clinics in rural communities that are within the radius of 5 to 10

kilometers away from Mvera Mission Hospital in Dowa district (Figure 1) during the months of May to September 2018.

6.4.2 Study sample

We employed a descriptive cross-sectional study design. A multi-stage cluster sampling technique was used to select representative research participants (Remler & Ryzin, 2014). Specifically, we randomly selected six out of eight outreach postnatal clinics that operate under Mvera Mission Hospital. The selected outreach clinics were Mkhalanjoka, Gogo, Mvera, Kalinyengo, Mphande, and Ching'amba. During the time of the study, Mvera hospital was serving a population of 27,719 people. Out of the total population, there were 4,820 under-five year old child/mother dyads that were clients of postnatal health services in the selected six-outreach clinics. A Raosoft online software program was used to calculate a sample size (McCrum-Gardner, 2010).The margin of error was set at 5%, with 95% confidence level, and a response distribution of 50%. The minimum sample size was found to be 356 under five-years-old child/mother dyads. We chose to increase our sample size to 538 dyads with an aim of strengthening the study's reliability and reducing the margin of error from 5% to 4%. A systematic sampling technique was used to select 538 out of 4,820 under-five child/mother dyads from postnatal registers by selecting every ninth pair starting with a randomly selected pair.

6.4.3 Participant recruitment

We contacted the selected children and their mothers through their postnatal clinics when they were attending a regular monthly health assessment. Health workers asked the mothers if they would be interested in participating in the study following their health assessment in a private consultation room. Five mothers did not consent to take part in the study, and they were subsequently replaced by randomly selected child-mother dyads that were not chosen during the initial sampling stage. For those who consented, a research assistant who was also a health worker

orally administered the questionnaire in the same consultation room, away from the other health workers and clients. Through this set-up, we were able to protect the confidentiality of children and their mothers because other clients were not aware that the mother took part in the study.

Figure 1: Location of the study area

6.5 Measures

9.5.1 Outcome variables

The primary outcome variable of our study was child undernutrition in the form of stunting, underweight, and wasting. Stunting refers to a chronic form of undernutrition that entails prolonged periods of insufficient nutrient intake and assimilation (Briend, Khara, & Dolan, 2015). In general, stunting is an indicator of overall community social-economic wellbeing, where there is enough accessible food for the child to consume (Onis & Branca, 2016). Wasting refers to an acute form of undernutrition and entails a deficit of body tissue and fat mass. The condition arises when a child fails to access adequate food nutrients within a short period of time (Briend et al., 2015). Underweight is a composite measure of child undernutrition that encompasses both stunting and wasting. SECA gmbh & co. Model 874 mother-infant weighing scale was used to measure and collect the weight of the children and mothers. All standard practices for weighing children were followed, which included children wearing minimal clothing and no shoes when they were weighed (de Onis & Blössner, 2003). For accuracy and consistency, a 2 kg weight was used to adjust the measuring scale to zero after weighing each mother-child pair. We recorded results of child and maternal weight to the nearest 100 grams. Length measuring boards were used to take children's height and were recorded to the nearest 0.1cm (Malawi Ministry of Health, 2017). Children who were two or more years old were measured in a standing position while those that were less than two years old were measured in a recumbent position.

We calculated height-for-age, weight-for-height, and weight-for-age Z-score values from measured children's heights, weights, age in months and reported child sex. A WHO Anthro software version 3.2.2, January, 2011 (WHO and Macros, 2011) was used to calculate the Z-scores with reference to the WHO child growth standards (Pimenta et al., 2018). Child stunting, underweight, and wasting were denoted as those that were less than or equal to 2 standard

deviations of height-for-age, weight-for age, and weight-for-height Z-scores (Malawi Ministry of Health, 2017).

6.5.2 Independent variables

Based on UNICEF's "care for nutrition" conceptual framework, we included numerous explanatory variables that have been linked to child undernutrition in developing countries (Danaei et al., 2016). The following immediate child risk factors were considered as potential explanatory variables. Childbirth weight which we coded 0 = normal birth weight (≥ 2.5 kg), and 1= low birth weight (< 2.5 kg). Common child morbidities in the study areas were diarrhea, malaria, and acute respiratory infection (ARI). We asked mothers to report the common sicknesses that the child suffered from in the two weeks prior to our research. Mothers' reported child morbidity was ascertained in the child health passport book as examined by medical personnel on the day that corresponded with the survey. We coded 1= diagnosed/reported sicknesses and 0 = no sickness in the past two weeks. Child gender was coded as 0 = female and 1= male. Children who were treated with deworming drugs such as albendazole within the past year were coded = 1 and those who did not receive the treatment were coded = 0. Age of children were categorized as 1= 1-5 months, 2= 6-11 months, 3 = 12-23 months, and 4 = 24-59 months old.

The first underlying risk factors of child undernutrition were maternal demographic characteristics. They included age which was coded as 1=16-24 years old, 2 = 25-34, and 3=35-49. Maternal education was categorized as 0 = no education, 1= primary school, and 2 = secondary school. Maternal faith was categorized as 1= Church of Central African Presbyterian (CCAP), 2=Catholic, and 3=Pentecostal. The number of children that a mother gave birth to were coded as 1= one, 2 = two, 3 = three, 4 = four, and 5 = five and more. We also considered whether the pregnancy for the child participant was planned or unplanned. We coded 0 = planned, and 1 =

unplanned. Mothers' nutritional status was categorized as 1 = underweight (BMI <18.5 kg/m^2), 2=normal (BMI 18.5–24.9 kg/m^2), 3 = overweight (25.0–29.9 kg/m^2), and 4 = obesity (≥30.0 kg/m^2) (Malawi Ministry of Health, 2017). Mothers who received nutritional counselling during pregnancy were coded 1 = yes and 0 = no. We also assessed whether a mother was exposed to IPV which was coded as 1 = yes and 0 = no. IPV was assessed by using a WHO Multi-country study questionnaire on women's health and life experiences that was previously validated and administered in Malawi (Fan et al., 2016; VanderEnde et al., 2016).

The second underlying risk factors of child undernutrition were attributed to the father. Amongst them was education which was coded 0 = no formal education, 1= primary, and 2=secondary and tertiary education. Age was coded as 1=15-24 years old, 2=25-34, and 3=35-49. We included fathers' risky health behaviours such as alcohol consumption, smoking, whether he was involved in polygamy, infidelity, and/or divorced. Each risk behavior was coded as 0 = no and 1 = yes.

Poverty threshold as a household level underlying risk factor for child undernutrition was defined based on the international poverty headcount ratio of USD 1.90 a day (Prydz, 2016). Household food security was measured by a Household Food Insecurity Access Scale (HFIAP), which is calculated based on responses to questions about the frequency of occurrence of nine experiences characteristic of food security in the past month (Coates, Swindale, & Bilinsky, 2007). Whereas the HFIAP yields four categories of food security, we coalesced the four HFIAP categories into food secure (food secure and mildly food insecure) and food insecure (moderately and severely food insecure) households to produce a binary set of categories (0 = food secure and 1= food insecure household). The nutritional quality of diets was measured by Household Dietary Diversity Scale (HDDS) (Malawi Ministry of Health, 2017; Swindale & Bilinsky, 2006b). We

coded households as 1 = inadequate household dietary diversity when the mother reported that they consumed four or less food groups in the past 24 hours. We coded 2=adequate household dietary diversity when a mother reported that they consumed five or more food groups in the past 24 hours (Malawi Ministry of Health, 2017; Mekuria, Wubneh, & Tewabe, 2017). We also inquired about household domestic water source. We coded 1 = borehole (clean water) and 0 = river/wells (unprotected water). We also considered time that the mother took to fetch a pail of water. This was coded as 0 = < 30 minutes, and 1= ≥ 30 minutes. We considered child delivery place as hospital = 1 and home or traditional birth attendant = 0. We did not include toilet facility and household type because almost 99% and 98% of participants reported having an open pit latrine and grass thatched houses respectively.

Our survey was administered on Android tablets. The Open Data Kit (ODK) was used to upload the digital version of the questionnaire into the tablets. An ODK is an Android application that can administer surveys, collect, and organize the survey data (Hartung, 2012). This application allows for immediate data validation in the field. Our team (the research trainers) included a clinical officer, a medical doctor, and a PhD social work candidate. Nine married female health surveillance assistants (research assistants) that were trained using the WHO protocol for conducting studies of IPV were responsible for data collection (Ellsberg & Heise, 2002; Ellsberg et al., 2001). We took five days to train the research assistants and to pretest the survey questionnaire. The research assistants and trainers all had professional training in child and maternal health. The researcher stakeholders also had vast experience in measuring child weight and height and diagnosing common child illnesses in Malawi. Since we examined a sensitive topic relating to IPV, we decided that the questionnaire should be administered in the clinic's consultation room (Bender, 2017; Tarzia et al., 2017). The procedure for recruitment was as

follows: when a mother and her child completed their monthly postnatal primary healthcare check-up, a health worker on-duty informed the mother about our nutritional study. If the mother was interested to take part in the research, the health worker invited the survey enumerator to administer the questionnaire. The arrangement was agreed upon by the survey team in consultation with hospital officials in order to maximize confidentiality of the research participants. Research assistants explained the objectives of the research and when the mother agreed to participate, she was requested to affirm her consent verbally.

6.6 Research Ethics Review

We obtained ethics approval to conduct this study from McGill University's Research Ethics Board in Canada protocol number (REB File #: 503-0518), and University of Livingstonia research committee in Malawi protocol number (UNILIA-REC-4/18). We also obtained written permission from the authorities at the Dowa district Commissioner's office, the Dowa Disctirct Health Office, and Mvera Mission Hospital. Oral consent was obtained from local health leaders in the study areas.

6.7 Data analysis

All 538 selected child-mother pairs were assessed for nutritional status. Cronbach's α analysis was conducted to calculate the internal reliability of the questionnaire items that were used to determine HFS, dietary diversity, and IPV (Nybergh et al., 2013). The HFIAS' 9 items ranged in severity from worrying about household access to food to going the whole day and night without consuming any food due to lack of resources (Desiere, D'Haese, & Niragira, 2015; Gebreyesus, Lunde, Mariam, Woldehanna, & Lindtjørn, 2015). The HDDS had 12 food categories which were used to probe the type of food that household members consumed in the past 24 hours. The scales on IPV controlling behavior had five items, psychological abuse had 4 items, physical abuse had six items, and sexual abuse had three items. We considered an α level of 0.70 or higher

as satisfactory (Nybergh et al., 2013). The calculated Cronbach's α for the HFIAS was 0.87, 0.83 for the HDSS, while the Cronbach's α for the controlling behavior items was 0.81, psychological violence was 0.75, physical violence was 0.83, and sexual violence was 0.87.

