UNPACKING THE COMPLEXITY IN THE CONNECTION BETWEEN ADOLESCENT PREGNANCY AND CHILD UNDERNUTRITION

Maoudi Diallo
6089984

Supervisor: Harrison Awuh
Field supervisor: Uwera Caroline

Sustainable Development Master Thesis

In collaboration with Kabarole Research and Resource Centre

Image: picture of adolescent mother with undernourished child. Source: author

Summary:

Since 2015, the prevalence of undernutrition has increased. This has led to approximately 800 million people being undernourished globally, resulting in growth stunting, underweight, anemia, and millions of deaths of children below the age of five. In order to engage with the problem, it is crucial to gain more insight into its relationship with other factors besides the food system. For instance, according to some sources, adolescent pregnancy is suspected to play a significant role in child undernutrition. However, it is unclear whether this relation is experienced in the everyday lives of impacted communities or how they perceive this interconnection between child undernutrition and adolescent pregnancy. Therefore, this thesis aims to deeply investigate the connection between adolescent pregnancy and child undernutrition from the perspective of impacted communities by conducting life history interviews, key informant interviews, photovoice, and focus group discussions with caregivers. The study was conducted in the Kabarole and Bundibugyo districts in Uganda, experiencing high numbers of child undernutrition and adolescent pregnancies. This study found that adolescent pregnancy is linked to child undernutrition through an extensive web of contributing factors, including poverty, inadequate education, a lack of knowledge on nutrition, health, family planning, and non-parental caregivers raising children. Multisectoral interventions are needed in order to address the issues. This thesis has contributed to the existing knowledge by describing the cohesion between different factors that contribute and/or link adolescent pregnancy and child undernutrition. Moreover, this thesis provides starting points to effective interventions that improve nutritional status without intensifying resource use in the food system.

Keywords (5): Undernutrition, adolescent pregnancy, food systems, inequality, health.

Table of Contents

1. Introduction

Currently, around 800 million people are undernourished globally, resulting in growth stunting, underweight, anemia, and millions of deaths of children below the age of 5 (Our World in Data, 2023; Martins et al., 2011). The issue of undernutrition is recognized within the United Nation's (UN) Sustainable Development Goals (SDGs) under goal number two which aims to eradicate hunger by 2030 (UN, 2023). However, this goal has a low probability of being achieved considering the prevalence of undernutrition has severely increased since 2015. In 2020, 9,3% of the world population was undernourished, with the highest increases in Sub-Saharan Africa where one in five people lack sufficient nutrition (Our World in Data, 2023).

To tackle this global issue, undernutrition is most commonly approached from a food systems perspective. The food and agricultural sectors have a great challenge in providing nutritional food within the boundaries of our natural resources. Our current global food system is responsible for between 19 percent and 29 percent of all greenhouse gas (GHG) emissions, 70 percent of freshwater use, and is the main driver of land use change and biodiversity loss (Wilson et al., 2019). Nonetheless, the problem of undernutrition cannot solely be explained by a lack of available food resources (Heidkamp et al., 2021). Thus, to address undernutrition, it is necessary to look beyond food production and turn to other causal factors.

For instance, a large study conducted in India by Nguyen et al. (2019) concluded that adolescent pregnancy increases the risk of undernutrition in mothers as well as in the children. This relationship is mediated by social determinants such as poverty, lower education, less health service access, and poor living conditions (Nguyen et al., 2019). There seems to be an intergenerational cycle of undernutrition in which adolescent pregnancies play a significant role. These findings are supported by similar studies, such as the research by Welch et al. (2023), Nguyen et al. (2021), Fall et al. (2015), Wemakor et al. (2018), and le Roux et al., (2019), that also reported an increased risk of underweight children from adolescent pregnancies. Pregnancy in adolescence has serious consequences on the health for both the mother and child, as well as on determinants for socioeconomic status (Sagalova et al., 2021; Moyano et al., 2021). Adolescent birth rate has been recognized as an indicator in the SDGs, since it is a major factor in mortality rates for this age group and it is strongly connected to sustainability aims that address issues of equity, education, and poverty (Nguyen et al., 2019; UN, 2023).

Notwithstanding, literature that analysis both adolescent pregnancy and child undernutrition is limited, especially studies conducted in the Global South (Tesfaye et al., 2021). Until now, the studies have been quantitative, studying the existence of the relation and identifying influencing factors (Nguyen et al., 2019; Nguyen et al., 2021; Welch et al., 2023; Wemakor et al., 2018; le Roux et al., 2019). Although quantitative data can be useful to identify and test the connections between influencing factors, they provide little information about causality or causality chains between these factors, especially in complex social systems (Wemakor et al., 2018). Therefore,

the statistical relation between adolescent pregnancies and child undernutrition that has been found in previous quantitative analyses, does not automatically mean that people experience this relationship or see the need to prioritize these issues in their everyday life or change their behavior. In order to better understand this possible relationship and its pathways within the complex social, cultural, and environmental context, people's perceptions and experiences have to be included in academic research. Yet, there is no research that has studied this topic from a qualitative perspective. A qualitative approach can provide meaning-centered and contextual data, crucial to design socially and culturally relevant intervention strategies (Goldman et al., 2003). A better understanding of a possible connection between adolescent pregnancy and child undernutrition within the social, cultural, and environmental context could provide tools for interventions that address the challenge of undernutrition in a more holistic, sustainable, and equal way.

Therefore, this study aims to find out the story behind the numbers and to explore if, why and how adolescent pregnancies are connected to child undernutrition in the experience of impacted communities. This study aims to highlight their stories, which are crucial in understanding the links between different individual, social, cultural, and environmental factors, as well as acknowledging their priorities and motivators. To gain a better understanding of potential socio-cultural and environmental pathways, a framework is constructed, which will aid in guiding the caregivers' perceptions and address their priorities within this framework.

This study will greatly contribute to the existing knowledge in literature by approaching this topic in a qualitative way, offering new perspectives and making valuable additions to current quantitative research on the topic. Moreover, the results of this research can be influential in the identification of starting points in improving nutritional status without intensifying resource use in the food system. By addressing adolescent pregnancies, this study contributes to sustainability challenges as defined by the World Health Organization (WHO) and the SDG's and connects them to gender inequality, poverty, and cultural context. The main research question is formulated as follows:

How do caregivers view adolescent pregnancy and child undernutrition?

To answer this question, four sub questions have been phrased.

I. How are life experiences of caregivers with undernourished children linked to adolescent pregnancy and child undernutrition?
II. What everyday life factors do caregivers associate with child nutrition?
III. How do caregivers and health care workers view the connection between adolescent pregnancies and child undernutrition?
IV. What experiences from professional health care workers are related to adolescent pregnancy and undernutrition?

In this thesis, I elaborate on the available literature, theoretical framework, proposed methods, results, discussion, and conclusion.

2. Literature review

This chapter contextualizes adolescent pregnancy and child undernutrition by exploring their definitions, effects, and shared contributing factors.

2.1 Adolescent pregnancy

Adolescence is defined as the phase of life between childhood and adulthood, it concerns children aged 10 to 19. Adolescence is a unique stage of human development, where they experience physical, cognitive, and physiological development. This period significantly shapes the foundations for later life (WHO, 2019). Pregnancy within this period greatly changes one's life trajectory and can pose barriers to full development (Sagalova et al., 2021).

In the past decades, the prevalence of adolescent pregnancies has declined. However, it is still a major health problem, with a highly unequal prevalence distribution throughout the world, see figure 1. The highest burdens lay in sub-Saharan Africa, in Uganda 127 women, aged between 15 and 19 years, gave birth out of 1000 in 2021, while the world average is 42 (Our World in Data, 2023).

