CANGO LYEC (HEALING THE ELEPHANT):

EXPLORING IMPACTS OF THE LORD'S RESISTANCE ARMY INSURGENCY

ON MENTAL HEALTH OF CONFLICT-AFFECTED POPULATIONS IN

NORTHERN UGANDA

by

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Abstract

Background: From 1986 to 2006, Northern Uganda experienced an atrocious civil war between the Lord's Resistance Army and the Ugandan government which left in its wake mass casualties, child abductions, sexual violence, and socio-economic breakdown. The local Acholi people continue to be impacted by trauma sequelae of the war and a variety of daily stressors including poverty, hunger, and an ongoing HIV epidemic. To date, there is a dearth of gender-differentiated research in this post-conflict context examining mental health and associated vulnerability factors.

Objectives: This thesis explores two mental health outcomes, PTSD and depression, among conflict-affected people in Northern Uganda five years after the cessation of hostilities. A socio-ecological framework is adopted to investigate risk factors at individual, relationship, and community levels. Special attention is paid to the plight of women and formerly abducted children.

Methods: This research is embedded within a longitudinal cohort project, Cango Lyec (Healing the Elephant), which evaluates HIV and associated risks in post-conflict Northern Uganda. Baseline categorical variables were compared between males and females using Fisher's exact test. Bivariate and multivariate logistic regression was used to model correlates of positive screening for PTSD and depression. All analyses were stratified by gender, and subgroup analyses for former abductees were conducted.

Results: We found the overall prevalence of probable PTSD and depression was 11.7% and 15.2% respectively. Among former abductees, the prevalence was 23.2% for probable PTSD and 26.6% for probable depression. Females were significantly more likely to have poor mental health than their male counterparts. Factors found to be associated with poor mental health included environmental stressors, war-related trauma, abduction and experiences in the bush, sexual violence, intimate partner violence, sexually transmitted infections, and HIV.

Conclusions: Cango Lyec participants displayed lower rates of PTSD and depressive symptoms compared to previous studies. Reviving the local agrarian economy, ensuring food and housing security, providing trauma-informed care, eliminating sexual violence and gender-biased social institutions, as well as increasing educational and employment opportunities for former abductees remain important tasks to facilitate post-conflict rehabilitation in Northern Uganda.

Lay Summary

Two decades of war between the Lord's Resistance Army and the Ugandan government left in its wake major damages to the social, economic, and cultural fabric of Northern Uganda. This thesis study, embedded in a longitudinal project called Cango Lyec (Healing the Elephant), sought to investigate the state of population mental health in this post-conflict context. The prevalence of probable PTSD and depression among the baseline Cango Lyec cohort was 11.7% and 15.2% respectively. Results of this study demonstrate that Northern Ugandans bear a heavy burden of war-related trauma, which continues to have tremendous impacts on their post-conflict mental health. Other risk factors for poor mental health include environmental stressors, abduction and related experiences, sexual violence, and HIV infection. Firm actions are needed to curb the HIV epidemic, provide trauma-informed care to those in need, and revive the agrarian economy which has sustained the local Acholi people since time immemorial.

Preface

This work consists of a secondary analysis of the Cango Lyec Project baseline data, which were collected by staff on the ground in Northern Uganda. Jue Luo conceptualized the research design and wrote each chapter with guidance and feedback from the supervisory committee (Patricia M. Spittal, Anne M. Gadermann, and Martin T. Schechter). Recoding of data and statistical analyses presented in Chapter 3 and 4 were assisted by David Zamar, the Cango Lyec Project statistician. This research was approved by the University of British Columbia and Providence Health Care Research Ethics Board (certificate number: H20-00413). Adapted versions of Chapter 3 and 4 will be submitted for publication to peer-reviewed journals.

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List of Abbreviations

AIDS   Acquired immunodeficiency syndrome

AOR   Adjusted odds ratio

ARV   Antiretroviral therapy/treatment

DSM-IV   Diagnostic and Statistical Manual-IV

HIV   Human immunodeficiency virus

HSCL-25   Hopkins Symptom Checklist-25

HTQ   Harvard Trauma Questionnaire

IPV   Intimate partner violence

OHCHR   Office of the United Nations High Commissioner for Human Rights

PHC   Primary health care

PTSD   Post-traumatic stress disorder

SLRC   Secure Livelihoods Research Consortium-Uganda Survey

STI   Sexually transmitted infection

SWAY   The Survey of War Affected Youth

UNICEF   United Nations Children's Fund

UOR   Unadjusted odds ratio

UPDF   Uganda People's Defence Force

WAYS   The War-affected Youths Study

WHO   World Health Organization

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First and foremost, I would like to thank everyone who participated in the Cango Lyec Project. The depth of pain and suffering you have gone through is beyond my imagination. Writing this thesis was a very humbling experience. It made me genuinely cherish peace, the life I have, and the kinship I share with my family.

A huge thank you to my supervisor Dr. Patricia Spittal, who kindly took me under her wing when I was struggling to find the right path and offered me much needed guidance along the way. I am deeply indebted to David Zamar for his coding assistance, expertise on statistics, and incredible patience with me. Without David's help, this thesis would not have been possible. I wish to extend my gratitude to Drs. Anne Gadermann, Martin Schechter, and Rod Knight for their valuable feedback, which elevated what I wrote. Many thanks to people in the SPPH community who spent their precious time orienting me as a novice researcher: Emily, Dr. Susan Cox, and Dr. Oviedo-Joekes, among others.

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as who I am, even in the darkest moments of my life. Your personal story of surviving the

HIV/AIDS epidemic, which I did not get to know till recently, was one of the inspirations for

this thesis.

Dedication

To all those who've survived unspeakable trauma.

Chapter 1: Introduction, Historical Background, & Literature Review

1.1   Thesis overview

From 1986 to 2006, Northern Uganda experienced one of the most atrocious civil wars in modern history. Until today, a large number of survivors in the region are plagued by poverty, a rising HIV epidemic, as well as the lingering effects of trauma. The purpose of this thesis is to examine two mental health outcomes–post-traumatic stress disorder (PTSD) and depression–in this unique context of post-conflict transition. It takes a gender-focused approach and pays special attention to former child abductees who are considered a "lost generation" (S. H. Patel, 2012).

This thesis is divided into five sections. Chapter 1 gives an overview of the historical background and summarizes previous literature on post-conflict mental health. It includes an explanation of the socio-ecological framework underpinning the thesis. Chapter 2 introduces the Cango Lyec Project and provides details of quantitative methods used to investigate mental health and associated factors among the baseline cohort. Chapters 3 and 4 present gender-stratified results for the general population and former abductees, categorized into post-conflict environmental stressors, war-related trauma, sexual and relationship vulnerabilities, and sexual health outcomes. Chapter 5 synthesizes the findings and proposes recommendations for future research and policy development.

1.2   Timeline of the war and its aftermath

1.2.1   The Lord's Resistance Army insurgency

Northern Uganda, located along the border of Uganda and South Sudan, is traditionally inhabited by Luo-speaking people of the Acholi ethnicity. For two decades from 1986 to 2006,

the region experienced a brutal armed conflict between a rebel group, the Lord's Resistance Army (LRA), and the Ugandan government. This war eventually turned into a humanitarian crisis, resulting in innumerable deaths, child abductions, widespread sexual violence, and the destruction of social and economic structures. More than 10,000 civilians lost their lives and up to 2 million people–more than 90 percent of the population of Acholiland–were displaced (Day, 2019; Malamba et al., 2016).

At its beginning, the conflict stemmed from a longstanding division between the South and North of Uganda arising from the country's colonial and post-colonial legacies. Since British colonial rule (1894-1962), economic and political power had concentrated in the South, leading to underdevelopment of the North, while the Northern Acholi people controlled much of the country's military power (Finnström, 2008; Westerhaus, 2007). Mistrust and antagonism abounded between the Acholi and ethnic groups of southern Uganda. When South-born and raised President Yoweri Museveni took power through a coup in 1986, fear broke out among the Acholi for impending repression and reprisals by the southern tribes, leading to the formation of a wave of Acholi nationalist movements (Blair, 2017; Finnström, 2008; S. H. Patel, 2012). Prominent among those was the LRA, a rebel guerrilla force led by a man named Joseph Kony, who devised a cosmological system merging Acholi traditions with Christianity, claimed himself to be the spokesperson of God, and sought to establish a theocratic society in Northern Uganda (Day, 2019).

As the war progressed, Kony was faced with dwindling support from the Acholi and thus felt betrayed by his fellow men (Blair, 2017). He viciously turned against them by ordering his troops to commit a range of heinous crimes, which included looting, burning, torture, mutilation, and killing with no sparing of the elderly, women, or children. After raiding a village, the LRA

would order villagers to kill their loved ones, sometimes even to dismember and cook body parts

of the dead (OHCHR & UHRC, 2011). Numerous shrines in Acholiland were burned down, with

elders who practiced ancestral worship targeted to be killed (Finnström, 2008).

1.2.2   Internally displaced persons (IDP) camps

In order to eliminate pockets of LRA sympathizers, control land of the countryside, cut

food supplies to the LRA, and facilitate military pursuit of the rebels, the Ugandan government

forced local civilians to move into internally displaced persons (IDP) camps–often at gunpoint

(Day, 2019; Finnström, 2008; OHCHR & UHRC, 2011). They were given less than 48 hours to

evacuate from their home villages and, once in camps, could not return home due to government-

enforced travel restrictions (Blair, 2017; Roberts, Odong, et al., 2009).

The living situation in IDP camps was characterized by overcrowding, squalor, poverty,

diseases, and food/water insecurity (S. H. Patel, 2012; Roberts, Ocaka, Browne, Oyok, &

Sondorp, 2008). Basic services, including infrastructure, education, and healthcare, were scarcely

provided in camps, since the Ugandan government, determined to win the war militarily, chose

to pour money into military operations (Westerhaus, 2007). Overcrowded living space led to the

loss of freedom and privacy for camp residents, who expressed longings for "fresh air" (Roberts,

Odong, et al., 2009). They became dependent on food supplies, which were often inconsistent

and insufficient, from relief agencies, leaving these residents in a chronic state of hunger (Allen,

2007; McElroy, Muyinda, Atim, Spittal, & Backman, 2012; Westerhaus, 2007). At the height of

the conflict in 2005, an unprecedented number of deaths in IDP camps was recorded, mostly due

to malnutrition and preventable diseases (Finnström, 2008; Uganda Ministry of Health & WHO,

2005). Children in particular fell prey to infectious diseases that were easily transmitted in

congested settings, with an exceedingly high mortality rate (Uganda Ministry of Health & WHO, 2005).

As people were rendered powerless to access their family land and cultivate income-generating crops, poverty spread rampantly in IDP camps (Roberts, Odong, et al., 2009; Spittal et al., 2008). Impoverished parents were frustrated by their inability to provide for their children, including buying them clothes and paying school fees (Roberts, Odong, et al., 2009). Moreover, parents lived in a state of perpetual fear of the LRA abducting their children, especially for those living on the periphery of a camp (Finnström, 2008; Kizza, Knizek, Kinyanda, & Hjelmeland, 2012a; Mugisha, Muyinda, Wandiembe, & Kinyanda, 2015). Family separation became a painful choice, as parents sent their children to commute over long distances and sleep in temporary shelters near urban trading centres to escape the LRA's nightly abductions (Spittal et al., 2008; Westerhaus, 2007). Among these "night commuters," young girls who traveled unsupervised and unprotected were especially vulnerable as older men would coerce them into transactional sex (Blair, 2017; Spittal et al., 2008).

On a collective level, IDP camp life weakened the Acholi family structure, deprived people of kin-based relationships and support, and reduced the traditional authority of elders (OHCHR & UHRC, 2011). Rapid shifts in social and gender dynamics were witnessed in those settings: formal marriages through the exchange of customary payments became nearly extinct, as residents engaged in culturally inappropriate sexual behaviours fueling a rise in HIV infections (Blair, 2017; H. Porter, 2019). Parents expressed woes about negative peer influences to which their children were exposed, while feeling disempowered to pass on traditional values and norms and earn the latter's respect under constrained circumstances (Spittal et al., 2008). As Porter (2019) noted through her extensive field work as an anthropologist, "(t)he result was new

vulnerabilities to sexual violence and exploitation coupled with greater sexual autonomy in IDP camps." Of note, women were susceptible to gender-based violence and exploitation during their daily activities of living, such as when going to the washroom, fetching firewood or water, and tending to their gardens on the outskirts of the camps (Karunakara et al., 2004; Westerhaus, 2007). Sexual assault against women was perpetrated by a range of actors, including members of armed forces and fellow camp residents, the latter often under the influence of alcohol (S. H. Patel, 2012; H. E. Porter, 2015). With the loss of livelihood, Northern Ugandan men became unable to fulfill the cultural expectation of protecting and providing for their families; many sought escape in maladaptive behaviours, including gambling, over-drinking, and involvement in promiscuous relationships (Kizza et al., 2012a; McElroy et al., 2012). Women, on the other hand, frequently took on the role of breadwinners, for example, by brewing alcohol and participating in petty trading (Kizza et al., 2012a; McElroy et al., 2012). This reversal of gender roles further threatened Acholi men's sense of masculinity and exacerbated their feelings of defeat, humiliation, and loss of control, contributing to elevated rates of suicide (Kizza, Knizek, Kinyanda, & Hjelmeland, 2012b).

1.2.3   Abduction of children and young women

During the war, the LRA forcibly abducted between 25,000 and 66,000 children, subjecting them to extreme cruelties, including forced labor, indiscriminate killings, physical mutilation, and sexual violence (Annan, Blattman, & Horton, 2006; Finnström, 2008). The LRA favoured abducting adolescent boys, who were then indoctrinated into a culture of violence and readily used as soldiers and human shields during battles (Annan et al., 2006; OHCHR & UHRC, 2011). The LRA reportedly adopted a strategy of "burning the bridge," coercing abductees to

commit atrocities against each other and their own communities, thereby severing pre-existent

social ties and becoming dependent on rebel activities for survival (Amone-P'Olak et al., 2013).

While in captivity, children faced the punishment of execution if they displayed any sign of

disobedience or homesickness (OHCHR & UHRC, 2011). They were threatened with revenge on

their home villages and family members if caught trying to escape (Amone-P'Olak et al., 2013).

In the meantime, the LRA was notorious for their horrific treatment of female abductees.

They targeted sexually naïve young girls based on the belief that they were less likely to be

infected with HIV (Amone-P'Olak et al., 2013; S. Patel et al., 2013). Rape was utilized as a war

tactic to terrorize the Northern population as well as to secure soldiers' loyalty through rewards

(H. E. Porter, 2015). Once abducted, pubescent girls would be assigned to LRA commanders or

fighters as "brides;" when their "husbands" died, they would be delegated to the next LRA

member in rank order (OHCHR & UHRC, 2011). The LRA prohibited any sexual relations

outside the confines of these forced marriages; any woman found to engage in extra-marital sex

would be court-martialed and executed by a firing squad (Amone-P'Olak et al., 2016; OHCHR

& UHRC, 2011; S. Patel et al., 2013).

Female abductees, upon becoming "brides," were forced to conceive and bear children to

satisfy the LRA's demand for a new generation of Acholi fighters uncontaminated by the blood

of Museveni and his southern tribes (Amone-P'Olak et al., 2016; H. E. Porter, 2015; Shanahan &

Veale, 2016). On occasions when pregnant women or mothers with children were captured, they

were forced to witness their existing children, deemed by the LRA as "useless civilian children,"

die from starvation or lack of medicine (OHCHR & UHRC, 2011). Captured women who

rebelled against the LRA were ruthlessly tortured or even burned alive (OHCHR & UHRC,

2011). In addition, the LRA conducted mass mutilation of female bodies, including "cutting off

people's ears, lips, nose, fingers or limbs ... [and] females' breasts and genitals" as described by a United Nations report (OHCHR & UHRC, 2011).

Besides forced sex and childbearing, the LRA also exploited women as farmers, cooks, and labourers out of their desperate need to live off the land and sustain rebel activities in an agrarian economy (OHCHR & UHRC, 2011; H. E. Porter, 2015). Women were ordered to carry children and heavy loads (looted goods, weapons, ammunitions, living supplies) on their backs over long distances in the midst of dangers (Atim, Mazurana, & Marshak, 2018; OHCHR & UHRC, 2011). This led to sustained injuries and medical problems that affected many women's ability to carry out productive activities in the post-conflict era (Atim et al., 2018; OHCHR & UHRC, 2011).

1.2.4   Operation Iron Fist and cessation of hostilities

The Northern Ugandan war ended up drawing global attention for its appalling human rights violations. In the wake of the 9/11 attacks, the United States government listed the LRA as a terrorist group, which compelled the Muslim Sudanese government to suspend aid to the LRA (Blair, 2017; S. H. Patel, 2012). In March 2002, the Uganda People's Defence Force (UPDF) launched an intensive attack on the LRA base in South Sudan called "Operation Iron Fist" with the goal of ending the protracted conflict once and for all. The move proved to be a miscalculation and resulted in disastrous consequences. The LRA rebels poured back into Northern Uganda *en masse* and committed atrocities against the civilian population on a scale never seen before (Spittal et al., 2008). IDP camps became major targets for looting, killings, and child abductions (OHCHR & UHRC, 2011). With the advancement of Operation Iron Fist, an even greater number of people were displaced and deprived of land access (Spittal et al., 2008).

This accelerated the breakdown of Acholi culture that is intrinsically linked to agriculture and livestock breeding (Blair, 2017; S. H. Patel, 2012).

Brutal counter-insurgency tactics employed by governmental troops aimed at intimidating the Northern people into submission caused no less amount of suffering (Day, 2019). The UPDF was accused of using excessive force and unlawfully torturing and executing captured LRA fighters, despite the latter being mostly victims of abduction and abuse (OHCHR & UHRC, 2011). The UPDF reportedly engaged in widespread raping of females, especially those suspected of LRA affiliation (OHCHR & UHRC, 2011). They also looted people's homes to force them into camps and recruited minors into the combat force (Finnström, 2008; OHCHR & UHRC, 2011).

Operation Iron Fist was followed by a period of intensified fighting, which ended up causing enormous damages for the LRA (Blair, 2017). In 2006, through mediation by the Sudanese government, the LRA and the Ugandan government signed a Cessation of Hostilities Agreement, marking an end to the protracted conflict (Malamba et al., 2016). Joseph Kony, the LRA leader, ultimately refused to sign the Final Peace Agreement and remains at large to this day. Although the LRA continues to launch sporadic attacks in neighbouring countries, no LRA activity has been noted within the bounds of Northern Uganda. In 2005, the International Criminal Court indicted top members of the LRA on charges of war crimes and crimes against humanity (Allen, 2007; Schultz & Weisæth, 2015).

1.2.5   Post-conflict transition and resettlement

After the ceasefire and the lifting of wartime mobility bans, more than 90% of IDP camp residents had migrated back to their ancestral lands as of December 2010 (Malamba et al., 2016).

Though peace prevailed, vulnerabilities engendered by the war persisted, and the resettling process presented a host of new challenges to the local population. As relief agencies quickly withdrew from the region, people were left without immediate access to basic services and goods, including food (S. H. Patel, 2012). On the governmental level, the implementation of rehabilitation and redevelopment programs was thwarted by temporal delays, corruption, lack of intersectoral coordination, and funding shortages (S. H. Patel, 2012; Spittal et al., 2018). Years after the war, food and water supplies, sanitation facilities, health centres, and schools are still notably insufficient in Northern Uganda (Blair, 2017; UNICEF, 2011a).

On the journey back to ancestral lands, many people left vulnerable members of their families (e.g., young girls, the elderly, and the disabled) near urban centres where essential infrastructure clustered (Blair, 2017). This exposed those members to a lack of protection and social connections and disrupted intergenerational transmission of knowledge and cultural norms (Blair, 2017). As women navigated environments outside the bush and IDP camps, they faced daily challenges of poverty, malnutrition, stigma, and gender-based violence, as well as limited education and job opportunities (Spittal et al., 2018). With the rapid expansion of cross-border trade between Northern Uganda and South Sudan, young girls and women were seen engaged in sex work on highways to survive (Spittal et al., 2018). Many of these young Acholi women had been raped or sexually abused during the war and thus were faced with increased risk for sexual exploitation, infectious diseases, and compounded trauma (Spittal et al., 2018).

The once fertile Acholiland had been severely damaged by warfare; some pieces of land even became uncultivable because of unexploded landmines previously planted by the LRA (OHCHR & UHRC, 2011). Numerous land disputes arose as families returned home, only to find their land had been resettled by strangers or unauthorized family members (Mabikke, 2011).

These disputes surrounding land ownership were hard to resolve due to official documentation being destroyed during the war and the death of elders who traditionally oversaw land use and transfer (Kobusingye, 2018; Mabikke, 2011). In combination, constricted land access and post-conflict land disputes undermined the Acholi people's ability to resume farming and livestock breeding for daily subsistence, leading to widespread hunger (S. H. Patel, 2012). To make matters worse, a drought struck the region in 2009 and led to mass crop failure and a dire shortage of food (IRIN News, 2009a, 2009b).

The 20-year war resulted in a profound erosion of cultural values, social cohesion, and intergenerational bonding within Acholi society, hindering not only individual psychosocial adjustment but also community-wide reconstruction efforts (S. H. Patel, 2012). The time-honoured tradition of elders teaching and sharing life experiences with youth around the *Wangoo* (bonfire) in the Acholi homestead largely dissipated as a result of IDP camp living (Kobusingye, 2018). Instead, conflicts between the older and younger generations grew in relation to high birth rates in camps and a swollen youth population. Elders lamented that young people born and growing up during the war were ignorant of their own culture and disrespectful of authority of the clan (Kobusingye, 2018). As Kobusingye (2018) noted through her ethnographic research, the youth became important and powerful stakeholders in land governance during periods of post-conflict transition. A large number of them were uneducated and unskilled, therefore remaining in rural communities where land was the only source of livelihood (Kobusingye, 2018). Many youth were observed asserting claims on and selling for profit lands traditionally governed by elders, sometimes achieving such by resorting to violence (Kobusingye, 2018). As customary institutions became progressively weakened by the incursion of other authorities and market influences, more and more communally-owned land became privatized and commodified

(Kobusingye, 2018; Mabikke, 2011). Some senior officials of the Ugandan government exacerbated the situation of land grabbing by allocating agricultural land to international investors or for personal use, leaving vulnerable children, women, and elders "landless wanderers in their own homeland" (Mabikke, 2011). For war-battered Northern Ugandans, the lack of land security served to perpetuate the cycle of poverty and violence and concurrently impeded the larger redevelopment process.

1.3   Literature review of post-conflict mental health

1.3.1   Theoretical frameworks

Mental health problems are known to be prevalent in conflict and post-conflict settings around the world (Abi-Rached, 2009; Morina, Stam, Pollet, & Priebe, 2018; Steel et al., 2009). Beyond acute post-traumatic symptoms, psychological impacts of armed conflict can be long-lasting for individuals and societies and can even reverberate across generations (Abi-Rached, 2009; Chrisman & Dougherty, 2014). In resource-limited settings, war serves to magnify pre-existing vulnerabilities while at the same time generating novel and unusual hardships, potentially trapping affected populations in a cycle of violence and marginalization (Amone-P'Olak et al., 2013).

For the purpose of this thesis, we employ a socio-ecological framework to examine the state of the population's mental health in Northern Uganda after it was ravaged by two decades of war. First developed by psychologist Urie Bronenbrenner, the (socio)ecological model consists of four levels of factors co-occurring and interacting in a dynamic process–the individual, relational (microsystem), communal (exosystem), and societal (macrosystem)–in relation to a certain outcome (Bronenbrenner, 1977; Heise, 1998; Mootz, Stabb, & Mollen,

2017). In contrast to a clinical model focused on individual risk factors and morbidities, a socio-ecological model highlights the social, economic, and political dimensions that drive disease formation (de Jong et al., 2015). Conceptualizing post-conflict psychopathology as a collective response to extreme forms of trauma is less stigmatizing and more likely to promote resilience. In addition, applying socio-ecological approaches in the field of public mental health has the potential to facilitate collaboration across multiple government sectors (e.g., economic, social, legal, health, and education) and to promote community-based preventions and interventions, as pointed out by de Jong et al. (2015).

Besides the theoretical framework, it is no less–if not equally–crucial to elucidate the ethics underpinning this thesis research. As Powers and Faden (2008) expound in their theory of social justice with respect to public health, there are six essential dimensions of wellbeing that are of particular moral urgency. In our study setting of Northern Uganda, the dimension of personal security was prominently insufficient due to two decades of war, which then had ripple effects on all the other dimensions: health, reasoning, respect, attachment (bonding with other people and communities), and self-determination (Powers & Faden, 2008), resulting in a state of injustice that deserves close examination by the current thesis. On a personal note, the author, as a healthcare professional and having grown up in a country which was similarly rebuilt on the ashes of imperial invasions and a tumultuous civil war within the last century, is able to sympathize with the struggles of post-colonial Uganda and feels morally obligated to give voices to one of the world's most marginalized and dispossessed people. At the same time, the author recognizes her privilege of being able to conduct this research without visiting Northern Uganda herself. This lack of personal knowledge, as well as a sense of cultural foreignness, naturally limit her understanding of findings that emerge from this study.

While a large body of literature has focused on direct war exposure and its "dose-response relationship" with mental health (i.e., greater exposure to war violence corresponding to more serious mental health symptoms), in recent years, there has been a strong call to shift attention to daily stressors in conflict-affected settings as exerting ongoing stress and broader influence on post-conflict mental health (Miller & Rasmussen, 2010; Newnham, Pearson, Stein, & Betancourt, 2015; Siriwardhana & Stewart, 2013). Evidence from diverse global settings suggests that daily stressors frequently function as mediators between war exposure and distress, significantly improving the explanatory power of predictive models once included (Miller & Rasmussen, 2010; Newnham et al., 2015). Miller & Rasmussen (2010) argue that this daily stressor/psychosocial framework is preferable to the traditional trauma-focused framework partly in that it promises more efficient allocation of resources: priority is given to ameliorating stressful social and material conditions and reestablishing community support networks, followed by specialized mental health care to individuals who exhibit persistent distress. Given our study setting, we decided to incorporate both perspectives in recognition of the fact that Northern Ugandans faced intersecting layers of vulnerability ranging from highly traumatic events experienced during the war to cultural disintegration and community breakdown, from poverty, land deprivation, and lack of basic necessities and a social safety net to sexual and intimate partner violence in the post-conflict environment (Amone-P'Olak, Otim, Opio, Ovuga, & Meiser-Stedman, 2015; Betancourt, Agnew-Blais, Gilman, Williams, & Ellis, 2010; Miller & Rasmussen, 2010). All of these will be carefully unpacked below and in following chapters.

1.3.2   Forced displacement, return migration, and daily stressors

As yet, there is scant evidence elucidating the relationship between prolonged internal displacement and mental health problems in conflict-affected settings (Siriwardhana & Stewart, 2013). Defined as "persons who are forced to flee their habitual residence due to conflict or disaster, and who have not crossed a recognized international state border," internally displaced persons (IDPs) do not receive protections according to international refugee laws and are highly susceptible to predation, deprivation, and mental and physical illness (Siriwardhana & Stewart, 2013; UNOCHA, 2004). Compared to refugees, IDPs may experience higher levels of adversity and lower chances of receiving aid and services, yet their long-term health is underexplored by epidemiological research (Morina et al., 2018; Siriwardhana & Stewart, 2013). Through meta-regression analyses for a systematic review of mental health among populations exposed to mass conflict and displacement, Steel et al. (2009) identified higher rates of PTSD among populations who were in/externally displaced or living in refugee camps compared to refugees who were permanently resettled in another country.