We used the Kolmogorov-Smirnov test to determine the normality of the distribution of numerical variables that included age, number of children, and HFIAS. We found that our data was not normally distributed and we opted to construct numerical variables into categories according to standard procedures (Berger & Zhou, 2014). We calculated the determinants of stunting, wasting, and underweight based on socio-demographic characteristics of children, mothers, fathers, and household factors. A chi-square test was used to examine the association between indicators of each form of child undernutrition and given explanatory variables. Univariate logistic regressions were also performed to determine significant risk factors of child undernutrition from the selected independent variables. Three separate multivariable logistic regression analyses were performed to explore predictors of child stunting, underweight, and wasting. Variables that were significant at a bivariate level and those that have been demonstrated in literature as potential risk factors of child undernutrition in developing countries (McCloskey et al., 2016) were entered into the final multivariable logistic regression models using forward method.

Multicollinearity of explanatory variables was tested and a variance inflation factor (VIF) of 5.342 was obtained. The VIF was less than ten and we were confident that the included independent variables were not similar. Therefore, our regression coefficients estimates were reliable (Daoud, 2017). We have reported the results of each of the three-child undernutrition multivariable analyses models as crude and adjusted odds ratios (AORs) with a 95% confidence interval (CI). A *p* value was considered statistically significant when it was less than 0.05. An IBM

Statistical Package of Social Sciences (SPSS) for Windows version 23.0 (IBM Corp., Armonk, NY, USA) was used to analyze the data.

6.8 Results

6.8.1 Sociodemographic characteristics of study population

A total of 538 children, aged 0 to 59 months, were included in this study. More boys (51%) were sampled than girls (49%). The gender difference reflected the trends in the general population of children under five years old as hospital registers showed that more boys than girls were born in the past five years. Regarding children's age range, 13.4% were between 1 to 5 months, 16.7% were between 6 to 11 months, 29.0% were between 12 to 23 months, and 40.9% were between 24 to 59 months old. It was found that 35%, 40.1%, and 30.3% of the children had episodes of malaria, ARI, and diarrhea in the two weeks prior to the study respectively. The mean age of mothers was 27.64 years old (*SD* = 7). It was found that 31% of the mothers had one child, 23% had two children, 20% had three children, 11% had four children, and the remaining 15% of mothers had five or more children. In terms of education attainment, about 70% of mothers had primary school education, 16% had a secondary education, and 15% had no formal education. The study found that 16.2% of fathers were in the age range of 15 to 24 years old, 45.5% were in the age range of 25 to 34, and 38.3% were in the age range of 35 to 49. In terms of health risk behaviors, we determined that 26% of fathers were tobacco smokers, 22% had polygamous families, 43% consumed alcohol, and 30% had concubines. The results also showed that 127 (23.6%) of fathers divorced a wife.

At the household level, 97.5% of the households were below the poverty line of < USD 1.90/day per adult person. It was also found that about 60% of the households were food insecure, while 66% had inadequate dietary diversity. In terms of access to domestic water, 29.4% of the

households did not have access to clean water. In addition, 42% of mothers were spending ≥ 30 minutes to obtain and transport clean water. Table one highlight selected sociodemographic factors of our sample.

Table 6: Socio-demographic characteristics of study population

Mothers characteristics	Age (years)	N= 538	%
	15-24	224	41.6
	25-34	209	38.8
	35-49	105	19.5
	Education		
	No education	81	15.1
	Primary	370	68.8
	Secondary	87	16.2
	BMI		
	Underweight	27	5.0
	Normal	323	60.0
	Overweight	150	27.9
Children's characteristics	Sex		
	Female	263	48.9
	Male	275	51.1
	Age range		
	1-5	72	13.4
	6-11	90	16.7
	12-23	156	29
	24-59	220	40.9
	Diarrhea episode	163	30.3
	ARI episode	216	40.1
Fathers' characteristics	Age category		
	15-24	87	16.2
	25-34	245	45.5
	35-49	206	38.3
	Current smoker	138	26.0
	Ever divorced a wife	127	23.6
	Below poverty line (US$ 1.90/day)	515	95.7
	Food insecure	320	59.5
	Inadequate HDD	355	66.0
	Domestic water source		
	Borehole	380	70.6
	River/open well	158	29.4
	Time taken to drew water		
	<30 minutes	314	58
	≥ 30 minutes	224	42

	Number of children		
	one	168	31.2
	two	121	22.5
	three	106	19.8
	Four	61	11.3
	Five or more	79	14.7

6.8.2 Prevalence and correlates of child undernutrition in Dowa rural communities

The study showed that 224 (41.7%) of the children were stunted, 61 (11.3%) were underweight, and 17 (3.2%) were wasted. The results of chi-square tests highlighted a significant association between child stunting and maternal education ($\chi2$ =7.47, df= 2 *p*=.024), child sex ($\chi2$ =5.57, df= 1, *p*=.018), unplanned pregnancy ($\chi2$ =4.02, df = 1, *p*=.045), household dietary diversity ($\chi2$ =7.07, df= 1, *p*=.008), and maternal exposure to IPV controlling behavior ($\chi2$ =4.61, df= 1, *p*=.032). In addition, child stunting was significantly correlated with domestic water source ($\chi2$ =4.18, df= 1, *p*=.048), father who has divorced a wife ($\chi2$ =4.00, df= 1, p=.046), and household farm land size ($\chi2$ =8.58, df= 2, p=.014). Child underweight was significantly associated with water source ($\chi2$ =4.48, df= 1, *p*=.034), child access to deworming treatment ($\chi2$ =4.14, df= 1, *p*=.042), HFS ($\chi2$ =4.50, df= 1, *p*=.034), and father who has divorced a wife ($\chi2$ =4.67, df= 1, *p*=.031). Child wasting was significantly associated with maternal BMI ($\chi2$ =15.97, df= 3, *p*=.001), and time a mother took to fetch water ($\chi2$ =6.45, df= 1, *p*=.011).

6.8.3 Risk factors of child undernutrition in Dowa rural communities

The findings of unadjusted logistic regressions (Table 2, crude models 1, 2, and 3) show that being a male child, accessing domestic water from a river/well, mother's exposure to IPV, low household dietary diversity, mothers' lack of access to nutritional counseling, children who reside in families where fathers who have divorced a wife, and unplanned pregnancy are risk factors of child stunting. Household use of water obtained from a river or well, longer time taken by a mother to fetch domestic water, low child birthweight, HFS, and child not treated with deworming drugs

were risk factors of child underweight. Finally, only children whose mothers took more than thirty minutes to fetch water were at high risk of wasting than children whose mothers took less than 30 minutes.

In multivariable regression analyses, we adjusted for all variables that are considered predictors of child undernutrition in developing countries. The results of multivariable logistic regression of child stunting (Table 2, Model 1) show that boys were at an increased risk of stunting (*AOR*: 1.54, 95% *CI*: 1.06-2.23, *P*<0.023) compared to girls. Furthermore, children from households that use water from rivers and wells had an increased risk of stunting (*AOR*: 1.72, 95% *CI*: 1.13-2.61, P<0.011) than children from households that use water from boreholes. Children born from mothers who received nutritional education during gestational period had low risk of stunting (*AOR*: 0.29, 95% *CI*: 0.14-0.59, *P*<0.001) than children born from mothers who did not receive nutritional education when they were pregnant. Children who were residing in households that mothers experienced IPV were at an increased risk of stunting (*AOR*: 1.69, 95% *CI*: 1.14-2.49, *P*<0.009) compared to children whose mothers did not experience IPV.

The results of multivariable logistic regression analyses of underweight children (Table 2, Model 2) shows that children whose fathers have divorced were more likely to be underweight (*AOR*: 1.88, 95% *CI*: 1.02-3.48, *P*<0.044) than children whose fathers never divorced a wife. Children from families that use water from the borehole were less likely to be underweight (*AOR*: 0.50, 95% *C*I: 0.28-0.90, *P*<0.021) than children from families that used water from rivers or wells. Children whose mothers spent less than 30 minutes fetching water were less likely to be underweight (*AOR*: 0.44, 95% *CI*: 0.23-0.83, P<0.011) than children whose mothers spent 30 minutes or more. It was also observed that children from food insecure households had higher chances of being underweight (*AOR*: 1.89, 95% *CI*: 1.01-3.53, *P*<0.047) than children from food

secure households. In addition, children whose birthweight were less than 2.5kgs were at an increased risk of being underweight (*AOR*: 2.41, 95% *CI*: 1.13-4.71, *P*<0.011) than children who were born in the normal birthweight range. Finally, children who did not get deworming treatment were at an increased risk of underweight (*AOR*: 2.14, 95% *CI*: 1.82-3.89, *P*<0.012) than children who received the treatment.

In terms of child wasting, the results of multivariable logistic regression analysis (Table 2, Model 3) illustrate that only one variable was a risk factor for child wasting. Children whose mothers spent less than 30 minutes fetching a pail of water had a lower risk of wasting (*AOR*: 0.18, 95% *CI*: 0.04-0.79, *P*<0.023) than children whose mothers spent 30 minutes or more.

Table 7: Crude and adjusted odds ratios (95% CI) for factors associated with child undernutrition in Dowa

Variables	**Model 1** Stunting		**Model 2** Underweight		**Model 3** Wasting	
	Crude *OR*	*AOR*	Crude *OR*	*AOR*	Crude *OR*	*AOR*
Child sex						
Male	1	1	1	1	1	1
Female	0.66***	0.65*	0.92	0.94	0.93	0.76
Water source						
River	1	1	1	1	1	1
Borehole	0.67*	0.58**	0.56*	0.47**	0.73	0.80
Exposed to IPV						
Yes	1	1	1	1	1	1
No	0.68*	0.59***	0.86	0.93	0.57	0.62
Dietary Diversity						
Average	1	1	1	1	1	1
Low	1.64***	1.34	1.87	1.84	2.23	1.99
Nutrition information						
Yes	1	1	1	1	1	1
No	3.22***	3.50***	1.00	1.02	2.12	2.08
Husband divorced						
No	1	1	1	1	1	1
Yes	1.51*	1.66	1.87*	1.72	2.26	2.00
Unplanned pregnancy						
Yes	1	1	1	1	1	1

No	0.69*	0.69	0.64	0.78	0.66	0.88
Time taken to fetch water						
≥30 Minutes	1	1	1	1	1	1
<30 minutes	0.98	0.87	0.42***	0.50*	0.18*	0.25*
Child birth weight						
Normal	1	1	1	1	1	1
Low	1.32	1.39	2.47***	2.55***	2.64	2.93
Household food security						
Secure	1	1	1	1	1	1
Insecure	1.09	1.16	1.88*	1.92*	1.25	2.05
Child received Albendazole						
Yes	1	1	1	1	1	1
No	1.13	1.02	1.74*	1.82*	1.08	1.25

*p <.05; **p <.01; ***p <.0001.