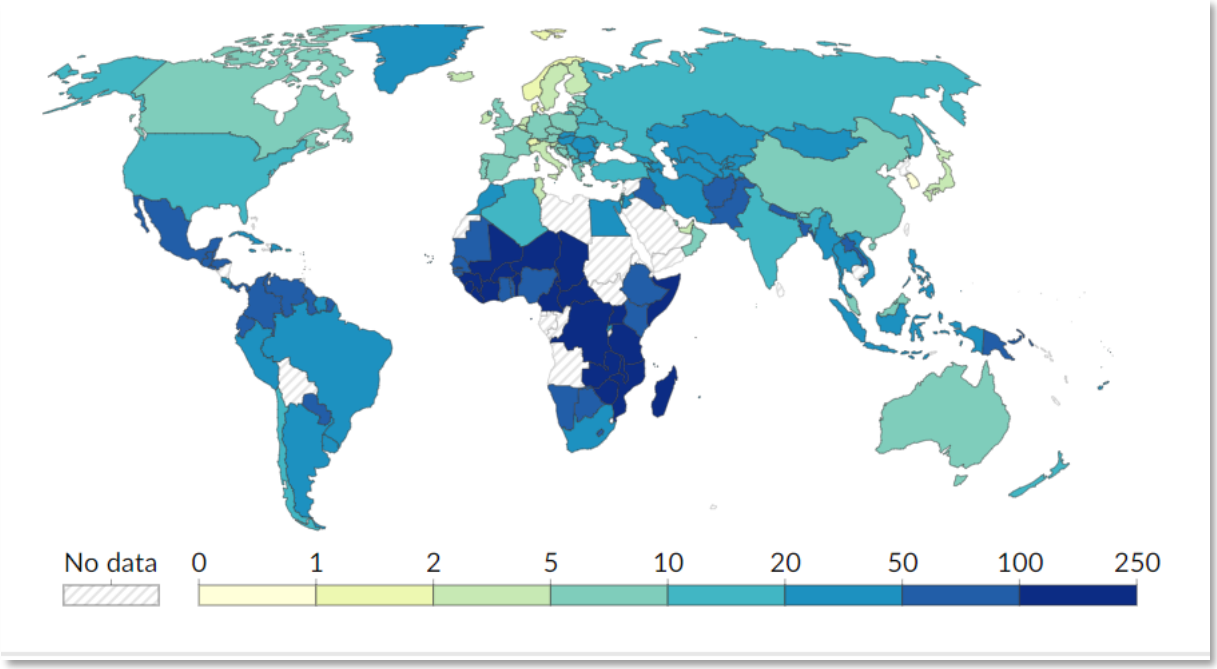

Figure 1: Prevalence of pregnancy of women between 15- and 19-years of 1000 women. (Our world in data, n.d.).

2.1.1 Factors that contribute to adolescent pregnancy

Numerous studies have explored factors contributing to adolescent pregnancies. Important sociocultural factors include poverty, low educational level, family history of adolescent pregnancy, early onset of sexual activity, early menarche, and lack of information on contraceptive use (Pires et al., 2021; Nguyen et al., 2019; Paudel et al., 2023). These factors themselves are all interconnected and related to deeper cultural structures (Pires et al., 2021).

This includes societies in which early marriages culturally accepted, unequal gender norms, living in a male-headed household, and a lack of agency for women to make decisions regarding marriage and family planning (Bhan, 2019; Akombi-Inyang et al., 2022; Poudel et al., 2023).

Low economic status can lead to early marriage and sexual initiation, as poor adolescents have less reason to avoid pregnancy because of fewer opportunities, lower future expectations, and are more likely to engage in transactional sex (Akombi-Inyang et al., 2022; November & Sandall, 2018). Additionally, poverty can be a barrier to access contraceptives and health care (Akombi-Inyang et al., 2022; Poudel et al., 2023). Higher educational level increases autonomy, decision-making power, knowledge of contraceptive use, and economic independence (Akombi-Inyang et al., 2022). Many African countries have seen a rise in the adolescent pregnancies during the COVID pandemic, which has been related the lock down of schools (Cullinan, 2022). The increase in adolescent pregnancies in Uganda is linked to the ban on sex education in 2016 (Health Journalists Network Uganda, 2022). These examples highlight the significant role of education.

Individual factors that have been associated with adolescent pregnancy are low self-esteem, the idea of romantic love, and lack of sexual assertiveness (Moyano et al., 2021). Girls with low self-esteem are unstable and more vulnerable to criticism or rejection, it is a risk factor in adolescent pregnancies and especially unplanned pregnancies. The idea of romantic love is the belief that love is the only thing that gives meaning to life and is associated with the stereotypical roles for men and women. Sexual assertiveness is conceptualized as the ability to initiate or reject sexual activities, and to negotiate contraceptive use (Moyano et al., 2021).

2.1.2 Risks of adolescent pregnancy

Adolescent pregnancy and early childbirth are associated with increased health and social risks for both the mother and child. Health risks for mothers during pregnancy include reduced growth, weight loss, diabetes mellitus, and iron deficiency, which can cause anemia (Sagalova et al., 2021; Tesfaye et al., 2021). The chances for pregnancies complications are increased, such as hypertensive pregnancy disorders, urinary infections, vesicoureteral fistulae, stillbirth, premature rupture of membranes, premature labor, obstructed labor, and post-partum hemorrhage (De la Calle et al., 2021; Sagalova et al., 2021; Tesfaye et al., 2021; Rao et al., 2010). Unsafe abortions are more common among adolescents and can pose serious health risks (Lambonmung et al., 2023).

After giving birth, the adolescent mothers have a higher susceptibility to infections, malaria, anemia, and malnutrition (Sagalova et al., 2021; Bussink-Voorend et al., 2020). These risks are further amplified if the mother is undernourished (Rao et al., 2010). Research has reported that maternal mortality rates in the age group 13 to 19 are twice as high compared to the age group of 20 to 34. The prevalence of health complications significantly decreases with every year of the mother's age (De la Calle et al., 2021). Adolescent pregnancy has implications on mental health as prevalences of depression, anxiety and somatization symptoms are higher compared to adult mothers (Sezgin & Punamäki, 2020). A review on adolescent pregnancy in West-Africa

reported higher rates of pregnancy-related stress, suicidal thoughts, feeling of rejection, self-condemnation, and guild (Lambonmung et al., 2023). Children born from adolescent mothers have increased risks of prematurity, low birth weight, major congenital defects, and perinatal mortality (Sagalova et al., 2021; Fall et al., 2015). A study by Fall et al. (2015) found that children of adolescent mothers are less likely to complete secondary education.

Additionally, adolescent pregnancy can have an impact on social factors such as school dropout, family instability, poverty, and insecure insertion in the labor market (Moyano et al., 2021; Nguyen et al., 2019). Pregnant adolescents are less likely to work for pay, to have their own money, to be able to make household decisions, and travel without permission (Nguyen et al., 2019). A study in Sierra Leone found that pregnant adolescents suffer from stigma and social abandonment, which was thought to contribute to the higher rates of maternal death through the lack of social support (November & Sandall, 2018).

2.2 Undernutrition in children

Undernutrition, characterized by an insufficient intake of essential nutrients vital for energy, growth, and immune system health can manifest in diverse ways (Burgess, 2008). Stunting occurs when a child is too short for their age due to chronic deficiency of nutrients and can have effects on the brain development. Wasting is a term used for children that have a low weight in relation to their height (UNICEF, n.d.). Wasting is a result of acute nutrient deficiency or illness, it reduces the efficacy of the immune system and therefore increases the risk of disease (Soliman et al., 2021; UNICEF, n.d.). Undernutrition can also occur when there is a deficiency in vitamins or essential minerals, which affects growth and the immune system. For example, anemia is a clinical condition as a result of iron deficiency, especially zinc deficiencies or vitamin A deficiency can have effects on susceptibility to infections (Burgess, 2008; Black et al., 2008).

According to the global estimates of UNICEF, 148.1 million children under 5 years of age were stunted in 2022, this is 22,3% of the children within this age range. 45.0 million children under 5 years were wasted. The regional differences are large with the percentage of stunting in children in Sub-Saharan Africa being as high as 30% compared to 3,5% in North America (UNICEF- Joint Child Malnutrition Estimates, 2023).

2.2.1 Factors that contribute to undernutrition in children.

Undernutrition is mostly caused by a poor diet, the meals that are consumed can be of little quantity, unvaried, or low in nutrients. Other causes of undernutrition are gut infections, diarrhea, HIV/AIDS, and respiratory and ear infections. Since children with undernutrition are more susceptible to infections, this interaction can lead to a vicious cycle of undernutrition and disease. Underlying causes include family food insecurity, inappropriate care for vulnerable household members, inadequate hygiene in living conditions, and inadequate health services. These conditions are linked to poverty, lack of information, political and economic insecurity,

unequal status of women, and natural disasters (Burgess, 2008). Black et al. (2008) summarized the immediate causes, underlying causes, and basic causes in a framework, shown in figure 2.

A study by Turyashemererwa et al. (2009) in the Kabarole district Uganda found that education level of the mother, information on child feeding, and disease were significantly associated with child stunting in the region. Repeated pregnancy has also been associated with child stunting increasing the risk by 40% (Maravilla et al., 2020).