Forced displacement and relocation create intense feelings of uncertainty about the future, accompanied by substantial material and emotional losses, including the abandonment of livelihoods and valuable assets, family separation, and the dissolution of traditional mores (Nuttman-Shwartz, Dekel, & Tuval-Mashiach, 2011; S. H. Patel, 2012). This process often disrupts the sense of belonging and trust people feel toward their original communities, which fail to protect them from dangers or compensate for their losses (Nuttman-Shwartz et al., 2011). In the post-conflict era, return migration can be retraumatizing to those who have broken ties with their communities and those who have witnessed horrific events during the initial flight phase (Siriwardhana & Stewart, 2013). To date, few studies have addressed these issues in

connection with mental health in the specific setting of post-conflict Northern Uganda, which will be a focus of research presented in this thesis.

Within the context of Northern Uganda, previous research suggests the collapse of the agrarian economy due to war-weakened communal and kin-based bonds caused immense frustration for rural populations in the region, contributing to widespread demoralization and poor mental health (McElroy et al., 2012; Roberts, Odong, et al., 2009). The impact of being unable to engage in productive work was particularly salient among males, whose traditional role as providers was disrupted and who were observed displaying "feelings of resentment, oppression, humiliation, and anger" (McElroy et al., 2012). The Wayo-Nero study of 2,362 residents living in the worst war-affected areas in Northern Uganda has linked unemployment to suicidality (both ideation and attempt) (Mugisha, Muyinda, et al., 2016). Despite the need for further research, the extant evidence makes it clear that local and international stakeholders should scale up activities that rejuvenate the agrarian economy, invest in poverty reduction, and provide skills training to young people who never learned agricultural skills under wartime circumstances (S. H. Patel, 2012), all of which would go a long way to foster collective healing and alleviate the burden of mental illness in the North.

1.3.3   War-affected children, reintegration, and the impact of stigma

When disastrous events such as an armed conflict occur, children who are yet to mature cognitively, emotionally, and socially are faced with considerable challenges to cope and adapt (Shaw, 2003). This puts them at heightened risks for psychological and developmental issues, especially when parents and other caregivers serving as their "first line of defense" are absent (Chrisman & Dougherty, 2014; Newnham et al., 2015). Common problems observed in war-

affected children include emotional dysregulation, mood disorders, academic failure, interpersonal difficulties, and behavioural/conduct problems (Betancourt, Speelman, Onyango, & Bolton, 2009). Aside from direct exposure to violence, war gives rise to a spectrum of chronic stressors that affect the key figures children depend on for survival and the immediate social environment in which they live (Miller & Jordans, 2016). It was reported that starvation and lack of healthcare were 20 times more frequently the causes of mortality for children than physical injuries from war in conflict-ridden Africa (Shaw, 2003). At the same time, however, children are incredibly resilient and resourceful; most of them do not develop enduring patterns of distress and turn into productive members of society in peacetime (Boothby, Crawford, & Halperin, 2006; Werner, 2012). Factors indicated to be protective of child war survivors include: good parental mental health; support of caregivers, peers, teachers, and community members; a shared sense of values; an internal locus of control; and the ability to find meaning through sufferings (Miller & Jordans, 2016; Shaw, 2003; Werner, 2012).

Due to the availability of lightweight automatic weapons in modern times, an increasing number of children worldwide are enlisted into armed groups as soldiers; they also perform other noncombatant roles such as cooks, porters, and forced wives (Derluyn, Vandenhole, Parmentier, & Mels, 2015; Klasen, Oettingen, Daniels, & Adam, 2010). These children, commonly known as "child soldiers," carry the dual identity of being both victims and perpetrators of war crimes and, as a result, may suffer from complex trauma, including feelings of guilt and shame (Klasen, Reissmann, Voss, & Okello, 2015). This was a prominent issue during the recent conflict in Northern Uganda, where thousands of children were abducted into the LRA rebel force. As previously described, former LRA abductees were put through unimaginable cruelties, including torture, killings, forced marriage and childbearing, and they were often confronted with life or

death situations. The length of their abduction varied from one day to more than a decade, yet even short-term abductees were reported to have been exposed to a substantial amount of violence (Annan et al., 2006). To bridge their transition upon escape or release from the bush, reception centres were set up by non-governmental organizations (NGOs) to receive these children and offer support services, including counselling, medical care, recreational activities, vocational training, and family tracing and reunification (Annan et al., 2006; S. Patel et al., 2013; Pham, Vinck, & Stover, 2009). With an emphasis on trauma-informed psychosocial assistance, these programs were designed based on the assumption that formerly abducted children were at high risk for developing psychological and emotional issues and therefore needed extra support in that respect (Blattman & Annan, 2008; S. H. Patel, 2012).

Despite its well-intended goals, the efficacy and suitability of the reception centre care model have been questioned. For one thing, the model appeared to have largely neglected girls who were less likely to have escaped (as they were often kept as wives of commanders and confined to LRA camps) and were released only toward the end of the war (De Temmerman, 2001; Spittal et al., 2008). In Muldoon et al.'s (2014) study of 129 young female ex-abductees in Northern Uganda, only 16 had been registered and lodged at a reception centre. In addition, abductees who were received at reception centres did not appear to have derived significant benefits from their stay, as the services provided were short-term, and follow-up care was extremely limited (Muldoon et al., 2014; S. Patel et al., 2013; Pham et al., 2009). There are further concerns about such specialized targeted interventions stigmatizing former abductees and creating more barriers to their reintegration into communities. Instead of psychological trauma, Blattman & Annan (2008) pointed out via their survey data that the most pervasive and largest impact of massive child abductions in Northern Uganda was on education and employment

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prospects. Therefore, they advocate for "more targeted psychosocial programs (to those exhibiting the worst symptoms) and large and broad-based support for schooling (including adult education) and employment and enterprise development" (Blattman & Annan, 2008).

Research has generally not supported the popular notion that children associated with fighting forces are more likely to display hostility or aggressive tendencies once they resume civilian life. On the contrary, most of them are motivated to behave in order to be accepted by their families and communities (Betancourt, Mcbain, Newnham, & Brennan, 2013). Shortly after the war, the Survey of War Affected Youth (SWAY) observed high levels of prosocial behaviours among Northern Ugandan youth, both the abducted and non-abducted (Blattman & Annan, 2008). In Klasen et al.'s (2010) study, formerly abducted children more commonly reported internalizing problems (e.g., anxiety, depression, withdrawal, somatic complaints) rather than externalizing problems (e.g., social problems, aggressive or rule-breaking behaviours). However, among those who meet criteria for clinical psychiatric disorders, long-term behavioural disturbances appear to be more common. In Betancourt et al.'s (2013) Sierra Leonean study, a small proportion of the sample who experienced persistently high or worsened psychological distress over time (10.9%) were more likely to experience functional impairments, including being in a physical fight or getting into trouble with the police. In Bayer, Klasen, & Adam's (2007) study of recently demobilized LRA child soldiers, PTSD symptoms were significantly associated with decreased willingness to reconcile and increased feelings of revenge.

Extensive evidence illustrates that children's responses to war-related stressors are greatly influenced by contextual factors, including cohesiveness within family, social support of teachers and peers, and availability of community resources (Amone-P'Olak et al., 2013; de Jong

et al., 2015; Miller & Rasmussen, 2010; Shaw, 2003; Werner, 2012). A longitudinal study of formerly abducted youth in Northern Uganda called the War Affected Youths Study (WAYS) found post-war hardships acted as a mediator in the relations between war trauma and mental ill-health (Amone-P'Olak et al., 2013, 2015). In Sierra Leone, child soldiers returning home after a ravaging civil war were perceived as "immoral' or "dangerous," and additional labels of being defiled or sexually "loose" were attached to girls (Betancourt et al., 2010). Those who reported more self-perceived stigma demonstrated higher levels of depression, anxiety, and hostility over time (Betancourt et al., 2010). Similar phenomena were observed in Northern Uganda where former child abductees were subject to a wide range of domestic and community violence from physical (caning, burning, confinement) to sexual (verbal sexual insults, sexual touches, rape) abuses (Klasen et al., 2010). In Ovuga et al.'s (2008) study based in a rehabilitative school, child returnees from the bush were referred to as *olum olum* ("bush man/woman") by the surrounding community, from which they were kept at a distance. Stigma linked to previous experiences of child soldiering has been shown to limit life opportunities for those affected in terms of marriage, employment, and education (Betancourt et al., 2013; Njamnshi et al., 2009). This stigma also leads to self-isolating behaviours, increases individuals' vulnerability to mental health issues, and serves as a barrier to accessing mental and other health services (Amone-P'Olak et al., 2016; Betancourt et al., 2010).

1.3.4   The plight of young girls and women

Gender-specific stigma toward female war survivors should be noted in particular, as it magnifies preexisting gender inequalities and predicts psychosocial difficulties for those women in post-conflict settings (Atim et al., 2018; H. Porter, 2013). A common belief in Northern

Uganda is that anyone who emerged from the bush is contaminated by the evil spirit *cen* for having witnessed or committed violence (Kiconco & Nthakomwa, 2018). Besides carrying *cen*, female abductees were frequently suspected of having marital ties to LRA members or being sexually promiscuous or HIV positive (Betancourt et al., 2010; Malamba et al., 2016; Shanahan & Veale, 2016).

In a cross-sectional analysis of female ex-abductees in Northern Uganda, Amone-P'Olak et al. (2016) demonstrated that the relationship between wartime sexual violence and general functioning (the ability to maintain self-care, perform household chores, and participate in social activities) was largely mediated by stigma and poor community relations. In qualitative interviews conducted for the Secure Livelihoods Research Consortium (SLRC)-Uganda Survey, women who had been sexually violated in the bush described experiencing emotional, physical, sexual, and verbal abuses in domestic and community settings (Atim et al., 2018). Those who returned with children were especially vulnerable as they were seen as visible victims of sexual violence and faced the double challenge of reintegrating themselves and their children (Atim et al., 2018; Shanahan & Veale, 2016). Some stayed in abusive relationships out of the need for protection, financial resources, and childraising support (Atim et al., 2018). In traditional Acholi culture, marriage bestows status and resources, but these women–considered "stained" and "polluted"–may never be able to marry customarily (Kiconco & Nthakomwa, 2018). In fact, Northern Ugandan households with members who suffered wartime sexual violence were reported to experience significantly more crimes, such as theft, burglary, land grabbing, and physical assault, by the SLRC-Uganda Survey (Atim et al., 2018).

Because of post-war economic hardships, women were forced to take on non-traditional roles to provide for their families (Kizza et al., 2012a). According to the SLRC-Uganda Survey,

women's livelihoods in the North were restricted to farming and small informal businesses, which were low-paying activities; those trained in vocational skills (such as tailoring) could barely find enough jobs to employ those skills (Atim et al., 2018). Many women's work productivity was compromised by injuries sustained in the war (e.g., chronic backache from carrying children and loads for the LRA) (Atim et al., 2018). Compounding the burden of economic destitution and lack of sustainable livelihoods were stressors women faced in domestic settings. In marriages where the mother-in-law perished during the war, the first wife (often very young themselves) had to take over the responsibility of ushering in the new wives of their husband with little support and guidance, leading to marital strife and tremendous emotional distress (Kizza et al., 2012a). Violence was prevalent in marriages where women attempted to rebel against their husband's patriarchal authority (Kizza et al., 2012a).

Intimate partner violence (IPV) is a common and serious type of interpersonal violence that disproportionately affects women, defined by the World Health Organization (WHO) as "behaviour within an intimate relationship that causes physical, sexual or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse and controlling behaviours" (WHO, 2010). Unfortunately, the majority of humanitarian programs operating in conflict-affected settings underprioritize IPV as a public health and human rights issue (J. Gupta et al., 2014). The 2011 Uganda Demographic and Health Survey reported high rates of IPV nationwide: 59.7 % of Ugandan women had experienced IPV in emotional, physical, or sexual form at least once in their lifetime (Uganda Bureau of Statistics, 2012). In the Northern region, IPV must be understood in the context of prolonged politico-military upheavals, the breakdown of traditional family structures, pervasive sexual trauma, and a culture of impunity and weak justice systems (Annan & Brier, 2010; Black et al., 2019). Investigators of IPV in conflict-

affected settings suggest that extensive exposure to war may lead to normalization and acceptance of violence in a society, which later manifests itself in the realm of interpersonal relationships (Black et al., 2019; Kinyanda et al., 2016; Saile, Neuner, Ertl, & Catani, 2013; Vinck & Pham, 2013). On an individual level, exposure to war violence may cause emotion dysregulation in victims and sensitize them to the effects of subsequent trauma of lesser magnitude (Betancourt et al., 2013; Breslau & Anthony, 2007). Those who display PTSD symptoms such as numbing and aloofness appear to be at a heightened risk for IPV victimization in private settings (Kinyanda et al., 2016; Krause, Kaltman, Goodman, & Dutton, 2006).

A recent study on the intersection of conflict, IPV, and mental health was conducted in the LRA-raided Teso sub-region of Eastern Uganda: nearly half of female respondents reported having experienced some form of IPV (sexual, physical, psychological), which was associated with wartime torture, alcohol consumption, depressive symptoms, and attempted suicide (Kinyanda et al., 2016). Through interviewing young female LRA ex-abductees in the Kitgum and Pader districts, Annan and Brier (2010) found that the new relationships these women established in the post-war era shared common features with the forced marriages they had endured in the bush, including physical violence and an inability to leave or escape. To explain this, Annan and Brier (2010) suggested that sexual exploitation by warring parties lead to feelings of low self-worth and a subsequent inability to negotiate with intimate partners. More broadly, these researchers underscored structural factors that contribute to and sustain IPV in Northern Uganda: widespread poverty, corrupt police, and disempowerment of men (Annan & Brier, 2010). It is clear that addressing IPV and other types of gender-based violence is indispensable to post-conflict psychiatric rehabilitation in the region.

1.3.5   Trauma and HIV infection

It is well-established that psychotrauma and HIV are interconnected via complex bidirectional mechanisms. On one hand, trauma suppresses the body's immune function, increases high-risk behaviours such as condomless sex and injection drug use, and poses challenges to HIV treatment initiation and adherence (Malamba et al., 2016; Prince et al., 2007; Sharer & Gutmann, 2011). On the other hand, living with HIV is accompanied by a high degree of trauma involving chronic stress, stigma, and healthcare burden, as well as neurobiological changes to the brain, all of which can induce or exacerbate mental health symptoms (Prince et al., 2007). In a scoping review of studies among conflict-affected populations, Koegler and Kennedy (2018) confirmed strong associations between mental health indicators (e.g., PTSD, depression, anxiety) and HIV-related factors (e.g., STIs, HIV sero-status, CD4 count, sexual risk behaviours). Most of these studies took place in sub-Saharan Africa, a region that is disproportionately affected by warfare and the HIV epidemic (Koegler & Kennedy, 2018).

Epidemiological evidence from sub-Saharan Africa has consistently shown elevated rates of trauma-related mental health disorders among people living with HIV (Bernard, Dabis, & De Rekeneire, 2017; Kinyanda et al., 2017; Mugisha, Muyinda, et al., 2016). With most of its population traumatized by decades of war and HIV/AIDS remaining a leading cause of death (Malamba et al., 2016; Sharer & Gutmann, 2011; Westerhaus, 2007), Northern Uganda faces an urgent task of integrating trauma-informed approaches with HIV services. Local HIV providers have raised concern that in the midst of post-conflict migration, people are moving away from urban centres back to remote ancestral lands where medical resources are rare and overstretched. Compounding access barriers are mental health sequelae of the war, which may result in self-neglect, lack of energy and motivation, and delays in seeking HIV care, potentially leading to

early mortality. Previous research in Uganda demonstrated that cognitive depressive symptoms (depressed mood, loss of interest, feeling bad about oneself, suicidal ideation) predicted poor adherence to antiretroviral (ARV) therapy (Wagner, Slaughter, & Ghosh-Dastidar, 2017).

Women in particular are challenged by intersecting layers of vulnerability, which may amplify the combined effects of trauma and HIV. A study with women of colour living with HIV in the United States found over half of them experienced poor quality of life despite taking ARV and having an undetectable viral load; it also found traumatic experiences were significantly associated with worse HIV-related stigma (Cuca et al., 2019). In post-conflict Northern Uganda, evidence generally supports that although men endured more war-related trauma events, women suffered from poorer mental health and more severe symptoms (Ovuga, Oyok, & Moro, 2008; Roberts et al., 2008; Spittal et al., 2018). A recent study based on a large representative sample found that Northern Ugandan women were almost twice more likely to be infected with HIV than men, and women with symptoms of depression/PTSD were twice more likely to be living with HIV (Spittal et al., 2018). The Peter C. Alderman Foundation (PCAF) Trauma Clinic, a local pioneer in providing HIV supports as part of mental health care, calls for gender-sensitive programming that responds to women's special needs in consideration of their biological, social, and economic disadvantages (Sharer & Gutmann, 2011).

Chapter 2: Methods

2.1 The Cango Lyec Project

Cango Lyec is a population-based, ongoing prospective cohort project initiated in 2011 by a group of Canadian and Ugandan researchers, in response to the rising HIV epidemic among conflict-affected populations in Northern Uganda. The name translates as "healing the elephant" in the Luo language, as elephant is the spiritual animal of the Acholi people (Blair, 2017). Overall, the project aims to understand the complex relationships between HIV, sexual relationships and practices, mental health, and resilience in the context of post-conflict transition to establish evidence for effective and culturally safe interventions. The project recruits participants from three districts in the Acholi sub-region of Northern Uganda that were most affected by the LRA insurgency: Amuru, Gulu, and Nwoya.

The current study draws from baseline Cango Lyec data and focuses on PTSD and depression as two mental health outcomes of interest. Previous research from the Cango Lyec Project indicates that poor mental health is a robust predictor of HIV infection in post-conflict Northern Uganda (Katamba et al., 2020; Malamba et al., 2016; Spittal et al., 2018). However, no previous study has specifically examined mental health as it is associated with war trauma, individual and relationship risk factors, and broader socio-environmental stressors. To date, there has been a paucity of evidence worldwide on the psychological impact of prolonged internal displacement, especially gender-differentiated analyses (Bayer et al., 2007; Klasen et al., 2010; Siriwardhana & Stewart, 2013). The current study seeks to help fill this knowledge gap and provide findings that will inform and guide future Cango Lyec initiatives and health interventions.

2.1.1 Study objectives and hypotheses

Objective 1: To determine the prevalence and correlates of probable PTSD and depression among people aged 13 to 49 in Northern Uganda five years after the end of the LRA insurgency.

Objective 2: To examine the effects of abduction and related events on the risk for probable PTSD and depression.

Hypothesis 1: Adverse living situations, traumatic war experiences, intimate partner violence, sexual vulnerabilities, and HIV/STIs were significantly associated with probable PTSD and depression.

Hypothesis 2: A high level of comorbidity of probable PTSD and depression existed among Cango Lyec participants.

Hypothesis 3: Females and former abductees were more likely to screen positive for PTSD and depression.

2.1.2 Ethical considerations

The Cango Lyec Project is funded by the Canadian Institutes of Health Research (CIHR) (grant No. 219124) and has gone through extensive peer review. The project has received ethics approvals from the University of British Columbia-Providence Healthcare Research Ethics Board (Canada), Makerere College of Health Sciences-School of Public Health (Uganda), and Uganda National Council of Science and Technology (Uganda). The Office of the President of Uganda issued a letter of approval, which was signed by the Resident District Commissioner in each study district. The present study embedded within the Cango Lyec Project was approved by the University of British Columbia and Providence Health Care Research Ethics Board (H20-00413).

2.1.3 Data collection

Baseline enrollment of Cango Lyec participants took place from November 2011 to July 2012. A desired sample size was calculated before enrollment using the formula: $n = \left(\frac{z}{m}\right)^2 \hat{p}(1-\hat{p})\frac{deff}{R}$, assuming an HIV prevalence of 6.4 to 9.1% ($\hat{p}$), sampling design effect of 2 (*deff*), margin of error between 2.0 and 2.3% (*m*), and response rate of 98.7% (*R*); z is the t-statistic for 95% confidence interval ($z = 1.96$) (Kirkwood & Sterne, 2003; Malamba et al., 2016). This calculation yielded an estimated sample size of 2400, which was exceeded by the actual number of participants recruited at baseline.

A rigorous two-stage sampling method was applied to produce a representative sample. First, all communities in the three districts (Amuru, Gulu, and Nwoya) were divided into three categories based on residential stability: permanent, transient, and displaced. Displaced communities were IDP camps created during the war, transient communities were those created to accommodate IDPs during the transition and rebuilding phase, and permanent communities consisted of homesteads that had existed prior to the war (Katamba et al., 2020). Based on this criteria, Amuru district had 10 communities (6 permanent, 2 transient, 2 displaced), Gulu district had 16 communities (10 permanent, 2 transient, 3 displaced, 1 pilot community), and Nwoya district had seven communities (4 permanent, 3 transient, 0 displaced) (Malamba et al., 2016). Three study communities were randomly selected from each district, one from each residential category, resulting in a total of eight communities: only two communities were selected from Nwoya district which did not have a displaced community. One pilot community was selected from Gulu district to test survey tools.

The research team in the field mapped out these eight communities and conducted house-to-house census, rendering a total population of 6,375 residents. Study eligibility criteria included 1) being between 13 and 49 years of age and 2) having resided in their household for over a month. After excluding residents outside the age range and those who were absent or had moved away, the team identified 2,954 individuals as eligible for the study. Among those, 2,458 gave consent to participate in the baseline survey (Amuru district=762, Gulu district=1,133, Nwoya district=563).

2.1.4   Questionnaire and testing

The baseline questionnaire elicited detailed information from participants on socio-demographic characteristics, environmental stressors, war-related experiences, sexual and relationship vulnerabilities, as well as physical and mental health outcomes. All questions were translated from English into Luo through a process of forward and backward translation. Acholi study personnel participated in designing and piloting the questionnaire to ensure cultural safety and sensitivities around war-related trauma. Trained interviewers explained the study to participants, obtained written consent, and administered the questionnaire. Each participant was able to choose their own interviewer and interview location to feel safe and private.

The primary outcomes of interest for our study–PTSD and depression–were assessed using the Harvard Trauma Questionnaire (HTQ) and Hopkins Symptom Checklist-25 (HSCL-25) respectively. Both instruments had been developed based on criteria from the Diagnostic and Statistical Manual-IV (DSM-IV) and used widely with displaced populations in Asia, Africa, Latin America, and Europe (Roberts et al., 2008). They were translated into Luo and validated in Gulu district by Roberts et al. (2008). Scores of the HTQ and HSCL-25 were calculated using

published guidelines and dichotomized into yes/no answers. Given the sensitive nature of questions, participants who reported high trauma scores, screened positive for PTSD or depression, or made any mention of suicidal ideation were immediately referred to local Trauma Clinics for psychological support. Cronbach's alpha was calculated for the HTQ ($\alpha = 0.89$) and HSCL-25 ($\alpha = 0.88$), both demonstrating high internal consistency in our study. We use the terms "probable PTSD" and "probable depression" to reflect the non-diagnostic nature of measures.

Nurses at the research site drew venous blood for HIV and syphilis testing and provided pretest/posttest counselling. Participants were invited but not required to return for test results and referrals to care. Participants testing positive for syphilis were offered free treatment with a single dose of azithromycin. Those testing positive for HIV were referred to the nearest health centre and offered guidance on accessing government-supported ARV treatment. Participants were given the equivalent of $1.25 USD for each study visit.

2.2   Measures

The baseline questionnaire was divided into female and male versions. The male version omitted questions applicable only to females such as pregnancy-related items and vaginal STI symptoms, but the majority of questions were identical in both versions. Variables were extracted for current analyses based on previous empirical evidence and classified into sociodemographic characteristics, environmental stressors, war-related trauma, abduction and experiences in the bush, sexual vulnerabilities, intimate partner violence, and health outcomes. All age- and time-related variables were dichotomized on the median value of the numeric variable, as suggested by consultation of existing literature and the study statistician.

Sociodemographic characteristics

Participants were asked about basic sociodemographic characteristics including gender (male/female), age (years), ethnicity (Acholi/other tribes), district of residence (Amuru/Gulu/Nwoya), religion (Roman Catholic/Anglican/others), highest education attained (no school/primary/secondary/post-secondary), and current marital status (not married/married). For assessment of polygamous marriage, females were asked "How many wives does your husband have?" and males were asked "How many wives do you have?" We created a new polygamy variable by combining both genders' answers and defined it as a marital relationship where one husband has multiple wives (yes/no). In addition, participants were asked whether they were living in a household headed by a youth under age 25 (yes/no) or a female (yes/no).

Environmental stressors

Environmental stressors posed by the resettling process were captured by: community displacement status (permanent/transient/displaced), level of safety felt in current community (very safe/moderately safe/not safe at all), safety of current community compared to mother camp (less safe/more safe/about the same/never lived in a camp), availability of basic goods and services in current community compared to mother camp (greater than/less than/about the same), number of camps lived in (0/1/2+), frequency of going back home (once a month or more/less than once a month/never/living at home), and hopefulness about returning home permanently (yes/no). Mother camp was defined as the IDP camp from which an individual had voluntarily or involuntarily migrated.

War-related trauma

War-related trauma was assessed by Part I of the HTQ which comprised 16 items on lifetime exposure to traumatic events with yes/no answers. These included lack of food or water, lack of housing or shelter, unnatural death of family member or friend, murder of family member or friend, being close to but escaping death, ill health without medical care, witnessing the murder of stranger(s), tortured or beaten, forced separation from family, being abducted or kidnapped, made to accept ideas against your will, serious injury, forced isolation from other people, being in a war fighting situation, imprisonment against your will, and being raped or sexually abused. The last item referred to sexual assault that happened in the context of war but outside of abduction, for example gang rape in IDP camps. We decided to create a variable to summarize the experience of war trauma, ">=10 traumatic events (yes/no)," based on the median number of HTQ trauma events reported by participants who screened positive for PTSD. We included "ill health without medical care" and "rape or sexual abuse" as individual explanatory variables since they had been found to be associated with HIV infection in previous Cango Lyec studies (Malamba et al., 2016; Spittal et al., 2018).

Abduction and experiences in the bush

Those who self-reported to have been abducted by the LRA were asked about details of their experience, including times of abduction (1/2+), age at first abduction (<15/15+), the longest time spent in captivity (less than two weeks/two weeks or more), as well as the following events in the bush with yes/no answers: carried heavy loads, been seriously beaten, got injured, witnessed killing of others, personally killed another person, forced into military training, been

sexually abused, had access to condoms, and been "given as a wife." The last item only applied to female abductees.

Sexual vulnerabilities

Given that the Cango Lyec Project has a primary focus on HIV and associated risks, a series of questions were concerned with sexual and relationship vulnerabilities: age at sexual debut (<16/16+), forced sexual debut (yes/no), condom use at sexual debut (yes/no), sexual debut for money or gifts (yes/no), exchanged sex in the past year for money or gifts (yes/no), and number of sexual partners in the past year (0/1/2+). Females were asked if their most recent partner was circumcised (yes/no); males were asked if they were circumcised themselves (yes/no). In addition, females were asked a set of questions regarding their past history of pregnancy: ever been pregnant (yes/no), age at first pregnancy (<17/17+), number of lifetime pregnancies (1-3/4+; 4 was the median), and dropping out of school due to pregnancy (yes/no). For the last question, only those who were in school and aged 20 years or less at first pregnancy were asked to report an answer.