6.9 Discussion

Our study used UNICEF'S "care for nutrition" conceptual framework to examine risk factors that were associated with child undernutrition in rural areas of Dowa district. The prevalence of children under five years old who have stunted was much higher in the study community compared to district level (39%) and national level. Although this is the case, the prevalence of child stunting in some districts of Malawi such as Mangochi and Neno are higher (45%) while other district such as Karonga child stunting is significantly lower at 28% (NSO, 2017).

Using multivariable logistic regressions, eight significant predictors of child undernutrition was identified. First, children of mothers that did not receive nutritional counselling during antenatal period were 3.5 times more likely to be stunted than children of mothers who received nutritional counselling during gestation period. It is important to note that in the four years prior to our study, the hospital implemented two nutritional counselling programs. The first was offered to pregnant mothers during antenatal clinic assessment visits and the second was door-to-door motherhood counselling that targeted pregnant mothers and their husbands. There is no rigorous study in the Dowa district that documented the effectiveness of the two interventions on child

stunting, but some studies suggest that nutritional education and counselling during pregnancy has a marginal positive effect on gestational weight, maternal anemia risk, and child birthweight (Girard & Olude, 2012; Lopes et al., 2017). Based on our study findings, we hypothesize that couples who did not receive nutritional counselling sessions led to their children not receiving adequate and proper feeding, negatively affecting their children's growth and development.

Secondly, we found that mothers who experienced IPV (controlling behavior) were more likely to have stunted children than mothers that did not experience the violence. A possible explanation for our finding is that controlling behavior prevents mothers from independently accessing nutritional resources and disempowers them from interacting with a community support network that enhances their household resources. In such a way the resources that supports their children's proper nutritional intake are jeopardized (Bezner Kerr, Dakishoni, Shumba, Msachi, & Chirwa, 2008; Riley & Chilanga, 2018; Simkhada, Porter, & van Teijlingen, 2010)

Furthermore, our study found that children that used household water that was obtained at boreholes were less likely to be stunted and underweight than children from household that obtain drinking water from the rivers or wells. This finding is unsurprising given studies in Malawi that suggest that water from many boreholes are within WHO and Malawi Bureau of Standards quality limits. Furthermore, the studies maintain that approximately 80% of well water in Malawi is unfit for human consumption. Specially, faecal coliforms that cause typhoid, diarrhea, and cholera are prevalent forms of pathogens in these open water sources (Mkwate, Chidya, & Wanda, 2017; Smiley, 2017). Therefore, the observed stunting in children who used water from rivers or wells can be partially attributed to recurrent illness from waterborne diseases such as diarrhea (Prüss-Ustün et al., 2014).

In this study, we have found that children from families who obtained water in less than 30 minutes were less likely to be underweight and wasted compared to children from families that took 30 minutes or more to access water. There are two possible explanations for this result. Firstly, studies suggest that the longer mothers take to collect water, the less time they have to care for their children (Koolwal & van de Walle, 2013), including providing regular breastmilk and frequent meals (Chilanga, 2013; Kerr, Chilanga, Nyantakyi-Frimpong, Luginaah, & Lupafya, 2016c). The second reason for the child nutritional outcome is related to household hygiene. Studies suggest that good hygienic practices are inversely related to distance from the water source. This means that households that are far away from the water source are more likely to be engaged in unhygienic childcare practices such as reduced laundry and unhygienic food preparation practices. These basic sanitary practices directly exacerbate poor child nutrition and health outcomes (Graham, Hirai, & Kim, 2016; Majuru, Suhrcke, & Hunter, 2016; Usman, Gerber, & Braun, 2018).

The study has also found that children born with low birth weight were 2.6 times more likely to be underweight than children who were born within the normal weight range. The explanation of our finding can be drawn from the literature which suggests that children who suffered intrauterine growth retardation as fetuses are more likely to be undernourished compared to children without such a condition (Sania et al., 2015; Sharma, Shastri, & Sharma, 2016). Furthermore, the phenomenon is intergenerational as maternal undernutrition, maternal underweight, and low stature exacerbate a low child birthweight. Therefore, the issue of underweight children can be addressed through programs that specifically ensure that girls, women, and pregnant mothers are adequately nourished, while also focusing on the first 1000 days of children's lives (Black & Merseth, 2018; Young et al., 2018).

This study has also found that children who did not receive intestinal deworming drugs such as albendazole in the year prior to the study were 1.8 times more likely to be underweight than children that were dewormed. Our finding supports the importance of child deworming programs that are underway in Malawi and other developing countries (Lo et al., 2018). There is no study that has been done in the Dowa district on the nutritional benefits of child deworming, but a randomized study in Southern Malawi did not find any significant benefits of the treatment (Wang et al., 2017). These two conflicting studies from Malawi confirm the global literature that shows inconclusive benefits of child deworming (Croke, Hicks, Hsu, Kremer, & Miguel, 2017; Harper, Mutasa, Prendergast, Humphrey, & Manges, 2018; Taylor-Robinson, Maayan, Soares-Weiser, Donegan, & Garner, 2015). For instance, a study in India reported that under five-years-old children who received albendazole significantly gained an average weight of 3.04 kg than untreated children (Awasthi et al., 2013). However, a recent literature review suggests that child deworming has little or no positive impact on child weight in many low and middle income countries (John & Issac, 2018). Therefore, more research is needed in our study area to validate our findings.

The study has also found that children from food insecure families were 1.9 times more likely to be underweight than children from food secure households. Our finding supports the available literature in developing countries that link HFI and child undernutrition. For instance, studies in Kenya and India found that household food insecurity was a risk factor for child stunting, wasting, and underweight (Chandrasekhar, Aguayo, Krishna, & Nair, 2017; Mutisya, Kandala, Ngware, & Kabiru, 2015). Similarly, a study that was conducted in Nicaragua found that even mild household food insecurity was detrimental not only to child nutrition but general child wellbeing (Schmeer & Piperata, 2017).

Finally, this study has found that sex of children predicted child stunting but not wasting and underweight. Specifically, girls were 0.65 less likely to be stunted than boys. The result agrees with the current findings of the national study in Malawi where 39% of the boys and 35% of girls under five years old were stunted (NSO, 2017). Likewise, studies suggest that young boys in SSA countries are at an increased risk of stunting (*OR* 1.16) than young girls (Akombi et al., 2017; Alemayehu et al., 2015). The sex-related difference in child stunting requires further study in Dowa district. Specifically, it is inconclusive whether behavioral factors such as a gender bias, in terms of preferential treatment of girls over boys, can explain the difference (Klasen, 1996; Svedberg, 1990). In biology, the evolution theory speculates that natural selection favors a 1.0 sex ratio (Diamond-Smith & Bishai, 2015). In our study area, there were more boys (51%) than girls (49%). Therefore, based on evolution concepts, girls are more likely to survive in this area than boys despite being exposed to the same environmental stressors (Wells, 2000).

6.10 Conclusion and recommendations

The study has found that the prevalence of stunted children is higher in the study areas as compared to national or regional prevalence. The prevalence of underweight and wasting are within the range of the national rate. The notable risk factors for child stunting include being a male child, access to open water sources, mothers' exposure to IPV controlling behavior, and lack of nutritional counselling during the gestational period. We also determined that accessing water from open sources, spending more than 30 minutes fetching household water, low child birthweight, household food insecurity, and non-dewormed children were associated with child underweight. Finally, the study found that the time that mothers took to fetch water was related to child wasting.

Based on our studies, we recommend that on top of already existing programs, which aim to prevent and address child undernutrition, should be to provide safe and accessible water sources to the rural areas of the Dowa district. Such programs can free up mothers and allow them to have ample time to dedicate to their childcare activities.

We also recommend that a holistic approach should be taken to address child undernutrition in the study areas. Programs that improve household food security, low child birthweight, access to nutritional education, and increased child deworming can have positive impact on child nutrition. Furthermore, child undernutrition in Malawi should be perceived as a problem that can be addressed by all policy stakeholders. Specifically, the Ministry of Health, Agriculture, Economics, Education, and Water among others should collaborate to address these issues at hand.

We are also suggesting that IPV against mothers of children under five years old should also be considered as one of the risk factors of child undernutrition. Fathers' controlling behavior towards mothers should be addressed as it may potentially minimize maternal access to social networks that can be used to support the child. As such, counselling should be given to couples to reduce incidences of divorce that seems to have an impact on child nutrition, in addition to dealing with IPV.

6.11 Strengths and Limitations

This study used the WHO reference group to measure the prevalence of child undernutrition in rural areas of Dowa district in Malawi. Therefore, our results are comparable to national and global studies. Nevertheless, this study had some limitations. Since this is a cross-sectional study, we are not claiming that the identified risk factors cause child undernutrition. In addition, some of the socio-demographic factors that were controlled were obtained retrospectively. Therefore, it is possible that a recall bias resulted in over or under reporting of

some variables. Finally, we did not have control over social desirability bias that could emanate from the responses of our research participants (Kim & Kim, 2016). Some of the questions such as exclusive breastfeeding, child complementary feeding, and sleeping under mosquito nets were asked. It was possible that a section of mothers accepted these services to appease the health workers who were our research assistants.

Summary and critic of manuscript 3 (Chapter 6)

Results of manuscript 3 suggest that child undernutrition is a problem of public importance in Dowa district. It shows that 42%, 11% and 3% of the children were stunted, underweight, and wasted, respectively. Comparably, the results highlighted that only child stunting was significantly higher in the study area than at national level.