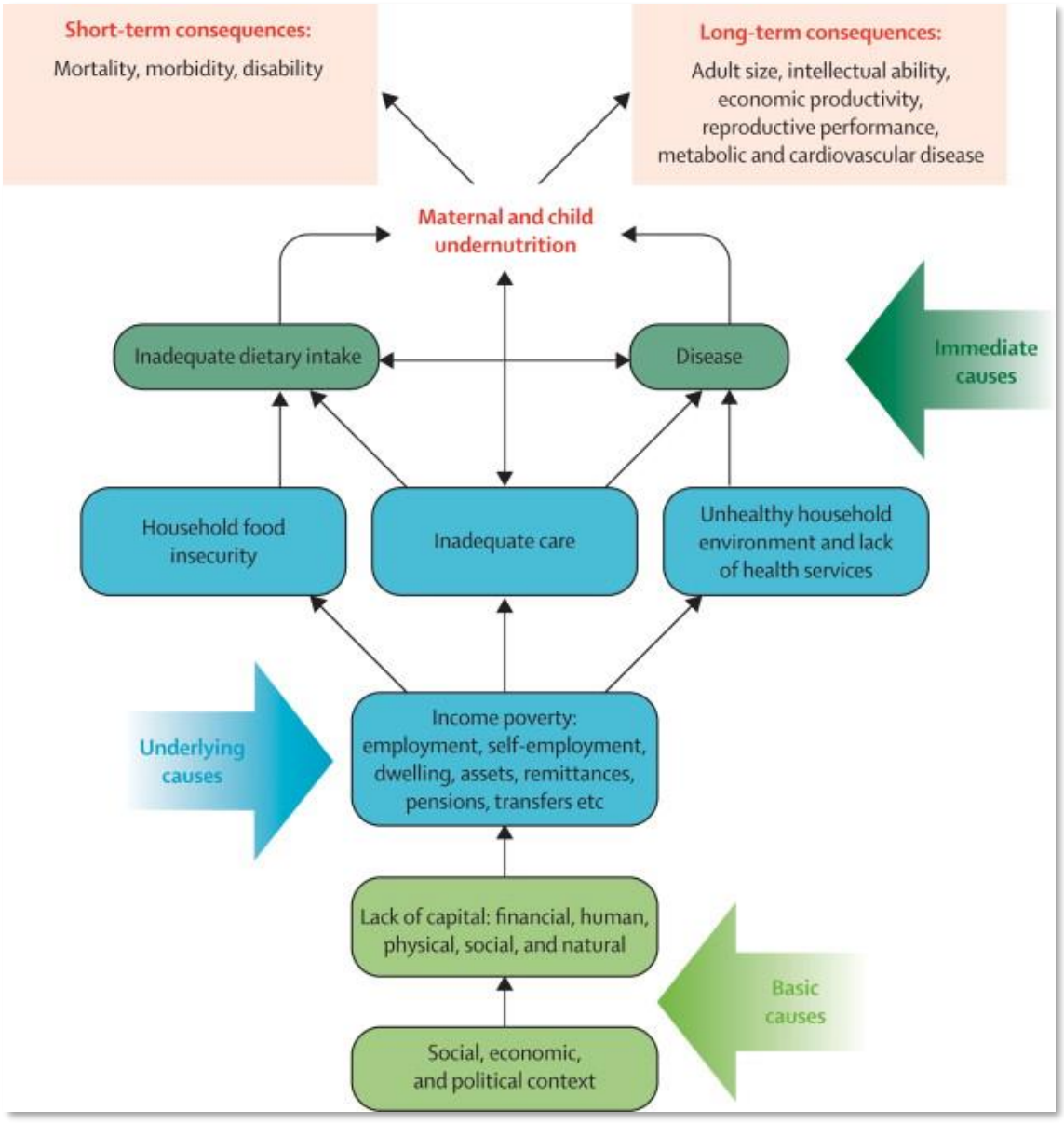

Figure 2. Framework of the relations between poverty, food insecurity, and other underlying and immediate causes of maternal and child undernutrition and its short-term and long-term consequences. (Black et al., 2008).

2.2.2 Risks of undernutrition

Undernutrition in children has many short-term effects which are influenced by the age of the child. Undernutrition of pregnant women can lead to intra-uterine growth restriction and low birth weight (Burgess, 2008; Black et al., 2008). Specific micronutrient insufficiencies, such as lack in iodine or folate, can distort brain or neural tube development (Burgess, 2008). A low birth weight increases mortality by 3,3–19,3 times in neonates through a higher risk of asphyxia and infection (Black et al., 2008). Babies younger than six months have a risk of undernutrition if they are not exclusively breastfed, since exclusive breastfeeding provides all the nutrients that are needed and reduces gastrointestinal and respiratory infections (Kramer & Kakuma, 2012). Undernutrition is most common in children between the age of 6 to 24 months since nutritional requirements are high in this period of rapid growth and development. Undernutrition during this time can cause a reduction in growth, prolonged infections, and hinder cognitive and social development (Soliman et al., 2021; Burgess, 2008). For children within this age group, it is especially important that complementary foods are suitable, sufficiently nutrient dens, and given in appropriate amount of feeding moments (Burgess, 2008). During the growth spurt in adolescence nutritional needs increase, children are undernourished enter later into puberty and can continue growing longer (Soliman et al., 2021).

Undernutrition early in life has long-term effects that influence later adult life. A distorted physical and cognitive development influences future working abilities (UNICEF- Joint Child Malnutrition Estimates, 2023). Additionally, they experience an increased risk to accumulate body fat, lower fat oxidation, lower energy consumption, insulin resistance, and higher risk to adhere diabetes, hypertension, and dyslipidemia as an adult (Martins et al., 2011; Soliman et al., 2021). Stunted children are found to have more anxiety, depression, and lower self-esteem (Soliman et al., 2021). Stunted women, who give birth have an increased risk for needing health care assistance during birth, such as cesarean section (Black et al., 2008).

2.3 Factors that are associated with adolescent pregnancy and undernutrition in children.

A small number of studies have examined the relation between adolescent pregnancy and undernutrition in children. Most of the results show that children born to adolescent mothers are 30-40% more likely to be stunted, have a lower weight for their age, weight for their height, and are more likely to be underweight (Nguyen et al., 2019; Nguyen et al., 2021; Welch et al., 2023; Wemakor et al., 2018; Fall et al., 2015; le Roux et al., 2019; Yu et al., 2016). Children experience this growth restriction beyond the age of 24 months (Yu et al., 2016).

Biological factors that were associated with both adolescent pregnancy and child undernutrition are small height, low weight of the mother, and a lower body mass index (Nguyen et al., 2019; Nguyen et al., 2021; Welch et al., 2023).

Social factors that play a role in both adolescent pregnancy and child undernutrition are lower education, inadequate diet, and socioeconomic status (Nguyen et al., 2019; Nguyen et al., 2021).

Le Roux et al. (2019) found that adolescent mothers are less likely to exclusively breastfeed the first 6 months.

However, not all studies find a relation between adolescent pregnancies and undernutrition of children (Welch et al., 2023; Yu et al., 2016). For example, a study in Vietnam found no association between adolescent pregnancy and risk of underweight in children (Nakamori et al., 2010). In this study they conclude that these findings can be explained by the familial involvement in childcare within this community (Nakamori et al., 2010). Additionally, there are indications that religion and cultural practices can have an influential role in feeding practices and nutrition of the mother (Sagalova et al., 2021). Therefore, cultural practices can be of significant importance in determining to what extend adolescent pregnancy contributes to undernutrition.

Figure 3 combines all factors that contribute to adolescent pregnancies and undernutrition found in the literature. In the middle are the factors that link adolescent pregnancies to undernutrition.