Intimate partner violence

For the assessment of IPV, participants were asked if their partner(s) had ever done the following to them with yes/no answers: verbal abuse/shouting, pushing/pulling/slapping/holding down, punching with fist or harmful objects, kicking/dragging, trying to strangle or burn, threatening with weapons, and attacking with weapons. Since no formal validation of this assessment tool has been undertaken in our study context, we created a binary summary variable by coding a positive answer to any of the items as "lifetime IPV," also in alignment with what

has been used in other IPV studies among conflict-affected people (Falb, McCormick,

Hemenway, Anfinson, & Silverman, 2013; J. Gupta et al., 2014; Kinyanda et al., 2016). Female

participants were asked three additional questions regarding sexual coercion by partner in the

past year: verbally threatened to have sex (yes/no), physically forced to have sex (yes/no), and

forced to perform unwanted sexual acts (yes/no).

HIV and non-HIV STIs

Participants were inquired about any STI symptoms they had experienced in the past

year, including genital ulcers, frequent urination, painful urination, pain during sex, bleeding

during sex, genital warts, vaginal discharge (colored or no), vaginal itching, and vaginal odor.

The last three vaginal symptoms only applied to females. For female participants, an affirmative

response to any item was coded as "yes" to the summary variable "any STI symptom in the past

year." For male participants, only genital ulcer was included in our analyses and no STI

summary variable was created due to a large number of responses missing for the other self-

reported STI symptoms. In addition, HIV serostatus and syphilis status were reported as

positive/negative based on laboratory results.

PTSD and depression

Probable PTSD was assessed by using Part IV of the HTQ. It comprised post-traumatic

symptoms with a one-week recall period measured on a four-point Likert scale (1 = not at all; 2

= a little bit; 3 = quite a bit; 4 = extremely). These symptoms were: flashbacks or nightmares of

traumatic events, inability to feel emotions or remember parts of traumatic events,

detachment/withdrawal, emotional/physical reactions to reminders of traumatic events, reduced

interest in daily activities, hopelessness about future, difficulty concentrating, trouble sleeping, feeling on guard, hypervigilance, avoidance, and irritability/outbursts of anger. A participant's PTSD score was calculated by dividing the sum of all answered items by the number of answered items; a mean score of ≥ 2 was considered positive for probable PTSD (Mollica, 2004).

Depression was assessed by using Part II of the HSCL-25. Item responses with a one-week recall period were measured on a four-point Likert scale (1 = not at all; 2 = a little bit; 3 = quite a bit; 4 = extremely). Cognitive-affective depressive symptoms (self-blaming, crying easily, feeling hopeless about future, feeling sad, feeling lonely, thoughts of ending one's life, feeling trapped or caught, excessive worrying, and feeling worthless) and somatic depressive symptoms (feeling low in energy/slowed down, loss of sexual interest or pleasure, poor appetite, and difficulty falling or staying asleep) were included. The score for depression was calculated by dividing the sum of all answered items by the number of answered items. Based on instrumental standards, a mean score of ≥ 1.75 was operationalized as being positive for probable depression (Mollica, 2004).

2.3 Statistical analysis

R Studio Version 1.1.456 was used to perform all analyses. Descriptive statistics summarized gender-stratified distributions of sociodemographic characteristics, environmental stressors, war-related trauma and experiences, sexual and relationship vulnerabilities, and health outcomes among the general population and the subset of former abductees. Differences between males and females were assessed using Fisher's exact test. In some instances, a subsample of data was presented and denoted by superscript (a, b, c).

Due to the cross-sectional nature of data, logistic regression was used to detect associations between explanatory variables of interest and probable PTSD/depression. Separate regression models were built for males and females to identify gender-specific risk factors. Unadjusted odds ratios and odds ratios adjusting for age and district as confounders were obtained with 95% confidence intervals. All p values are two-sided.

All variables within adjusted models significant at the $p < 0.10$ level were included in the final multivariate models. We restricted these models to sexually active participants only, considering the importance of sexual vulnerabilities and to ensure the same sample size for each variable included in the final models. Variable selection followed an *a priori* approach using forward and backward stepwise selection. Stepwise regression was used to identify parsimonious models that are simple to interpret and explain the relationships between the explanatory variables and the outcome well. Lastly, the Hosmer and Lemeshow goodness of fit test was performed: all the final models rendered large p-values above 0.15, indicating good model fit (Hosmer & Lemeshow, 1980).

2.4   Missing data

For the purpose of our study, pilot data were excluded. During the initial variable selection, we excluded variables that had a significant number of responses missing. The range of missing responses among explanatory variables included in our analyses varied between 0 and 6.7%; three-quarters of these variables had less than 2.4% of responses missing. Listwise deletion (i.e., removing all data for a participant that had one or more missing responses) was not adopted to avoid reducing the power of analysis and creating a biased sample (Statistics Solutions, 2020). Instead, available-case analysis with pairwise deletion of missing

data was conducted. Regarding construct-level missingness for the HTQ and HSCL-25, no more than 0.5% of participants were partial respondents (i.e., individuals who responded to only part of the composite scale), which fell well under the 10% threshold that would require missing-data treatment techniques such as maximum likelihood or multiple imputation (Newman, 2014). In all analyses, missing data were simply omitted, resulting in slightly different sample sizes for various statistical tests.

Chapter 3: Results & Discussion of Baseline Cango Lyec Participants

3.1   Descriptive statistics

Table 1 provides a summary of various characteristics and vulnerabilities among the Cango Lyec baseline cohort. A total of 2,458 participants were included, with a median age of 25 (IQR: 18-32) and a higher proportion of females (57.6%) than males (42.4%). Most participants were of Acholi ethnicity (90.8%), 46.1% resided in Gulu district, and a substantial proportion (74.9%) were Roman Catholic. Over half of participants were married (55.4%) and one in five participants reported being in a polygamous marriage (21.1%). We noticed a significant gender disparity in educational attainment (p<0.001): only 0.9% of males had no education and 11.2% had post-secondary education, while females showed a reverse pattern (15.4% had no education and 4.1% had post-secondary education).

More than half of participants were residing in communities which were formerly displaced or transient camps (53.5%) and less than one third were living at home (29.0%). The vast majority of our participants had lived in at least one camp since leaving their home villages (77.6%). Compared to females, males were more likely to endorse greater safety and access to goods and services in the current community, go back home at least once a month, and feel hopeful about returning home permanently (all p-values under 0.05). In contrast, females were more likely to report experiencing ill health without medical care (35.7% vs. 24.6%; p<0.001) and rape/sexual abuse (13.7% vs. 1.4%; p<0.001) in the context of war.

Female gender was also a significant determinant of sexual and relationship vulnerabilities. One in five female participants reported their sexual debut was forced (21.4%). A small proportion had exchanged sex for money/gifts at sexual debut (2.5%) and in the past year (1.1%). The majority of females had been pregnant (76.3%) at a median age of 17 (IQR: 16-18)

and the median number of pregnancies was 4. Among those who were attending school and aged 20 or younger at their first pregnancy, an overwhelming majority had dropped out of school due to pregnancy (88.0%). Nearly a third of females had experienced IPV in their lifetime (30.8%): the most common form was verbal abuse (24.4%), followed by various types of physical and sexual abuse.

Males were significantly more likely to have used condoms at sexual debut (37.0% vs. 31.7%; p=0.016) and had two or more partners in the past year (27.7% vs. 4.3%). 16.4% of male participants had been verbally abused by intimate partners, with negligible proportions having experienced any form of physical abuse. In addition, the rate of male circumcision was low, both self-reported (8.4%) and reported by partner (11.5%).

In terms of sexual health outcomes, almost half of female participants had STI symptoms in the past year (45.4%). Males and females had similar levels of genital ulcers in the past year (9.8% vs. 12.2%; p=0.109) and active syphilis (3.7% vs. 4.7%; p=0.259). However, a significantly higher proportion of females than males were tested positive for HIV (13.9% vs. 7.7%; p<0.001).

Table 1: Comparison of baseline characteristics of Cango Lyec participants by gender (n=2458)

	Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
1. Sociodemographic characteristics				
District				0.035
- Gulu	451 (43.2%)	682 (48.2%)	1133 (46.1%)	
- Amuru	349 (33.5%)	413 (29.2%)	762 (31.0%)	
- Nwoya	243 (23.3%)	320 (22.6%)	563 (22.9%)	
Age group				< 0.001
- 13-19	363 (34.8%)	382 (27.0%)	745 (30.3%)	
- 20-24	190 (18.2%)	252 (17.8%)	442 (18.0%)	
- 25-29	171 (16.4%)	292 (20.6%)	463 (18.8%)	
- 30-34	121 (11.6%)	199 (14.1%)	320 (13.0%)	
- 35+	197 (18.9%)	290 (20.5%)	487 (19.8%)	
Ethnicity				0.290

	Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
- Acholi	955 (91.6%)	1276 (90.2%)	2231 (90.8%)	
- Other tribes	88 (8.4%)	138 (9.8%)	226 (9.2%)	
Religion				< 0.001
- Roman Catholic	790 (75.8%)	1050 (74.2%)	1840 (74.9%)	
- Anglican	184 (17.7%)	208 (14.7%)	392 (16.0%)	
- Others	68 (6.5%)	157 (11.1%)	225 (9.2%)	
Highest education attained				< 0.001
- No school	9 (0.9%)	215 (15.4%)	224 (9.2%)	
- Primary	539 (51.8%)	884 (63.3%)	1423 (58.4%)	
- Secondary	376 (36.2%)	241 (17.3%)	617 (25.3%)	
- Post-secondary	116 (11.2%)	57 (4.1%)	173 (7.1%)	
Current marital status				< 0.001
- Not married	503 (48.6%)	574 (41.5%)	1077 (44.6%)	
- Married	532 (51.4%)	808 (58.5%)	1340 (55.4%)	
Polygamous marriage				< 0.001
- No	884 (85.4%)	1022 (74.0%)	1906 (78.9%)	
- Yes	151 (14.6%)	360 (26.0%)	511 (21.1%)	
Youth-headed household				< 0.001
- No	832 (79.8%)	1239 (87.6%)	2071 (84.3%)	
- Yes	211 (20.2%)	176 (12.4%)	387 (15.7%)	
Female-headed household				< 0.001
- No	868 (83.2%)	980 (69.3%)	1848 (75.2%)	
- Yes	175 (16.8%)	435 (30.7%)	610 (24.8%)	
2. Environmental stressors				
Community displacement status				< 0.001
- Permanent	433 (41.5%)	710 (50.2%)	1143 (46.5%)	
- Transient	455 (43.6%)	515 (36.4%)	970 (39.5%)	
- Displaced	155 (14.9%)	190 (13.4%)	345 (14.0%)	
Felt safety in community				< 0.001
- Very safe	763 (73.2%)	894 (63.2%)	1657 (67.4%)	
- Moderately safe	241 (23.1%)	461 (32.6%)	702 (28.6%)	
- Not safe at all	39 (3.7%)	60 (4.2%)	99 (4.0%)	
Safety compared to mother camp				< 0.001
- More safe	710 (68.1%)	854 (60.4%)	1564 (63.6%)	
- Less safe	108 (10.4%)	174 (12.3%)	282 (11.5%)	
- Same	29 (2.8%)	76 (5.4%)	105 (4.3%)	
- Never encamped	196 (18.8%)	311 (22.0%)	507 (20.6%)	
Service availability compared to mother camp				0.010
- Greater than	587 (56.3%)	707 (50.0%)	1294 (52.6%)	
- Less than	191 (18.3%)	273 (19.3%)	464 (18.9%)	

	Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
- About the same	69 (6.6%)	122 (8.6%)	191 (7.8%)	
- Never encamped	196 (18.8%)	313 (22.1%)	509 (20.7%)	
Number of camps lived in				< 0.001
- 0	202 (19.5%)	346 (24.5%)	548 (22.4%)	
- 1	510 (49.1%)	691 (49.0%)	1201 (49.0%)	
- 2+	326 (31.4%)	374 (26.5%)	700 (28.6%)	
Frequency of going back home				< 0.001
- Living at home	357 (34.3%)	356 (25.2%)	713 (29.0%)	
- Once a month or more	451 (43.3%)	474 (33.5%)	925 (37.7%)	
- Less than once a month	126 (12.1%)	352 (24.9%)	478 (19.5%)	
- Never	108 (10.4%)	232 (16.4%)	340 (13.8%)	
Hopeful about returning home permanently[a]				< 0.001
- No	142 (20.8%)	602 (57.0%)	744 (42.8%)	
- Yes	540 (79.2%)	455 (43.0%)	995 (57.2%)	
3. War-related trauma				
>=10 traumatic events				0.148
- No	846 (81.1%)	1180 (83.4%)	2026 (82.4%)	
- Yes	197 (18.9%)	235 (16.6%)	432 (17.6%)	
Ill health without medical care ever				< 0.001
- No	762 (75.4%)	900 (64.3%)	1662 (69.0%)	
- Yes	248 (24.6%)	499 (35.7%)	747 (31.0%)	
Ever experienced rape or sexual abuse				< 0.001
- No	995 (98.6%)	1204 (86.3%)	2199 (91.5%)	
- Yes	14 (1.4%)	191 (13.7%)	205 (8.5%)	
4. Sexual vulnerabilities				
Age at sexual debut[b]				0.888
- <16	341 (44.3%)	520 (44.8%)	861 (44.6%)	
- 16+	428 (55.7%)	642 (55.2%)	1070 (55.4%)	
Forced sexual debut[b]				< 0.001
- No	783 (97.8%)	924 (78.6%)	1707 (86.4%)	
- Yes	18 (2.2%)	251 (21.4%)	269 (13.6%)	
Condom use at sexual debut[b]				0.016
- No	507 (63.0%)	799 (68.3%)	1306 (66.1%)	
- Yes	298 (37.0%)	371 (31.7%)	669 (33.9%)	
Sexual debut for money/gifts[b]				0.015
- No	753 (99.1%)	1136 (97.5%)	1889 (98.1%)	
- Yes	7 (0.9%)	29 (2.5%)	36 (1.9%)	
Exchanged sex for money/gifts (past year)				< 0.001
- No	788 (75.6%)	1154 (81.6%)	1942 (79.1%)	
- Yes	11 (1.1%)	16 (1.1%)	27 (1.1%)	

	Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
- Never had sex	243 (23.3%)	244 (17.3%)	487 (19.8%)	
Number of sexual partners (past year)				< 0.001
- 0	309 (29.9%)	374 (26.6%)	683 (28.0%)	
- 1	437 (42.3%)	973 (69.1%)	1410 (57.8%)	
- 2+	286 (27.7%)	61 (4.3%)	347 (14.2%)	
Circumcised				
- No	954 (91.6%)	-	-	
- Yes	87 (8.4%)	-	-	
Most recent partner is circumcised[b]				
- No	-	1031 (88.5%)	-	
- Yes	-	134 (11.5%)	-	
History of pregnancy				
- Pregnant before	-	1076 (76.3%)	-	
- Never pregnant	-	335 (23.7%)	-	
Age at first pregnancy				
- <17	-	444 (41.6%)	-	
- 17+	-	623 (58.4%)	-	
Dropped out of school because of pregnancy[c]				
- No	-	42 (12.0%)	-	
- Yes	-	308 (88.0%)	-	
- Not applicable	-	1065	-	
Number of lifetime pregnancies				
- 1-3	-	532 (49.5%)	-	
- 4+	-	543 (50.5%)	-	
5. Intimate partner violence[b]				
Lifetime IPV				< 0.001
- No	653 (82.2%)	807 (69.2%)	1460 (74.5%)	
- yes	141 (17.8%)	359 (30.8%)	500 (25.5%)	
Ever been verbally abused				< 0.001
- No	664 (83.6%)	883 (75.6%)	1547 (78.8%)	
- Yes	130 (16.4%)	285 (24.4%)	415 (21.2%)	
Ever been pushed/pulled/slapped/held down				< 0.001
- No	735 (92.5%)	978 (83.7%)	1713 (87.3%)	
- Yes	60 (7.5%)	190 (16.3%)	250 (12.7%)	
Ever been punched/fisted				< 0.001
- No	778 (98.4%)	1014 (86.8%)	1792 (91.5%)	
- Yes	13 (1.6%)	154 (13.2%)	167 (8.5%)	
Ever been kicked/dragged				< 0.001
- No	793 (99.9%)	1046 (89.5%)	1839 (93.7%)	
- Yes	1 (0.1%)	123 (10.5%)	124 (6.3%)	

	Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
Ever been strangled/burned				< 0.001
- No	787 (99.2%)	1111 (95.1%)	1898 (96.8%)	
- Yes	6 (0.8%)	57 (4.9%)	63 (3.2%)	
Ever been threatened with weapons				0.016
- No	779 (98.1%)	1124 (96.2%)	1903 (96.9%)	
- Yes	15 (1.9%)	45 (3.8%)	60 (3.1%)	
Ever been attacked with weapons				< 0.001
- No	790 (99.5%)	1133 (97.0%)	1923 (98.0%)	
- Yes	4 (0.5%)	35 (3.0%)	39 (2.0%)	
Verbally forced to have sex (past year)				
- No	-	1083 (93.8%)	-	
- Yes	-	71 (6.2%)	-	
Physically forced to have sex (past year)				
- No	-	1117 (96.8%)	-	
- Yes	-	37 (3.2%)	-	
Forced to perform unwanted sexual acts (past year)				
- No	-	1116 (96.7%)	-	
- Yes	-	38 (3.3%)	-	
6. STIs and HIV				
Any STI symptoms (past year)[b]				
- No	-	635 (54.6%)	-	
- yes	-	527 (45.4%)	-	
Genital ulcers (past year)[b]				0.109
- No	719 (90.2%)	1026 (87.8%)	1745 (88.8%)	
- Yes	78 (9.8%)	142 (12.2%)	220 (11.2%)	
Syphilis				0.259
- NEG	961 (96.3%)	1303 (95.3%)	2264 (95.7%)	
- POS	37 (3.7%)	64 (4.7%)	101 (4.3%)	
HIV				< 0.001
- NEG	941 (92.3%)	1197 (86.1%)	2138 (88.7%)	
- POS	79 (7.7%)	194 (13.9%)	273 (11.3%)	

[a] *among those not living at home*

[b] *among those who were sexually active*

[c] *only applicable to those who were in school and aged 20 years or less at first pregnancy*

Counts and proportions of trauma events derived from the HTQ Part I are provided in Table 2. Overall, the study sample reported high levels of war-related trauma. More than half of participants had experienced insecurities around food/water (65.1%) and housing (55.0%).

Nearly half reported past history of family member or friend being murdered (49.0%) or having narrowly escaped death themselves (49.0%). More than a third had been tortured or beaten (36.0%), made to accept ideas against will (38.4%), and seriously injured (34.0%).

In general, males were significantly more likely to report violent types of trauma (forced separation from family; serious injury; imprisonment) (p-values under 0.05), although negligible gender difference was observed for exposure to war fighting situations (p=0.294). In contrast, females were more likely to report passive types of trauma (lack of food, water, or housing; unnatural death or murder of loved ones; ill health without medical care) and were nearly ten times more likely to have been raped or sexually abused than males (13.7% vs. 1.4%; p<0.001). Regarding mental health outcomes, the overall prevalence was 11.7% for probable PTSD and 15.2% for probable depression. Females were significantly more likely to screen positive for both outcomes than males (p<0.001).

Table 2: Comparison of HTQ Part I trauma events and mental health outcomes by gender among Cango Lyec participants (n=2458)

		Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
Lack of food or water					0.024
	- No	379 (37.5%)	463 (33.0%)	842 (34.9%)	
	- Yes	633 (62.5%)	940 (67.0%)	1573 (65.1%)	
Lack of housing or shelter					< 0.001
	- No	504 (49.8%)	581 (41.5%)	1085 (45.0%)	
	- Yes	508 (50.2%)	819 (58.5%)	1327 (55.0%)	
Unnatural death of family member or friend					< 0.001
	- No	449 (44.4%)	510 (36.4%)	959 (39.8%)	
	- Yes	562 (55.6%)	890 (63.6%)	1452 (60.2%)	
Murder of family member or friend					< 0.001
	- No	563 (55.7%)	667 (47.6%)	1230 (51.0%)	
	- Yes	447 (44.3%)	735 (52.4%)	1182 (49.0%)	
Being close to, but escaping, death					0.351
	- No	504 (49.9%)	724 (51.8%)	1228 (51.0%)	
	- Yes	506 (50.1%)	673 (48.2%)	1179 (49.0%)	

		Male (N=1043)	Female (N=1415)	Total (N=2458)	p value
Ill health without medical care					< 0.001
	- No	762 (75.4%)	900 (64.3%)	1662 (69.0%)	
	- Yes	248 (24.6%)	499 (35.7%)	747 (31.0%)	
Witnessing the murder of stranger(s)					0.020
	- No	765 (75.8%)	1117 (79.8%)	1882 (78.1%)	
	- Yes	244 (24.2%)	283 (20.2%)	527 (21.9%)	
Tortured or beaten					0.350
	- No	658 (65.1%)	884 (63.2%)	1542 (64.0%)	
	- Yes	353 (34.9%)	514 (36.8%)	867 (36.0%)	
Forced separation from family					0.002
	- No	691 (68.3%)	1035 (74.1%)	1726 (71.7%)	
	- Yes	321 (31.7%)	361 (25.9%)	682 (28.3%)	
Being abducted or kidnapped					0.002
	- No	860 (85.3%)	1121 (80.4%)	1981 (82.4%)	
	- Yes	148 (14.7%)	274 (19.6%)	422 (17.6%)	
Made to accept ideas against your will					< 0.001
	- No	562 (55.5%)	921 (65.9%)	1483 (61.6%)	
	- Yes	450 (44.5%)	476 (34.1%)	926 (38.4%)	
Serious injury					< 0.001
	- No	612 (60.6%)	979 (69.9%)	1591 (66.0%)	
	- Yes	398 (39.4%)	421 (30.1%)	819 (34.0%)	
Forced isolation from other people					0.107
	- No	733 (72.6%)	1053 (75.5%)	1786 (74.3%)	
	- Yes	277 (27.4%)	342 (24.5%)	619 (25.7%)	
Being in a war fighting situation					0.294
	- No	779 (77.4%)	1108 (79.1%)	1887 (78.4%)	
	- Yes	228 (22.6%)	292 (20.9%)	520 (21.6%)	
Imprisonment against your will					< 0.001
	- No	809 (80.3%)	1227 (88.0%)	2036 (84.7%)	
	- Yes	199 (19.7%)	168 (12.0%)	367 (15.3%)	
Rape or sexual abuse					< 0.001
	- No	995 (98.6%)	1204 (86.3%)	2199 (91.5%)	
	- Yes	14 (1.4%)	191 (13.7%)	205 (8.5%)	
Probable PTSD (HTQ score >=2)		89 (8.8%)	193 (13.7%)	282 (11.7%)	< 0.001
Probable depression (HSCL score >=1.75)		87 (8.5%)	282 (20.0%)	369 (15.2%)	< 0.001

3.2   Regression analyses of female participants

Table 3 presents univariate and adjusted analyses examining correlates of probable PTSD among female participants. Adjusting for age and district of residence, we observed significant associations between probable PTSD among women and the following environmental stressors: feeling moderately safe (AOR=1.47; 95% CI: 1.05-2.07) or not safe at all (AOR=4.42; 95% CI: 2.41-8.10) in one's community; less safety in one's current community compared to mother camp (AOR=1.60, 95% CI: 1.02-2.51); and having lived in two or more camps (AOR=1.68, 95% CI: 1.04-2.70).

With regard to war-related trauma, women who had experienced ill health without medical care (AOR=2.62; 95% CI: 1.90-3.62) or rape/sexual abuse (AOR=3.71; 95% CI: 2.57-5.37) had increased odds of screening positive for PTSD. Remarkably, cumulative exposure to 10 or more traumatic events was associated with six times the odds of probable PTSD among women (AOR=6.00; 95% CI: 4.23-8.50).

Among sexually active female participants, sexual vulnerabilities positively associated with probable PTSD included forced sexual debut (AOR=2.36; 95% CI: 1.66-3.36), being physically forced by partner to have sex (AOR=2.43; 95% CI: 1.12-5.25), being forced by partner to perform unwanted sexual acts (AOR=3.88; 95% CI: 1.94-7.78), past-year STI symptoms (AOR=2.18; 95% CI: 1.56-3.04), and HIV sero-positivity (AOR=1.60; 95% CI: 1.07-2.40). On the other hand, never having had sex (AOR=0.29; 95% CI: 0.14-0.62) and never having been pregnant (AOR=0.48; 95% CI: 0.27-0.87) were negatively associated with probable PTSD.

In the final multivariate model (Table 4), feeling not safe at all in one's community, cumulative exposure to 10 or more traumatic events, ill health without medical care, being forced

by partner to perform unwanted sexual acts, and past-year STI symptoms remained significantly

associated with probable PTSD among female participants who were sexually active.

Rape/sexual abuse in the context of war retained marginal association.