This dissertation supports previous global studies that claim that IPV against mothers is one of significant risk factors of child undernutrition. The study established that out of three indices of child undernutrition, only child stunting was associated with maternal exposure to domestic violence. Global studies affirm that stunting in children is caused by a combination of poor nutrition, recurrent infection and inadequate childcare practices. Therefore, I can infer that cumulative effect of poor childcare practices, due to maternal exposure to violence, could be the underlying causes of child stunting in this district. The possible pathways is that male partners' perpetration of IPV exacerbate poor maternal mental health outcomes, low autonomy and limited decision-making. These factors diminish maternal childcare abilities with high likelihood of deteriorating child health. Therefore, preventing maternal exposure to IPV can be one of the critical policy and program area to improve childhood nutritional status in Dowa district

Chapter 7

7.0. Discussion and conclusion

Based on the concept of social determinants of health, scholars and program planners recognize the role of social contexts in determining the health of individuals, groups, and society as a whole (Islam, 2019; Rine, 2016). Conceptually, the social determinants of health (SDOH) perspective refers to the conditions in which individuals are born, live, grow up, and age. These conditions include physical and social environments, gender, culture, social support, and social status (Moniz, 2010). The literature suggests that IPV against women is one of the SDOH that undermines the health of women and children (Alhusen, Ray, Sharps, & Bullock, 2014; Okafor et al., 2018; Quintanilla, Taft, McDonald, Pollock, & Henriquez, 2016). The fifth UN Sustainable Development Goal (SDG), achieving gender equality, recognizes that addressing discrimination and violence against women can substantially increase the chances of success for all other SDGs and consequently promote the wellbeing of all people (Allotey, Remme, & Lo, 2019; Langer et al., 2015; Muñoz Boudet, 2013; Weber et al., 2019).

Global and regional studies document the prevalence and risk factors of IPV against women in the general population, among pregnant women, women living with HIV, adolescent girls, and women with disabilities (Devries et al., 2013e; Heise, Ellsberg, & Gottmoeller, 2002; Watts & Zimmerman, 2002). The findings show that the problem of IPV is pervasive among these population groups. Notable risk factors include low educational attainment, poverty, alcohol abuse, hegemonic masculine cultural norms, and limited implementation of human rights policies (Abramsky et al., 2011b). Community-based research that focuses on IPV against mothers and its health outcomes for children is scarce in Malawi. However, studies show that a strained relationship between parents undermines childcare capacities that consequently affect their wellbeing. Hence, I have dedicated this dissertation to filling this gap by first establishing

the risk factors associated with IPV against mothers and its health outcomes among children under the age of five. My research addresses gaps in policies and programs in order to promote the health of women and children in rural areas of central Malawi.

7.1 Prevalence and underlying risk factors of IPV against mothers in central Malawi

The results of my research suggest that mothers in the study area are prone to experiencing IPV. They report controlling behaviour as well as sexual, physical, and emotional abuse. Specifically, I found that the prevalence of controlling behaviour, psychological abuse, physical violence, and sexual violence was 75%, 49%, 44% and 73%, respectively. These are alarming figures when compared with the national prevalence of IPV against women in the general population, which is at an average of 53% (NSO, 2018). One of the reason for this variance could be that my study included an almost homogenous group of women in terms of children, socioeconomic status, and education while previous studies focused on a diverse group of women (Fan et al., 2016a). The second reason could be that in this rural area, mothers with children under five years of age were more likely to have a male partner than women in previous studies. In Malawi, a woman who has a child out of wedlock is regarded as a public disgrace (Mtenje, 2017). Hence, despite being in an abusive relationship, it has been reported that women still hold fast in their marriages for reasonable fear of punitive social ramifications (Flax et al., 2017).

In the following sections, I draw upon gender order and ecological theories to interpret my results.

7.1.1 Cultural norms

As in many districts of the central region, communities in Dowa District have reproduced and sustained a patriarchal society through cultural norms that assign power to men over women.

One of these cultural traditions is *Gule wankulu* (big dance) cult, a tradition that UNESCO in 2008 listed as an intangible cultural heritage of humanity. *Gule wankulu* is the most feared male traditional secret cult in the area (Comaroff & Comaroff, 1993). It should be noted that in the course of this study, I thought of *Gule wankulu* with fear, not yet having gone through the initiation process. Given this, my social status was similar to that of a woman or a child in the area. Traditionally, the purpose of "big dance" is to transform boys into sexually mature men and members of the cult. To achieve this, boys are instructed to consume raw chicken and drink fresh blood in order for them to acquire the dominant qualities of a strong man. In so doing, the boys are induced to behave like *carnivorous beasts* and to some extent *ghosts* towards women, girls and uninitiated males (de Aguilar, 1995). The aforementioned italicized words are typical examples of dominant terms that feminists use to describe physical appearances of masculinity (Ricciardelli, 2015). In light of these cultural norms, the high prevalence of IPV against women in my findings is not surprising. Initiated men do not negotiate either with women or with men who are considered weak.

7.1.2 Household poverty

Another reason for the high prevalence of IPV against women in Malawi may be due to increasing household poverty in the face of dwindling agricultural productivity (Sassi, 2015). Traditionally, men in central Malawi are the breadwinners, but poor agricultural productivity has prevented men from fulfilling their role as the head of the family (Komarek et al., 2017; Warnatzsch & Reay, 2019). Meanwhile, a household with a young child in this precarious situation needs extra money for basic childcare needs such as soap, body lotion, diapers, and household fuel, which are difficult to purchase in rural Malawi (Verheijen, 2018).

7.1.3 Alcohol abuse

My dissertation supports literature that indicates that alcohol use by male partners is the strongest predictor of women's exposure to violence (Davis, Rotheram-Borus, Weichle, Rezai, & Tomlinson, 2017; Mthembu, Khan, Mabaso, & Simbayi, 2016; Rotheram-Borus, Tomlinson, Roux, & Stein, 2015). One theory is that alcohol use undermines interaction between couples that subsequently escalate into IPV. In Malawi, alcohol abuse amongst men of all socioeconomic contexts is a problem of public concern (Conroy, McKenna, & Ruark, 2019; Tran et al., 2018; Yaya, Buh, & Bishwajit, 2019). However, theories of masculinity offer a better interpretation that takes into account the underlying reasons for the reported alcohol abuse in my study area. Studies in Malawi suggest that men resort to alcohol abuse when they encounter life challenges such as an HIV diagnosis or unemployment (Mambulu et al., 2015; Namondwe, Ching'anda, Gama, & Matumba, 2019). Since these social factors undermine the attainment of the accolades of masculinity, men become frustrated and resort to alcohol. Therefore, failure to attain socially prescribed male roles is considered as one of the drivers of violence against women.

There is an emerging body of literature in Malawi suggesting that destitute populations are not the only groups abusing alcohol. In the general population, alcohol and tobacco use are increasingly becoming symbols of masculinity. A study by Tran et al., (2018) among Malawian military officers shows that alcohol and cannabis abuse were regarded as an expression of toughness. A recent study by Yaya et al., (2019) highlights that men who were satisfied with their jobs were more likely to abuse alcohol and tobacco. Given that the literature indicates alcohol abuse as a trigger for high impulsivity and antisocial behaviours, therefore, alcohol abuse may contributes to strain in intimate relationship in the study area.

7.2 HIV discourse, women's empowerment and gender order transgression

Customary laws, unlike the civil marriage law, recognize and support polygyny marriage in Malawi (Mwambene, 2010). Polygyny is an institutionalized heterosexual marriage practice whereby a man marries more than one wife. More than 14% of married women in Malawi are in polygamous unions (NSO, 2017). Scientific discourses in the country features polygyny and extramarital affairs as cultural practices that fuel the spread of HIV and AIDS (Limaye, Babalola, Kennedy, & Kerrigan, 2013; Lwanda, 2003). Consequently, Malawian policymakers and gender activists have empowered women to challenge concurrent sexual partners among men. Unintentionally, the practice of challenging men who have multiple sexual partners is tantamount to transgressing the gender order, the backlash from which may involve violence against the women (Mkandawire-Valhmu et al., 2016). This dissertation has confirmed the findings of other studies that suggest male involvement in extramarital affairs or polygamy is a risk factor for IPV. Thus, policymakers should reconsider the delivery of HIV messages targeting mothers only, as they seem to become victims of abuse when challenging men's extramarital sexual behaviour.

A second explanation for the association of men's extramarital affairs or polygyny marriages with maternal exposure to IPV in rural central Malawi can be related to reduced family support and its subsequent coping strategies. First, as stated above, unlike women, men are socially sanctioned to have extramarital affairs, which women sometimes tolerate (Mlenga, 2016). In my qualitative interviews with women and gatekeepers, they highlighted that men who have extramarital affairs reduce their moral and financial support for their families. This in turn may trigger women to stand up for their rights, which results in marital conflict. My findings support a qualitative study by Greco, Skordis-Worrall, Mkandawire, & Mills (2015), which found that women with partners who had extramarital affairs reported having an overall poorer

quality of life. This could be due to family pressure exerted on women to compensate for the loss of support by engaging in promiscuous behaviour, which may exacerbate family tension (Conroy et al., 2018).

7.3 Intimate partner violence and poor child health outcomes

In this dissertation, I have hypothesized that children raised in families experiencing stress stemming from the interaction of poverty, household food insecurity, unsafe water, and IPV against mothers will be at a significant risk of poor health outcomes. I have noted that child health is a multidimensional construct. The focus of previous research has been on child morbidity in terms of undernutrition, malaria, and diarrhoea (Forrest, Blackwell, & Camargo, 2018). My study brings new insight to the negative effects of IPV on child wellbeing. There was no significant socioeconomic differences in terms of household income, food security, and dietary diversity between the families where women experienced abuse and families where women did not. Although the research participants were homogenous in terms of poverty, my research findings indicate that IPV against women undermines child wellbeing over and above household socioeconomic status.

My study supports literature demonstrating that poor interpersonal factors induce stress, which undermines childcare regardless of household poverty (Wong et al., 2018). These findings concur with the UNICEF Care for Nutrition and Ecological Conceptual frameworks, which look at child survival as a product of both immediate and distant factors (Coll-Seck et al., 2019). Therefore, to achieve the third SDG, ensuring healthy lives and promoting wellbeing for people of all ages, this dissertation recommends a multisectoral approach that can address all the determinants of maternal and child health.

7.4 Summary of the findings

First, manuscript I presents the results of the first two research questions that examined the prevalence and risk factors of IPV against mothers of under-five children perpetrated by a current or recent partner. Based on the four broad categories of IPV, the prevalence of controlling behaviour, psychological abuse, physical violence, and sexual violence was 75%, 49%, 44%, and 73% respectively. These findings suggest that the prevalence of IPV against mothers of under-five children in this study area is a public health problem that requires urgent intervention.

The findings of the multivariate analyses show that mothers with male partners who had extramarital affairs correlated with an increased risk of experiencing controlling behaviours, as well as psychological and physical abuse. In addition, mothers whose partners consumed alcohol were at a high risk of experiencing sexual violence. I also observed that mothers who had to take more than 30 minutes to access communal domestic water sources were at an increased risk of experiencing controlling behaviour and physical and sexual violence. Based on the ecological framework, these findings suggest that risk factors for IPV against mothers of under-five children in this study area operate at both interpersonal and community levels.