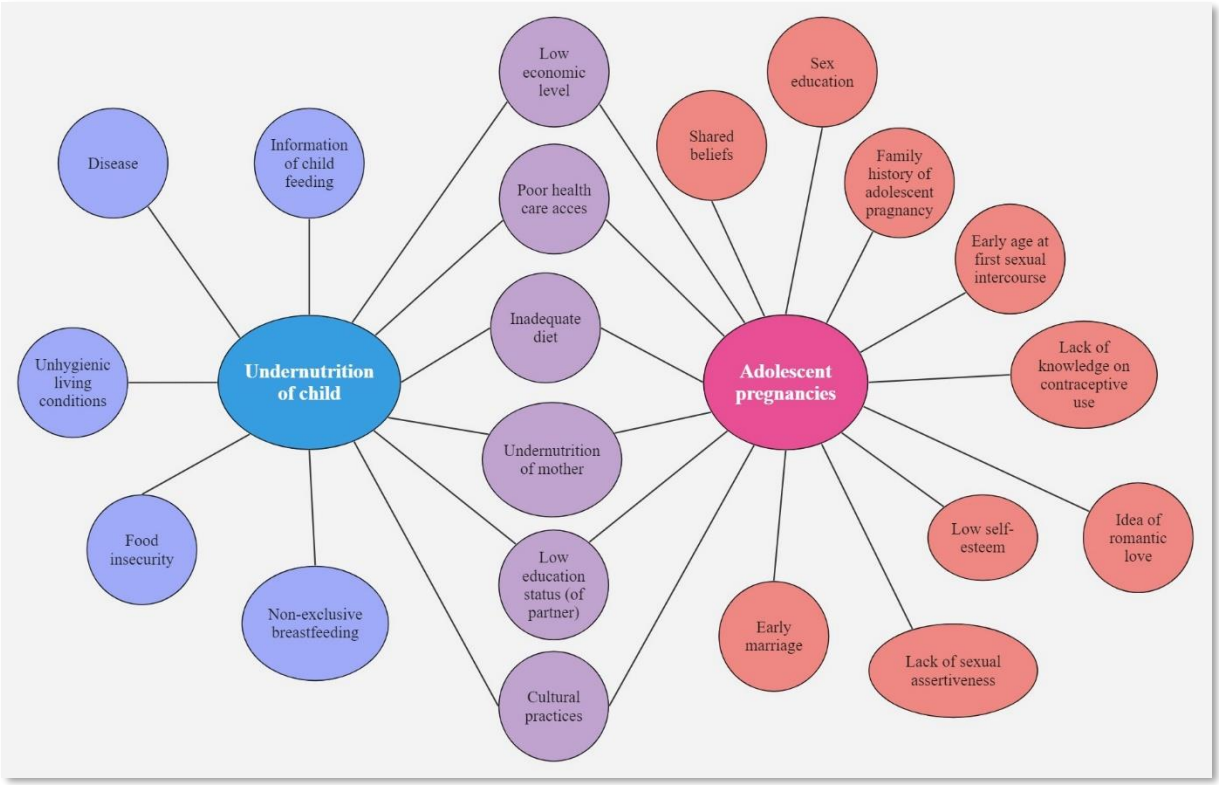

Figure 3: Summary of factors that contribute to undernutrition of the child and adolescent pregnancies. Source: author.

3. Theoretical framework

In this chapter the determinants, which have been identified by previous literature, are connected through four hypothetical mechanisms. The conceptual framework combines these pathways. The chapter concludes with elaboration on the structure of this research.

3.1 Hypothetical mechanisms connecting adolescent pregnancies to undernutrition.

These factors and determinants found in statistical research provide hints to possible mechanisms through which adolescent pregnancies are linked to undernutrition of the children. Derived from previous research, four possible mechanisms were identified.

3.1.1 Biological pathway

The hypothesis of the biological pathway is that children of adolescent mothers are more likely to have undernutrition because of the nutritional status of the mother. In adolescence pregnancy the energy needs of the mother, who is still growing, and the fetus are competing, resulting in a poorer nutritional status for both (Black et al., 2008; Sherer & Trujillo, 2023). Adolescent mothers can cease growing and lose weight during pregnancy and lactation (Nguyen et al., 2019; Rah et al., 2008). Several studies found that adolescent women had lower BMI's and gained less weight during their pregnancy compared to adult women (Kalanda et al., 2006; Sherer & Trujillo, 2023, Nguyen et al., 2019; Workicho et al., 2019).

Undernutrition of the adolescent mother makes her more susceptible to infections. A study in Sierra Leone showed that adolescent mothers experienced increased prevalences of malaria and anemia, which is a cause for disturbed placenta development, low birth weight, and neonatal deaths (Bussink-Voorend et al., 2018). Undernutrition by itself increases the risk for low birth weight of the child (Workicho et al., 2019). For the child, a low birth weight provides a predisposition to undernutrition later in life (Welch et al., 2023).

3.1.2 Education pathway

This hypothesis states that pregnancy in adolescence leads to less education since pregnant adolescents tend not to continue their education (Nguyen et al., 2019; le Roux et al., 2019). Education also plays a crucial role in the nutritional status of adolescent mothers and is a protective factor against adolescent pregnancy (Sagalova et al., 2021). Low education can lead to undernutrition of the child in two different ways.

I. It is hypothesized that low education leads to a lack of knowledge about childcare, hygiene, and appropriate feeding, which impacts the risk of undernutrition in the children as well as the risk of disease (Welch et al., 2023). In the study by Nguyen et al. (2019) adolescent mothers gave their children less adequate and iron-rich foods. Clean and healthy behaviors of adolescent mothers are associated with child undernutrition in Indonesia (Fuada et al., 2020).

II. Low education influences the opportunities on the labor market, since it is more difficult to find formal occupation without a higher educational degree (Moyano et al., 2021; Nguyen et al., 2019). Additionally do many mothers face the challenge of combining work with childcare. These challenges can result in a lower economic status with consequences for living conditions, food security, and access to health services.

The hypothesis for this pathway is supported by the finding that high education is associated with a higher economic status, a better-quality environment and better healthcare through nutritional knowledge, attitudes, and practices (Turyashemererwa et al., 2009). Education is also connected to nutritional status of the mother during pregnancy, linked to a lack of knowledge of appropriate weight gain or appropriate foods to eat during pregnancy (Sagalova et al., 2021; Sherer & Trujillo, 2023).

3.1.3 Healthcare access pathway

A third pathway that links adolescent pregnancy to child undernutrition is the access to healthcare. A study by Owolabi et al. (2017) in West Africa found that adolescent mothers make fewer visits to health care facilities compared to adult mothers. They seek care later and receive less care (Owolabi et al., 2017). Adolescent girls experience greater obstacles to health care, which is related to knowledge of the benefits of antenatal checks, their level of education, socio-economic status, social and cultural beliefs, and attitude of health care providers (Mekonnen et al., 2019). Studies in India and Bangladesh have also found lower access to health care among adolescents (Nguyen et al., 2019; Nguyen et al., 2021). Factors concerning access to antenatal health care are linked to child undernutrition (Nguyen et al., 2019).

3.1.4 Power pathway

The power pathway is a more abstract conceptualization of how adolescent pregnancy could lead to undernutrition of children. Adolescence is a vulnerable time in which girls are developing both physically and mentally. Since adolescent girls are still developing their identity, their independence, their sense of power, and their status within society, they are more dependent on care givers, have less say, and are more vulnerable to abuse.

Statistical analysis reported that adolescent mothers have less power in ownership over money, less say in household decisions, and less freedom of mobility (Nguyen et al., 2019). Child marriage is associated with reduced autonomy and access to healthcare (Welch et al., 2023). In India children of adolescents that married early had poorer nutritional outcomes even after adjusting for socio-economic factors and maternal malnutrition (Raj et al., 2010). A study in Turkey indicated that adolescent pregnancy and early marriage are associated with increased partner violence and sexual coercion (Sezgin & Punamäki, 2020). Adolescent girls that give birth in Sierra Leone experience social exclusion due to stigma and discrimination (November & Sandall, 2018).

This lack of power within the household and society has implications for the nutritional status of the children. It could be that adolescents are less able to advocate for adequate nutrition for their children (Raj et al., 2010). Research shows that there is a strong link between social status and the power to make decisions of mothers and child undernutrition. Interventions that are targeted at empowerment of women and increasing their social status have a significant positive effect on the nutritional status of their children (Pridmore & Carr-Hill, 2009; Heidkamp et al., 2021). Personal distress caused by feelings of guilt or financial problems can have effects on the quality of care, nursing, and nurturing for the children (Wemakor et al., 2018; Fuada et al., 2020).

3.2 Conceptual framework

The four hypothetical pathways that were identified in the literature are summarized within the conceptual framework in figure 4.