Table 3: Association between probable PTSD and selected variables among females (n=1415)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	1.53	[1.10;2.13]	0.012	1.57	[1.12;2.20]	0.009
	Nwoya	0.52	[0.33;0.84]	0.007	0.53	[0.33;0.85]	0.008
Age (years)		1.06	[1.04;1.08]	<0.001	1.06	[1.04;1.08]	<0.001
Ethnicity	Acholi	Ref			Ref		
	Other tribes	0.41	[0.21;0.83]	0.013	0.50	[0.25;1.03]	0.059
Religion	Roman Catholic	Ref			Ref		
	Anglican	0.84	[0.54;1.31]	0.444	0.83	[0.52;1.31]	0.419
	Others	0.62	[0.36;1.09]	0.096	0.62	[0.35;1.09]	0.098
Highest education attained	No school	Ref			Ref		
	Primary	0.67	[0.45;0.98]	0.041	1.05	[0.69;1.59]	0.829
	Secondary	0.37	[0.21;0.65]	<0.001	0.72	[0.39;1.31]	0.281
	Post-secondary	0.39	[0.15;1.05]	0.063	0.67	[0.24;1.82]	0.430
Current marital status	Not married	Ref			Ref		
	Married	1.42	[1.03;1.96]	0.034	0.97	[0.69;1.37]	0.859
Polygamous marriage	No	Ref			Ref		
	Yes	1.97	[1.42;2.72]	<0.001	1.29	[0.91;1.82]	0.152
Youth-headed household	No	Ref			Ref		
	Yes	0.90	[0.56;1.44]	0.652	1.52	[0.92;2.52]	0.106
Female-headed household	No	Ref			Ref		
	Yes	1.16	[0.84;1.60]	0.371	1.08	[0.77;1.52]	0.649
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.41	[1.01;1.97]	0.047	1.27	[0.90;1.80]	0.174
	Displaced	1.96	[1.27;3.01]	0.002	1.35	[0.85;2.16]	0.203
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	1.56	[1.12;2.16]	0.008	1.47	[1.05;2.07]	**0.025**
	Not safe at all	5.64	[3.22;9.89]	<0.001	4.42	[2.41;8.10]	**<0.001**
Safety compared to mother camp	More safe	Ref			Ref		
	Less safe	1.80	[1.19;2.72]	0.006	1.60	[1.02;2.51]	**0.042**
	Same	1.14	[0.58;2.22]	0.707	1.19	[0.59;2.40]	0.620

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
	Never encamped	0.75	[0.49;1.14]	0.175	0.85	[0.54;1.33]	0.471
Service availability compared to mother camp	Greater than	Ref			Ref		
	Less than	1.21	[0.82;1.78]	0.332	1.06	[0.70;1.60]	0.777
	About the same	0.85	[0.48;1.52]	0.588	0.89	[0.49;1.63]	0.716
	Never encamped	0.71	[0.47;1.08]	0.112	0.84	[0.54;1.32]	0.458
Number of camps lived in	0	Ref			Ref		
	1	1.20	[0.79;1.81]	0.397	1.06	[0.69;1.64]	0.797
	2+	2.10	[1.36;3.22]	<0.001	1.68	[1.04;2.70]	**0.033**
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	1.06	[0.71;1.58]	0.769	1.09	[0.72;1.64]	0.688
	Less than once a month	1.08	[0.70;1.65]	0.735	1.17	[0.75;1.82]	0.490
	Never	0.90	[0.55;1.49]	0.688	0.84	[0.50;1.41]	0.514
Hopeful about returning home permanently[a]	No	Ref			Ref		
	Yes	0.92	[0.65;1.31]	0.649	0.92	[0.64;1.33]	0.665
3. War-related trauma							
>=10 traumatic events	No	Ref			Ref		
	Yes	7.00	[5.02;9.76]	<0.001	6.00	[4.23;8.50]	**<0.001**
Ill health without medical care ever	No	Ref			Ref		
	Yes	2.93	[2.15;3.99]	<0.001	2.62	[1.90;3.62]	**<0.001**
Ever experienced rape or sexual abuse	No	Ref			Ref		
	Yes	4.24	[2.98;6.02]	<0.001	3.71	[2.57;5.37]	**<0.001**
4. Sexual vulnerabilities							
Age at sexual debut[b]	<16	Ref			Ref		
	16+	0.80	[0.58;1.10]	0.172	0.73	[0.52;1.01]	0.055
Forced sexual debut[b]	No	Ref			Ref		
	Yes	2.47	[1.75;3.47]	<0.001	2.36	[1.66;3.36]	**<0.001**
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	0.44	[0.30;0.65]	<0.001	0.64	[0.41;1.00]	0.051
Exchanged sex for money/gifts (past year)		Ref			Ref		
	Yes	1.77	[0.57;5.55]	0.327	1.62	[0.50;5.25]	0.421
	Never had sex	0.18	[0.09;0.37]	<0.001	0.29	[0.14;0.62]	**0.001**
Number of sexual partners (past year)	0	Ref			Ref		
	1	1.47	[1.01;2.14]	0.046	1.18	[0.80;1.76]	0.403
	2+	1.92	[0.92;4.00]	0.081	2.08	[0.97;4.45]	0.059

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Most recent partner is circumcised[b]	No	Ref			Ref		
	Yes	0.74	[0.44;1.27]	0.279	0.92	[0.53;1.59]	0.768
History of pregnancy	Pregnant before	Ref			Ref		
	Never pregnant	0.26	[0.15;0.44]	<0.001	0.48	[0.27;0.87]	**0.016**
5. Intimate partner violence[b]							
Lifetime IPV	No	Ref			Ref		
	yes	1.37	[0.99;1.92]	0.061	1.33	[0.94;1.86]	0.106
Verbally forced to have sex (past year)	No	Ref			Ref		
	Yes	1.61	[0.89;2.92]	0.119	1.51	[0.81;2.79]	0.193
Physically forced to have sex (past year)	No	Ref			Ref		
	Yes	2.62	[1.26;5.46]	0.010	2.43	[1.12;5.25]	**0.024**
Forced to perform unwanted sexual acts (past year)	No	Ref			Ref		
	Yes	4.30	[2.21;8.36]	<0.001	3.88	[1.94;7.78]	**<0.001**
6. STIs and HIV							
Any STI symptoms (past year)[b]	No	Ref			Ref		
	yes	2.14	[1.55;2.95]	<0.001	2.18	[1.56;3.04]	**<0.001**
Syphilis	NEG	Ref			Ref		
	POS	0.64	[0.27;1.50]	0.3	0.47	[0.19;1.12]	0.087
HIV	NEG	Ref			Ref		
	POS	1.84	[1.26;2.71]	0.002	1.60	[1.07;2.40]	**0.022**

*Adjusted for age and district
[a] among those not living at home
[b] among those who were sexually active

Table 4: Final model of probable PTSD among sexually active females based on stepwise selection (n=1055)

Variable	Units	Odds Ratio	95% CI	p-value
District	Gulu	Ref		
	Amuru	1.07	[0.62;1.84]	0.815
	Nwoya	0.25	[0.12;0.53]	< 0.001
Age (years)		1.04	[1.01;1.07]	0.013
Ethnicity	Acholi	Ref		
	Other tribes	0.45	[0.16;1.24]	0.123
Felt safety in community	Very safe	Ref		
	Moderately safe	1.07	[0.64;1.78]	0.791
	Not safe at all	5.09	[1.75;14.75]	0.003
Hopeful about returning home permanently	No	Ref		

Variable	Units	Odds Ratio	95% CI	p-value
	Yes	0.70	[0.43;1.14]	0.155
>=10 traumatic events	No	Ref		
	Yes	3.83	[2.14;6.85]	< 0.001
Ill health without medical care	No	Ref		
	Yes	2.46	[1.51;4.02]	< 0.001
Raped or sexually abused in the context of war	No	Ref		
	Yes	1.73	[0.94;3.20]	0.080
Forced by partner to perform unwanted sexual acts (past year)	No	Ref		
	Yes	5.43	[1.83;16.12]	0.002
Any STI symptoms (past year)	No	Ref		
	yes	1.81	[1.11;2.93]	0.017

Correlates of probable depression among female participants are presented in Table 5. Environmental stressors associated with increased odds of probable depression included: feeling moderately safe (AOR=1.54; 95% CI: 1.15-2.07) or not safe at all (AOR=4.55; 95% CI: 2.54-8.14) in one's community; less safety in one's current community compared to mother camp (AOR=1.88; 95% CI: 1.27-2.79); having lived in two or more camps (AOR=1.65; 95% CI: 1.09-2.48); and residing in a female-headed household (AOR=1.37; 95% CI: 1.03-1.83).

War-related trauma including 10 or more traumatic events (AOR=4.51; 95% CI: 3.28-6.20), ill health without medical care (AOR=2.45; 95% CI: 1.85-3.23), and rape/sexual abuse in the context of war (AOR=3.53; 95% CI: 2.51-4.95) were strongly associated with probable depression among women.

For sexually active females, sexual vulnerabilities associated with probable depression included forced sexual debut (AOR=2.36; 95% CI: 1.72-3.24), having two or more partners in the past year (AOR=2.44; 95% CI: 1.28-4.65), lifetime IPV (AOR=1.71; 95% CI: 1.28-2.30), being physically forced by partner to have sex (AOR=2.36; 95% CI: 1.16-4.82), being forced by

partner to perform unwanted sexual acts (AOR=3.21; 95% CI: 1.63-6.33), past-year STI

symptoms (AOR=2.05; 95% CI: 1.54-2.74), and HIV sero-positivity (AOR=2.37; 95% CI: 1.67-

3.36).

Moreover, several factors relating to sexual behaviors/practices turned out to be

protective of probable depression for women: being 16 or older at sexual debut (AOR=0.69; 95%

CI: 0.52-0.92), condom use at sexual debut (AOR=0.56; 95% CI: 0.38-0.82), never having had

sex (AOR=0.41; 95% CI: 0.23-0.73), and never having been pregnant (AOR=0.56; 95% CI:

0.35-0.90).

In the final multivariate model (Table 6), feeling not safe at all in one's community,

cumulative exposure to 10 or more traumatic events, ill health without medical care, being forced

by partner to perform unwanted sexual acts, and past-year STI symptoms remained significantly

associated with probable depression among females who were sexually active. HIV sero-

positivity retained marginal association.

Table 5: Association between probable depression and selected variables among females (n=1415)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	1.57	[1.17;2.10]	0.002	1.62	[1.20;2.20]	0.002
	Nwoya	0.70	[0.49;1.02]	0.063	0.71	[0.49;1.04]	0.077
Age (years)		1.06	[1.05;1.08]	<0.001	1.07	[1.05;1.08]	<0.001
Ethnicity	Acholi	Ref			Ref		
	Other tribes	0.49	[0.29;0.85]	0.010	0.61	[0.35;1.07]	0.084
Religion	Roman Catholic	Ref			Ref		
	Anglican	0.84	[0.57;1.23]	0.378	0.82	[0.55;1.23]	0.338
	Others	0.68	[0.43;1.08]	0.101	0.69	[0.43;1.11]	0.129
Highest education attained	No school	Ref			Ref		
	Primary	0.56	[0.40;0.78]	<0.001	0.90	[0.62;1.29]	0.563
	Secondary	0.39	[0.25;0.63]	<0.001	0.79	[0.48;1.31]	0.363
	Post-secondary	0.38	[0.17;0.84]	0.017	0.64	[0.28;1.48]	0.297
Current marital status	Not Married	Ref			Ref		
	Married	1.33	[1.01;1.74]	0.043	0.88	[0.66;1.19]	0.412

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Polygamous marriage	No	Ref			Ref		
	Yes	1.57	[1.18;2.09]	0.002	0.99	[0.73;1.35]	0.956
Youth-headed household	No	Ref			Ref		
	Yes	0.77	[0.50;1.17]	0.221	1.29	[0.83;2.02]	0.264
Female-headed household		Ref			Ref		
	Yes	1.46	[1.11;1.91]	0.007	1.37	[1.03;1.83]	**0.030**
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.20	[0.90;1.60]	0.217	1.09	[0.81;1.47]	0.573
	Displaced	1.67	[1.14;2.43]	0.008	1.20	[0.79;1.82]	0.386
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	1.63	[1.23;2.16]	<0.001	1.54	[1.15;2.07]	**0.004**
	Not safe at all	5.82	[3.38;10.00]	<0.001	4.55	[2.54;8.14]	**<0.001**
Safety compared to mother camp	More safe	Ref			Ref		
	Less safe	2.09	[1.46;2.99]	<0.001	1.88	[1.27;2.79]	**0.002**
	Same	0.99	[0.54;1.82]	0.977	1.00	[0.53;1.89]	0.998
	Never encamped	0.80	[0.56;1.13]	0.204	0.92	[0.63;1.35]	0.677
Service availability compared to mother camp		Ref			Ref		
	Less than	1.25	[0.90;1.75]	0.183	1.12	[0.78;1.60]	0.546
	About the same	1.03	[0.64;1.66]	0.901	1.09	[0.66;1.78]	0.746
	Never encamped	0.76	[0.53;1.08]	0.120	0.92	[0.63;1.35]	0.674
Number of camps lived in		Ref			Ref		
	1	1.19	[0.84;1.69]	0.323	1.03	[0.71;1.48]	0.893
	2+	2.06	[1.43;2.98]	<0.001	1.65	[1.09;2.48]	**0.017**
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	1.21	[0.85;1.71]	0.290	1.26	[0.87;1.81]	0.221
	Less than once a month	1.27	[0.88;1.84]	0.207	1.42	[0.96;2.09]	0.080
	Never	1.06	[0.69;1.63]	0.788	1.03	[0.66;1.61]	0.907
Hopeful about returning home permanently[a]	No	Ref			Ref		
	Yes	1.10	[0.82;1.49]	0.532	1.13	[0.83;1.55]	0.443
3. War-related trauma							
>=10 traumatic events	No	Ref			Ref		
	Yes	5.50	[4.06;7.45]	<0.001	4.51	[3.28;6.20]	**<0.001**
Ill health without medical care ever	No	Ref			Ref		
	Yes	2.77	[2.12;3.62]	<0.001	2.45	[1.85;3.23]	**<0.001**

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Ever experienced rape or sexual abuse	No	Ref			Ref		
	Yes	4.11	[2.97;5.69]	<0.001	3.53	[2.51;4.95]	**<0.001**
4. Sexual vulnerabilities							
Age at sexual debut[b]	<16	Ref			Ref		
	16+	0.76	[0.58;1.01]	0.055	0.69	[0.52;0.92]	**0.011**
Forced sexual debut[b]	No	Ref			Ref		
	Yes	2.49	[1.83;3.38]	<0.001	2.36	[1.72;3.24]	**<0.001**
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	0.38	[0.27;0.54]	<0.001	0.56	[0.38;0.82]	**0.003**
Exchanged sex for money/gifts (past year)	No	Ref			Ref		
	Yes	1.55	[0.53;4.50]	0.421	1.47	[0.49;4.44]	0.492
	Never had sex	0.24	[0.14;0.40]	<0.001	0.41	[0.23;0.73]	**0.002**
Number of sexual partners (past year)	0	Ref			Ref		
	1	1.42	[1.04;1.96]	0.030	1.11	[0.79;1.56]	0.551
	2+	2.28	[1.23;4.23]	0.009	2.44	[1.28;4.65]	**0.007**
Most recent partner is circumcised[b]	No	Ref			Ref		
	Yes	0.63	[0.39;1.02]	0.062	0.77	[0.47;1.27]	0.308
History of pregnancy	Pregnant before	Ref			Ref		
	Never pregnant	0.29	[0.20;0.45]	<0.001	0.56	[0.35;0.90]	**0.017**
5. Intimate partner violence[b]							
Lifetime IPV	No	Ref			Ref		
	yes	1.75	[1.32;2.33]	<0.001	1.71	[1.28;2.30]	**<0.001**
Verbally forced to have sex (past year)	No	Ref			Ref		
	Yes	1.64	[0.97;2.78]	0.064	1.52	[0.88;2.62]	0.132
Physically forced to have sex (past year)	No	Ref			Ref		
	Yes	2.56	[1.30;5.05]	0.006	2.36	[1.16;4.82]	**0.018**
Forced to perform unwanted sexual acts (past year)	No	Ref			Ref		
	Yes	3.66	[1.91;7.02]	<0.001	3.21	[1.63;6.33]	**<0.001**
6. STIs and HIV							
Any STI symptoms (past year)[b]	No	Ref			Ref		
	yes	2.01	[1.52;2.66]	<0.001	2.05	[1.54;2.74]	**<0.001**
Syphilis	NEG	Ref			Ref		
	POS	1.77	[1.01;3.08]	0.045	1.36	[0.76;2.42]	0.299
HIV	NEG	Ref			Ref		
	POS	2.68	[1.93;3.72]	<0.001	2.37	[1.67;3.36]	**<0.001**

Adjusted for age and district

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value

a among those not living at home
b among those who were sexually active

Table 6: Final model of probable depression among sexually active females based on stepwise selection (n=1055)

Variable	Units	Odds Ratio	95% CI	p-value
District	Gulu	Ref		
	Amuru	1.14	[0.70;1.88]	0.594
	Nwoya	0.53	[0.30;0.92]	0.024
Age (years)		1.03	[1.00;1.06]	0.020
Felt safety in community	Very safe	Ref		
	Moderately safe	1.34	[0.88;2.06]	0.173
	Not safe at all	7.00	[2.37;20.70]	< 0.001
>=10 traumatic events	No	Ref		
	Yes	3.80	[2.26;6.38]	< 0.001
Ill health without medical care	No	Ref		
	Yes	1.78	[1.17;2.72]	0.008
Raped or sexually abused in the context of war	No	Ref		
	Yes	1.55	[0.89;2.69]	0.123
Lifetime IPV	No	Ref		
	yes	1.41	[0.90;2.21]	0.138
Forced by partner to perform unwanted sexual acts (past year)	No	Ref		
	Yes	3.69	[1.25;10.89]	0.018
Any STI symptoms (past year)	No	Ref		
	yes	1.83	[1.21;2.78]	0.004
HIV	NEG	Ref		
	POS	1.52	[0.92;2.52]	0.103

3.3   Regression analyses of male participants

Table 7 summarizes the results of univariate and adjusted analyses examining probable

PTSD among males. Controlling for age and district of residence, two sociodemographic

characteristics were found to be associated with probable PTSD among men: being currently

married (AOR=2.34; 95% CI:1.23-4.45) and residing in a youth-headed household (AOR=2.07;

95% CI: 1.21-3.54). Similarly, significant associations were observed between probable PTSD and two environmental stressors: living in a transient community (AOR=1.72; 95% CI: 1.06-2.79) and feeling not safe at all in one's community (AOR=2.85; 95% CI: 1.23-6.60).

Men who experienced 10 or more war-related traumatic events had almost 12 times the odds of screening positive for PTSD (AOR=11.62; 95% CI: 6.81-19.82). Specifically, those who experienced ill health without medical care (AOR=5.63; 95% CI: 3.54-8.96) or rape/sexual abuse in the context of war (AOR=4.82; 95% CI: 1.53-15.15) had approximately five to six times the odds of probable PTSD.

Among sexually active male participants, probable PTSD was significantly associated with exchanging sex for money/gifts (AOR=5.33; 95% CI: 1.47-19.31) and having two or more sexual partners (AOR=3.72; 95% CI: 1.68-8.23) in the past year and marginally associated with lifetime IPV (AOR=1.71; 95% CI: 0.97-3.02; p=0.0651). Men reporting past-year genital ulcers had over twice the odds of probable PTSD (AOR=2.38; 95% CI: 1.27-4.46).

In the final multivariate model (Table 8), living in a transient community, cumulative exposure to 10 or more traumatic events, and ill health without medical care remained significantly associated with probable PTSD among males who were sexually active. Past-year genital ulcers retained marginal association.

Table 7: Association between probable PTSD and selected variables among males (n=1043)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	1.80	[1.11;2.92]	0.017	1.82	[1.12;2.95]	0.016
	Nwoya	0.84	[0.45;1.58]	0.589	0.81	[0.43;1.53]	0.521
Age (years)		1.02	[1.00;1.05]	0.031	1.03	[1.00;1.05]	0.024
Ethnicity	Acholi	Ref			Ref		
	Other tribes	0.76	[0.32;1.80]	0.535	0.82	[0.34;1.98]	0.666
Religion	Roman Catholic	Ref			Ref		

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
	Anglican	0.74	[0.40;1.36]	0.328	0.72	[0.39;1.33]	0.293
	Others	0.60	[0.21;1.69]	0.332	0.66	[0.23;1.89]	0.443
Highest education attained**		-	-	0.810	-	-	-
Current marital status	Not married	Ref			Ref		
	Married	2.16	[1.36;3.45]	0.001	2.34	[1.23;4.45]	**0.010**
Polygamous marriage	No	Ref			Ref		
	Yes	1.45	[0.83;2.54]	0.192	0.95	[0.50;1.80]	0.873
Youth-headed household	No	Ref			Ref		
	Yes	1.50	[0.92;2.47]	0.107	2.07	[1.21;3.54]	**0.008**
Female-headed household		Ref			Ref		
	Yes	0.69	[0.36;1.32]	0.263	0.76	[0.39;1.48]	0.427
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.74	[1.08;2.82]	0.023	1.72	[1.06;2.79]	**0.029**
	Displaced	1.07	[0.52;2.19]	0.858	0.81	[0.38;1.70]	0.575
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	1.34	[0.81;2.23]	0.260	1.16	[0.68;1.97]	0.588
	Not safe at all	3.74	[1.69;8.28]	0.001	2.85	[1.23;6.60]	**0.015**
Safety compared to mother camp**		-	-	0.526	-	-	-
Service availability compared to mother camp	Greater than	Ref			Ref		
	Less than	1.31	[0.77;2.25]	0.320	1.13	[0.64;1.98]	0.679
	About the same	0.62	[0.22;1.78]	0.374	0.54	[0.19;1.56]	0.256
	Never encamped	0.65	[0.34;1.25]	0.197	0.77	[0.39;1.53]	0.451
Number of camps lived in	0	Ref			Ref		
	1	1.11	[0.58;2.15]	0.749	1.04	[0.52;2.06]	0.910
	2+	2.13	[1.11;4.09]	0.023	1.77	[0.85;3.68]	0.125
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	0.93	[0.56;1.55]	0.785	0.89	[0.53;1.50]	0.674
	Less than once a month	0.72	[0.32;1.61]	0.425	0.77	[0.34;1.73]	0.523
	Never	1.74	[0.90;3.37]	0.102	1.89	[0.96;3.72]	0.065
Hopeful about returning home permanently[a]		Ref			Ref		
	Yes	0.65	[0.36;1.20]	0.173	0.66	[0.36;1.22]	0.187
3. War-related trauma							
>=10 traumatic events	No	Ref			Ref		
	Yes	9.41	[5.91;15.00]	<0.001	11.62	[6.81;19.82]	**<0.001**

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Ill health without medical care ever		Ref			Ref		
	Yes	6.10	[3.87;9.63]	<0.001	5.63	[3.54;8.96]	**<0.001**
Ever experienced rape or sexual abuse	No	Ref			Ref		
	Yes	6.03	[1.97;18.39]	0.002	4.82	[1.53;15.15]	**0.007**
4. Sexual and relationship vulnerabilities							
Age at sexual debut[b]	<16	Ref			Ref		
	16+	0.84	[0.52;1.35]	0.469	0.77	[0.47;1.27]	0.313
Forced sexual debut[b]**	No	Ref			Ref		
	Yes	1.96	[0.35;7.26]	0.237	-	-	-
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	0.95	[0.59;1.55]	0.852	1.11	[0.66;1.88]	0.691
Exchanged sex for money/gifts (past year)	No	Ref			Ref		
	Yes	5.35	[1.53;18.71]	0.009	5.33	[1.47;19.31]	**0.011**
	Never had sex	0.46	[0.24;0.89]	0.021	0.52	[0.25;1.08]	0.079
Number of sexual partners (past year)	0	Ref			Ref		
	1	2.36	[1.21;4.59]	0.012	2.65	[1.26;5.59]	**0.010**
	2+	3.61	[1.84;7.08]	<0.001	3.72	[1.68;8.23]	**0.001**
Circumcised	No	Ref			Ref		
	Yes	0.49	[0.17;1.36]	0.171	0.58	[0.20;1.64]	0.304
Lifetime IPV	No	Ref			Ref		
	yes	1.93	[1.12;3.32]	0.017	1.71	[0.97;3.02]	0.065
5. STIs and HIV							
Genital ulcers (past year)[b]	No	Ref			Ref		
	Yes	2.49	[1.34;4.63]	0.004	2.38	[1.27;4.46]	**0.007**
Syphilis**	NEG	Ref			Ref		
	POS	0.97	[0.19;3.21]	1	-	-	-
HIV	NEG	Ref			Ref		
	POS	0.70	[0.27;1.77]	0.447	0.57	[0.22;1.49]	0.249

*Adjusted for age and district

**Fisher's exact test was performed due to small cell counts

[a] among those not living at home

[b] among those who were sexually active

Table 8: Final model of probable PTSD among sexually active males based on stepwise selection (n=756)

Variable	Units	Odds Ratio	95% CI	p-value
District	Gulu	Ref		
	Amuru	2.42	[1.32;4.45]	0.004

Variable	Units	Odds Ratio	95% CI	p-value
	Nwoya	1.03	[0.49;2.18]	0.933
Age (years)		0.96	[0.93;0.99]	0.020
Community displacement status	Permanent	Ref		
	Transient	1.97	[1.09;3.54]	0.024
	Displaced	0.71	[0.27;1.90]	0.498
>=10 traumatic events	No	Ref		
	Yes	6.21	[3.33;11.55]	< 0.001
Ill health without medical care	No	Ref		
	Yes	3.00	[1.69;5.34]	< 0.001
Genital ulcers (past year)	No	Ref		
	Yes	1.98	[0.96;4.08]	0.063

For probable depression, unadjusted and adjusted bivariate associations among men are found in Table 9. Living in a transient community (AOR=1.81; 95% CI: 1.10-3.00), feeling moderately safe (AOR=1.82; 95% CI: 1.09-3.04) or not safe at all (AOR=3.26; 95% CI: 1.31-8.13) in one's community, having lived in two or more camps (AOR=2.43; 95% CI: 1.20-4.91), and never going back home to visit (AOR=2.54; 95% CI: 1.29-5.02) were environmental stressors associated with elevated odds of probable depression.

Among male participants, strong associations were observed between probable PTSD and war-related trauma including having experienced 10 or more traumatic events (AOR=8.05; 95% CI: 4.79-13.52), ill health without medical care (AOR=3.92; 95% CI: 2.46-6.22), and rape/sexual abuse in the context of war (AOR=4.31; 95% CI: 1.30-14.24).

In terms of males' sexual and relationship vulnerabilities, probable depression was significantly associated with self-reported genital ulcers (AOR=2.15; 95% CI: 1.12-4.14) and marginally associated with forced sexual debut (AOR=2.95; 95% CI: 0.94-9.27; p=0.0637) and having two or more partners in the past year (AOR=2.09; 95% CI: 0.95-4.56; p=0.0653).

In the final multivariate model (Table 10), living in a transient community, never going back home, cumulative exposure to 10 or more traumatic events, and ill health without medical care remained significantly associated with probable depression among males who were sexually active. Past-year genital ulcers retained marginal association.