Second, the third research question intended to asses whether IPV against mothers was a risk factor of under-five child morbidity. The study used undernutrition and malaria, common childhood morbidities in Malawi (manuscript II and III). I chose to focus on these particular diseases as both are prevalent throughout the year (NSO 2017) and nutritional measures (anthropometric) and malaria testing (rapid diagnosis) are the most reliable, cost effective measures among children in developing countries (Bhutta et al., 2017; Moyeh et al., 2019). The findings show that the prevalence of child malaria infection in the study area was at 35%

suggesting that alongside low maternal education, and child age (24-59 months), IPV against mothers was also a significant risk factor for child malaria.

Child undernutrition is a widespread public health issue in Malawi. Despite the government's commitment to reduce the problem, current statistics show that 37% of children are undernourished. In this dissertation, I tried to examine whether IPV against mothers is one of the risk factors for the three measures of child undernutrition. The findings of my study show that the prevalence of child stunting, underweight, and wasting was at 62%, 11%, and 3%, respectively in Dowa district. The study shows that independently of household's use of unprotected domestic water, children of mothers that reported experiencing IPV were at an increased risk of stunting. There was no evidence to suggest that IPV was a risk factor for child underweight and child wasting. My study supports the findings of Choi et al. (2017), who found that child stunting was only associated with IPV against women in Malawi. One possible explanation could be that the cumulative effect of poor childcare practices that prevent children from realizing their growth potential (Kim, Subramanian, Orav, & Fawzi, 2019).

7.5 Policy and practice implications

Social workers aim to understand the prevalence and negative effects of IPV against women in order to tailor policies and interventions in order to effectively address this phenomenon (Tam et al., 2016). Thus, based on the findings of this dissertation, I make three policy and practice recommendations to enhance our understanding of the negative effects of IPV against women in rural communities of central Malawi.

First, this dissertation identified that IPV against mothers of children under the age of five is widespread in the remote areas of Dowa District, and thus a public health problem. Specifically, the study suggests that hegemonic masculine attributes that encourage men to abuse

their partners should be the entry point for behavioral change interventions. In addition, information regarding the criminalization of marital rape should be disseminated in the study area (Gottardi, 2019; Karimakwenda, 2018; Kolade-Faseyi, 2018).

Second, I suggest that social workers should have spaces in the hospitals and victim support units in the study areas to screen and support mothers who are victims of IPV. This recommendation is informed by the findings that, despite a high prevalence of IPV in the study areas, primary healthcare facilities do not offer IPV screening, counselling, and mitigation services due to inadequate staff and training. Additionally, despite the government's provision of free mosquito nets and contraception to mothers in the area, IPV exacerbates underutilization of these government programs. Screening for IPV can proactively identify mothers whose partners are preventing them from using healthcare resources that could address poor child health outcomes. This recommendation is supported by studies conducted in many developing countries that highlight health system failure to implement the 67th World Health Assembly resolution requiring health facilities to take a leading role in addressing VAW (García-Moreno, Hegarty, et al., 2015).

Finally, this study suggests that integration of various development programs can significantly reduce the prevalence of IPV against women and at the same time promote positive child health outcomes in Malawi. The tendency of implementing health and development programs in isolation results in the omission of important stakeholders. For instance, family planning, gender equality, and prevention of mother to child (PMTC) HIV transmission advocacy primarily target women, while development programs, such as cooperative farming and rural public infrastructures, mainly target men (Adams, Juran, & Ajibade, 2018; Malunga, Dungumaro, & Koda, 2018; Mkandawire & Hendriks, 2018). Hence, gender mainstreaming, a

concept that focuses on the implication of policy or programs on different genders should be the priority for all development programs in Dowa District.

7.6 Limitations

This dissertation has used various validated research instruments to capture data used to answer the research questions. For instance, a well-established WHO multi-country questionnaire was used to determine the prevalence of four forms of IPV against women. In addition, measures of child nutrition, household food security, household dietary diversity, and malaria diagnosis were based on standard procedures. Therefore, the results of this dissertation are comparable to other studies that use the same or similar instruments.

However, this dissertation has some limitations. First, the research was founded on a non-experimental cross-sectional study design. As such, I cannot establish a casual relationship between the identified risk factors and observed health outcomes. In addition, the discourse of IPV against women in Malawi, as in most countries in SSA, is a sensitive issue. According to Towns and Adams (2016), the research of IPV against women is different from other sensitive topics, such as bereavement for example, because participants who are current or past victims may be living in prolonged fear, shame, disbelief, and guilt. Thus, asking victims about their lived experiences may potentially trigger recurring trauma (McCosker, Barnard, & Gerber, 2001). Therefore, I do not rule out the possibility that participants may underreport their exposure to IPV for fear of unknown repercussions. Finally, this is a retrospective study design whereby mothers were recalling past experiences such as incidences of abuse, food consumption in the past 24 hours, and partners' risk behaviors. In this case, it was not possible to control for a recall bias that could attenuate the results of this study.

7.7 Future research directions

The findings of this dissertation provided baseline information regarding risk factors for IPV against mothers of children under five in remote areas of Dowa District in Malawi. In addition, the study established that IPV against mothers is a social determinant of child malaria infection and undernutrition, which causes stunting. However, knowledge gaps remain, and I think that future research should take up the following topics in order to enhance our understanding. First, I suggest that future research investigate the relationship between IPV and maternal access to healthcare services. The findings of my study suggest that perhaps maternal exposure to IPV undermines utilization of primary healthcare services that consequently compromise child health. Studies in other parts of SSA show that IPV against women constrain the use of healthcare services (Gichane et al., 2018; Mohammed et al., 2017; Rivara et al., 2007).

I also recommend an investigation into the relationship between IPV and mental health problems amongst mothers. Women who experience IPV in the area may be more likely to be depressed than their peers, which has the potential to reduce timely responses to childcare needs. Furthermore, this study calls upon an investigation into best practices to address the high prevalence of IPV and its negative implications for child health outcomes.

8.0 References

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9.0 Appendices

Appendix 1: Ethics approval (McGill University)

Removed deliberately

Apendix 2: Ethics approval, University of Livingstonia, Malawi

Removed deliberately

https://www.mcgill.ca/gps/thesis/final-thesis-submission/students

Appendix 3: Consent form

School of Social Work
McGill University, Montreal, Canada

Letter Seeking Informed Consent for in-depth interview research participation

Dear _____,

This letter is an invitation to consider participating in a qualitative follow-up research study as part of Emmanuel Chilanga's thesis-based PhD degree in the School of Social Work at McGill University in Canada under the supervision of Dr. Delphine Collin-Vezina. I would like to provide you with more information about this project and what your involvement would entail if you decide to take part.

The name of the study is: *An examination of the association between intimate partner violence against women and child health outcomes in central and northern Malawi.* This study aims at understanding different pathways in which intimate partner violence against women is associated with child undernutrition and morbidity in four geographical areas of Malawi. The knowledge that will be produced in this study will inform stakeholders to develop tailored policies that can address child undernutrition and morbidity in the study areas.

Participation in this study is voluntary and it will involve a face-to-face oral interviews to understand your perception about the relationship between intimate partner violence and child health outcomes. The length of the discussion will be entirely up to you but I am anticipating that it will be within 45 to 60 minutes. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With your permission, your responses will be audio recorded. Later, I will combine your responses with that of other participants for analysis. I may use information from the interviews in papers or articles that I write on this topic. You will not be identified in any publication as pseudonyms shall be used throughout. But, if you suggest that your views should be attributed in the publication, you can let me know.

Data collected during this study will be retained for at least seven years in a locked office, and locked cabinet and electronic data will be password protected. The dataset without identifiers may be shared publicly. Your identity will be kept confidential. If you have not agreed to attribution, all information that could identify you will be removed from the data collected. I will be the only person who will have access. You can withdraw consent to participate and have your data destroyed by contacting myself at any time during the seven years if it has not yet been submitted to publishers. It is not possible to withdraw your consent once papers and publications have been submitted to publishers. All records will be destroyed according to McGill University policy. I foresee minimal risks to you as a participant in this study. The minimal risks include

remembering past or present traumatic events that are associated with intimate partner violence. There is no commercial application of these results, and there is no conflict of interest.

If after reading this letter, you have any questions about this study, or would like additional information to assist you in reaching a decision about participation, please feel free to contact Emmanuel at my local cellophane number 265 (0)999917292. You may also contact my advisor, Dr. Delphine Collin-Vezina, at delphine.collin-vezina@mcgill.ca. Or my Malawian local supervisor Dr. Bernard Kamanga at bcgkamanga@gmail.com at University of Livingstonia, Malawi.

I would like to assure you that this study has been reviewed and received ethics clearance through McGill University Research Ethics Committee (Number: 503-0518), as well as through the University of Livingstonia Research and Ethics Committee (Number: UNILIA-REC/4/18). However, the final decision about participation is yours.
I hope that the results of my study will be of benefit to those organizations working on the mitigation of child undernutrition and morbidity in central and northern Malawi, as well as to the broader research community, including researchers at the University of Livingstonia, Mzuzu University, Bunda University of Agriculture, and the University of Malawi.

I very much look forward to speaking with you during the in-depth discussions and thank you in advance for your assistance in this project.

Sincerely,

Emmanuel Chilanga
PhD Candidate
School of Social Work
McGill University
Montreal, Canada
emmanuel.chilanga@mail.mcgill.ca
265(0)999917292

CONSENT FORM

By signing this consent form, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

_____

I have read the information presented in the information letter about a study being conducted by Emmanuel Chilanga of School of Social Work at McGill University. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted. I have been advised that I may contact the researcher with any concerns I may have at emmanuel.chilanga@mail.mcgill.ca or at the local Malawian phone

number of 265(0) 999917292. I may also contact the researcher's supervisor Delphine Collin-Vezina, at delphine.collin-vezina@mcgill.ca Or a local supervisor Dr. Bernard Kamanga at bcgkamanga@gmail.com.

I am aware that I have the option of allowing my in-depth interview discussion to be audio recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous unless I wish to be attributed.

I was informed that I may withdraw my consent within two weeks of my being made aware that information I provided will be used in a publication by advising the researcher.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

☐YES ☐NO

I agree to have my focus group interviews audio recorded.

☐YES ☐NO

I agree to the use of my information in any thesis or publication that comes of this research.

☐YES ☐NO

Participant Name (print): ___ Participant Signature: _____ accept orally …….