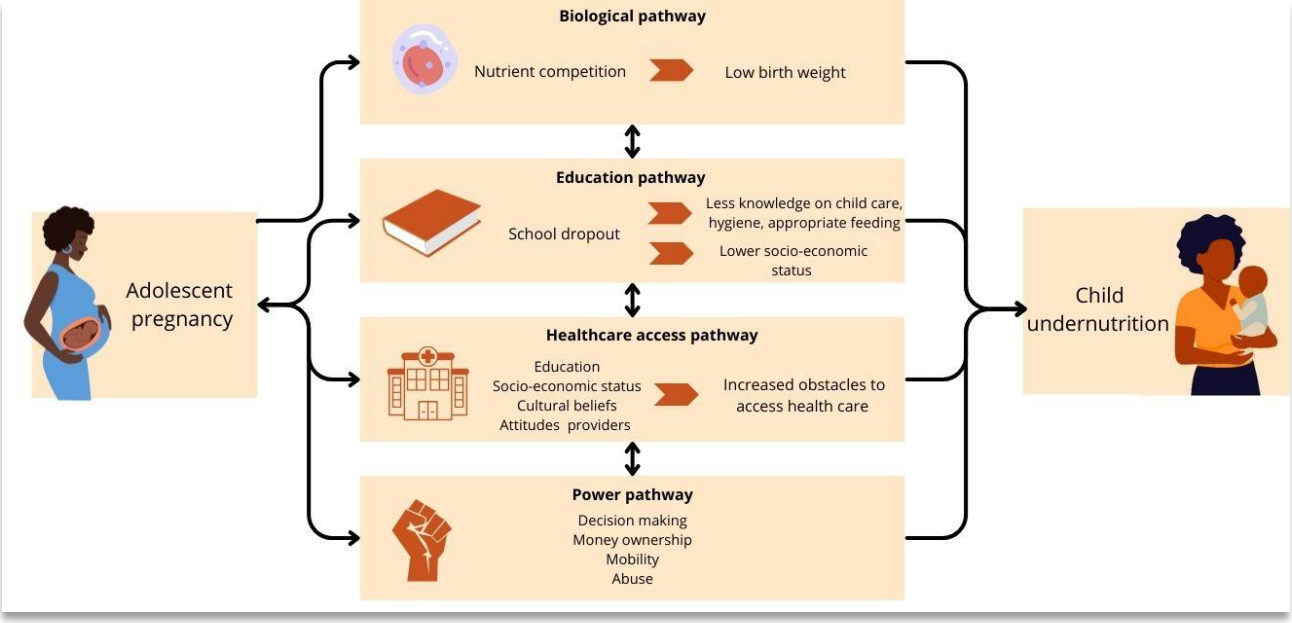

Figure 4: Conceptual framework, hypothetical pathways that link adolescent pregnancy to child undernutrition. Source: author.

3.3 Relevance

The quantitative approaches in previous research have contributed to identifying factors that can possibly be influential in both adolescent pregnancy and child undernutrition. The strengths of large-scale quantitative research lie in its potential to produce findings that are generalizable across a population and measure the magnitude of certain influences (Tierney & Lanford, 2019). However, testing the hypothesis and understanding the connection in a quantitative way is extremely complex since many factors are intertwined and cannot be tested in isolation. Statistical analysis can find relationships between variables through regression or correlation tests; however, these models are often too simplistic and are not able to capture the complexity of real-life events without making multiple assumptions (Krumeich et al., 2001). The studies

that analyzed the relation between adolescent pregnancies and child undernutrition were predominantly observational studies that did not incorporate adjustments for cofounders in their statistical models (Welch et al., 2023). This poses a serious limitation in the interpretation and applicability of the data. Moreover, many studies had a cross-sectional study design which is not appropriate to study cause-effect relationships (Wemakor et al., 2018). Another limitation is the reductive nature of the qualitative approach. By creating a general overview of a certain population, outliers are removed, and a considerable amount of data is lost behind the numbers (Tierney & Lanford, 2019).

That is why various academics argue that different methodologies, techniques, and perspectives are needed in research to create a breadth of knowledge and a deeper understanding (Krumeich et al., 2001). Qualitative methods are less focused on providing a general understanding. Instead, these approaches allow researchers to concentrate on individual narratives, thereby uncovering novel insights and connections that may not have been discovered through quantitative means (Tierney & Lanford, 2019). The additional value of qualitative approaches to health behavior and health perceptions has long been acknowledged, especially within the field of medical anthropology, a scientific research field specialized in studying the relationship between cultural and social structures, people's beliefs, and their health behaviors (Krumeich et al., 2001).

By conducting a qualitative study, this thesis aims to contribute to the current body of knowledge with a novel approach. Insights from a qualitative approach can uncover how impacted communities view adolescent pregnancies and child undernutrition and how different influences in their lives contribute to their views and behaviors. With this study we can learn whether impacted communities see adolescent pregnancies as a problem that contributes to child undernutrition. Moreover, this study contributes to obtaining a better understanding of the plausibility of hypothetical pathways that have been put forward by previous research.

The challenges of adolescent pregnancies and child undernutrition have been acknowledged by international organizations as important targets to improve health and general well-being (UN, 2023). For instance, target 3.7 of the SDGs by the UN is to ensure "universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programs" (UN, 2023, SDG 3). Progress towards achieving this target is measured by adolescent birth rate. Child stunting rates are the most widely used indicator for a community's nutritional status and are used to monitor the general health in a population (WHO, n.d.). In order to achieve progress towards better child nutrition and adolescent pregnancy outcomes, interventions need to cater to the specific needs of a community and fit into the cultural context (Nitz, 1999). By analyzing the impact of social, cultural, and environmental factors on people's lives and their health decision making, this study contributes to a crucial step into developing culturally sensitive, effective mitigation measures (Goldman et al., 2003).

3.4 Research framework

This research aims to test and explore this complex connection between adolescent pregnancy and child undernutrition in the lives of concerned people. The research framework (figure 5) is designed to form an overview of the research activities. First, the literature review serves as the foundation for this research, providing an analysis of existing scholarly work on adolescent pregnancy and its links to undernutrition in children. It aims to identify gaps in current knowledge, theoretical frameworks, and contextual information about the topic that form part of the interview guide and codebook. The second source of data is provided by life history interviews that are conducted in the Kabarole district with caregivers. The third data input is generated from the photovoice focus groups and the pictures. A codebook will be created to systematize the coding process during data analysis, it will include deductive codes derived from the literature and inductive codes from the focus groups. The codebook will aid in identifying patterns, themes, and relationships within the qualitative data obtained from interviews and will be created by combining codes derived from the literature with inductive codes that come up during the interviews. The analysis of the data will lead to new insights in the connection between adolescent pregnancies and child undernutrition. From these insights recommendations can be formulated.

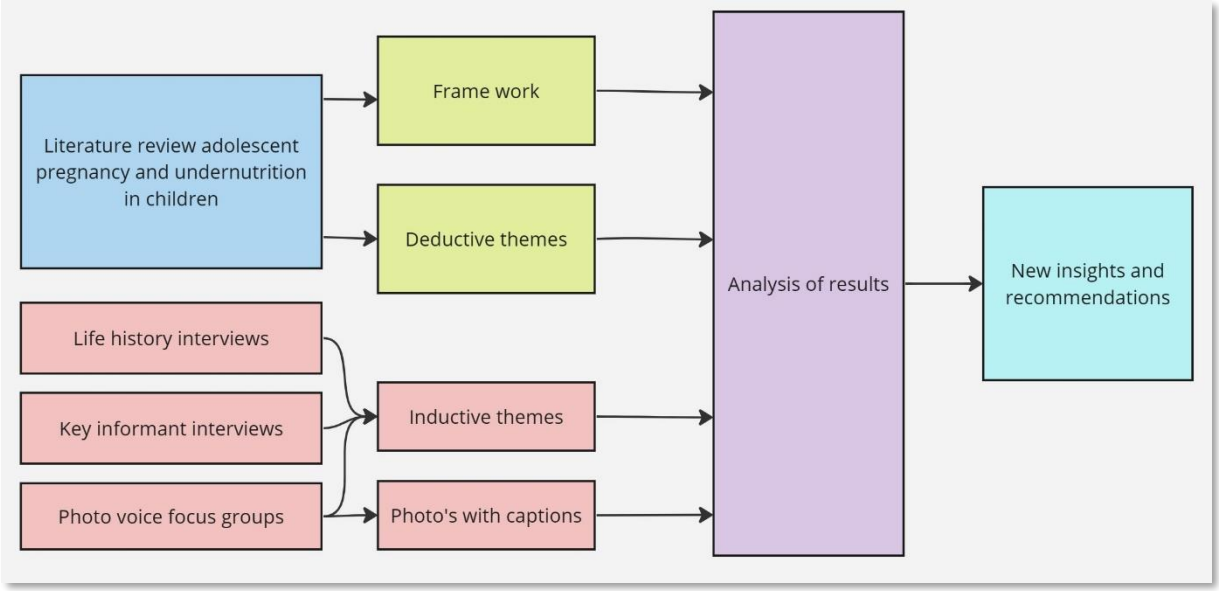

Figure 5: Research framework. Source: author.