Table 9: Association between probable depression and selected variables among males (n=1043)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District							
	Gulu	Ref			Ref		
	Amuru	0.90	[0.55;1.49]	0.689	0.90	[0.55;1.50]	0.698
	Nwoya	0.80	[0.45;1.42]	0.443	0.78	[0.44;1.39]	0.393
Age (years)		1.02	[1.00;1.05]	0.054	1.02	[1.00;1.05]	0.050
Ethnicity	Acholi	Ref			Ref		
	Other tribes	1.29	[0.62;2.68]	0.491	1.22	[0.58;2.57]	0.601
Religion	Roman Catholic	Ref			Ref		
	Anglican	0.88	[0.48;1.60]	0.678	0.84	[0.46;1.53]	0.569
	Others	1.02	[0.43;2.45]	0.960	1.10	[0.45;2.66]	0.835
Highest education attained**		-	-	0.465	-	-	-
Current marital status	Not married	Ref			Ref		
	Married	1.77	[1.12;2.80]	0.014	1.69	[0.89;3.20]	0.106
Polygamous marriage	No	Ref			Ref		
	Yes	1.14	[0.63;2.08]	0.667	0.85	[0.44;1.67]	0.647
Youth-headed household	No	Ref			Ref		
	Yes	1.19	[0.71;2.01]	0.511	1.36	[0.78;2.36]	0.278
Female-headed household	No	Ref			Ref		
	Yes	1.05	[0.58;1.87]	0.880	1.14	[0.63;2.06]	0.653
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.83	[1.11;3.01]	0.018	1.81	[1.10;3.00]	**0.020**
	Displaced	1.57	[0.80;3.10]	0.191	1.56	[0.77;3.17]	0.219
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	1.69	[1.04;2.76]	0.035	1.82	[1.09;3.04]	**0.021**
	Not safe at all	2.88	[1.21;6.83]	0.017	3.26	[1.31;8.13]	**0.011**
Safety compared to mother camp**		-	-	0.819	-	-	-

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Service availability compared to mother camp	Greater than	Ref			Ref		
	Less than	1.34	[0.77;2.32]	0.299	1.46	[0.82;2.59]	0.202
	About the same	0.86	[0.33;2.25]	0.762	0.89	[0.34;2.33]	0.807
	Never encamped	0.86	[0.46;1.59]	0.630	0.78	[0.41;1.49]	0.456
Number of camps lived in	0	Ref			Ref		
	1	0.97	[0.51;1.85]	0.927	1.09	[0.56;2.11]	0.804
	2+	1.87	[0.99;3.53]	0.055	2.43	[1.20;4.91]	**0.013**
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	1.11	[0.65;1.90]	0.694	1.15	[0.67;1.97]	0.623
	Less than once a month	1.28	[0.61;2.69]	0.513	1.32	[0.63;2.78]	0.466
	Never	2.32	[1.19;4.53]	0.014	2.54	[1.29;5.02]	**0.007**
Hopeful about returning home permanently[a]	No	Ref			Ref		
	Yes	0.78	[0.42;1.45]	0.438	0.78	[0.42;1.45]	0.440
3. War-related trauma							
>=10 traumatic events	No	Ref			Ref		
	Yes	6.89	[4.36;10.90]	<0.001	8.05	[4.79;13.52]	**<0.001**
Ill health without medical care ever	No	Ref			Ref		
	Yes	4.00	[2.54;6.29]	<0.001	3.92	[2.46;6.22]	**<0.001**
Ever experienced rape or sexual abuse	No	Ref			Ref		
	Yes	4.51	[1.38;14.70]	0.013	4.31	[1.30;14.24]	**0.017**
4. Sexual and relationship vulnerabilities							
Age at sexual debut[b]	<16	Ref			Ref		
	16+	0.73	[0.45;1.18]	0.202	0.67	[0.41;1.10]	0.114
Forced sexual debut[b]	No	Ref			Ref		
	Yes	2.82	[0.90;8.79]	0.074	2.95	[0.94;9.27]	0.064
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	1.06	[0.65;1.72]	0.818	1.11	[0.66;1.87]	0.700
Exchanged sex for money/gifts (past year)**		-	-	0.132	-	-	-
Number of sexual partners (past year)	0	Ref			Ref		
	1	2.21	[1.18;4.12]	0.013	2.00	[0.99;4.07]	0.055
	2+	2.35	[1.21;4.54]	0.011	2.09	[0.95;4.56]	0.065
Circumcised	No	Ref			Ref		
	Yes	0.95	[0.42;2.13]	0.901	0.95	[0.42;2.15]	0.900
Lifetime IPV	No	Ref			Ref		

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
	yes	1.54	[0.86;2.74]	0.147	1.55	[0.85;2.84]	0.154
6. STIs and HIV							
Genital ulcers (past year)[b]	No	Ref			Ref		
	Yes	2.16	[1.12;4.14]	0.021	2.15	[1.12;4.14]	**0.022**
Syphilis**	NEG	Ref			Ref		
	POS	0.66	[0.08;2.65]	0.762	-	-	-
HIV	NEG	Ref			Ref		
	POS	2.10	[1.09;4.06]	0.028	1.79	[0.89;3.60]	0.102

Adjusted for age and district
**Fisher's exact test was performed due to small cell counts*
[a] *among those not living at home*
[b] *among those who were sexually active*

Table 10: Final model of probable depression among sexually active males based on stepwise selection (n=756)

Variable	Units	Odds Ratio	95% CI	p-value
District	Gulu	Ref		
	Amuru	0.65	[0.33;1.26]	0.200
	Nwoya	1.01	[0.51;1.99]	0.983
Age (years)		0.97	[0.93;1.00]	0.054
Community displacement status	Permanent	Ref		
	Transient	2.16	[1.18;3.97]	0.013
	Displaced	1.14	[0.41;3.17]	0.805
Frequency of going back home	Living at home	Ref		
	Once a month or more	1.05	[0.55;1.98]	0.890
	Less than once a month	1.30	[0.51;3.30]	0.579
	Never	3.29	[1.36;7.96]	0.008
>=10 traumatic events	No	Ref		
	Yes	4.70	[2.47;8.96]	< 0.001
Ill health without medical care	No	Ref		
	Yes	2.12	[1.17;3.86]	0.013
Raped or sexually abused in the context of war	No	Ref		
	Yes	3.13	[0.81;12.18]	0.099
Genital ulcers (past year)	No	Ref		
	Yes	2.07	[0.99;4.33]	0.053

**3.4	Summary of results and discussion**

The prevalence of probable PTSD and depression in our sample was 11.7% and 15.2% respectively, much lower than rates reported in earlier studies (Karunakara et al., 2004; Mugisha, Muyinda, Malamba, & Kinyanda, 2015; Roberts et al., 2008; Vinck, Pham, Stover, & Weinstein, 2007), as well as in a recent systematic review of adult civilian war survivors worldwide (26% for PTSD and 27% for major depression) (Morina et al., 2018). Our relatively low prevalence rates may reflect the fact that some of our participants resided in the town of Gulu and were never encamped during the war. On the other hand, they speak to the enormous resilience Northern Ugandans exhibited in the face of trauma and adversity. As residents moved back to ancestral villages and reconnected with their kin members, many might have experienced spontaneous remission of war-induced symptoms such as hypervigilance, intense fear/anxiety, and nightmares. Previous research suggests that returning home in the aftermath of natural or man-made disasters can bring a sense of belonging, hopefulness, and renewed economic opportunities that are conducive to post-traumatic healing on both individual and collective levels (Nuttman-Shwartz et al., 2011; Siriwardhana & Stewart, 2013).

In our study, females were significantly more likely to screen positive for PTSD and depression than males. However, males were more likely to have experienced physically traumatizing events (e.g., serious injury, forced separation from family, forced imprisonment), which is consistent with results from other studies conducted in the region (Ainamani, Elbert, Olema, & Hecker, 2020; Amone-P'Olak et al., 2013; Mugisha, Muyinda, Wandiembe, et al., 2015; Roberts et al., 2008). The observation that Northern Ugandan men exhibited better mental health in spite of greater violence exposure could be related to the common experience of rough-and-tumble play for boys growing up, leading them to normalize violence and potentially

develop "militarized masculinity," a set of personality traits that are hyper-masculine and hegemonic and that involve emotional control and insensitivity to others (Amone-P'Olak et al., 2016; Breslau & Anthony, 2007; Lopes, 2011).

There is a growing body of literature from around the world demonstrating that women are more susceptible to mental illness when confronted with traumatic events (Breslau & Anthony, 2007; Ditlevsen & Elklit, 2012; Irish et al., 2011; Tolin & Foa, 2008). Epidemiological research on psychotrauma has suggested that differential exposure to specific types of trauma may be related to women's heightened responses to acute traumatic stress: women more frequently experience high-impact trauma, such as sexual assault, which carries more conditional risk for PTSD, at a younger age (Ainamani et al., 2020; Olff, 2017; Tolin & Foa, 2008). In summarizing existing evidence on gender differences with PTSD, Olff (2017) pointed out that women tend to adopt coping strategies that are "emotion-focused, defensive and palliative," rather than the problem-focused ones that are more prevalent in men. Neurobiological mechanisms relating to oxytocin have also been speculated to influence gendered patterns in post-traumatic mental health (Olff, 2017).

In previous studies undertaken by Mugisha et al. (2016; 2015) and Roberts et al. (2008) in Northern Uganda, the female gender remained a prominent risk factor for suicidality, PTSD, and major depressive disorder after adjusting for all other significant variables. Such gender asymmetry in trauma-related conditions has also been shown in other African settings impacted by prolonged warfare (Ainamani et al., 2020; Roberts, Damundu, Lomoro, & Sondorp, 2009). In the context of post-conflict Northern Uganda, women faced a multitude of hardships, such as economic destitution, loss of kin and/or partner, as well as single parenthood, which put them at elevated risk for mental distress and maladaptation. Adding to the strain were layers of gender

inequality dating back to the pre-war era, which resulted in female-specific experiences such as early marriage and pregnancy, living in a polygamous relationship, domestic violence, and sexual abuse; those who endured wartime sexual violence were further marginalized from their peers and communities due to stigma and misunderstanding (Annan & Brier, 2010; S. Patel et al., 2013). Taken together, these realities point to the importance of establishing gender-sensitive mental health programs and dismantling structural barriers women face in the Acholi patriarchal culture.

We observed a significant overlap between probable PTSD and depression in our study: 75.9% of participants with probable depression also had probable PTSD, and 58.5% of those with probable PTSD concurrently had probable depression. In addition, these two outcomes shared many of the same predictors in our analyses. According to other comparable studies in Northern Uganda, such comorbidity is the norm rather than an exception (Mugisha, Muyinda, Wandiembe, et al., 2015; Pfeiffer & Elbert, 2011). We relate this to Singer's syndemic theory, which posits that diseases do not exist in isolation but interact synergistically within social contexts, creating multiple epidemics simultaneously called a "syndemic" (Closson et al., 2016; de Jong et al., 2015; Singer, 2009). In light of this perspective, it is crucial for local policymakers to build infrastructure that provides integrated mental health services and to find solutions to broader socio-political issues that affect and shape the population's health as a whole.

3.4.1 Forced displacement and environmental stressors

Our study demonstrates that stressful physical and social environments were prevalent in Northern Uganda and were tightly linked to post-conflict mental health. At the time of our data collection (five years after the war ended), more than half of our participants were still residing

in communities that were formerly displaced or transient camps. Among females, feeling unsafe in one's community increased the odds of probable PTSD/depression by more than four-fold. Among males, feeling unsafe in one's community increased the odds of probable PTSD/depression by approximately three-fold. Living in a transient community was also associated with elevated odds of probable PTSD (AOR=1.72; 95% CI: 1.06-2.79) and depression (AOR=1.81; 95% CI: 1.10-3.00) in the male population. These results speak to the profound sense of loss and rootlessness Northern Ugandans continued to experience despite the return of peace and to the imperative to provide them with needed assistance in the resettling process.

During the protracted war, entire villages were burned down by LRA rebels, family belongings looted, and many Acholi ancestral shrines destroyed (De Temmerman, 2001; Finnström, 2008). Village dwellers were forced to move into overcrowded IDP camps, separated from kin-based structures that had traditionally supported their survival, protection, and wellbeing (McElroy et al., 2012). In the post-conflict era, members of vulnerable populations such as elders and persons with disabilities were left behind in IDP camps without stable homesteads to return to (S. H. Patel, 2012). For individuals and families who embarked on the journey of return migration, many had to move back and forth between transit camps and home villages while rebuilding from the ashes (S. H. Patel, 2012). The psychological impact of displacement was salient in our study: above a quarter (28.6%) of participants reported having lived in multiple IDP camps, and this was associated with meeting criteria for both PTSD (AOR=1.68; 95% CI: 1.04-2.70) and depression (AOR=1.65; 95% CI: 1.09-2.48) among females and with more than two times the odds of meeting criteria for depression among males (AOR=2.43; 95% CI: 1.20-4.91). For IDPs, the combination of housing transience, poverty, food

insecurity, and shattered infrastructure served to perpetuate stress and potentially exacerbate the traumatizing effect of previous war experiences.

Interestingly, residing in the Nwoya district appeared to be protective of probable PTSD/depression for females as seen in our final models. Indeed, we found a lower prevalence of both outcomes in Nwoya, compared to Gulu and Amuru, among female participants. One plausible explanation is that Nwoya was less impacted by rebel activities due to its geographical location. On the other hand, this result could be due to residual confounding, with the "district" confounder inadequately controlled for in our analyses, as there might be persistent differences in communities within Nwoya (LaMorte, 2016).

Tied to war-induced displacement was the deprivation of agrarian land that had nurtured and sustained the Acholi people since time immemorial (McElroy et al., 2012). Through conducting interviews and focus group discussions with 249 respondents in the Amuru district, McElroy and colleagues (2012) identified occupation as a theme that repeatedly emerged. They found that lacking access to ancestral land had kept people from engaging in productive work, contributing to dysfunctional behaviours seen in IDP camps (e.g., excessive drinking, thefts, extramarital affairs) and a gradual breakdown of Acholi culture. They recommended occupation-focused programs be an essential part of post-conflict rehabilitation and redevelopment to help individuals resume their former occupations and regain a sense of control, meaning, and purpose (McElroy et al., 2012). Although participants in our study did not receive questions directly relating to their loss of traditional livelihoods, it was likely a risk factor for probable PTSD/depression based on existing literature; alternatively, it could also have mediated the relationship between land deprivation and those mental health outcomes. We recognize the tremendous value of recovering land and an agricultural lifestyle for the Acholi people in

bringing back collaborative communal work, restoring cultural connectedness, and healing collective wounds during periods of post-war transition.

To the best of our knowledge, no specific study to date has investigated the connection between precarious housing situations and impaired mental health in war-affected Northern Uganda. In a recent commentary, Siriwardhana and Stewart (2013) pointed out that worldwide, there is a paucity of research concerning the impact of prolonged forced displacement on population health. That being said, our findings are congruent with results from a pioneer study in the conflict-ridden Gaza strip which used similar survey-based assessment (Nuttman-Shwartz et al., 2011). Among a group of 269 Israelis forced to evacuate their homes due to a sudden political decision, Nuttman-Shwartz and colleagues (2011) found that one year later, living in temporary housing was linked to higher levels of post-traumatic stress and lower levels of post-traumatic growth. These researchers noted that "(r)elocation following war, political conflict or natural disaster intensifies the individual's loss of control and sense of threat that are caused by the losses that accompany the move" (Nuttman-Shwartz et al., 2011). Their findings in conjuction with ours highlight the importance of ensuring safe living arragements for forcibly displaced people as a first step toward rehabilitation in humanitarian settings.

3.4.2   War-related trauma

Among all the variables included in our analyses, war-related trauma–summarized by ">=10 traumatic events"–turned out to be the most robust predictor of probable PTSD and depression. Remarkably, men who experienced 10 or more traumatic events during the war had almost 12 times the odds of screening positive for PTSD (AOR=11.62; 95% CI: 6.81-19.82). These findings concur with other studies that have documented the relationship between greater

war violence exposure and worse mental health in Northern Uganda (Roberts et al., 2008; Vinck et al., 2007). Although the LRA insurgency had ended 5 years prior to our data collection, the traumatizing effect of horrific war events evidently continued to take a heavy toll on the mental wellbeing of local populations. Our findings lend strong support to the validity of the "trauma pathway," which in recent years has been contested with the "psychosocial pathway," in explaining conflict-related mental health outcomes (Amone-P'Olak et al., 2013; Miller & Rasmussen, 2010). The former theory emphasizes direct exposure to wartime violence as a key factor in determining mental health of war-affected individuals, while the latter maintains stressful social and material conditions mediate or exacerbate the effect of previous war experiences and exert more lasting psychological impacts (Amone-P'Olak et al., 2013; Miller & Rasmussen, 2010). As critiqued by Neuner (2010) in his commentary, an arbitrary dichotomy of war and non-war-related stress may not be helpful at all for understanding mental health in conflict and post-conflict settings and guiding interventions. Specialized psychotherapeutic interventions are still needed in Northern Uganda to address the lingering effects of war trauma. On a broader scale, remedial measures should be taken by local stakeholders to promote truth-telling and bring about transitional justice by holding major perpetrators of war crimes accountable as a path toward community healing.

Based on answers to the HTQ, food and water insecurity stood out as the most frequently reported traumatic event by our study participants. During and following the war, Northern Uganda has seen persistent problems related to food shortage, owing to damages to arable land, a recent drought in the region, and the failure of NGOs and government agencies to supply basic necessities (IRIN News, 2009a, 2009b; S. Patel et al., 2013). Cross-culturally, the experience of being food insecure has been shown to engender feelings of helplessness, shame, suffering, and

humiliation (Tsai et al., 2012). In qualitative interviews with Roberts and colleagues (2009), a third of respondents residing in 15 IDP camps randomly selected from Gulu and Amuru voiced complaints about having inadequate food to eat, which caused lethargy and locally defined problems of *two tam* and *par* (stress and depression-like symptoms).

For decades the global community has focused attention on hunger, malnutrition, and associated physical health consequences in sub-Saharan Africa, yet recent evidence has emerged to uncover their invisible and no less severe harms to psychosocial wellbeing. A number of studies in Uganda and other sub-Saharan settings have documented an independent positive association between food insecurity and a variety of psychiatric problems, including anxiety, depression, and post-traumatic stress (R. Gupta et al., 2010; Hadley et al., 2008; Mugisha, Muyinda, Malamba, et al., 2015; Mugisha, Muyinda, Wandiembe, et al., 2015; Natamba et al., 2017; Roberts et al., 2008; Tsai et al., 2012). Of particular interest to us is a study conducted in rural Uganda (Mbarara District southwest of Kampala) among a group of HIV-infected individuals (n=456), which used the Hopkins Symptom Checklist for depression screening and found food insecurity to be associated with depression in women, but not men (Tsai et al., 2012). In part, this could be attributed to the reality that women in Uganda are frequently responsible for supporting and feeding their families through subsistence livelihoods, making the uncertainty around food availability a major stressor for them (Tsai et al., 2012). Having explored gender differences among abducted and non-abducted Northern Ugandans, Patel et al. (2013) suggests that food insecurity in times of conflict heightens HIV-related sexual vulnerabilities for women, who may be coerced into providing sexual services in exchange for food; within non-transactional sexual relationships, food-dependent women are also more likely to experience power inequities and compromised agency and find themselves unable to make decisions

including negotiating condom use. It is deeply concerning that female participants in our study were significantly more likely to report a lack of food/water than their male counterparts (67.0% vs. 62.5%; p=0.024), which may have contributed to their higher rates of mental health problems. More research based on longitudinal data is needed to clarify potential gender-differentiated effects of food insufficiency on mental health in Northern Uganda and other conflict-affected settings.

Although age was treated as a confounder in our study, we also found it to be positively associated with both mental health outcomes in all subgroup analyses. There is a dearth of evidence on how age impacts post-conflict mental health in Northern Uganda, although one population-based cross-sectional study (the Wayo-Nero study) showed older age to be predictive of major depressive disorder but not PTSD (Mugisha, Muyinda, Malamba, et al., 2015; Mugisha, Muyinda, Wandiembe, et al., 2015). We interpreted older age as a proxy measure of longer exposure to war and intense fighting, which corresponded to higher levels of psychiatric symptomatology as previously shown by a myriad of studies in conflict situations globally (Murthy & Lakshminarayana, 2006).

3.4.3   Sexual violence and vulnerabilities

Our study revealed high levels of sexual trauma among Cango Lyec participants: one in five female participants reported experiencing forced sexual debut, which was associated with over twice the odds of probable PTSD and depression; 13.7% reported being raped or sexually abused in the context of war, which was associated with over 3.5 times the odds of either outcome. The latter association was also observed among males, although only 1.4% of our male participants reported a past history of war-related rape/sexual abuse. Throughout the 20-year war

that engulfed Acholiland, rape and sexual abuse by both armed forces were pervasive and have been well-documented. The LRA carried out serious crimes of sexual violence in a systematic manner, including sexual mutilation, forced marriage, and forced pregnancy, resulting in early sexual debut of young abducted girls (OHCHR & UHRC, 2011). At the same time, it is alleged that government troops used rape as a deliberate strategy to intimidate and dominate the civilian population (OHCHR & UHRC, 2011). In addition, it is alleged that non-combatant males perpetrated sexual assault against female residents in the chaotic IDP camp setting with frequent impunity (S. H. Patel, 2012; H. E. Porter, 2015).

According to a large-scale survey conducted in post-conflict Northern Uganda by the Office of the United Nations High Commissioner for Human Rights (OHCHR), "many female victims and victims of sexual violence will not initially come forward to claim reparation, in part due to the stigma attached to the harms they have suffered" (OHCHR & UHRC, 2011). Such stigma should be understood within the local cultural context, as being sexually violated by a stranger transgressed the Acholi taboo on premarital sex and norms of marriage and love, with children born as a result facing significant barriers accessing key resources (e.g., land, burial ground) due to ambiguous paternal lineage (Atim et al., 2018; H. Porter, 2013). In many cases, it diminished women's prospect of marrying in the post-conflict period and forced them into abusive relationships (Annan & Brier, 2010; Atim et al., 2018).

In the post-conflict period, women were confronted with new dangers during the process of navigating environments outside the bush and IDP camps. Through extensive field work for the Wayo Initiative, Spittal et al. (2008) discovered that daughters were often left behind in large towns or trading centres for schooling where they became vulnerable to sexual predation by strangers (Spittal et al., 2008). With prevailing peace, cross-border trade between Northern

Uganda and South Sudan rapidly expanded, and the previously isolated region saw an influx of truckers, agricultural traders, and cattle-loaders, putting women at high risk for gender-based violence (Malamba et al., 2016). In a state of destitution, some young women who never learned agricultural skills were seen working in strip/sex clubs and exchanging sex for goods along the Kampala-Juba highway (Amone-P'Olak et al., 2016; Malamba et al., 2016; Spittal et al., 2018). Unfortunately, limited to no services were available to women in Northern Uganda who experienced rape, leaving them unprotected from HIV infection and associated mental health sequelae (Spittal et al., 2018). It is deeply concerning that years of war alienated young girls from their own culture and communities, many of whom missed opportunities to learn about culturally appropriate sexual behaviours through traditional Acholi institutions (Spittal et al., 2008). Post-war hardships likely compounded trauma and the sense of disempowerment for those vulnerable young women and further compromised their psychological wellbeing.

For both genders in our study, having multiple sexual partners in the past year was associated with probable PTSD and depression. This correlation between high-risk sexual behaviours and psychopathology has also been reported in other Ugandan studies and hypothesized to be bidirectional (Amone-P'Olak et al., 2016; Kinyanda et al., 2010; Lundberg et al., 2011). It is suggested that having multiple partners may give rise to feelings of guilt and HIV-related worries, therefore negatively impacting mental health (Lundberg et al., 2011). In addition, mental health conditions such as PTSD and depression may lead people to seek multiple sexual relationships. For our traumatized war-affected population, engaging in high-risk sexual behaviors may be an unconscious strategy to cope with the trauma and hopelessness they were experiencing. Moreover, poor mental health and having multiple partners may share the

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same cause, such as poverty and food insecurity which both affected mental health directly and forced some women into transactional sex with multiple partners (Lundberg et al., 2011).

One important finding from our study is that women reporting to have been older in age (>=16) at sexual debut or to have had access to condoms at sexual debut were less likely to meet criteria for PTSD and depression. These two factors may indeed be correlated based on evidence suggesting that early initiation of sexual behaviors is linked to lesser use of condoms in young adults (Vasilenko, Kugler, & Rice, 2016). In addition, we found women who had never had sex or been pregnant to be less likely to screen positive for PTSD and depression. One explanation for the protective effect of later sexual initiation is life course theory, which stipulates that the timing for experiencing major life transitions (e.g., first sex, marriage, childbearing, job acquisition), relative to age norms or expectations, is psychologically resonant for individuals (Meier, 2007). For example, the National Longitudinal Study of Adolescent to Adult Health (Add Health), a multiwave study of adolescents in the United States, has repeatedly shown that girls who initiated sex early in life had worse mental health outcomes including depression and lower self-esteem, with a steady pattern of decreased risk associated with later age of onset of sex (Meier, 2007; Vasilenko et al., 2016). In the context of pervasive sexual violence against women in Northern Uganda, younger age at sexual debut may reflect the pressured or forced nature of this intercourse, which in itself was deeply traumatizing.

Although the proportions of males in our study reporting wartime rape/sexual abuse and forced sexual debut were small, this could be owing to underreporting related to social stigma and shame, as indicated by a study of sexual violence and poor mental health outcomes in war-affected Liberia (Johnson et al., 2008). More research is needed to examine gender-differentiated

responses to war-related sexual trauma, and more support that is sensitive to their needs and experiences should be provided to male victims (S. Patel et al., 2013).

3.4.4 Intimate partner violence

Nearly one third of sexually active females in our study reported a history of IPV (30.8%), which was significantly associated with probable depression (AOR=1.71; 95% CI: 1.28-2.30). Three to six percent of females had been sexually abused by their partners in the past year: specifically, those who had been physically forced to have sex were over twice more likely to screen positive for PTSD and depression, and those who had been forced to perform unwanted sexual acts were over three times more likely to screen positive for both outcomes. In the final multivariate models, being forced by partner to perform unwanted sexual acts was independently associated with over five times the odds of probable PTSD (AOR=5.43; 95% CI: 1.83-16.12) and over three times the odds of probable depression (AOR=3.69; 95% CI: 1.25-10.89). In contrast, sexually active males in our study demonstrated a much lower rate of lifetime IPV (17.8%), which was marginally associated with probable PTSD (AOR=1.71; 95% CI: 0.97-3.02; p=0.065), with verbal abuse being the predominant form (16.4%).

It is likely that IPV was underreported by our female participants due to stigma and fear of retaliation. In Côte d'Ivoire, a West African country similarly affected by war, community-based surveys revealed that up to 50% of women did not disclose their experiences of IPV to anyone, including family and friends (J. Gupta et al., 2014). The secrecy surrounding IPV makes women less likely to seek and receive external supports, therefore becoming prone to chronic mental health issues (J. Gupta et al., 2014). Future research should investigate the feasibility and

efficacy of interventions such as women-only support groups where private matters can be safely discussed in helping women trapped in abusive relationships.

Kinyanda and colleagues (2016) conducted a seminal study on the intersection between war torture, IPV, and mental health in conflict-affected Uganda based on a large representative sample. In 2008, they surveyed 1,110 residents of the Eastern Teso sub-region that had recently been raided by the LRA. Nearly half of the respondents had experienced some form of IPV (sexual, physical, psychological) with negligible differences between males and females (Kinyanda et al., 2016). These researchers attributed the observed gender symmetry in the prevalence of IPV to cultural beliefs and practices specific to certain communities (Kinyanda et al., 2016). In addition, IPV victimization in women was found to be associated with a broad range of mental health issues, including problematic drinking, attempted suicide, and probable major depressive disorder as assessed by the HSCL-25 (Kinyanda et al., 2016), which mirrored findings from our study.

Although our study did not seek to determine the direct causes of IPV among Northern Ugandans, recent evidence emerging from the region suggests that women younger in age or coupled with male partners who are controlling or physically violent or who have alcohol-related issues are at higher risks for IPV victimization (Black et al., 2019; Saile et al., 2013). Qualitative interviews conducted in the Kitgum and Pader districts revealed daily stressors such as poverty, resource scarcity, and single motherhood pushed many women to look for a husband out of necessity and desperation (Annan & Brier, 2010). In these new marriages, physical and verbal abuse, conflicts with co-wives or in-laws, poor treatment of children who were born in the bush, and alcohol use by the male partner were commonly reported (Annan & Brier, 2010). Multiple studies have highlighted the concern that female victims of wartime sexual assault in Northern

Uganda may be particularly susceptible to lifelong interpersonal difficulties such as IPV through a process of re-victimization and accepting violence as normative (Annan & Brier, 2010; Atim et al., 2018; Saile et al., 2013).

It is notable that evidence emerging from longitudinal studies has linked IPV to HIV infection. The Rakai Community Cohort Study based in southwestern Uganda found that women with a past history of IPV had an adjusted incidence rate ratio of HIV infection of 1.55 (95% CI 1.25–1.94) compared with women who had never experienced IPV, with greater risk associated with longer duration of IPV and more severe and frequent IPV (Kouyoumdjian et al., 2013). The causal pathway from IPV to HIV was hypothesized to include coerced sex and associated physical trauma; low condom use due to inability to negotiate safe sex practices; domestically abused women engaging in transactional sex or sex with unfamiliar partners; and immune suppression due to psychological stress (Kouyoumdjian et al., 2013). On the other hand, IPV can be a direct consequence of HIV infection; for example, disclosure of one's HIV status may precipitate anger or violence from one's partner (Kouyoumdjian et al., 2013). It is clear that compound trauma resulting from IPV victimization and HIV infection can exacerbate the burden of psychological distress for our already traumatized study population.

3.4.5   HIV and STIs

We note that HIV sero-positivity among female participants was significantly associated with both probable depression and PTSD when adjusting for confounders, while no such association was observed for male participants. This gendered patterning of HIV and mental health is concerning, especially given that women in our study were nearly twice as likely to be living with HIV as men. HIV positivity is known to be a major cause of chronic stress, physical

complaints, and healthcare burden, thereby increasing the infected person's vulnerability to emotional and psychological issues. This is notably true in resource-poor settings such as sub-Saharan Africa where HIV support services beyond medications are rare despite the high prevalence rate (Bernard et al., 2017; Katamba et al., 2020; Koegler & Kennedy, 2018). There is evidence suggesting that HIV may also contribute to poor mental health in those indirectly affected by the disease, such as family members who are obligated to take care of their loved ones and share the task of life-long HIV management (Lundberg et al., 2011). For the resettling population in war-torn Northern Uganda, their risk of contracting HIV may be heightened by greater population mobility, insufficient access to condoms and pre/post-exposure prophylaxis, new opportunities for sexual partnerships, and increased risky sexual behaviours amid a landscape of rapidly shifting cultural norms (Koegler & Kennedy, 2018; Sharer & Gutmann, 2011; Spittal et al., 2008).