Date: _____

Appendix 4: Survey questionnaire

Women and Child health study in Central Malawi

Clinic Name:		**Clinic Number:**	
		District	
Field Manager			

Date of interview: *(Please ensure that you record the date correctly.)*	Day	Month	**2018**
Start Time of Interview	HH : MM		

INTERVIEWER COMPLETE BELOW

Interviewer name		**Interviewee pseudonym**		**Interviewer number:**	

Respondent Selection Procedure

The health worker should check the name of the mother who is attending the antenatal clinic to find out if she was randomly selected to participate in this study. If so, at the end of her consultation you can introduce the study as follow:

PROJECT INFORMATION AND INFORMED CONSENT

INTRODUCTION: Good Day! I want to let you know that I am working with Emmanuel Chilanga, a student of Social Work at McGill University in Canada as a research assistant. We are talking to mothers who have an under-five year old child about women and child health and other topics related to social and economic issues. You have been randomly selected and we would like to discuss these issues with you. Your opinions will help us to get a better idea about how people here feel about these issues. There are no right or wrong answers. The

interview will take about 45 to 60 minutes. Your answers will be combined with those of over 1000 other people we are talking to in the four areas to get an overall picture. Any answers you provide will be kept absolutely confidential, and there is no way anyone will be able to identify you by what you have said in this interview. We are not recording either your address or your name, so you will remain anonymous so please feel free to tell us what you think. The data we collect from these interviews will always be kept in a secure location. You have the right to terminate this interview at any time and you have the right to refuse to answer any questions you might not want to respond to.

Are you willing to participate? .....

Yes	1	➢ **Continue**
No	0	➢ **IF NO: READ OUT: Thank you for your time. Goodbye.**

Thank you for agreeing to participate in this study. Are there any questions you wish to ask before we begin?

A.	**Clinic details**		
A1	Study site name	Mzuzu	1
		Lilongwe	2
		Dowa	3
		Mzimba	4
A2	Under-five clinic name		……..
A3	Average monthly number of women attending the clinic		…….
A4	Total catchment population		

B.	**Maternal socio-demographic factors**		
B1	How long have you been living continuously in this area	Years	……..
		declined	99
B2	Just before you moved here, did you live in a city/town, at a trading center, or in a rural area?	City/town	1
		Trading center	2
		village	3
		Was born in this area	97
		declined	99
B3	Before you moved here, which [region] did you live in?	Northern	1
		Central	2
		Southern	3
		Outside Malawi	4
		I was born here	97
		declined	99
B4	What is your religion?	Catholic	1
		CCAP	2

		Anglican		3
		seventh day advent./ Baptist		4
		other Christian		5
		Muslim		6
		no religion		7
		Other specify		8
B5	What is your tribe or ethnic group	Chewa		1
		Tumbuka		2
		Lomwe		3
		Tonga		4
		Yao		5
		Sena		6
		Nkhonde		7
		Ngoni		8
		Other specify		9
B6	In the last 12 months, how many times have you been away from home for one or more nights?	Number of times		…….
		none		0
B7	In the last 12 months, have you been away from home for more than one month at a time?	no		0
		yes		1
		declined		99
B8	In what year were you born? (date/month/year)			....
B9	How old are you now?		Age in years	……
B10	Have you ever attended school?		no	0
			Yes	1
B11	If yes, what is the highest level of school you attended?		Junior Primary	1
			Senior primary	2
			Junior Secondary	3
			Senior secondary	4
			Tertiary	5
B12	Do you own a mobile phone?		yes	1
			no	0
B13	Do you have a bank account		yes	1
			no	0
B14	Do you listen to the radio at least once a week, less than once a week or not at all?		More than three times/week	1
			Less than thrice/ week	2
			Not at all	0
B15	Do you watch television at least once a week, less than once a week or not at all?		Not at all	0
			At least thrice a week	1
			Less than thrice/ week	2

B16	Do you read a newspaper or magazine at least once a week, less than once a week or not at all?		Not at all	0
			At least thrice a week	1
			Less than thrice/ week	2
B17	Do you use Facebook chart?		Not at all	0
			At least thrice a week	1
			Less than thrice/ week	2
B18	Do you use WhatsApp chart?		Not at all	0
			At least thrice a week	1
			Less than thrice/ week	2
B19	Are you a member of village bank		no	0
			yes	1
			declined	99
B20	Are you a regular member of the following social groups?	Church/Islamic choir	no	0
			yes	1
		Sports club	no	0
			yes	1
		Dancing group	No	0
			yes	1
		Political party	no	0
			yes	1
B21	Are you in paid employment?		no	0
			yes	1
B22	If yes, state your occupation		teacher	1
			shopkeeper	2
			Security officer	3
			secretary	4
			banker	5
			Others, specify…	6
B23	If no, what do you do to earn a living?		Casual work	1
			Informal business	2
			I don't do anything	3
			Others specify……	4
B24	How much money did you got from your work last months?			……..
B25	On average how much money did you get per month in the past 12 months			……..
B26	How much money did your household got in the last 30 days?			…….
B27	On average, how much money did your household got in the past 12 months?			……..
B28	Do you have someone whom you confide with?		no	0

		yes	1
B29	Does the father of your child has been living with you at home in the past two months	no	0
		yes	1
B30	What is the main source of income in your household?	Formal wage	1
		Casual wage	2
		Formal business	3
		Informal business	4
		Cash Remittances	5
		Others, specify…	

C	**Child anthropometric measures** Check on child health card and also verify with the mother about the following		
C1	Child's date of birth	Day	…..
		Month	……
		Year	…….
C2	Child age in months		…….
C3	Sex	Male	0
		Female	1
C4	Weight in kilograms		……..
C5	Height in (cm)		…….
C6	Measured lying down or standing	Lying down	0
		standing	1
C7	Mid upper arm circumference (MUAC) in cm)		……
C8	Can you explain the main illness that your child suffered in the past 6 months	malaria	1
		Diarrhea	2
		Anemia	3
		Others, specify	4
C9	Are you still breastfeeding your child?	no	0
		yes	1

FOOD INSECURITY EXPERIENCE SCALE				
	Now I would like to ask you some questions about your food consumption in the last 12 months. During the last 12 MONTHS, was there a time when:	No	Yes	Declined
D1	You were worried you would run out of food because of a lack of money or other resources?	0	1	99
D 2	You were unable to eat healthy and nutritious food because of a lack of money or other resources?	0	1	99
D 3	You ate only a few kinds of foods because of a lack of money or other resources?	0	1	99
Q4	You had to skip a meal because there was not enough money or other resources to get food?	0	1	99
D 5	You ate less than you thought you should because of a lack of money or other resources?	0	1	99

D 6	Your household ran out of food because of a lack of money or other resources?	0	1	99
D 7	You were hungry but did not eat because there was not enough money or other resources for food?	0	1	99
D 8	You went without eating for a whole day because of a lack of money or other resources?	0	1	99

E	**Postnatal care**		
E1	When you got pregnant with this child, did you want to get pregnant at that time?	no	0
		yes	1
		Declined	99
E2	Did you see anyone for antenatal care for this pregnancy?	no	0
		yes	1
		declined	99
E3	Where did you receive antenatal care for this pregnancy?	At home	1
		Public clinic	2
		Mission hospital	3
		Private clinic	4
E4	How many months pregnant were you when you first received antenatal care for this pregnancy?	months	……..
		Don't know	
		Declined	
E5	How many times did you receive antenatal care during this pregnancy?	none	0
		one	1
		two	2
		three	3
		four	4
		five	5
		six	6
		seven	7
		Don't know	97
		Declined	99

F	**As part of your antenatal care during this pregnancy, were any of the following done at least once:**		
F1	Was your blood pressure (BP) measured?	no	0
		yes	1
F2	If yes, what was the BP?		……..
F3	Did you give a blood sample?	No	0
		yes	1
F4	What was your hemoglobin level in (g/dl)?	<12	1
		12 to 15.1	0
		>15.1	2

F5	Was your height measured?	no	0
		yes	1
F6	If yes, what was your height (cm)		…….
F7	Were you weighed?	no	0
		yes	1
F8	If yes, what was your weight?		……..
F9	Was the fetal heartbeat checked?	no	0
		yes	1
F10	Did you receive information on what foods to eat?	no	0
		yes	1
F11	During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?	no	0
		yes	1
F12	If yes, how many times did you get a tetanus injection?	times	……..
		Don't know	97
F13	During this pregnancy, did you take Fansidar to keep you from getting malaria?	no	0
		yes	1
		Don't know	97
F14	How many times did you take SP/Fansidar during this pregnancy	Times	…….
F15	When your child was born, how was she in size?	Very large	1
		Larger than average	2
		average	3
		Smaller than average	4
		Very small	5
		Don't know	97
F16	Was your child weighed at birth?	No	0
		Yes	1
		Don't know	97
F17	If yes, how much did your child weigh at birth?	Kgs from card	……..
		Kgs from recall	……..
F18	Who assisted you with the delivery of your child?	Health personnel	1
		Other person	2
		No one assisted	3
F19	Where did you gave birth to your child	home	1
		Public hospital	2
		Mission hospital	3
		Private hospital	4
		Other, specify …..	5
F20	How long after your child was delivered did you stay there?	Hours	1
		Days	2
		Weeks	3
		Don't know	97
F21		no	0

	Was baby delivered by caesarean, that is, did they cut your belly open to take the baby out?	yes	1
		declined	99
F22	Was your child given any drug for intestinal worms in the last six months?	no	0
		yes	1
		Don't know	97
F23	Have you had sexual intercourse since the birth of your child?	no	0
		yes	1
		Declined	99
F24	For how many months after the birth of your child did you not had sexual intercourse?	Number of months	……
F25	Did you ever breastfeed your child?	no	0
		Yes	1
		decline	99
F26	How long after birth did you first put your child to the breast?	Immediately within 1 hr.	1
		After 1 hour	2
		Days	3
		Declined	99
F27	In the first three days after delivery, was your child given anything to drink other than breast milk?	no	0
		yes	1
F28	Are you still breastfeeding your child?	no	0
		yes	1
F29	Did your child drink anything from a bottle with a nipple yesterday or last night?	no	0
		yes	1
		Don't know	97
F30	Did your child ate anything yesterday or last night?	no	0
		yes	1
		Don't know	2
F31	Did your child suffer from diarrhea in the past four weeks?	no	0
		yes	1
		Don't know	97
F32	Now I would like to know how much was your child was given to drink during diarrhea including breastmilk. Was your child given less than usual to drink, about the same amount, more than usual to drink or nothing was given?	Nothing to drink	0
		Much less	1
		Somewhat less	2
		About the same	3
		more	4
F33	When your child had diarrhea, was he/she given less than usual to eat, about the same amount, more than usual, or nothing to eat?	Never gave food	0
		Much less	1
		Somewhat less	2
		About the same	3
		more	4
		Stopped food	5
		Don't know	97
F34		no	0