4. Methods

This study used live history interviews, photovoice, focus group discussions, and key informant interviews to investigate the connection between adolescent pregnancy and child undernutrition in everyday life experiences. This chapter will provide further elaboration on the study area and how these methods contribute to answering the sub-questions and the main research question. It describes how the data was collected and the different ethical issues that needed to be considered.

4.1 The study area: Kabarole district and Bundibugyo district

The Kabarole district and Bundibugyo districts are two administrative entities in the Tooro region in the western part of Uganda. The Kabarole district has a population of 337,000 people. The Bundibugyo district borders with the Kabarole district and lays next to the border with the Democratic Republic of Congo. This district has a population of 263,000. Both districts have a wide variety of ethnic groups (City Population, 2020). The most prominent ethnic groups are Batooro, Batuku, Basongora, Bakiga, Bakonjo, Bakonzo, Babwisi and Bamba, the major languages are Rutooro, Rukiga and Runyankore (IFPRI, 2012). Around 70% of the population lives in rural areas (City Population, 2020). The Kabarole and Bundibugyo districts lie in a mountainous region with altitudes between 1300-3800 meters above sea level. They have high agricultural outputs, due to its favorable temperatures, high rainfall, and fertile volcanic and red clay soils (Kabarole District, 2023; Bundibugyo District, 2023). The Kabarole district is a leading producer in soya beans, onions, casava, bananas, maize, beans, sorghum, sweet potatoes, and Irish potatoes (IFPRI, 2012). Other agricultural products include tea, coffee, dairy cattle, and apiary (Kabarole District, 2023). The Bundibugyo districts economic activities encompass mostly agriculture and life stock farming (Bundibugyo District, 2023). The district is the largest producer of cocoa in Uganda, 60% of the cocoa produced in Uganda is grown in this district by small holders (Uganda Bundibugyo Organic, 2024). Because of its location next to the politically instable Democratic Republic of Congo, the Bundibugyo district receives thousands of Congolese refugees, who are mostly accommodated in refugee camps (Muhindo & Ashaba, 2023; Uganda, Africa, 2022). The geographical location of the Kabarole and Bundibugyo district are shown in figure 6.

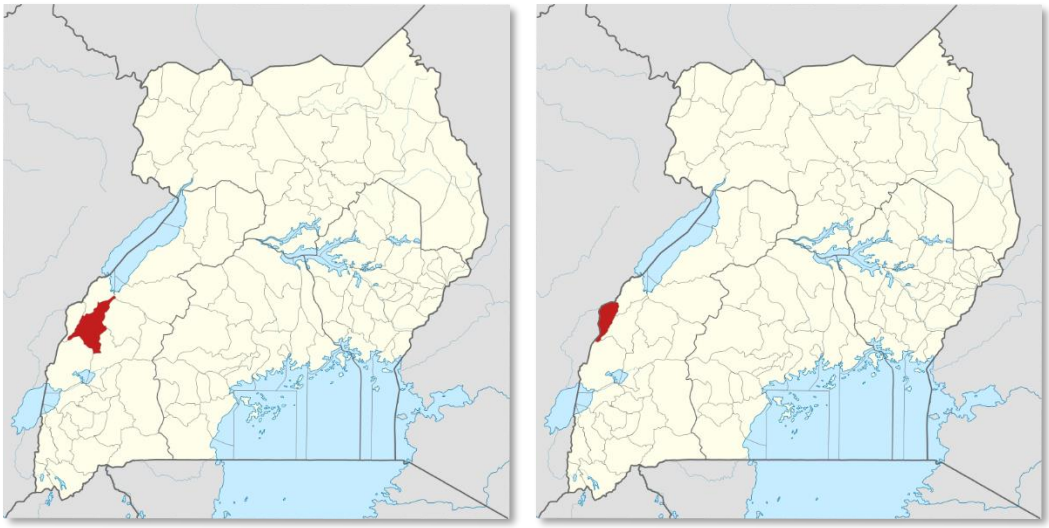

Figure 6: The location of Kabarole district (left) and Bundibugyo district (right) in Uganda, showing district boundaries as they stood in June 2017. (Wikipedia, n.d.).

A study conducted in the district found a prevalence of 41,6% of stunting for children between 6 months and 5 years, which is higher than the average in Uganda (Turyashemererwa et al., 2009). In the Bundibugyo district the prevalence of stunting was estimated at 44,8% (Jilcott et al., 2007). According to the health department of the Kabarole district, family planning uptake is 30% which is low. The numbers of adolescent pregnancies have increased. Among adolescent girls, only 6,1% uses contraceptives (Performance Report, 2022).

4.2 Recruitment and procedures

The data was collected by one researcher (Maoudi Diallo) between the 22nd of January 2024 and 5th of April 2024 in the Kabarole and Bundibugyo districts in Uganda. The participants were approached with help from the networks of the Kabarole Research and Resource Centre in Fort Portal, Regional Referral Hospital, and health clinics in the Fort Portal region. The participants were caregivers for children that were treated with nutritional support by the health clinics. In line with qualitative sampling principles, participants were purposefully chosen by employing a stratified method to enable a varied exploration of issues with a small sample size (Goldman et al., 2003).

Participants that were included are caregivers of children born to a mother that had her first child between the age of 10 and 19. This age range is internationally identified as adolescence (WHO, 2019). Caregivers of children born to a mother above the age of 19 were included as a control group. Further inclusion criteria are living within the Tooro region and having a child with undernutrition with an age between 0 and 10 years. The nutritional status of the children was already determined by the health clinic measurements. It was chosen to include both mothers and fathers in the research in an effort to transition gender roles and involve fathers with regard to childcare (Nguyen et al., 2019). Father involvement in childcare is an important determinant for child healthcare outcomes, which is overlooked in many healthcare focused

studies (Allport et al., 2018). The key informant interviews included professional health care workers that work directly with children with undernutrition.

4.3 Operationalization of the variables

In order to be able to be able to research the above-described theories and concepts, they are translated into variables.

4.3.1 Description of the variables

The important variables are adolescent pregnancy, child undernutrition, and the relation between adolescent pregnancy and child undernutrition. In this research adolescent pregnancy is defined as a pregnancy between the ages of 10 and 19 years. It was chosen to use the term "adolescent pregnancy" rather than "adolescent motherhood", as certain aspects occurring before and during pregnancy were deemed significant within this study. Additionally, the term "adolescent pregnancy" is more often used within the literature. Therefore, in this research, the term adolescent pregnancy refers to experiences and perceptions connected to the pregnancy and motherhood of adolescents. In the interviews and focus group discussions, the term "teenage pregnancy" or "teenage motherhood" was used as it may be easier to understand by the participants. Undernutrition is defined as all types of undernutrition that can be visible or recorded by participant and/or health care services. These include stunting, being underweight, wasting, and all recorded deficiencies. The relation between adolescent pregnancy and undernutrition of a child can be defined as all factors that connect adolescent pregnancy to child undernutrition. Within this research the term "poverty" is used instead of "low economic status/level". This research did not measure the level of poverty, it was based on the experiences of a lack of financial resources to provide basic needs such as food, housing, education, and healthcare. Because the term "poverty" is more subjective and emotionally resonates better with the feeling of deprivation, it was considered more suitable than "economic level".

4.3.2 Implementation of the variables

The aim of the research is to gain insight in the lives of concerned people, to know how they interact with different individual, social, cultural, and environmental components and see how the variables of adolescent pregnancies and child undernutrition interact within their context. To do so, it was chosen to use a mix of three qualitative methods. Adolescent pregnancy is a highly complex issue which is determined by various social, economic, and individual factors. Due to this complexity, it is difficult to identify specific causes of adolescent pregnancies. Most people are not able to oversee the underlying factors that motivate them to specific behaviors. That is why this research did not aim to find the causes for adolescent pregnancies, rather the goal was to gain a deeper understanding of the context in which adolescents live before they get pregnant.

Researching a connection between two variables in a qualitative method brings several challenges. Asking questions directed to a connection could steer participants towards preconceived ideas. Whereas the strength in a qualitative approach lies in the ability for

participants to voice their priorities and challenges instead of answering the top-down topics that are put forward by academics. To overcome this challenge, it was chosen to use the qualitative methods of life history interviews and photovoice method that allow for participants to set the agenda and take an active role in the research. It also allows the participants to show their experiences as they see it and not based on predetermined characteristics or factors. The key informant interviews were more directed towards the topics of adolescent pregnancy and child undernutrition. Their experience and expertise were deemed useful to provide health informed views of these issues.