Follow-up data of the Cango Lyec Project have highlighted an increased risk of HIV seroconversion among participants who reported recent suicidal ideation at baseline (Katamba et al., 2020). With a similar design to our study but without performing gender-stratified analysis, the Wayo-Nero study of 2,362 residents living in the Amuru, Gulu, and Nwoya districts showed a positive relationship between self-reported HIV status and being diagnosed with PTSD and depression (Mugisha, Muyinda, Malamba, et al., 2015; Mugisha, Muyinda, Wandiembe, et al., 2015). The same study found among people living with HIV, those currently off antiretroviral treatment were over three times more likely to have major depressive disorder (Mugisha, Muyinda, Malamba, et al., 2015). Given these findings and the ongoing HIV epidemic in Northern Uganda, there is a strong imperative to integrate psychosocial interventions into HIV-specific programs encompassing routine screening of common mental disorders and culturally

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sensitive treatment (P. Y. Collins, Holman, Freeman, & Patel, 2006; Nakimuli-Mpungu et al., 2015; Odokonyero et al., 2015). In fact, the severe shortage of psychiatric specialists within Uganda has led some researchers to propose involving lay community workers and non-mental health staff in the provision of cost-effective psychiatric care. For example, Odokonyero et al. (2015) performed an evaluation of depression care delivered by HIV clinic staff with no prior mental health training or experience in locations near Kampala, the capital city of Uganda. They found this task-shifting, protocolized model showed efficacy in managing even severe cases of depression: it incorporated depression screening at triage, evaluation and diagnosis conducted by trained nurses, antidepressant treatment, as well as ongoing supervision and monitoring by a psychiatrist (Odokonyero et al., 2015). Meanwhile, local mental health service providers, such as the Peter C. Alderman Foundation (PCAF) Trauma Clinic, have recognized the high correlation between HIV and trauma and have introduced HIV-related supports (e.g., counselling, testing, referral to treatment, follow-up group support) into their model of care (Sharer & Gutmann, 2011). These promising initiatives not only speak to a holistic approach toward physical and mental health, but they also allow patients with comorbidities to save time and transportation costs by completing all health visits within one setting, which is especially valuable for our study population living in rural areas.

Apart from being disproportionately affected by HIV, almost half of our female participants had experienced at least one STI symptom in the past year. For both male and female participants involved in our study, past-year STI symptoms including genital ulcers were significantly associated with probable depression and PTSD. Although the intersection between HIV and mental health has been extensively researched and established in both resource-poor and rich settings, few studies have examined the impact of non-HIV STIs on mental health.

Broadly speaking, conflict analysts and health researchers have identified several factors that put conflict-affected persons at risk for STIs, including sexual violence, IPV victimization, displacement, and survival sex work (Koegler et al., 2018).

Despite the dearth of existing evidence, we were able to find two HIV-centered studies from sub-Saharan Africa that contained information about mental health consequences related to non-HIV STIs. In Rwanda, Adedimeji et al. (2015) found among 928 female genocide survivors that a past history of STIs was associated with higher scores of depression as assessed by the CES-D scale; in Eastern DR Congo, Koegler et al. (2018) identified strong positive associations between symptoms of depression, anxiety, and PTSD with self-reported STI treatment among 753 rural villagers entrenched in conflict and poverty, using the HTQ and HSCL for assessment. Yet similar to our study, both of these two studies had a cross-sectional design, which made it difficult to infer causality and the direction of observed associations. We hypothesize that STI symptoms could be a direct risk factor for poor mental health, or they could have mediated the traumatic effect of war-related sexual violence and sexual vulnerabilities explored earlier in this thesis. Given our novel findings in the context of Northern Uganda, more effort should be devoted to promoting reproductive health and curbing STI transmission in the region, including sexual health education, universal access to condoms, free male circumcision, and eliminating targeted violence against women and girls. As well, more longitudinal studies are needed to document the pathway from STIs to mental health problems and to unravel mediating or causal mechanisms potentially at play to guide future programming.

Chapter 4: Results & Discussion of Former LRA Abductees

4.1 Descriptive statistics

In total, 603 participants in our study self-reported to have been abducted during the war, as shown in Table 11. Out of those, 283 (46.9%) were males and 320 (53.1%) were females. The median age at first abduction was 15 (IQR: 12-19) and the median length of time spent in captivity was 14 days (IQR: 2-180). A significantly higher proportion of females than males had been abducted under the age of 15 (60.4% vs. 34.4%; p<0.001). Male abductees in general attained higher levels of education (p<0.001) and were more likely to be married (80.3% vs. 66.0%; p<0.001), while female abductees were more likely to be living in female-headed households (33.1% vs. 12.7%; p<0.001). The majority of former abductees described their current communities to be safer (73.1%) and providing greater access to services (64.0%) compared to mother camps. Nearly two-thirds (61.7%) of former abductees were living in transient or displaced communities.

More than half (54.4%) of former abductees reported having experienced at least 10 trauma events listed on the HTQ Part I with no significant gender difference. While in the bush, the vast majority of abductees carried heavy loads (77.6%), and a third were forced into military training (33.7%). Approximately half of abductees were beaten (50.7%), were injured (46.6%), and witnessed killing (50.2%). Among female abductees, over a quarter were sexually abused (28.5%) and/or given as a wife (26.6%) while in captivity. Except for these two sex-related trauma events, male abductees were more likely than female abductees to report all the other abduction-specific trauma events (p-values less than 0.05).

Among abductees who were sexually experienced, more than a third (35.7%) of females had been forced into sexual debut, compared to only 2.6% among males (p<0.001). Female

abductees were also more likely to have experienced IPV at some point in their lives (34.0% vs. 22.2%; p=0.002). In contrast, a significantly higher proportion of male abductees reported having used condoms at sexual debut (27.2% vs. 19.1%; p=0.022).

In terms of health outcomes, female abductees were almost twice more likely to be infected with HIV than their male counterparts (19.5% vs. 11.6%, p=0.010). The prevalence of probable PTSD (28.9% vs. 16.5%; p<0.001) and depression (36.5% vs. 15.4%; p<0.001) was also significantly higher among female abductees. No significant gender difference was observed for genital ulcers or syphilis.

Table 11: Comparison of baseline characteristics of former abductees in the Cango Lyec Project by gender (n=603)

	Male (N=283)	Female (N=320)	Total (N=603)	p value
1. Sociodemographic characteristics				
District				0.909
- Gulu	122 (43.1%)	141 (44.1%)	263 (43.6%)	
- Amuru	91 (32.2%)	105 (32.8%)	196 (32.5%)	
- Nwoya	70 (24.7%)	74 (23.1%)	144 (23.9%)	
Age group				0.223
- 13-19	29 (10.2%)	34 (10.6%)	63 (10.4%)	
- 20-24	37 (13.1%)	43 (13.4%)	80 (13.3%)	
- 25-29	50 (17.7%)	80 (25.0%)	130 (21.6%)	
- 30-34	60 (21.2%)	61 (19.1%)	121 (20.1%)	
- 35+	107 (37.8%)	102 (31.9%)	209 (34.7%)	
Ethnicity				0.860
- Acholi	268 (94.7%)	301 (94.1%)	569 (94.4%)	
- Other tribes	15 (5.3%)	19 (5.9%)	34 (5.6%)	
Religion				0.043
- Roman Catholic	212 (74.9%)	244 (76.2%)	456 (75.6%)	
- Anglican	54 (19.1%)	43 (13.4%)	97 (16.1%)	
- Others	17 (6.0%)	33 (10.3%)	50 (8.3%)	
Highest education attained				< 0.001
- No School	4 (1.4%)	65 (20.6%)	69 (11.6%)	
- Primary	152 (54.3%)	212 (67.1%)	364 (61.1%)	
- Secondary	92 (32.9%)	34 (10.8%)	126 (21.1%)	
- Post Secondary	32 (11.4%)	5 (1.6%)	37 (6.2%)	
Current marital status				< 0.001

	Male (N=283)	Female (N=320)	Total (N=603)	p value
- Not Married	55 (19.7%)	106 (34.0%)	161 (27.2%)	
- Married	224 (80.3%)	206 (66.0%)	430 (72.8%)	
Polygamous marriage				0.183
- No	199 (71.3%)	206 (66.0%)	405 (68.5%)	
- Yes	80 (28.7%)	106 (34.0%)	186 (31.5%)	
Youth-headed household				0.183
- No	240 (84.8%)	284 (88.8%)	524 (86.9%)	
- Yes	43 (15.2%)	36 (11.2%)	79 (13.1%)	
Female-headed household				< 0.001
- No	247 (87.3%)	214 (66.9%)	461 (76.5%)	
- Yes	36 (12.7%)	106 (33.1%)	142 (23.5%)	
2. Environmental stressors				
Community displacement status				0.018
- Permanent	96 (33.9%)	135 (42.2%)	231 (38.3%)	
- Transient	149 (52.7%)	131 (40.9%)	280 (46.4%)	
- Displaced	38 (13.4%)	54 (16.9%)	92 (15.3%)	
Felt safety in community				0.004
- Very safe	194 (68.6%)	180 (56.2%)	374 (62.0%)	
- Moderately safe	73 (25.8%)	123 (38.4%)	196 (32.5%)	
- Not safe at all	16 (5.7%)	17 (5.3%)	33 (5.5%)	
Safety compared to mother camp				0.080
- More safe	218 (77.0%)	223 (69.7%)	441 (73.1%)	
- Less safe	36 (12.7%)	49 (15.3%)	85 (14.1%)	
- Same	8 (2.8%)	21 (6.6%)	29 (4.8%)	
- Never encamped	21 (7.4%)	27 (8.4%)	48 (8.0%)	
Service availability compared to mother camp				0.374
- Greater than	191 (67.5%)	195 (60.9%)	386 (64.0%)	
- Less than	53 (18.7%)	70 (21.9%)	123 (20.4%)	
- About the same	18 (6.4%)	28 (8.8%)	46 (7.6%)	
- Never encamped	21 (7.4%)	27 (8.4%)	48 (8.0%)	
Number of camps lived in				0.739
- 0	23 (8.2%)	31 (9.7%)	54 (9.0%)	
- 1	153 (54.4%)	177 (55.3%)	330 (54.9%)	
- 2+	105 (37.4%)	112 (35.0%)	217 (36.1%)	
Frequency of going back home				< 0.001
- Living at home	106 (37.5%)	81 (25.3%)	187 (31.0%)	
- Once a month or more	132 (46.6%)	117 (36.6%)	249 (41.3%)	

	Male (N=283)	Female (N=320)	Total (N=603)	p value
- Less than once a month	25 (8.8%)	67 (20.9%)	92 (15.3%)	
- Never	20 (7.1%)	55 (17.2%)	75 (12.4%)	
Hopeful about returning home permanently[a]				< 0.001
- No	34 (19.3%)	133 (55.6%)	167 (40.2%)	
- Yes	142 (80.7%)	106 (44.4%)	248 (59.8%)	
3. War-related trauma and abduction				
>=10 traumatic events				0.513
- No	125 (44.2%)	150 (46.9%)	275 (45.6%)	
- Yes	158 (55.8%)	170 (53.1%)	328 (54.4%)	
Ill health without medical care ever				0.458
- No	154 (55.6%)	165 (52.2%)	319 (53.8%)	
- Yes	123 (44.4%)	151 (47.8%)	274 (46.2%)	
Number of abductions				0.061
- 1	171 (60.6%)	217 (68.0%)	388 (64.6%)	
- 2+	111 (39.4%)	102 (32.0%)	213 (35.4%)	
Age at first abduction				< 0.001
- <15	97 (34.4%)	189 (60.4%)	286 (48.1%)	
- 15+	185 (65.6%)	124 (39.6%)	309 (51.9%)	
Longest time spent in captivity				0.007
- < 2weeks	120 (43.0%)	171 (54.3%)	291 (49.0%)	
- >= 2 weeks	159 (57.0%)	144 (45.7%)	303 (51.0%)	
Carried loads in the bush				0.011
- No	50 (17.7%)	85 (26.6%)	135 (22.4%)	
- Yes	233 (82.3%)	235 (73.4%)	468 (77.6%)	
Beaten in the bush				< 0.001
- No	113 (39.9%)	184 (57.5%)	297 (49.3%)	
- Yes	170 (60.1%)	136 (42.5%)	306 (50.7%)	
Injured in the bush				< 0.001
- No	129 (45.6%)	193 (60.3%)	322 (53.4%)	
- Yes	154 (54.4%)	127 (39.7%)	281 (46.6%)	
Witnessed killing in the bush				0.001
- No	121 (42.8%)	179 (55.9%)	300 (49.8%)	
- Yes	162 (57.2%)	141 (44.1%)	303 (50.2%)	
Killed others in the bush				< 0.001
- No	244 (86.5%)	306 (95.6%)	550 (91.4%)	
- Yes	38 (13.5%)	14 (4.4%)	52 (8.6%)	

	Male (N=283)	Female (N=320)	Total (N=603)	p value
Military training in the bush				0.012
- No	173 (61.1%)	226 (70.8%)	399 (66.3%)	
- Yes	110 (38.9%)	93 (29.2%)	203 (33.7%)	
Sexually abused in the bush				< 0.001
- No	271 (95.8%)	228 (71.5%)	499 (82.9%)	
- Yes	12 (4.2%)	91 (28.5%)	103 (17.1%)	
Had access to condoms in the bush				0.009
- No	268 (95.4%)	315 (99.1%)	583 (97.3%)	
- Yes	13 (4.6%)	3 (0.9%)	16 (2.7%)	
Given as a wife in the bush				
- No	-	234 (73.4%)	-	
- Yes	-	85 (26.6%)	-	
4. Sexual and relationship vulnerabilities				
Forced sexual debut[b]				< 0.001
- No	260 (97.4%)	196 (64.3%)	456 (79.7%)	
- Yes	7 (2.6%)	109 (35.7%)	116 (20.3%)	
Condom use at sexual debut[b]				0.022
- No	195 (72.8%)	246 (80.9%)	441 (77.1%)	
- Yes	73 (27.2%)	58 (19.1%)	131 (22.9%)	
Exchanged sex for money/gifts (past year)				0.942
- No	260 (91.9%)	296 (92.5%)	556 (92.2%)	
- Yes	6 (2.1%)	7 (2.2%)	13 (2.2%)	
- Never had sex	17 (6.0%)	17 (5.3%)	34 (5.6%)	
Number of sexual partners (past year)				< 0.001
- 0	28 (9.9%)	64 (20.0%)	92 (15.3%)	
- 1	135 (47.9%)	237 (74.1%)	372 (61.8%)	
- 2+	119 (42.2%)	19 (5.9%)	138 (22.9%)	
Most recent partner is circumcised[b]				
- No	-	270 (88.8%)	-	
- Yes	-	34 (11.2%)	-	
Circumcised				
- No	262 (92.6%)	-	-	
- Yes	21 (7.4%)	-	-	
History of pregnancy				
- Pregnant before	-	291 (90.9%)	-	
- Never pregnant	-	29 (9.1%)	-	
Lifetime IPV[b]				0.002
- No	207 (77.8%)	200 (66.0%)	407 (71.5%)	
- yes	59 (22.2%)	103 (34.0%)	162 (28.5%)	

	Male (N=283)	Female (N=320)	Total (N=603)	p value
5. Health outcomes				
Any STI symptoms (past year)[b]				
- No	-	143 (47.8%)	-	
- yes	-	156 (52.2%)	-	
Genital ulcers (past year)[b]				0.143
- No	235 (88.7%)	254 (84.4%)	489 (86.4%)	
- Yes	30 (11.3%)	47 (15.6%)	77 (13.6%)	
Syphilis				0.114
- NEG	253 (95.8%)	291 (92.7%)	544 (94.1%)	
- POS	11 (4.2%)	23 (7.3%)	34 (5.9%)	
HIV				0.010
- NEG	243 (88.4%)	256 (80.5%)	499 (84.1%)	
- POS	32 (11.6%)	62 (19.5%)	94 (15.9%)	
Probable PTSD (HTQ score>=2)	46 (16.5%)	92 (28.9%)	138 (23.2%)	< 0.001
Probable depression (HSCL score >=1.75)	43 (15.4%)	116 (36.5%)	159 (26.6%)	< 0.001

[a] *among those not living at home*
[b] *among those who were sexually active*

4.2   Regression analyses of female former abductees

Table 12 presents the results of univariate and adjusted analyses on probable PTSD among female abductees. Sociodemographic and environmental factors associated with probable PTSD were residing in a youth-headed household (AOR=2.80; 95% CI:1.28-6.14); feeling moderately safe (AOR=1.69; 95% CI: 1.00-2.85) or not safe at all (AOR=3.77; 95% CI: 1.29-11.06) in one's community; and returning home less than once a month (AOR=2.16; 95% CI: 1.04-4.47).

War and abduction-related experiences were highly associated with probable PTSD among female abductees, including cumulative exposure to 10 or more traumatic events (AOR=3.04; 95% CI: 1.78-5.19) and having two or more abductions (AOR=2.23; 95% CI: 1.30-3.82). Probable PTSD among female abductees was significantly associated with all but one

abduction-specific trauma events (killing others in the bush): carried loads (AOR=2.18; 95% CI: 1.17-4.06), been beaten (AOR=2.19; 95% CI: 1.32-3.64), been injured (AOR=2.10; 95% CI: 1.27-3.48), witnessed killing (AOR=2.65; 95% CI: 1.59-4.41), and forced into military training (AOR=2.07; 95% CI: 1.22-3.50). In particular, female abductees who had been sexually abused had over four times the odds of probable PTSD (AOR=4.05; 95% CI: 2.37-6.92), and those given as a wife in the bush had over three times the increased odds (AOR=3.25; 95% CI: 1.90-5.57).

In terms of sexual health and vulnerabilities, female abductees screening positive for PTSD were more likely to have experienced forced sexual debut (AOR=2.95; 95% CI: 1.74-4.99) and STI symptoms in the past year (AOR=2.27; 95% CI: 1.33-3.88). On the other hand, condom use at sexual debut was associated with reduced likelihood of screening positive for PTSD among female abductees (AOR=0.42; 95% CI: 0.18-0.96).

In the final multivariate model (Table 13), ill health without medical care, being injured in the bush, and being sexually abused in the bush remained significantly associated with probable PTSD among sexually active female abductees. Past-year STI symptoms retained marginal association.

Table 12: Association between probable PTSD and selected variables among female abductees (n=320)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	1.68	[0.97;2.89]	0.062	1.71	[0.99;2.96]	0.054
	Nwoya	0.63	[0.31;1.25]	0.184	0.61	[0.31;1.23]	0.169
Age (years)		1.03	[1.00;1.06]	0.075	1.03	[1.00;1.06]	0.053
Ethnicity	Acholi	Ref			Ref		
	Other tribes	0.87	[0.30;2.49]	0.796	1.04	[0.36;3.06]	0.938
Religion	Roman Catholic	Ref			Ref		
	Anglican	1.59	[0.81;3.14]	0.182	1.80	[0.89;3.62]	0.101
	Others	1.22	[0.55;2.71]	0.627	1.20	[0.53;2.73]	0.659

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Highest education attained**		-	-	0.611	-	-	-
Current marital status	Not Married	Ref			Ref		
	Married	0.94	[0.56;1.58]	0.821	0.82	[0.48;1.40]	0.461
Polygamous marriage	No	Ref			Ref		
	Yes	1.19	[0.71;2.00]	0.497	0.94	[0.55;1.63]	0.837
Youth-headed household	No	Ref			Ref		
	Yes	1.90	[0.93;3.88]	0.077	2.80	[1.28;6.14]	**0.010**
Female-headed household	No	Ref			Ref		
	Yes	1.25	[0.75;2.08]	0.382	1.29	[0.76;2.19]	0.342
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.32	[0.76;2.28]	0.326	1.20	[0.68;2.12]	0.519
	Displaced	2.19	[1.12;4.29]	0.022	1.57	[0.76;3.25]	0.221
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	1.67	[1.00;2.79]	0.050	1.69	[1.00;2.85]	**0.049**
	Not safe at all	4.77	[1.71;13.33]	0.003	3.77	[1.29;11.06]	**0.016**
Safety compared to mother camp	More safe	Ref			Ref		
	Less safe	1.71	[0.90;3.26]	0.104	1.60	[0.81;3.16]	0.172
	Same	1.16	[0.43;3.15]	0.775	0.98	[0.35;2.77]	0.969
	Never encamped	0.95	[0.38;2.35]	0.903	0.98	[0.38;2.52]	0.964
Service availability compared to mother camp	Greater than	Ref			Ref		
	Less than	1.08	[0.59;1.96]	0.806	0.96	[0.52;1.80]	0.905
	About the same	0.99	[0.41;2.37]	0.974	0.95	[0.39;2.34]	0.913
	Never encamped	0.86	[0.35;2.15]	0.751	0.92	[0.35;2.38]	0.860
Number of camps lived in		Ref			Ref		
	1	0.93	[0.39;2.23]	0.870	0.93	[0.38;2.27]	0.867
	2+	1.68	[0.69;4.11]	0.252	1.41	[0.55;3.60]	0.479
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	1.01	[0.52;1.94]	0.988	1.11	[0.57;2.17]	0.762
	Less than once a month	1.93	[0.96;3.91]	0.067	2.16	[1.04;4.47]	**0.038**
	Never	1.44	[0.67;3.10]	0.351	1.31	[0.59;2.89]	0.507
Hopeful about returning home permanently[a]	No	Ref			Ref		
	Yes	1.01	[0.58;1.76]	0.977	0.89	[0.49;1.59]	0.683
3. War-related trauma and abduction							

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
>=10 traumatic events	No	Ref			Ref		
	Yes	2.98	[1.76;5.03]	<0.001	3.04	[1.78;5.19]	**<0.001**
Ill health without medical care ever	No	Ref			Ref		
	Yes	2.11	[1.29;3.47]	0.003	2.35	[1.40;3.95]	**0.001**
Number of abductions	1	Ref			Ref		
	2+	2.27	[1.37;3.77]	0.002	2.23	[1.30;3.82]	**0.003**
Age at first abduction	<15	Ref			Ref		
	15+	0.86	[0.52;1.42]	0.561	0.57	[0.31;1.07]	0.081
Longest time spent in captivity	< 2weeks	Ref			Ref		
	>= 2 weeks	1.45	[0.88;2.36]	0.141	1.40	[0.84;2.33]	0.192
Carried loads in the bush	No	Ref			Ref		
	Yes	2.09	[1.14;3.84]	0.018	2.18	[1.17;4.06]	**0.014**
Beaten in the bush	No	Ref			Ref		
	Yes	2.10	[1.29;3.44]	0.003	2.19	[1.32;3.64]	**0.002**
Injured in the bush	No	Ref			Ref		
	Yes	2.16	[1.32;3.54]	0.002	2.10	[1.27;3.48]	**0.004**
Witnessed killing in the bush	No	Ref			Ref		
	Yes	2.63	[1.60;4.33]	<0.001	2.65	[1.59;4.41]	**<0.001**
Killed others in the bush	No	Ref			Ref		
	Yes	3.02	[0.99;9.24]	0.053	2.56	[0.81;8.11]	0.109
Military training in the bush	No	Ref			Ref		
	Yes	2.04	[1.22;3.42]	0.007	2.07	[1.22;3.50]	**0.007**
Sexually abused in the bush	No	Ref			Ref		
	Yes	4.32	[2.56;7.30]	<0.001	4.05	[2.37;6.92]	**<0.001**
Had access to condoms in the bush**	No	Ref			Ref		
	Yes	1.22	[0.02;23.79]	1	-	-	-
Given as a wife in the bush	No	Ref			Ref		
	Yes	3.57	[2.11;6.06]	<0.001	3.25	[1.90;5.57]	**<0.001**
4. Sexual and relationship vulnerabilities							
Forced sexual debut[b]	No	Ref			Ref		
	Yes	3.00	[1.80;5.02]	<0.001	2.95	[1.74;4.99]	**<0.001**
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	0.38	[0.18;0.82]	0.013	0.42	[0.18;0.96]	**0.039**
Number of sexual partners (past year)	0	Ref			Ref		
	1	0.69	[0.38;1.25]	0.226	0.70	[0.38;1.28]	0.243
	2+	0.86	[0.29;2.58]	0.788	0.92	[0.30;2.83]	0.887

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Most recent partner is circumcised[b]	No	Ref			Ref		
	Yes	0.71	[0.31;1.64]	0.422	0.90	[0.38;2.13]	0.808
History of pregnancy	Pregnant before	Ref			Ref		
	Never pregnant	1.18	[0.51;2.72]	0.695	1.62	[0.65;4.02]	0.303
Lifetime IPV[b]	No	Ref			Ref		
	yes	1.55	[0.92;2.60]	0.098	1.60	[0.94;2.73]	0.082
5. Health outcomes							
Any STI symptoms (past year)[b]	No	Ref			Ref		
	yes	2.21	[1.32;3.72]	0.003	2.27	[1.33;3.88]	**0.003**
Syphilis**	NEG	Ref			Ref		
	POS	0.35	[0.06;1.21]	0.100	-	-	-
HIV	NEG	Ref			Ref		
	POS	0.82	[0.44;1.54]	0.534	0.91	[0.48;1.75]	0.785

*Adjusted for age and district
**Fisher's exact test was performed due to small cell counts
[a] among those not living at home
[b] among those who were sexually active

Table 13: Final model of probable PTSD among sexually active female abductees based on stepwise selection (n=258)

Variable	Units	Odds Ratio	95% CI	p-value
District	Gulu	Ref		
	Amuru	1.95	[0.85;4.49]	0.116
	Nwoya	0.36	[0.13;1.05]	0.062
Age (years)		1.03	[0.98;1.09]	0.212
Ill health without medical care	No	Ref		
	Yes	2.49	[1.14;5.40]	0.021
Injured in the bush	No	Ref		
	Yes	2.31	[1.10;4.83]	0.027
Sexually abused in the bush	No	Ref		
	Yes	4.44	[2.06;9.55]	< 0.001
Any STI symptoms (past year)	No	Ref		
	yes	2.09	[0.95;4.62]	0.068

Results regarding probable depression and associated variables among female abductees are given in Table 14. Compared to probable PTSD, probable depression was found to be

associated with a greater number of sociodemographic and environmental factors, including

youth-headed household (AOR=2.54; 95% CI: 1.20-5.38), female-headed household

(AOR=1.68; 95% CI: 1.03-2.75), living in a displaced community (AOR=2.26; 95% CI: 1.12-

4.55), feeling not safe at all in one's community (AOR=6.05; 95% CI: 1.82-20.06), feeling less

safe in current community compared to mother camp (AOR=2.44; 95% CI: 1.27-4.66), and

returning home less than once a month (AOR=2.89; 95% CI: 1.43-5.83).

In terms of war experiences, female abductees reporting 10 or more HTQ-listed trauma

events were significantly more likely to screen positive for depression than those reporting less

than 10 events (AOR=2.44; 95% CI: 1.50-3.95). All abduction-specific trauma events, except

killing others, were associated with probable depression among female abductees: carried loads

(AOR=1.96; 95% CI: 1.12-3.43), been beaten (AOR=2.06; 95% CI: 1.29-3.30), been injured

(AOR=2.01; 95% CI: 1.25-3.22), witnessed killing (AOR=3.08; 95% CI: 1.91-4.98), and forced

into military training (AOR=2.34; 95% CI: 1.42-3.86). Again, sexual abuse (AOR=2.99; 95%

CI: 1.79-4.98) and forced marriage (AOR=3.16; 95% CI: 1.88-5.32) in the bush were associated

with markedly elevated odds of probable depression.