	Did you seek advice or treatment for the diarrhea from any source?	yes	1
		declined	99
F35	How many days after the illness began did you first seek advice or treatment for your child?	days	……
F36	Where did you seek advice or treatment?	Public hospital	1
		Mission hospital	2
		Private hospital	3
		From shops	4
		From friends	5
		Traditional medicine	6
		Other specify…..	7
F37	Was your child given any of the following at any time since he/she started having the diarrhea:		
F38	A fluid made from a special packet called THANZI -ORS?	no	0
		yes	1
F39	A homemade fluid such as THOBWA?	no	0
		yes	1
F40	Zinc tablets or syrup?	no	0
		yes	1
F41	Was anything else given to treat the diarrhea?	no	0
		yes	1
F42	If yes, what was given to treat diarrhea?	Pill or syrup	1
		injection	2
		intravenous	3
		Home remedy/ herbal medicine?	4
		Other specify…	5
F43	Has your child been ill with a fever at any time in the last 4 weeks?	no	0
		yes	1
	If yes, did you gave any LA or SP or any medicine to the child due to fever?	no	0
		yes	1
F44	How long after the fever started did your child first take LA or SP?	Same day	1
		Next day	2
		2 days after fever	3
		3 or more days after fever	4
		Don't know	97
F45	Has your child had an illness with a cough at any time in the last 2 weeks?	no	0
		yes	1
F46	Has your child had fast, short, rapid breaths or difficulty breathing at any time in the last 2 weeks?	no	0
		yes	1
		Don't know	97
F47	If yes, was the fast or difficult breathing due to a problem in the chest or to a blocked or runny nose?	Chest only	1
		Nose only	2
		Both	3

		Don't know	97
F48	Did you seek advice or treatment for the illness from any source?	no	0
		yes	1
F49	Where did you seek advice or treatment?	government hospital	1
		Mission hospital	2
		Private hospital	3
		Grocery	4
		Traditional practitioner	5
		Other specify…..	6

H	**Child feeding Practices**		
	Now I would like to ask you about liquids or foods that your child had yesterday during the day or at night. I am interested in whether your child had the item I mention even if it was combined with other foods. Did your child drink or eat		
H1	Plain juice	No	0
		yes	1
H2	Juice or juice drinks	No	0
		yes	1
H3	Soft drinks?	No	0
		yes	1
H4	Clear broth? (Mzuwa/la)	no	0
		yes	1
H5	Milk such as tinned, powdered, or fresh animal milk?	No	0
		yes	1
H6	Infant formula (S26, Naan, Lactogene, Infant care)?	No	0
		Yes	1
H7	Any other liquids?	No	0
		Yes	1
H8	Yogurt?	No	0
		Yes	1
H9	Any fortified cereals (Cerelac, Likuni Phala, Nestum, Sibusiso, Gluco Phala)?	No	0
		Yes	1
H10	Bread, rice, noodles, porridge, maize meal (ngaiwa), maize flour (ufa woyera), millet, sorghum, or other foods made from grains.	No	0
		Yes	1
H11	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside?	No	0
		Yes	1
H12	Cocoyams, Irish potatoes, white sweet potatoes, white yams, cassava, or any other foods made from roots or tubers.	No	0
		Yes	1
H13	Any dark green, leafy vegetables e.g. pumpkin leaves, Chinese cabbage, cassava	No	0
		Yes	1

	leaves, beans, cowpeas or sweet potato leaves that are fresh.		
H14	Ripe mangoes, papayas, or guava?	No	0
		Yes	1
H15	Any other fruits or vegetables (e.g. bananas, apples, green beans, avocados, tomatoes, okra)?	No	0
		Yes	1
H16	Liver, kidney, heart, or other organ meats?	No	0
		Yes	1
H17	Any meat, such as beef, pork, lamb, goat, chicken, rabbit or rodents (such as mice, moles, etc.)?	No	0
		Yes	1
H18	Grubs, snails or insects?	No	0
		Yes	1
H19	Eggs?	No	0
		Yes	1
H20	Fresh or dried fish or shellfish, crabs or seafood?	No	0
		Yes	1
H21	Any foods made from beans, pigeon peas, cow peas, lentils, nuts, soybeans or ground nut powder (nsinjiro)?	No	0
		Yes	1
H22	Cheese or other food made from milk?	No	0
		yes	1
H23	Any oil, fats, or butter, or foods made with any of these?	No	0
		yes	1
H24	Any sugary foods such as chocolates, sweets, candies, sugar cane, honey, cakes, or biscuits?	No	0
		yes	1
H25	Did your child eat any solid, semi-solid, or soft foods yesterday during the day or at night?	No	0
		yes	1
H26	If yes, what kind of food	solid	…….
		semisolid	……..
		Soft foods	…….
H27	The last time your child passed stools, what was done to dispose of the stools?	Child used toilet	1
		Put/rinse into toilet or latrine	2
		Put/rinse into drain or ditch	3
		Thrown into garbage	4
		Buried	5
		Left in the open	6
		Thrown into the bush	7

		Other specify….	8

G	HOUSEHOLD FOOD INSECURITY ACCESS SCALE (HFIAS). I would like to start off by reading some statements that people have made about their household's food consumption over the past four weeks. For each statement I would like you to tell me whether this happened rarely, sometimes, often or never in the past four weeks.				
	Question (Check only one response). Note that all the following questions are for the last 30 days or month.	**Never**	**Rarely (Once or Twice)**	**Sometimes (3-10 Times)**	**Often (More than 10 times)**
G1	In the past four weeks, did you worry that your household would not have enough food?	0	1	2	3
G2	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources (money)?	0	1	2	3
G3	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources (money)?	0	1	2	3
G4	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0	1	2	3
G5	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0	1	2	3
G6	In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?	0	1	2	3
G7	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources (money) to get food?	0	1	2	3
G8	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0	1	2	3
G9	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0	1	2	3

I	**Number of children**

	In this section, I want to know more about your children. You are free to decline answering any question that you feel you don't want to		
I1	How many children did you gave birth in total		……
I2	How many children that you gave birth are alive in total		……..
I3	Do you have any sons to whom you have given birth who are now living with you?	no	0
		yes	1
I4	If yes, how many sons are you living with you at the moment		……
I5	Do you have any daughters to whom you have given birth who are now living with you?	no	0
		yes	1
I6	If yes, how many daughters are living with you in your household		……..
I7	Do you have any sons to whom you have given birth who are alive but do not live with you	no	0
		yes	1
I8	How many sons are alive but do not live with you?		…….
I9	Do you have any daughters to whom you have given birth who are alive but do not live with you?	no	0
		yes	1
I10	How many daughters are alive but do not live with you?		
I11	Have you ever given birth to a boy or girl who was born alive but later died?	no	0
		yes	1
I12	How many boys have died?		……
I13	How many girls have died?		……...

J	**Household Dietary diversity Score (HDDS)** Now I would like to ask you about the types of foods that you or anyone else in your household ate **YESTERDAY.** By yesterday we are referring to foods that were eaten during the day and/or at night.			
	Food group	**Examples**	**No**	**Yes**
J1	Cereals	Any pasta, bread, rice noodles, biscuits or any other foods made from flour, millet, sorghum, maize, rice, wheat, or oats	0	1
J2	Tubers and roots	Any potatoes, sweet potatoes, beetroots, carrots or any other foods made from them	0	1
J3	Vegetables	Relish of dark green leafy vegetables as well as the indigenous vegetables including, Cat's whiskers leaves, Amaranthus, cassava leaves, sweet potato leaves, rape, local rape, pumpkin leaves, cow peas leaves, bean leaves, black jack leaves	0	1
J4	Fruits	Any other fruits including the indigenous wild fruits e.g. oranges, tangerines, lemons, tamarind, elephant fruits, masawo, avocado pears, bananas and baobab fruits.	0	1

J5	Meats	Any meat e.g. beef, lamb, pork, goat meat, rabbit meat, mice, wild game, poultry duck, flying insects e.g. guinea fowl or any other bird, liver, kidney, heart, or any other meat.	0	1
J6	Eggs	Eggs of any kind?	0	1
J7	Fish	Any fresh or dried fish**?**	0	1
J8	Legumes, nuts and seeds	Any type of beans and peas e.g. beans, cow peas, pigeon peas, peas, ground beans, soya beans, ground nuts, green gram, custard apple, chick?	0	1
J9	Milk and milk products	Any cheese, yoghurt, milk or other milk/dairy products	0	1
J10	Oils and Fats	Any foods made with oil, fat, or butter	0	1
J11	Sweets	Any sweet, sugar, honey, soft drinks	0	1
J12	coffee/tea	Any tea or coffee?	0	1

K	READ TO THE RESPONDENT: Now I would like to ask you questions about some other important aspects of a woman's life. You may find some of these questions very personal. However, your answers are crucial for helping to understand the condition of women in Malawi. Let me assure you that your answers are completely confidential and will not be told to anyone and no one else in your household will know that you were asked these questions. If I ask you any question you do not want to answer, just let me know and I will go on to the next question.		
	Controlling behavior First, I am going to ask you about some situations which happen to some women. Please tell me if these apply to your relationship with your (last) (husband/partner)?		
K1	He (is/was) jealous or angry if you (talk/talked) to other men?	no	0
		yes	1
		declined	97
K2	He frequently (accuses/accused) you of being unfaithful?	no	0
		yes	1
		declined	97
K3	He (does/did) not permit you to meet your female friends?	no	0
		yes	1
		declined	97
K4	He (tries/tried) to limit your contact with your family?	no	0
		yes	1
		declined	97
K5	He (insists/insisted) on knowing where you (are/were) at all times?	no	0
		yes	1

		declined	97
L	**Emotional abuse** Now I need to ask some more questions about your relationship with your (last) (husband/partner).		
	Did your (last) (husband/partner) ever:		
L1	Say or do something to humiliate you in front of others?	no	0
		yes	1
		declined	97
L2	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
L3	Threaten to hurt or harm you or someone you care about?	no	0
		yes	1
		declined	97
L4	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
L5	Insult you or make you feel bad about yourself?	no	0
		yes	1
		declined	97
L6	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M	**Physical abuse** Did your (last) (husband/partner) ever do any of the following things to you		
M1	Push you, shake you, or throw something at you?	no	0
		yes	1
		declined	97
M2	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M3	Slap you?	no	0
		yes	1
		declined	97
M4	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M5	Twist your arm or pull your hair?	no	0
		yes	1

		declined	97
M6	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M7	Punch you with his fist or with something that could hurt you?	no	0
		yes	1
		declined	97
M8	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M9	Kick you, drag you, or beat you up?	no	0
		yes	1
		declined	97
M10	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M11	Try to choke you or burn you on purpose?	no	0
		yes	1
		declined	97
M12	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
M13	Threaten or attack you with a knife, gun, or other weapon?	no	0
		yes	1
		declined	97
M14	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3

N	**Sexual abuse** Did your (last) (husband/partner) ever do any of the following things to you		
N1	Pressured you to have sex, through harassment, threats or tricks and did succeed?	no	0
		yes	1
		declined	97
N2	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
N3	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?		