4.4 Life history interviews

Life history interview is a well-known method within the field of anthropology, it focuses on understanding of how past and present events or circumstances influence people's perceptions and behaviors (Goldman et al., 2003). With the life histories method, the researcher and participant collaboratively create a narrative that represents the life of the participant. This can be constructed using participant observations, one-on-one in-depth interviews, and (digital) artifacts (Tierney & Lanford, 2019). The life history approach has been recognized as a suitable method to explore psychosocial topics, it acknowledges the agency of the individual, as well as the essential role of the context (Haglund, 2004). The researcher serves as a guide through the participants' life history, by encouraging participants to remember and share reflections, interpretations, and insights (Haglund, 2004).

With the life history interviews, it is aimed to gain answers to the sub questions:

- How are life experiences of caregivers with undernourished children linked to adolescent pregnancy and child undernutrition?
- What everyday life factors do caregivers associate with child nutrition?
- How do caregivers and health care workers view the connection between adolescent pregnancies and child undernutrition?

Life history interviews provide an insight into the longitudinal interaction between the factors that are connected to adolescent pregnancy and child undernutrition, which were identified in the literature. This method offers a deeper understanding of how past events and relationships might be influential to present day life and the understanding of life (Haglund, 2004).

The researcher is supported by an interview guide that consists of topical area's that include contexts that are expected to be important in the life history of participants and contexts that reflect the aim of the study (Goldman et al., 2003; Haglund, 2004). This will include key factors such as own childhood, family setting, school experiences, pregnancy experiences, and thoughts about the future. The interview guide is described in appendix one. In this study 22 life history interviews were held. The interviews took place at health facilities, at facilities of community organizations, or in their homes. In many circumstances the interview was combined with their appointment for the child nutritional assessment. Therefore, there were no additional transportation costs and the added time investment for the participants was minimal.

A translator was used to translate the questions and answers during the interview. The translator was purposefully chosen to be female, not working for any of the health clinics, and having no knowledge on the research topics. This was done to ensure that the participants would perceive minimal judgment.

Despite the strengths of life history interview, it was deemed useful to add a more participatory research method to this study. To acquire a more thorough understanding of child undernutrition in the everyday experiences of the participants, it was chosen to use photovoice method in this research.

4.5 Photovoice method

The photovoice method is a participatory visual method that aims to actively engage participants in collaborative knowledge production. It has been increasingly used by social science researchers. It provides several advantages compared to quantitative or conventional qualitative methods (Bandauko & Arku, 2023). For example, photo stories offer a rich source of nuanced information of social issues that would have been harder to grasp using other methods (Bandauko & Arku, 2023). The participants are allowed to set the research agenda, thereby gaining ownership over the research and its outcomes. It increases their understanding of their problems and needs and empowers them to find solutions to these problems (Meenar & Mandarano, 2021). In this study six participants were included in the photovoice method. Participants were chosen considering logistical feasibility for distributing and retrieving the cameras, as well as ensuring their availability for the focus group. The photovoice method provides an overview of people's current everyday life experiences and struggles and addresses the sub-question:

- What everyday life factors do caregivers associate with child undernutrition?

The photovoice method consists of three phases (Bandauko & Arku, 2023). The first phase is the recruitment of participants. It involves a photographing training during which the mechanical practicalities of using the camera are discussed (Wang & Burris, 1997). The participants are trained in fieldwork ethics, where questions will be asked concerning what can be photographed and how to ask for consent (Wang & Burris, 1997). In this study the training was combined with the life history interview. The participants were asked to capture pictures of their experiences concerning child undernutrition. They will have a period of one week to take photos.

In the second phase participants interpreted the pictures in a focus group. Focus groups can be a useful setting in which participants discuss their pictures, create captions, and think of solutions together (Meenar & Mandarano, 2021). The SHOWED guide was used to structure the focus group, it is described in appendix two (Liebenberg et., 2020). By sharing stories in a group, participants can support each other, show their recognition and affirmation (Wang & Burris, 1997).

4.6 Key informant interviews

In this research five health care workers that work directly with children with undernutrition were interviewed as key informants. The interview guide for the semi-structured interviews is shown in appendix three and includes topics with possible questions and probes. The interviews lasted between 40 minutes and one and a half hours. Three key informants were female and two were male health care workers. Their professions included a doctor, three nurses of which one was the head nurse of the nutrition department, and one facilitating health care worker. Because of their position and professional experience, they were thought to have additional knowledge and insights on the topics of adolescent pregnancy and child undernutrition. Moreover, because of the sensitivity of the topics, key informants can speak more freely than the people that are personally affected (Lokot, 2021). Tremblay describes five characteristics for key informants: a role in the community, knowledge, willingness, communicability, and impartiality (Tremblay, 1982). All key informants were observed to possess these characteristics. In her paper Lokot (2021) rightfully expresses concerns regarding the valuation of key informant interviews compared to interviews or focus groups with community members. She explains that key informant interviews can reinforce agendas of the dominant instead of representing the community, since their opinion can be higher valued due to their expertise and position of power (Lokot, 2021). This research used the key informant interviews as a supplement to the insights derived from the life history interviews, to answer the sub-questions:

- What experiences from professional health care workers are related to teenage pregnancy and undernutrition?
- How do caregivers and health care workers view the connection between adolescent pregnancies and child undernutrition?

Being aware of the possible bias towards key informant interviews, it was aimed to analyze all the interviews and focus groups equally and avoid hierarchy in the results.

4.7 Demographic information

Table 1 presents the demographic information of the participants. These include age, age at first pregnancy, occupation, living situation, highest level of education, and the place of the interview. This table aims at providing a broad overview of important characteristics of the caregivers with undernourished children.

Participant	Age	Age at first pregnancy	Occupation	Living situation	Highest level of education	Place of interview
P1	19	17	Cocoa buyer	Alone with child	Primary 3	Nyahuka
P2	18	16	Farmer	With grandmother	None	Nyahuka

P3	18	17	Farmer	With husband and a nephew	Primary 7	Nyahuka
P4	18	18	At home	With parents and siblings	Senior 3	Nyahuka
P5	20	12	Plaint hair	With her father and child	Primary 4	Nyahuka
P6	teenage	-	Selling fish, cassava flour, tomatoes	With grandfather	Primary 5	Nyahuka
P7	46	Mother of child was 15	Farmer	With six children and four grandchildren	None	Nyahuka
P8	18	17	Selling fish, tomatoes, onion	With mother-in-law and child	Primary 7	Nyahuka
P9	18	17	Farmer and business	With the husband and child	Until 15 years	Nyahuka
P10	22	14	At home	With the husband and child	Senior 1	Fort Portal
P11	19	16	Farmer	With the husband and two children	Primary 2	Kanyamiyaga
P12	17	15	At home	With the husband and twins	Primary 5	Kanyamiyaga
P13	50	18	Farmer	With her three children	None	Kanyamiyaga
P14	29	21	Selling firewood and fried cassava	With husband and two children	Senior 1	Fort Portal
P15	28	27	Working at a banana plantation	Alone with child	None	Fort Portal
P16	20	16	At home	With mother, two children, siblings, and cousins	Primary 1	Fort Portal
P17	23	15	Hair dressing	With mother and child	Primary 7	Nyakasura at home
P18	39	19	Laundry attendant	With husband, nephew, and child	Senior 4	Fort Portal at home

P19	28	23	Selling firewood and katogo	With mother and three children	Primary 3	Kiko at home
P20	20	16	Farming for other people	With mother, two children and siblings	Primary 2	Regional Referral Hospital
P21	20	19	At home	With mother, child, nephew, and siblings	None	Regional Referral Hospital
P22	22	19	At home	With uncle and child	Primary 3	Regional Referral Hospital

Table 1: Demographic information participants

Nineteen participants had their first child before the age of 19 years and three participants had their first child when they were older than 19. Nine participants were adolescents at the moment of the interview.

For the focus groups, additional participants were approached that did not have a child with undernutrition. In the following tables, the age and children of the additional participants are shown. Figure 7 shows the setting of the focus group.

Focus group one with pictures of P17, P18, and P19.

	Age	**Children**
1	20 years	1 child, 5 months
2	32 years	2 children, schooling
3	20 years	2 children, 3 years, 2 months
4	32 years	2 children, 1 passed on
5	42 years	3 children, P3, P1
6	22 years	1 child, 1 year
7	20 years	1 child, 1,5 year

Table 2: The age and children of the additional participants focus group one.