Finally, female abductees who had ever experienced IPV had almost twice the odds of

probable depression compared to those who had never experienced IPV (AOR=1.94; 95% CI:

1.18-3.20). Other sexual vulnerabilities associated with probable depression among female

abductees were forced sexual debut (AOR=2.11; 95% CI: 1.29-3.47) and past-year STI

symptoms (AOR=1.81; 95% CI: 1.11-2.96).

In the final multivariate model (Table 15), youth-headed household, living in a displaced

community, returning home less than once a month, ill health without medical care, witnessing

killing in the bush, and being sexually abused in the bush remained significantly associated with

probable depression among sexually active female abductees.

Table 14: Association between probable depression and selected variables among female abductees (n=320)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	1.46	[0.87;2.46]	0.154	1.48	[0.88;2.51]	0.141
	Nwoya	0.86	[0.47;1.58]	0.636	0.85	[0.47;1.56]	0.608
Age (years)		1.02	[0.99;1.05]	0.116	1.02	[1.00;1.05]	0.098
Ethnicity	Acholi	Ref			Ref		
	Other tribes	0.79	[0.29;2.15]	0.648	0.91	[0.33;2.50]	0.851
Religion	Roman Catholic	Ref			Ref		
	Anglican	1.19	[0.61;2.32]	0.602	1.28	[0.65;2.53]	0.467
	Others	1.25	[0.59;2.65]	0.563	1.25	[0.58;2.68]	0.570
Highest education attained**		-	-	0.971	-	-	-
Current marital status	Not Married	Ref			Ref		
	Married	1.08	[0.66;1.77]	0.751	0.99	[0.60;1.63]	0.962
Polygamous marriage	No	Ref			Ref		
	Yes	1.09	[0.67;1.77]	0.735	0.91	[0.55;1.52]	0.719
Youth-headed household	No	Ref			Ref		
	Yes	1.88	[0.93;3.77]	0.077	2.54	[1.20;5.38]	**0.015**
Female-headed household	No	Ref			Ref		
	Yes	1.65	[1.02;2.67]	0.040	1.68	[1.03;2.75]	**0.039**
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.16	[0.69;1.94]	0.572	1.11	[0.66;1.88]	0.693
	Displaced	2.54	[1.33;4.86]	0.005	2.26	[1.12;4.55]	**0.022**
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	1.19	[0.74;1.93]	0.472	1.19	[0.73;1.94]	0.479
	Not safe at all	6.72	[2.10;21.53]	0.001	6.05	[1.82;20.06]	**0.003**
Safety compared to mother camp	More safe	Ref			Ref		
	Less safe	2.50	[1.34;4.70]	0.004	2.44	[1.27;4.66]	**0.007**
	Same	1.10	[0.42;2.87]	0.847	0.99	[0.37;2.65]	0.986
	Never encamped	1.02	[0.44;2.38]	0.962	1.03	[0.43;2.48]	0.946

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Service availability compared to mother camp	Greater than	Ref			Ref		
	Less than	1.34	[0.77;2.36]	0.303	1.26	[0.71;2.25]	0.426
	About the same	1.03	[0.45;2.35]	0.945	1.03	[0.44;2.37]	0.951
	Never encamped	0.93	[0.39;2.17]	0.861	0.97	[0.40;2.36]	0.955
Number of camps lived in	0	Ref			Ref		
	1	0.83	[0.37;1.84]	0.641	0.81	[0.36;1.84]	0.622
	2+	1.49	[0.65;3.40]	0.343	1.33	[0.56;3.16]	0.520
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	1.56	[0.84;2.89]	0.159	1.70	[0.90;3.18]	0.099
	Less than once a month	2.60	[1.31;5.16]	0.006	2.89	[1.43;5.83]	**0.003**
	Never	1.38	[0.65;2.92]	0.401	1.32	[0.61;2.85]	0.482
Hopeful about returning home permanently[a]	No	Ref			Ref		
	Yes	1.36	[0.81;2.30]	0.245	1.28	[0.75;2.20]	0.363
3. War-related trauma and abduction							
>=10 traumatic events	No	Ref			Ref		
	Yes	2.45	[1.52;3.95]	<0.001	2.44	[1.50;3.95]	**<0.001**
Ill health without medical care ever	No	Ref			Ref		
	Yes	2.98	[1.85;4.80]	<0.001	3.23	[1.97;5.30]	**<0.001**
Number of abductions	1	Ref			Ref		
	2+	1.39	[0.86;2.27]	0.180	1.30	[0.78;2.17]	0.306
Age at first abduction	<15	Ref			Ref		
	15+	1.06	[0.66;1.69]	0.820	0.78	[0.44;1.38]	0.395
Longest time spent in captivity	< 2weeks	Ref			Ref		
	>= 2 weeks	1.51	[0.95;2.40]	0.080	1.50	[0.93;2.40]	0.095
Carried loads in the bush	No	Ref			Ref		
	Yes	1.94	[1.12;3.36]	0.019	1.96	[1.12;3.43]	**0.018**
Beaten in the bush	No	Ref			Ref		
	Yes	2.03	[1.28;3.23]	0.003	2.06	[1.29;3.30]	**0.003**
Injured in the bush	No	Ref			Ref		
	Yes	2.04	[1.28;3.25]	0.003	2.01	[1.25;3.22]	**0.004**
Witnessed killing in the bush	No	Ref			Ref		
	Yes	3.04	[1.89;4.88]	<0.001	3.08	[1.91;4.98]	**<0.001**

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Killed others in the bush	No	Ref			Ref		
	Yes	2.92	[0.93;9.14]	0.066	2.72	[0.84;8.73]	0.094
Military training in the bush	No	Ref			Ref		
	Yes	2.31	[1.41;3.79]	<0.001	2.34	[1.42;3.86]	**<0.001**
Sexually abused in the bush	No	Ref			Ref		
	Yes	3.18	[1.92;5.26]	<0.001	2.99	[1.79;4.98]	**<0.001**
Had access to condoms in the bush**	No	Ref			Ref		
	Yes	0	[0.00;4.19]	0.302	-	-	-
Given as a wife in the bush	No	Ref			Ref		
	Yes	3.37	[2.01;5.65]	<0.001	3.16	[1.88;5.32]	**<0.001**
4. Sexual and relationship vulnerabilities							
Forced sexual debut[b]	No	Ref			Ref		
	Yes	2.14	[1.32;3.48]	0.002	2.11	[1.29;3.47]	**0.003**
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	0.55	[0.29;1.04]	0.065	0.63	[0.31;1.27]	0.196
Number of sexual partners (past year)	0	Ref			Ref		
	1	0.62	[0.35;1.09]	0.095	0.62	[0.35;1.10]	0.104
	2+	1.39	[0.50;3.88]	0.531	1.47	[0.52;4.16]	0.467
Most recent partner is circumcised[b]	No	Ref			Ref		
	Yes	0.70	[0.32;1.52]	0.369	0.82	[0.37;1.83]	0.632
History of pregnancy	Pregnant before	Ref			Ref		
	Never pregnant	1.14	[0.51;2.53]	0.747	1.47	[0.62;3.49]	0.376
Lifetime IPV[b]	No	Ref			Ref		
	yes	1.89	[1.16;3.10]	0.011	1.94	[1.18;3.20]	**0.009**
5. Health outcomes							
Any STI symptoms (past year)[b]	No	Ref			Ref		
	yes	1.80	[1.11;2.92]	0.016	1.81	[1.11;2.96]	**0.017**
Syphilis	NEG	Ref			Ref		
	POS	0.93	[0.38;2.26]	0.865	0.84	[0.34;2.08]	0.707
HIV	NEG	Ref			Ref		
	POS	1.44	[0.82;2.53]	0.206	1.56	[0.87;2.79]	0.134

*Adjusted for age and district
**Fisher's exact test was performed due to small cell counts
[a] among those not living at home
[b] among those who were sexually active

Table 15: Final model of probable depression among sexually active female abductees based on stepwise selection (n=258)

Variable	Units	Odds Ratio	95% CI	p-value
District	Gulu	Ref		
	Amuru	1.19	[0.50;2.85]	0.695
	Nwoya	0.88	[0.34;2.29]	0.785
Age (years)		1.02	[0.96;1.07]	0.565
Youth-headed household	No	Ref		
	Yes	3.95	[1.28;12.19]	0.017
Community displacement status	Permanent	Ref		
	Transient	1.37	[0.60;3.13]	0.454
	Displaced	5.41	[1.54;18.99]	0.008
Frequency of going back home	Once a month or more	Ref		
	Less than once a month	2.82	[1.20;6.64]	0.017
	Never	0.76	[0.27;2.20]	0.618
Ill health without medical care	No	Ref		
	Yes	3.29	[1.56;6.93]	0.002
Witnessed killing in the bush	No	Ref		
	Yes	2.88	[1.29;6.42]	0.010
Sexually abused in the bush	No	Ref		
	Yes	2.43	[1.06;5.57]	0.037

4.3   Regression analyses of male former abductees

Overall, we noted a fewer number of factors associated with mental health outcomes among male abductees. Results for probable PTSD among male abductees are found in Table 16. With regard to environmental stressors, never going back home to visit was strongly associated with probable PTSD (AOR=3.55; 95% CI: 1.23-10.24); a marginal association was observed between probable PTSD and residing in a youth-headed household (AOR=2.22; 95% CI: 0.94-5.24; p=0.0682).

For male abductees, war and abduction-related experiences were significant risk factors of probable PTSD, including reporting 10 or more HTQ trauma events (AOR=11.17; 95% CI: 3.84-32.50); spending two weeks or longer in captivity (AOR=5.13; 95% CI: 2.23-11.80); being beaten (AOR=2.79; 95% CI: 1.32-5.93), injured (AOR=5.32; 95% CI: 2.35-12.06), forced into military training (AOR=5.80; 95% CI: 2.83-11.90), and sexually abused in the bush (AOR=6.69; 95% CI: 1.88-23.82); as well as witnessing killing (AOR=6.56; 95% CI: 2.65-16.23) and killing others (AOR=4.92; 95% CI: 2.21-10.97) in the bush. In addition, carrying loads in the bush was univariately associated with probable PTSD (UOR=3.44; 95% CI: 1.03-18.1).

Adjusting for age and district, past-year genital ulcers were associated with over three times the odds of meeting criteria for PTSD (AOR=3.21; 95% CI: 1.35-7.62). No other sexual vulnerabilities were found to be significantly associated with probable PTSD among male abductees.

In the final multivariate model (Table 17), cumulative exposure to 10 or more traumatic events, being injured in the bush, and military training in the bush remained significantly associated with probable PTSD among sexually active male abductees.

Table 16: Association between probable PTSD and selected variables among male abductees (n=283)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	1.80	[0.88;3.68]	0.107	1.77	[0.86;3.62]	0.119
	Nwoya	0.92	[0.39;2.19]	0.846	0.89	[0.37;2.13]	0.797
Age (years)		0.98	[0.95;1.02]	0.409	0.99	[0.95;1.02]	0.429
Ethnicity**	Acholi	Ref			Ref		
	Other tribes	1.28	[0.22;5.02]	0.721	-	-	-
Religion**		-	-	0.736	-	-	-
Highest education attained**		-	-	0.243	-	-	-
Current marital status	Not Married	Ref			Ref		
	Married	0.98	[0.44;2.19]	0.967	1.28	[0.49;3.35]	0.619
Polygamous marriage	No	Ref			Ref		

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
	Yes	0.97	[0.48;1.95]	0.925	0.99	[0.45;2.16]	0.971
Youth-headed household	No	Ref			Ref		
	Yes	2.04	[0.94;4.43]	0.072	2.22	[0.94;5.24]	0.068
Female-headed household**	No	Ref			Ref		
	Yes	0.42	[0.08;1.44]	0.228	-	-	-
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	0.97	[0.49;1.91]	0.925	1.17	[0.57;2.41]	0.673
	Displaced	0.56	[0.18;1.80]	0.333	0.41	[0.12;1.38]	0.150
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	0.60	[0.26;1.37]	0.223	0.51	[0.22;1.19]	0.119
	Not safe at all	2.39	[0.77;7.46]	0.132	1.61	[0.48;5.45]	0.442
Safety compared to mother camp**	-	-	-	0.768	-	-	-
Service availability compared to mother camp**	-	-	-	0.926	-	-	-
Number of camps lived in**	-	-	-	0.131	-	-	-
Frequency of going back home	Living at home	Ref			Ref		
	Once a month or more	0.55	[0.26;1.15]	0.111	0.52	[0.24;1.12]	0.095
	Less than once a month	0.91	[0.28;2.95]	0.869	0.89	[0.27;2.97]	0.848
	Never	4.07	[1.46;11.39]	0.007	3.55	[1.23;10.24]	**0.019**
Hopeful about returning home permanently[a]	No	Ref			Ref		
	Yes	0.59	[0.23;1.56]	0.289	0.60	[0.23;1.62]	0.317
3. War-related trauma and abduction							
>=10 traumatic events	No	Ref			Ref		
	Yes	10.50	[3.65;30.23]	<0.001	11.17	[3.84;32.50]	**<0.001**
Ill health without medical care ever	No	Ref			Ref		
	Yes	3.52	[1.78;6.95]	<0.001	3.61	[1.81;7.18]	**<0.001**
Number of abductions		Ref			Ref		
	2+	1.12	[0.59;2.14]	0.724	1.18	[0.61;2.29]	0.625
Age at first abduction	<15	Ref			Ref		
	15+	0.99	[0.51;1.93]	0.984	1.42	[0.60;3.34]	0.427
Longest time spent in captivity	< 2weeks	Ref			Ref		
	>= 2 weeks	4.43	[1.98;9.91]	<0.001	5.13	[2.23;11.80]	**<0.001**
Carried loads in the bush**	No	Ref			Ref		
	Yes	3.44	[1.03;18.1]	0.034	-	-	-

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Beaten in the bush	No	Ref			Ref		
	Yes	2.37	[1.15;4.89]	0.020	2.79	[1.32;5.93]	**0.007**
Injured in the bush	No	Ref			Ref		
	Yes	4.92	[2.20;10.99]	<0.001	5.32	[2.35;12.06]	**<0.001**
Witnessed killing in the bush	No	Ref			Ref		
	Yes	6.12	[2.50;14.98]	<0.001	6.56	[2.65;16.23]	**<0.001**
Killed others in the bush	No	Ref			Ref		
	Yes	4.10	[1.91;8.81]	<0.001	4.92	[2.21;10.97]	**<0.001**
Military training in the bush	No	Ref			Ref		
	Yes	5.93	[2.91;12.10]	<0.001	5.80	[2.83;11.90]	**<0.001**
Sexually abused in the bush	No	Ref			Ref		
	Yes	6.81	[1.98;23.38]	0.002	6.69	[1.88;23.82]	**0.003**
Had access to condoms in the bush	No	Ref			Ref		
	Yes	2.34	[0.69;7.95]	0.173	2.30	[0.66;7.98]	0.190
4. Sexual and relationship vulnerabilities							
Forced sexual debut[b]**	No	Ref			Ref		
	Yes	2.54	[0.22;18.35]	0.266	-	-	-
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	0.99	[0.48;2.06]	0.987	0.95	[0.43;2.10]	0.900
Number of sexual partners (past year)**		-	-	0.334	-	-	-
Circumcision**	No	Ref			Ref		
	Yes	0.24	[0.01;1.56]	0.218	-	-	-
Lifetime IPV[b]	No	Ref			Ref		
	yes	1.91	[0.93;3.92]	0.078	1.91	[0.90;4.02]	0.090
5. Health outcomes							
Genital ulcers (past year)[b]	No	Ref			Ref		
	Yes	3.00	[1.29;6.98]	0.011	3.21	[1.35;7.62]	**0.008**
Syphilis**	NEG	Ref			Ref		
	POS	1.17	[0.12;5.94]	0.692	-	-	**-**
HIV**	NEG	Ref			Ref		
	POS	0.47	[0.09;1.63]	0.317	-	-	**-**

Adjusted for age and district
***Fisher's exact test was performed due to small cell counts*
[a] *among those not living at home*
[b] *among those who were sexually active*

Table 17: Final model of probable PTSD among sexually active male abductees based on stepwise selection (n=261)

Variable	Units	Odds Ratio	95% CI	P-value
District	Gulu	Ref		
	Amuru	2.42	[1.00;5.82]	0.049
	Nwoya	1.11	[0.41;3.03]	0.840
Age (years)		0.99	[0.94;1.03]	0.542
>=10 traumatic events	No	Ref		
	Yes	4.30	[1.14;16.22]	0.031
Ill health without medical care	No	Ref		
	Yes	2.77	[1.23;6.23]	0.014
Injured in the bush	No	Ref		
	Yes	2.85	[1.07;7.62]	0.036
Military training in the bush	No	Ref		
	Yes	2.93	[1.27;6.74]	0.012

Table 18 presents the associations between selected variables and probable depression among male abductees. No sociodemographic factor was found to be associated with probable depression in this subgroup. The only significant environmental stressor was never going back home to visit (AOR=6.23; 95% CI: 2.16-17.98). On the other hand, returning home at least once a month was associated with reduced risk of probable depression (AOR=0.41; 95% CI: 0.18-0.95).

In terms of war and abduction-related experiences, men reporting 10 or more HTQ trauma events (AOR=3.82; 95% CI: 1.72-8.48) and those who had spent two weeks or longer in captivity (AOR=2.83; 95% CI: 1.32-6.08) had elevated odds of meeting criteria for depression. Except for carrying loads in the bush, all abduction-specific trauma events were associated with probable depression among male abductees: been beaten (AOR=2.26; 95% CI:1.06-4.82), been injured (AOR=3.91; 95% CI: 1.78-8.61), witnessed killing (AOR=4.72; 95% CI: 2.01-11.10), killed others (AOR=2.86; 95% CI: 1.27-6.45), forced into military training (AOR=4.53; 95% CI:

2.23-9.21), and sexually abused in the bush (AOR=4.09; 95% CI: 1.10-15.20). Among other

sexual vulnerabilities included in this analysis, only forced sexual debut was univariately

associated with probable depression (UOR=7.79; 95% CI: 1.26-55.36).

In the final multivariate model (Table 19), being injured and military training in the bush

remained significantly associated with probable depression among sexually active male

abductees.

Table 18: Association between probable depression and selected variables among male abductees (n=283)

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
1. Sociodemographic characteristics							
District	Gulu	Ref			Ref		
	Amuru	0.81	[0.38;1.73]	0.594	0.79	[0.37;1.68]	0.535
	Nwoya	0.71	[0.31;1.66]	0.435	0.67	[0.29;1.58]	0.365
Age (years)		0.97	[0.94;1.01]	0.171	0.97	[0.94;1.01]	0.147
Ethnicity**	Acholi	Ref			Ref		
	Other tribes	1.40	[0.24;5.51]	0.710	-	-	-
Religion**		-	-	0.833	-	-	-
Highest education attained**		-	-	0.500	-	-	-
Current marital status	Not Married	Ref			Ref		
	Married	0.64	[0.30;1.38]	0.256	0.83	[0.32;2.10]	0.688
Polygamous marriage	No	Ref			Ref		
	Yes	0.61	[0.28;1.34]	0.222	0.71	[0.30;1.67]	0.435
Youth-headed household	No	Ref			Ref		
	Yes	1.36	[0.58;3.18]	0.48	1.08	[0.44;2.70]	0.862
Female-headed household**	No	Ref			Ref		
	Yes	0.29	[0.03;1.21]	0.087	-	-	-
2. Environmental stressors							
Community displacement status	Permanent	Ref			Ref		
	Transient	1.15	[0.56;2.36]	0.698	1.13	[0.53;2.39]	0.755
	Displaced	0.92	[0.30;2.75]	0.874	0.85	[0.27;2.66]	0.776
Felt safety in community	Very safe	Ref			Ref		
	Moderately safe	0.67	[0.29;1.54]	0.347	0.72	[0.30;1.68]	0.444
	Not safe at all	2.44	[0.79;7.53]	0.121	2.81	[0.81;9.73]	0.104
Safety compared to mother camp**		-	-	0.6566	-	-	-

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Service availability compared to mother camp**	-	-	0.821	-	-	-	-
Number of camps lived in**	-	-	0.07162	-	-	-	-
Frequency of going back home	Living at home	Ref				Ref	
	Once a month or more	0.40	[0.18;0.92]	0.030	0.41	[0.18;0.95]	**0.039**
	Less than once a month	0.97	[0.29;3.17]	0.955	0.89	[0.26;3.00]	0.846
	Never	5.91	[2.14;16.33]	<0.001	6.23	[2.16;17.98]	**<0.001**
Hopeful about returning home permanently[a]	No	Ref				Ref	
	Yes	0.54	[0.20;1.44]	0.218	0.51	[0.19;1.38]	0.184
3. War-related trauma and abduction							
>=10 traumatic events	No	Ref				Ref	
	Yes	3.41	[1.57;7.43]	0.002	3.82	[1.72;8.48]	**<0.001**
Ill health without medical care ever	No	Ref				Ref	
	Yes	2.06	[1.05;4.01]	0.035	2.12	[1.08;4.16]	**0.029**
Number of abductions	1	Ref				Ref	
	2+	1.43	[0.74;2.75]	0.288	1.54	[0.78;3.05]	0.212
Age at first abduction	<15	Ref				Ref	
	15+	0.69	[0.36;1.34]	0.273	0.86	[0.37;2.03]	0.732
Longest time spent in captivity	< 2 weeks	Ref				Ref	
	>= 2 weeks	2.92	[1.38;6.21]	0.005	2.83	[1.32;6.08]	**0.008**
Carried loads in the bush	No	Ref				Ref	
	Yes	1.37	[0.55;3.46]	0.5	1.37	[0.54;3.50]	0.506
Beaten in the bush	No	Ref				Ref	
	Yes	2.14	[1.03;4.45]	0.042	2.26	[1.06;4.82]	**0.034**
Injured in the bush	No	Ref				Ref	
	Yes	3.78	[1.74;8.22]	<0.001	3.91	[1.78;8.61]	**<0.001**
Witnessed killing in the bush	No	Ref				Ref	
	Yes	4.57	[1.95;10.67]	<0.001	4.72	[2.01;11.10]	**<0.001**
Killed others in the bush	No	Ref				Ref	
	Yes	2.87	[1.29;6.38]	0.010	2.86	[1.27;6.45]	**0.011**
Military training in the bush	No	Ref				Ref	
	Yes	4.59	[2.27;9.28]	<0.001	4.53	[2.23;9.21]	**<0.001**
Sexually abused in the bush	No	Ref				Ref	
	Yes	3.36	[0.94;12.00]	0.063	4.09	[1.10;15.20]	**0.035**

Variable	Units	UOR	95% CI	p-value	AOR*	95% CI	p-value
Had access to condoms in the bush	No	Ref			Ref		
	Yes	3.72	[1.15;11.96]	0.028	3.53	[1.09;11.48]	**0.036**
4. Sexual and relationship vulnerabilities							
Forced sexual debut[b]**	No	Ref			Ref		
	Yes	7.79	[1.26;55.36]	0.013	-	-	-
Condom use at sexual debut[b]	No	Ref			Ref		
	Yes	1.48	[0.72;3.00]	0.284	1.20	[0.55;2.62]	0.639
Number of sexual partners (past year)	0	Ref			Ref		
	1	0.78	[0.26;2.30]	0.653	0.95	[0.30;3.05]	0.935
	2+	0.82	[0.28;2.44]	0.721	1.14	[0.33;3.93]	0.830
Circumcision**	No	Ref			Ref		
	Yes	0.91	[0.16;3.33]	1	-	-	-
Lifetime IPV[b]	No	Ref			Ref		
	yes	1.26	[0.57;2.76]	0.568	1.42	[0.63;3.20]	0.395
5. Health outcomes							
Genital ulcers (past year)[b]	No	Ref			Ref		
	Yes	1.84	[0.73;4.62]	0.197	1.89	[0.75;4.79]	0.179
Syphilis**	NEG	Ref			Ref		
	POS	0.58	[0.01;4.29]	1	-	-	**-**
HIV	NEG	Ref			Ref		
	POS	1.59	[0.64;3.94]	0.32	1.92	[0.72;5.13]	0.191

*Adjusted for age and district
**Fisher's exact test was performed due to small cell counts
[a] among those not living at home
[b] among those who were sexually active

Table 19: Final model of probable depression among sexually active male abductees based on stepwise selection (n=261)

Variable	Units	Odds Ratio	95% CI	P-value
District	Gulu	Ref		
	Amuru	0.89	[0.37;2.13]	0.794
	Nwoya	0.91	[0.35;2.35]	0.849
Age (years)		0.96	[0.92;1.01]	0.113
Ill health without medical care	No	Ref		
	Yes	1.90	[0.90;4.00]	0.093
Injured in the bush	No	Ref		
	Yes	3.16	[1.27;7.89]	0.014

Military training in the bush	No	Ref		
	Yes	2.89	[1.30;6.39]	0.009

4.4   Summary of results and discussion

According to Article 39 of the United Nations Convention on the Rights of the Child, psychosocial rehabilitation and reintegration of child victims should be an indispensable part of post-conflict transition (The UN General Assembly, 1989). However, as noted by many researchers, there is a dearth of literature using gender-differentiated analysis to evaluate the mental health of formerly abducted children (Bayer et al., 2007; Kiconco & Nthakomwa, 2018; Klasen et al., 2010).

In our present study, around a quarter (24.5%) of study participants indicated they were formerly abducted by the LRA (n=603). Compared to the general population, former abductees were nearly twice more likely to meet screening criteria for PTSD (11.7% vs. 23.2%) and depression (15.2% vs. 26.6%). This is in keeping with other studies from Northern Uganda that demonstrated worse mental health outcomes among former abductees than non-abductees (Ertl, Pfeiffer, Schauer-Kaiser, Elbert, & Neuner, 2014; Moscardino, Scrimin, Cadei, & Altoè, 2012; Okello, Onen, & Musisi, 2007). However, compared to the general cohort, fewer explanatory variables associated with impaired mental health were found for former abductees in our study. It is possible that abductees experienced a unique set of vulnerabilities that were not fully captured by our questionnaire, such as stigma, community and family rejection, physical disabilities, and thwarted educational and employment pursuits.

That being said, levels of mental health issues among abductees in our study were much lower than previously reported during and shortly after the war. In one study conducted in 2002, nearly all "child soldiers" randomly selected from a rehabilitation program had clinically

significant scores for PTSD (Derluyn, Broekaert, Schuyten, & De Temmerman, 2004). In 2004, Okello, Onen, and Musisi (2007) performed a comparison study of 153 abducted and non-abducted adolescents in the Gulu district, in which 70.7% of abducted adolescents met criteria for at least one psychiatric disorder, and 51.2% reported significant psychosocial disturbance. Two 2006 cross-sectional studies undertaken in school settings also found extremely high rates of psychological issues among formerly abducted children (Moscardino et al., 2012; Ovuga et al., 2008). In consonance with our findings, some researchers argue that symptoms of chronic psychiatric distress concentrate in only a small proportion of war-affected children, with survival and recovery from trauma being a far more common experience (Blattman & Annan, 2008; Siriwardhana & Stewart, 2013).