N4	Physically force you to have sexual intercourse with him when you did not want to?	no	0
		yes	1
		declined	97
N5	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
N6	Physically force you to perform any other sexual acts you did not want to?	no	0
		yes	1
		declined	97
N7	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3
N8	Force you with threats or in any other way to perform sexual acts you did not want to?	no	0
		yes	1
		declined	97
N9	If yes, how often did this happen during the last 12 months: often, only sometimes, or not at all?	often	1
		sometimes	2
		Not in last 12 months	3

O	Additional questions on violence experience		
O1	How long after you first (got married/started living together) with your (last) (husband/partner) did (this/any of these things) first happen?	Number of years	…..
O2	Did the following ever happen as a result of what your (last) (husband/ partner) did to you:		
O3	You had cuts, bruises, or aches?	No	0
		yes	1
O4	You had eye injuries, sprains, dislocations, or burns?	No	0
		yes	1
O5	You had deep wounds, broken bones, broken teeth, or any other serious injury?	No	0
		yes	1
O6	Does (did) your (last) (husband/partner) drink alcohol?	No	0
		yes	1
O7	How often does (did) he get drunk: often?	often	1
		sometimes	2
		never	3
O8	Are (Were) you afraid of your (last) (husband/partner)	often	1
		sometimes	2
		Never afraid	3

P	**So far we have been talking about the behavior of your (current/last) (husband/partner). Now I want to ask you about the behavior of any previous (husband/partner/boyfriend)**

P1	Did any previous (husband/partner) ever hit, slap, kick, or do anything else to hurt you physically?	no	0
		yes	1
P2	If yes, how long ago did this last happen?	0-11 months ago	1
		12+ months ago	2
		Declined	99
P3	Did any previous (husband/partner) physically force you to have intercourse or perform any other sexual acts against your will?	No	0
		yes	1
P4	If yes, how long ago did this last happen?	0-11 months ago	1
		12+ months ago	2
		Don't remember	99

Q	**Child health condition**				
	Now I would like to talk to you about the health condition of your child. All the information you give me will remain strictly confidential and your answers will never be shared with those outside of our team.	no	yes	Don't know	declined
Q1	Compared with other children, does or did this child have any serious delay in sitting standing, or walking?	0	1	97	99
Q2	Compared with other children, does your child have difficulty seeing, either in the daytime or at night?	0	1	97	99
Q3	Does your child appear to have any difficulty hearing (uses hearing aid with difficulty or completely deaf)?	0	1	97	99
Q4	When you tell your child to do something, does he/she seem to understand what you are saying?	0	1	97	99
Q5	Does your child have difficulty in walking or moving his/her arms or does he/she have weakness and/or stiffness in the arms or legs?	0	1	97	99
Q6	Does your child sometimes have fits, become rigid, or lose consciousness?	0	1	97	99
Q7	Does your child learn to do things like other children of his/her age?	0	1	97	99
Q8	Compared with other children of the same age, does your child appear in any way mentally backward, dull or slow?	0	1	97	99

R	**Self-Reporting Questionnaire (SRQ) to screen maternal depressive disorder.** I want to ask you the following questions. Please feel free to respond or not to respond if it is not okay with you.	No	Yes	Decline
R1	Do you often have headaches?	0	1	99
R2	Is your appetite poor?	0	1	99
R3	Do you sleep badly?	0	1	99
R4	Do your hands shake?	0	1	99
R5	Do you feel nervous tense or worried?	0	1	99
R6	Are you easily frightened?	0	1	99
R7	Is your digestion poor?	0	1	99
R8	Do you have trouble thinking clearly?	0	1	99
R9	Do you feel unhappy?	0	1	99
R10	Do you cry more than usual?	0	1	99
R11	Do you find it difficult to enjoy your daily activities?	0	1	99
R12	Do you find it difficult to make decisions?	0	1	99
R13	Is your daily work suffering?	0	1	99
R14	Are you unable to play a useful part in life?	0	1	99
R15	Have you lost interest in things?	0	1	99
R16	Do you feel that you are a worthless person?	0	1	99
R17	Has the thought of ending your life been on your mind?	0	1	99
R18	Do you feel tired all the time?	0	1	99
R19	Do you have uncomfortable feelings in your stomach?	0	1	99
R20	Are you easily tired?	0	1	99

S	**Family planning and household characteristics** I want to ask you some questions that are important to this study. Please feel free to let me know if you do not want to respond to any question.		
S1	Are you pregnant now?	no	0
		yes	1
		Unsure	2
		declined	99
S2	When you got pregnant, did you want to get pregnant at that time?	no	0
		yes	1
		Declined	99
S3	Have you ever had a pregnancy that miscarried, was aborted, or ended in a stillbirth?	no	0
		yes	1
		Declined	99
S4	If yes, in total, how many miscarriages have you had		…….
S5	In total, how many stillbirths have you had?		…….
S6	When did the last such pregnancy end?		……..
S7	Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?	no	0
		yes	1

S8	If yes, which method are you using?	Female sterilization	1
		Male sterilization	2
		IUD	3
		Implants	4
		Pill	5
		Male condom	6
		Female condom	7
		Standard days method	8
		Lactational amenorrhea method	9
		Rhythm method	10
		Withdrawal	11
		Other modern methods specify	12
		Other traditional method specify	13
S9	In the last 12 months, have you visited a health facility for care for yourself or your children?	no	0
		yes	1
		Declined	99

O	**Household hygiene**		
T1	What is the main source of drinking and domestic water for members of your household?	Piped water	1
		Borehole	2
		Dug well	3
		Water from spring	4
		Rain water	5
		River/dam/ lake	6
		Bottled water	7
		Others, specify…	8
T2	How long does it take to go and get water, and come back?	Half hour or less	1
		30 to 1 hour	2
		1hr to 1.5hr	3
		1.5 to 2hrs	4
		More than 2 hrs	5
T3	Do you do anything to the water to make it safer to drink?	no	0
		yes	1
T4	If yes, What do you usually do to make the water safer to drink?	boil	1
		Add bleach/chlorine.	2
		strain through a cloth	3
		use water filter	4
		solar disinfection	5

		let it stand and settle	6
		Other specify…..	7
T5	What kind of toilet facility do members of your household usually use?	flush toilet	1
		pit latrine	2
		composting toilet	3
		no facility /bush/ field	4
		Other specify ……	5
T5	What type of fuel does your household mainly use for cooking?	electricity	1
		charcoal	2
		wood	3
		agricultural crop	4
		Other specify …….	5
T6	How many agricultural acres does your family own?	1 acre	1
		1 to 2 acres	2
		2-4 acres	3
		5 or more acres	4
T7	Does your child sleep under mosquito nets?	no	0
		yes	1
T8	At any time in the past 12 months, has anyone come into your dwelling to spray the interior walls against mosquitoes?	no	0
		yes	1

U	**Husband demographic characteristics**		
U1	How old is your husband/partner (years)		…..
U2	What is the age range of your husband/partner compared to your age	Almost same age as you	1
		5 years older than you	2
		5 years younger than you	3
		6-10 years older than you	4
		10 and more years older than you	5
U3	What is the educational level of your husband	No education	1
		primary	2
		secondary	3
		Tertiary	4
U4	Does your husband drink beer	no	0
		yes	1
U5	Does your husband smoke	no	0
		yes	1
U6		no	0

	Does your husband have another wife apart from you?	yes	1
U	Does your husband has an extra marital affair with other women/girls apart from you?	no	0
		yes	1
U7	What is does your husband does to earn a living?	farming	1
		Formal employment	2
		Does informal employment	3
		Do not do anything	4
		others	5
U8	What kind of illness does your husband usually complain of?	headache	1
		malaria	2
		HIV/AIDS	3
		Diarrhoea	4
		STIs	5
		TB	6
		Others, specify	7
U9	Was your husband married before marrying you?	no	0
		yes	1

T	**MONTHLY HOUSEHOLD EXPENSES**	**AMOUNT**
V1	How much money does your household spent in the past 30 days	……..
V2	What was the average monthly household expenditure in the past 12 months in Malawi kwacha (MK)	……
V3	How much money did your household spent on the following items last months:	
V3a	Food and Groceries	…….
V3b	Housing (rent, mortgage payments, maintenance, renovation)	……..
V3c	Clothing	…….
V3d	Transportation (minibus, bicycle, motor vehicle)	……
V3e	Telecommunications (cell-phone, telephone, internet)	…….
V3f	Medical care (doctor's visits, medications, supports)	……
V3g	Education (tuition, books, uniforms)	…….
V4	Approximate Total expenditure last month	……

W	**ASSETS Does your household have the following?**	**Yes**	**No**
W1	Television	1	0
W2	Cellular phone	1	0

W3	Sofa set	1	0
W4	Refrigerator	1	0
W5	Bicycle	1	0
W6	Tobacco press	1	0
W7	Ox-cart	1	0
W8	Motorcycle or car	1	0
W9	Solar electricity	1	0
W10	ESCOM electricity	1	0
W11	Cattle [enter #]	1	0
W12	Pigs [enter #]	1	0
W13	Sheep [enter #]	1	0
W14	Goats [enter#]	1	0

X	House structure quality Question (*Instructions*)	Possible Responses	Code
X1	What is the main construction material of the outside walls of your household's dwelling unit? ***(Circle one code to indicate the main material)***	Earth bricks (not fired)	1
		Fired bricks	2
		Timber planks	3
		Cement blocks	4
		Sticks	5
		Mud house	6
		Other (specify) _____	7
X2	What is the main construction material of the roof of your household's dwelling unit?	Grass thatch	1
		Corrugated iron	2
		Clay tiles	3
		Other (specify) _____	4

Y	Acknowledgement

Thank you very much for spending this time talking with us. The information you have provided is very valuable and we appreciate you sharing it with us. Just to reiterate, as we have not recorded your family name so no one can link what you have said to you or this household, so your confidentiality is totally guaranteed.

Goodbye.

Interviewer / Supervisor pledge: I hereby certify that this interview has been completed in full with the respondent and according to the instructions I received from Emmanuel. Furthermore, this interview has been thoroughly checked.

Interviewer:		**Date:**		**Supervisor:**		**Date:**	

End Time of Interview	HH : MM