In comparison with male abductees, female abductees were almost twice more likely to screen positive for PTSD and over twice more likely to screen positive for depression. Such gender asymmetry in mental health among abductees has been noted in a number of studies across Northern Uganda (Amone-P'Olak et al., 2013; MacMullin & Loughry, 2004; Moscardino et al., 2012). The WAYS (War-affected Youths Study), for example, showed that formerly abducted girls were more negatively affected by war experiences and scored higher on depression and anxiety, somatic complaints, and difficulties with daily tasks than boys (Amone-P'Olak et al., 2013). Drawing on her years of research and fieldwork with children associated with fighting forces in sub-Saharan Africa, Betancourt (2008) traced these gender differences to differing family and community responses to male and female abductees, which will be discussed below.

4.4.1   Lack of education and its potential long-term impacts

Overall, former LRA abductees in our study reported low levels of educational attainment. It is staggering that one in five female abductees had received no education at all. Although our analyses did not include statistical comparisons based on abduction status, multiple studies in Northern Uganda have shown that abductees had significantly lower levels of schooling and higher levels of illiteracy than non-abductees (Annan et al., 2006; Blattman & Annan, 2010; S. Patel et al., 2013). Traditionally, Acholi children and youth were tutored by the extended family in mastering skills that would serve them in the future, such as how to grow crops, breed animals, and conduct small-scale trade (McElroy et al., 2012). But war disrupted this process and severely diminished the transmission of intergenerational knowledge. During the war, while displaced children were–no matter how sporadically–able to access schools set up inside or near IDP camps, those forcibly recruited into the LRA were completely deprived of any learning opportunities (S. Patel et al., 2013).

We did not find a positive relationship between lack of schooling and mental health; however, the influence of education on ex-abductees' long-term functioning and development should not be underestimated. There is evidence to suggest that educational disparity experienced by former abductees may translate into a lifelong gap in human capital, competence in the labor market, and career prospects (Blattman & Annan, 2008). According to findings from the Survey of War Affected Youth (SWAY), male abducted youth were over 40% less likely to be engaged in skilled work and earned 33% less than their non-abducted counterparts in the post-conflict period (Blattman & Annan, 2010). Aside from the benefit of future economic security, Betancourt et al. (2008) point out that the school system provides a sense of normalcy and safety, fosters hope for the future, allows abductees to rebuild friendships and disentangle from their

former identity as combatants, and ultimately, facilitates community reintegration and reconciliation for these young people. In particular, anthropological accounts revealed that school serves as a protective environment for Northern Ugandan girls, who once left at home alone, face heightened risk of coerced sex and HIV infection (Spittal et al., 2008).

Despite the pressing need, former abductees face various barriers to returning to school and receiving civilian education: insufficient financial and material resources, feeling too old to resume school after prolonged time spent in the bush, transportation difficulties, and low self-efficacy related to traumatic war experiences (Betancourt et al., 2008; S. Patel et al., 2013). Poverty is indicated as a primary driver of widespread under-education in Northern Uganda. Despite a policy of Universal Primary Education in Uganda, children are required to pay various types of fees in order to attend school (Annan et al., 2006; McElroy et al., 2012; Spittal et al., 2008). These additional costs proved to be prohibitive to families who had lost all means of generating income, so many children were seen engaged in unskilled labor to earn cash, such as making bricks, burning charcoal, and collecting firewood, putting themselves at risk for injuries and exploitation (Annan et al., 2006). In some cases, NGOs and community-based organizations have stepped in to provide war-affected children with school fee assistance and needed school supplies, though these supports are often inadequate and short-lived (Betancourt et al., 2008). Offering free meals in schools has been suggested as another approach to encourage enrollment and retain children plagued by poverty and hunger in the educational system (Spittal et al., 2008).

It is worth noting that stigma attached to being sexually violated at the hands of the LRA as well as childrearing responsibilities prevented many formerly abducted girls from re-entering school (S. Patel et al., 2013; Spittal et al., 2008). In order to empower and increase life

opportunities for these vulnerable women, Spittal et al. (2008) proposed the provision of accelerated learning programs equipped with childcare centres where they can gain marketable skills with minimal distractions. Yet more than a decade later, there remains a huge gap in reintegrating former abductees into the school system, and tremendous efforts are still needed to put best practice programs into place.

4.4.2   Environmental stressors and community reintegration

Although it is encouraging to see the vast majority of ex-abductees in our study reporting their current communities to be "very safe" (62.0%) or "moderately safe" (32.5%), a high proportion of them were still living in displaced or transient communities (61.7%). It is interesting that for male abductees, no association was found between community safety and mental health, while these associations were prominent for female abductees. A possible explanation is that male abductees had been exposed to a great amount of hostilities during the bush war and, as a result, developed psychological resilience to cope with safety threats in the post-war environment.

We found living in a youth-headed household was strongly associated with probable PTSD among all abductees, and with probable depression among female abductees. From 1986 to 2006, thousands of children in Northern Uganda had lost their parents to warfare or disease and become orphans. Researchers of the seminal SWAY study noted that child abduction by the LRA was commonly accompanied by looting of household possessions, murder of one or more caregivers, and destruction of the family compound (Annan et al., 2006). In a school-based sample of 234 Acholi adolescents from the Gulu district, 73.5% had experienced loss of father and 47.4% had experienced loss of mother, with both losses more frequently reported by

formerly abducted youth than non-abducted youth (Moscardino et al., 2012). As orphaned

abductees returned home, many of them were forced to become functioning heads of the family

or, if they were underage, to be taken care of by older siblings. These child/youth-headed

households were often mired in poverty and received little support from surrounding

communities (L. Collins et al., 2016). Recent HIV/AIDS-related investigations in western and

southern Uganda have shed light on the daily difficulties these households are faced with,

including frequent illnesses; fear of abuse, rape, or property theft by strangers; inability to pay

school fees and thwarted educational progress; as well as substandard living conditions and not

having enough food or bedding for all children in the household (L. Collins et al., 2016;

Satzinger, Kipp, & Rubaale, 2012). To ensure family unity and survival, the eldest child heading

the household assumed the role of parents, took on responsibilities of making complex decisions

for their younger siblings and chronically ill grandparents, and struggled to make ends meet

through menial work (L. Collins et al., 2016). The deprivation of childhood and not having

sufficient time and means to process their own grief put these children under enormous

emotional strain.

Indeed, parental loss can have profound, even lifelong, consequences on the physical and

psychological wellbeing of children who are left behind. Two early studies conducted in

Northern Uganda revealed parents played a vital role in protecting child victims of abduction

from toxic influences of the conflict. MacMullin and Loughry (2004) found former abductees

living with one or both parents were less anxious and depressed than those living with non-

parental guardians, and Derluyn et al. (2004) noted the availability of a parent, especially of the

mother, buffered stress reactions for former child abductees in adverse situations. In Sierra

Leone where Betancourt et al. (2008) examined former child combatants associated with the

rebel army RUF, separation from parents or caregivers was the mostly frequently voiced emotional challenge by these children. Later in their longitudinal follow-up, Betancourt et al. (2013) identified the death of a parent due to war as the most robust war exposure associated with deteriorated internalizing problems (OR=4.03). Based on these findings, it is crucial to make continuous efforts to reunite families dispersed by war, call for extended families to offer orphaned children/youth needed assistance and guidance, as well as build institutional support networks for these vulnerable individuals.

Our analyses illustrate the importance of familial ties by showing that abductees who never or seldom visited home had higher odds of screening positive for PTSD and depression. Furthermore, our study revealed important gendered patterns in living arrangements among former abductees that are largely unexamined by previous research. Compared to female abductees, male abductees were more likely to be living at home at the time of our data collection. Among those living away from home, male abductees were also more likely to return home on a regular basis and feel hopeful about eventually settling back home. These gender disparities could be partly attributed to the fact that in traditional Acholi culture, sons inherit land from their father after the latter's death, with land ownership commonly denied to daughters (Kobusingye, 2018). At the same time, female abductees could have avoided returning home due to potential stigmatization and rejection, especially those who returned from the bush with children. As Atim, Mazurana, and Marshak (2018) summarized, "experience of wartime sexual violence violated community norms of virginity before marriage, undermined the paternal identity of children in patrilineal settings, and reduced women's potential to marry in the post-conflict period." Hence, there is an urgent need to combat stigma at the community and district level to safeguard these vulnerable women from compounded trauma and marginalization.

4.4.3　War and abduction-related trauma

Former abductees in our study had undergone indescribable horrors and cruelties under LRA's hostage. More than half of them had been forced to carry loads, been beaten, or witnessed killings of other people. Male abductees who spent two weeks or longer in captivity had three to five times the odds of having probable PTSD and depression, and female abductees who experienced multiple abductions were over two times more likely to screen positive for depression. Almost every abduction-related trauma event demonstrated strong associations with both mental health outcomes. Importantly, forced military training for male abductees was independently associated with nearly three times the odds of screening positive for PTSD and depression in multivariate analyses. However, it is unclear why having killed others in the bush was not associated with probable PTSD/depression among female abductees.

Our findings add to the large body of existing research on the detrimental psychosocial impacts of child abduction and soldiering in Northern Uganda (Derluyn et al., 2004; Ertl et al., 2014; Okello et al., 2007; Pfeiffer & Elbert, 2011; Pham et al., 2009; Winkler et al., 2015). Conducted immediately after the war, the SWAY found each additional act of violence experienced by a former abductee was associated with a ten percent increase in reported levels of distress (Blattman & Annan, 2008). In the longitudinal WAYS project, studies showed the direct effect of war experiences on depression, anxiety, and psychotic symptoms among formerly abducted youth remained significant after adjusting for post-war hardships (Amone-P'Olak et al., 2013, 2015). In a comparison study of abducted and non-abducted adolescents in the Gulu district, the former group had experienced significantly more war-related traumatic events and scored higher on PTSD symptoms, psychological distress, and emotional and behavioural

problems than the latter group (Moscardino et al., 2012). It is clear that amidst prevailing peace and the passage of time, former abductees in Northern Uganda kept struggling with residual effects of their painful past of being abducted and living in the bush under inhuman conditions. Similar findings have emerged from other war-affected African countries as well. In Mozambique, Boothby, Crawford, & Halperin (2006), having followed 39 former child soldiers for 16 years after demobilization, discovered that all of them continued to suffer from intrusion of troubling memories, despite having become productive and caring adults.

Similar to other categories of variables, significant gender differences were seen for war and abduction-related experiences. Male abductees were more likely to have spent two weeks or more in captivity and report all types of traumatic events in the bush, except for sexual abuse. Of note, male abductees reporting 10 or more HTQ-listed trauma events were over eleven times more likely to meet criteria for PTSD when adjusting for age and district. Our analyses also demonstrated that male abductees who were forced into military training had nearly three times the odds of probable PTSD and depression, after adjusting for all other variables in multivariate models. These findings depart from previous studies which showed no significant effect of military engagement on the psychosocial wellbeing of male child soldiers (Amone-P'Olak, Ovuga, Croudace, Jones, & Abbott, 2014; Kohrt et al., 2008; Moscardino et al., 2012). It is deeply concerning that worldwide, an estimated 300,000 child soldiers are involved in more than thirty conflicts (UNICEF, 2011b). There needs to be more international pressure to stop armed groups such as the LRA from recruiting and abusing children, in accordance with the Optional Protocol to the Convention on the Rights of the Child on the Involvement of Children in Armed Conflict (UN, 2002).

On the other hand, female abductees were more likely to have been abducted under age 15 and almost two-thirds of them were first abducted under that age. Moreover, female abductees bore a disproportionate burden of sexual trauma: over a quarter reported being sexually abused (28.5%) and/or given as a wife (26.6%) at the hands of the LRA, both of which were highly associated with probable PTSD and depression. This is deeply tragic and worrisome as early sexual trauma is known to have severe consequences on victims' medical, psychological, behavioural, and sexual health (Maniglio, 2009). In the WAYS study, wartime sexual violence was linked to elevated stigma, poor community relations, and low self-esteem among young Acholi women (Amone-P'Olak et al., 2016). More discussion with regard to sexual vulnerabilities of female abductees is presented in the next section.

4.4.4 Sexual violence and vulnerabilities

Marked gender differences in sexual vulnerabilities were observed among former abductees, with male abductees less likely to have experienced forced sexual debut and lifetime IPV and more likely to have had access to condoms at sexual debut than female abductees. Alarmingly, female abductees constituted almost half of all female participants in the baseline Cango Lyec cohort reporting forced sexual debut (109 out of a total of 251), which was associated with over twice the odds of probable PTSD and depression among this subgroup. During the war, the LRA adopted a deliberate strategy of abducting young pre-menstrual girls who were assumed to be less likely to be infected with HIV. Once menstruation started, these girls were assigned to a rebel "husband" and entered a life of involuntary sex and childbearing (Amone-P'Olak et al., 2013; S. Patel et al., 2013). It is plausible that these distinctive experiences of high-impact trauma contributed to the greater rates of mental health issues seen

among female abductees in the present study. Other than leaving indelible psychological injuries in its wake, sexual violence can be followed by long-term reproductive health problems including infertility, vaginal/perineal tears, chronic backache and pelvic pain, and sexual dysfunction (Amone-P'Olak et al., 2016; Kinyanda et al., 2010). Through close examination of 210 formerly abducted girls, the WAYS study reported independent correlations between prior sexual violence with adverse mental health outcomes as well as poor general functioning (Amone-P'Olak et al., 2016, 2014). In addition, Amone-P'Olak et al. (2016) identified that stigma and poor community relations significantly mediated the relationship between sexual violence and poor functioning.

Previous research suggests because the LRA had abducted sexually naïve children and enforced stringent sexual rules in the bush, the majority of abductees were free from HIV infection during the immediate post-conflict period (S. Patel et al., 2013). However, our data collected five years later showed a substantial proportion of them were engaging in sexual behaviours associated with a higher chance of HIV infection: 31.5% reported being in a polygamous marriage (vs. 21.1% in the general population) and 22.9% reported having had multiple sexual partners in the past year (vs. 14.2% in the general population). Partly, this could be attributed to the fact that Acholi men are culturally approved to have multiple female partners according to the tradition of patriarchal dominance (42.2% male abductees versus only 5.9% female abductees had more than one past-year sexual partner). However, high-risk sexual behaviours could also be a coping mechanism for abductees to deal with their trauma and immense emotional pain. Patel and colleagues (2013) found similar sexual behavioural patterns among a group of ex-LRA abductees staying in transit camps in Gulu: formerly abducted youth were more likely than never-abducted youth to report a greater median number of sex partners in

the previous 6 months and to lack knowledge of their sexual partners' HIV status. Although HIV prevalence was similar among former abductees and non-abductees (12% vs. 13%; p = 0.824) in their study, Patel et al. (2013) suggested psychological sequelae of widespread sexual violence in the bush may put abductees at particular risk for HIV infection once they returned home. Our results lend some support to that hypothesis in finding noticeably higher HIV prevalence among abductees than the general population (15.9% vs. 11.3%). More research is needed to disentangle the complex intersections of HIV, abduction, post-traumatic coping, and mental health in the unique context of Northern Uganda.

Having been forcibly separated from their families and living amongst cultural degeneration permeated by the war, most former abductees never learned the sexual norms of their culture and received little guidance in navigating adult relationships. Evidence from diverse global settings indicates that victims of childhood sexual abuse are more likely to engage in unsafe sexual practices and be re-victimized later in life through behaviours such as unprotected sexual intercourse, sex with multiple partners, and trading sex for money, drugs, or shelter (Amone-P'Olak et al., 2013; Maman, Campbell, Sweat, & Gielen, 2000; Maniglio, 2009). In Northern Ugandan communities, female ex-abductees faced a high degree of stigma, especially those who returned with children born of wartime sexual violence, making some of them return to sexual partners they met in the bush and form unsanctioned relationships (Atim et al., 2018; Spittal et al., 2018). Others have been noted to leave for urban areas to avoid daily humiliation and rejection, with some resorting to sex work for subsistence (Atim et al., 2018; Katamba et al., 2020).

Chapter 5: Conclusions

The purpose of this thesis was two-fold: 1) to estimate the prevalence of probable PTSD and depression among conflict-affected populations in Northern Uganda based on a large representative sample and 2) to examine social, environmental, sexual, and war-related vulnerabilities associated with mental health within the local context. We conceptualized post-conflict mental health using a socio-ecological framework and paid special attention to risk factors existing at relationship and community levels.

Limited data on the epidemiology of common mental disorders in Uganda constitutes a major hindrance to policymaking and resource allocation in regard to the country's mental health sector (Mugisha, Ssebunnya, & Kigozi, 2016). A recent statistic showed that less than 5% of health publications in Uganda were concerned with topics in mental health (Kigozi, Ssebunnya, Kizza, Cooper, & Ndyanabangi, 2010). Of particular concern is the paucity of gender-differentiated analyses, which limits the inference of research findings to the female population given their distinct needs and vulnerabilities (Kinyanda et al., 2016; Muldoon et al., 2014). This thesis study attempted to address these research gaps, and below is a summary of key findings, policy implications, and discussion of study limitations.

5.1   Key findings and policy implications

Two decades of war and displacement imprinted a profound sense of loss and rootlessness on the psyche of Northern Ugandans. Our analyses identified strong relationships between mental health with community safety levels, housing transience, and frequency of contact with original homes. Assisting local residents with rebuilding their homesteads, resolving land disputes, and protecting land tenure security for each family should be priorities in

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redevelopment programming. Vulnerable households such as those headed by youth should be given special attention and protections, such as by involving trusted adults (e.g., relatives, neighbors, village leaders) to pay regular home visits, check on orphaned children's health and wellbeing, and transfer skills in agriculture and childcare methods (Satzinger et al., 2012).

High rates of food insecurity reported by our study participants were deeply concerning. Even though the emergency conflict situation had resolved in Northern Uganda, many people were still in dire need of food aid to ensure their basic survival. In the long run, more funding from the government and international donors should be channeled to programs that promise poverty reduction and sustainable economic development. Research has delineated the negative cycle between poverty and mental illness: poverty can lead to poor mental health by causing heightened stress, social exclusion, and violence, while mental illness reduces opportunities in life and makes people more likely to drift into or stay in poverty (Lund et al., 2011). Reviving traditional livelihoods and the local agrarian economy would also empower Acholi men as providers and facilitate the restoration of cultural values, which would help achieve psychiatric rehabilitation on a population level.

That war-related traumas were the most robust correlates of probable PTSD/depression in our study highlights the lasting psychological impacts of the Northern Ugandan war. Although the prevalence of both outcomes was modest among Cango Lyec participants, it is important to ensure the availability of mental health services to those in need. In the local context, mental health problems are rarely discussed due to stigma, fear of family rupture, low mental health literacy, and the normalization of everyday stress (Amone-P'Olak et al., 2013; Liebling, Davidson, Akello, & Ochola, 2016; Odokonyero et al., 2015). As a low-income country heavily burdened by communicable diseases, Uganda devotes a minimal portion of its national budget to

the mental health sector, with existing services prioritizing hospital-based institutional care over community-based interventions (Kigozi et al., 2010; Mugisha, Ssebunnya, et al., 2016). A large service gap exists between rural and urban areas: a 2010 system evaluation revealed that 62.4% of Uganda's inpatient psychiatric beds were located in Kampala, the capital city which also had the majority of psychiatric specialists and nurses (Kigozi et al., 2010). For many years, Ugandan researchers and clinicians have been calling for integration of psychiatric services, including routine screening and referrals, into the country's primary health care (PHC) system (Amone-P'Olak et al., 2013; Liebling et al., 2016; Mugisha, Ssebunnya, et al., 2016; Musisi, 2004). Within this decentralized approach, there is a clear need for more rural health centres to be established in the North and for investment in training mental health professionals well-versed in Luo and Acholi culture. To retain these personnel and prevent burnout, they should be given adequate supports, including ongoing supervision, skills development opportunities, and vehicles for conducting community outreach (Liebling et al., 2016; Musisi, 2004). Efforts should be made to actively recruit female personnel who can counsel women around sensitive issues such as sexual trauma, relationship and marital issues, and HIV-related stigma (Liebling et al., 2016).

At the same time, a wider truth and reconciliation process is called for in Northern Uganda to facilitate collective healing; only when war crimes are acknowledged and justice is restored can people truly move on from their past traumas. Some of the suggested measures include public truth-telling, traditional justice mechanisms, and the provision of remedy and reparation according to the Juba Peace Agreement (OHCHR & UHRC, 2011). In particular, female survivors of sexual violence should be compensated properly and be included on all levels of decision-making. Holding sexual perpetrators accountable is essential to healing survivors and preventing future incidents of sexual violence, since some of the perpetrators are

living in the same community with girls they had previously victimized (Amone-P'Olak et al., 2016).

Gender-based violence must be firmly tackled as a notorious legacy of the protracted conflict in Northern Uganda. Consistent with existing literature, our study identified powerful associations between poor mental health with sexual trauma and vulnerabilities, especially among females. Narrative exposure therapy, trauma-focused cognitive-behavioural therapy, psychoeducation, and group therapies have shown efficacy as tertiary interventions in mitigating psychological harms of war-related sexual violence (Ainamani et al., 2020; Amone-P'Olak, Elklit, & Dokkedahl, 2018). More broadly, systemic changes are urgently required to dismantle social structures that sustain gender inequalities and to eliminate various forms of gender-based violence on a societal scale. Local and international researchers have called for the following broad-based measures: enhancing educational and economic opportunities for women, supporting their participation in governance and public life, increasing community awareness of more equitable gender norms, and reforming gender-biased laws in relation to property ownership and inheritance (Annan & Brier, 2010; Mootz et al., 2017; OHCHR & UHRC, 2011).

Moreover, our study provides further evidence to support the intersection of trauma, mental health, and HIV-related outcomes in conflict-affected settings. The HIV prevalence in our population-based sample was 7.7% among males and 13.9% among females, both higher than rates reported in the 2011 Uganda AIDS Indicator Survey (6.3% among men and 10.1% among women) (Uganda Ministry of Health and ICF International, 2012). To curb HIV transmission in post-conflict Northern Uganda that sees a burgeoning youth population, local policymakers need to go beyond the narrow focus on individual risk behaviours toward a holistic approach. It is important to understand how unresolved trauma and cultural breakdown contributed to fueling

the HIV epidemic, so that trauma-informed, culturally safe programs can be implemented

accordingly (Katamba et al., 2020; Spittal et al., 2008). Spittal et al. (2008) proposed utilizing the

Wayo institution embedded in Acholi culture as an innovative HIV prevention strategy. *Wayo*,

meaning "paternal aunts" in Luo, are older women who traditionally play the role of a sex

educator teaching young people about sexuality, family planning, and STIs/HIV as they

transition from adolescence to adulthood (Spittal et al., 2008). Research on this initiative is

ongoing and has shown some promising results.

Former abductees in our study had much higher levels of probable PTSD and depression

than the general cohort, speaking to an urgent need for action. However, targeted mental health

programs have been called into question for emphasizing the "victimhood" of former abductees,

downplaying the crimes they had committed, and stirring discontent within communities (Annan

et al., 2006; Derluyn et al., 2015). As Annan et al. (2006) explained, "targeting the abducted for

special assistance may undermine what should be one of our primary objectives: social

reintegration of the youth in the community, free from resentment and stigmatization." In fact,

other researchers have identified that stigma–which was not directly measured by our study–is a

major contributor to poor mental health among "child soldiers" (Amone-P'Olak et al., 2016;

Betancourt et al., 2010). Alternatively, school-based mental health and psychosocial support

(MHPSS) is suggested as a feasible low-cost option to ensure all traumatized youth get the help

they need regardless of abduction status, avoiding stigma attached to specialized programs;

MHPSS facilitates peer interactions, mitigates social isolation and withdrawal, and enhances the

role of schools as supportive community resources (Miller & Jordans, 2016; Werner, 2012).

These programs also have the desired benefit of encouraging school uptake among former

abductees, for whom inadequate education poses a major challenge to post-conflict reintegration.

Still, there is much work to be done in terms of reconciliation between former LRA fighters and the communities they had deeply wounded. Accountability can be sought through non-criminal judicial methods, acknowledging that the majority of LRA fighters were victims themselves who were forcefully recruited and committed atrocities against their will (Anyeko et al., 2012). In traditional Acholi culture, the immediate community response to acts of violence is not punishment but rather restoration of social order and harmony (H. E. Porter, 2015). Ceremonial practices such as cleansing rituals have been documented to provide solace to participants, support reintegration and acceptance of the formerly abducted, and allow community members to bear witness to each other's sufferings (Schultz & Weisæth, 2015; Spittal et al., 2008). Although our research findings provide valuable insight into the unique vulnerabilities of former abductees, more qualitative research is needed to explore meaning attributed to the experience of abduction; how former abductees are perceived by their communities; how age, gender, and ethnicity shape decision-making and power dynamics; as well as how healing and mental health are understood within the local social ecology (Betancourt, 2008; MacMullin & Loughry, 2004).

5.2   Limitations

This study has several potential limitations. First, it relies on self-reported data that are subject to recall and reporting bias. Participants may have remembered war experiences inaccurately due to stress-induced memory loss or distortion. Also, their answers may be influenced by social desirability or cultural norms: for example, males may have felt reluctant to disclose history of sexual abuse due to stigma (Johnson et al., 2008). Some of the violent events may have been underreported by those who feared retribution or future harms as a result of

personal disclosure, which has been identified as a major barrier to the truth-telling process (Anyeko et al., 2012; Betancourt, Borisova, et al., 2010). Moreover, the option for participants to choose their own interviewers may have biased their answers to certain questions.

By using standardized tools, we failed to capture culture-specific elements of mental illness that have been illustrated by previous studies, such as *tam/par/kumu* (depression and dysthymia-like syndromes), *ma lwor* (a mixed anxiety and depression-like syndrome), and *kwo maraco/gin lugero* (a category of conduct problems) (Betancourt, Speelman, Onyango, & Bolton, 2009). Previous research identified that somatization of psychological distress, as manifested by pain and unexplained physical symptoms, is common among survivors of abduction and trauma in Northern Uganda (Liebling et al., 2016). Both the HTQ and HSCL-25 are screening tools with limited diagnostic ability, so the rates of PTSD and depression in our study could have been inflated or deflated by including false positive or false negative results. In addition, these relatively low rates should be interpreted with caution as there has been great variation in the prevalence of mental health problems reported in post-conflict Northern Ugandans due to studies conducted at different time periods (e.g., immediately after the war versus several years later); varying time frames of symptom assessment; differences in sampling techniques, psychometric instruments, and cutoff points used for those instruments (Klasen, Oettingen, Daniels, & Adam, 2010).

Although the Cango Lyec Project employed rigorous sampling methods, we cannot completely rule out selection bias, as some residents in our sampled districts were repeatedly absent or refused to participate in the study. Some of them were found to be mobile individuals who were at high risk for contracting HIV and therefore more likely to be traumatized or depressed. Furthermore, the three districts (Amuru/Gulu/Nwoya) had been most seriously

affected by the LRA insurgency, so findings from this study may not be generalizable to the entire Northern region. Due to the observational nature of the study, causality and temporality cannot be established between probable PTSD/depression and identified risk factors.

Longitudinal data are urgently required to clarify the observed associations and track the long-term trajectory of mental health among war-affected Northern Ugandans. The need for a more robust assessment of PTSD was noted after our baseline data collection. Therefore, we introduced the WHO-World Mental Health Composite International Diagnostic Interview for PTSD (CIDI-PTSD), a gold-standard instrument for PTSD diagnosis, in follow-up rounds of data collection. Administered by locally trained nurses, this tool will allow us to have a more accurate picture of the mental health profile of our participants.

5.3   Concluding remarks

This thesis has contributed to understanding post-conflict mental health and its various correlates in a sub-Saharan African context, providing direction for humanitarian programming and community-based interventions. It is crucial to consider the different forms of violence at individual, family, social, and structural levels (Annan & Brier, 2010). Based on our findings, further research is recommended to set forth interventions that respond to local mental health needs and improve holistic wellbeing of the long-suffering people of Northern Uganda.

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