Figure 7: Picture of the setting of focus group one.

Focus group two with pictures of P11 and P12. Figure 8 shows the setting of the focus group.

	Age	**Children**
1	21 years	1 child, 11 years
2	28 years	3 children, schooling
3	19 years	1 child, 1,5 years
4	30 years	4 children, 10 years, 8 years, 5 years, 2 years

Table 3: The age and children of the additional participants focus group two.

Figure 8: Picture of the setting of focus group two.

4.8 Action research activities

This section speaks on the activities that were conducted as part of the research. Their primary aim was not to gain knowledge, but to give back knowledge to the communities.

4.8.1 Presenting the research findings

The research findings were presented to multiple stakeholders. These presentations simulate the exhibition phase of the photovoice method which is aimed at driving social change by starting a dialogue regarding key issues (Bandauko & Arku, 2023).

One of the presentations was held for a group of youth living with HIV, their ages varied between sixteen and thirty years. Some had come with their children. The presentation was held in collaboration with a translator. The youth listened with attention, the presentation was interactive, and they participated well. They appreciated learning more about adolescent pregnancies and undernutrition. In the end they could ask questions, one boy asked where he could find more information. Other questions were related to healthy eating behaviors. The pictures in figure 9 show the researcher presenting with a translator and the youth listening.

Figure 9: Picture of presentation by researcher on the research findings to a group of young people living with HIV.

The research findings were also presented to the members of the DNCC meeting and all staff of the Kabarole Research and Resource Centre. The DNCC meeting is a quarterly meeting organized by the Kabarole District. Figure 10 below shows the setting of this meeting. Different stakeholders that are involved in nutrition are invited to join the meeting. These include members of different members of the district for instance officers that work on education, health, and nutrition, representatives NGO's such as UNICEF, SNV, Care, a catholic referent, and representatives of the Tooro kingdom. Within this meeting issues are discussed, progress is reported, and new initiatives are initiated. The presentation of the preliminary results was very well received in this meeting. It started a discussion among the members and the results were consulted while drafting action points on nutrition policies.

Figure 10: Picture of DNCC meeting on 26th of April 2024, Kabarole district headquarters.

4.8.2 Poster

A poster was created to give back the knowledge gained within this research in an accessible way. This poster was printed and given to the organizations that had helped with the recruitment of participants. The organization all reacted positively to receiving the posters. They said that they would like to acquire more of the posters. However, financing the printing of the posters would be an issue.

4.8.3 Workshop for girls

The researcher had organized a one-hour workshop for seven girls with ages ranging between 14 and 17 years. In the workshop they were free to ask questions that they had. They asked about how women can get pregnant, how babies are born, and how milk would come from breast. They wanted to know how they could prevent pregnancies. When they were asked to perform a play in which they encountered a difficult situation, their plays were about situations in which they need to say 'no'. For example, a situation where a boy wants a girl to join him at the disco and she does not want to go. Other exercises included practicing self-defense techniques, drawing their desired future, and a kickboxing exercise for empowerment. The following figures 11 and 12 show the group and an empowering exercise.

[Image withheld for privacy reasons]

Figure 11: Picture of the group with researcher

The workshop was received very well. The girls said that they enjoyed it very much and had learned a lot.

[Image withheld for privacy reasons]

Figure 12: Picture of one a kickboxing exercise for empowerment.

4.9 Data analysis

Demographic information that was collected includes gender, age, tribe, religion, family structure, nutritional status of children, age of mother at first pregnancy, and age of father at first pregnancy. The interviews and focus groups were recorded and anonymously transcribed verbatim. Thereafter, transcripts were coded using both inductive and deductive methods. The deductive codes are derived from literature and inductive codes were added to the codes according to patterns that derive from the interviews. The code tree is shown in appendix five. The coding was done using the program NVivo. After coding the themes and patterns were analyzed and systemized using the conceptual framework provided in the theory section. To analyze themes regarding teenage pregnancies, the experiences of participants that had their first child before the age of 19 were seen as relevant. The experiences of P13 were not included in this analysis since her first pregnancy was more than 30 years ago and this data was seen as less suitable to mirror the situation of today. To analyze themes regarding child undernutrition, all experiences of the participants were included in the data processing. Studying the relationship between adolescent pregnancy and child undernutrition was done by isolating all experiences that were explicitly connected to pregnancies in adolescence or regarded the differences between adolescents and adults.

4.10 Ethical considerations

All participants participated on a voluntary basis in this study. Before participating in this research, all participants were informed about the aim of the study, the methods, and how the collected data will be used. This information was given in written text and verbally discussed with the participants, during this conversation were able to ask questions. It was stressed that they have the right to refrain from participation in the study at any time, during the interview or focus group as well as after the interview or focus group. They had to agree to the informed consent form either by written consent or recorded verbal consent. The information letter and informed consent form can be viewed in appendix four. When taking pictures, consent was asked for use within the thesis. Therefore, the pictures will only be used within the thesis and will be deleted when sharing the research findings with other parties. It could be that not all participants fully understand the consent that they agree to. This could be caused by unfamiliarity with research, illiteracy, or miscommunication and was avoided as much as possible by the conversation in which the researcher tested their understanding through asking questions and asking them to summarize the given information. At the end of each interview or focus group there was also time and space for the participants to ask questions about the research.

The participants invest their time and private information in the research, they do not receive any financial compensation for this and participate completely voluntarily and will not be pressured in any way. At the end of the interviews the participants received a small gift in the form of child clothes, a small toy, and ‘stroopwafels’. To minimize any risks for the participants

in this study the researcher will be mindful of the emotional status of the participant by creating a safe and open environment. If needed participants can be referred to the local supervisor.

The collected data will be stored on the server of the student's laptop. Data will only be available to the student. The student will anonymize the data before communicating it with the supervisors or other third parties. To ensure anonymity, no recognizable people were displayed on the design of the poster.

It is important to reflect on the positionality of the researcher. As a student raised in the Global North, I have my own interpretations of how certain topics should be approached and I live within my own cultural perceptions of what is normal. My frame of reference has been broadened by my Ghanaian roots and the experiences I have gained through interactions with my Ghanaian family and in my travels. This all has an effect on how I interact with people, how I asked questions and what questions I asked. In this research, I tried to be as open as possible, to learn from the people around me, and to adjust to their behaviors. However, since this mostly works in a subconscious manner, it influenced the data found in this research (Doorewaard et al., 2019). My background, appearance, and manners also influenced how people reacted to me as a researcher. For example, young woman, I could be perceived as less intimidating, which could make it easier for participants to talk freely. The fact that I am seen as a white person and do not speak any local language could be experienced as restricting.

5. Results

This chapter describes the results of the study conducted in the Kabarole and Bundibugyo district, Uganda. The insights and perspectives of adolescent mothers and key informants on adolescent pregnancy and child undernutrition are explored, their experiences are organized in thematic categories. These are supplemented with the insights from their everyday experiences that were discussed in the photovoice focus groups. The findings show that unstable family situations, unsustainable relationships, poverty, no or low educational levels, inadequate knowledge on nutrition and sex contribute both to the burden of adolescent pregnancy and child undernutrition. Child undernutrition can be exacerbated by stress, illness, inadequate health care facilities, poor child spacing, and the attitudes of adolescents. These topics are all elaborated on in the following sub-sections.

5.1 Unstable family situation at the base of adolescent pregnancy and child undernutrition

Many of the adolescent mothers came from unstable family situations. They were born in big families, they lost one or two of their parents, were raised by a single parent or a non-parental caregiver. In most cases, a non-parental caregiver was a grandmother from either the mother or fathers' side. It could also be an uncle or stepmother. Living with extended family or moving from one place to another could raise challenges and create instability for the children. This unstable living situation could increase the chances of dropping out of school or getting pregnant. A caregiver recounted her upbringing with her stepmother, stating:

"My mum died when I was seven years old. Then after she died, I was taken to my daddy's place whereby I was staying with my stepmother. The life we were living at my stepmum's place was not giving us any freedom. We used to wake up at 5:00 in the morning, we went to dig (farm). Then afterwards, like at 9:00. That's when we could go report for school. […] Also, the stepsisters started mistreating me, like even when I could get things right in class in the books, they could say maybe you've copied. They couldn't believe that I could perform that way. I could one week stay, spend it at the daddy's place where the stepmother is and another week I could go at the grandparents where my mum was born." [P14 translated by local translator]

Non-parental caregivers often find it more challenging to regulate children under their care. Children often lack clear rules to live by, which increases their risk of adolescent pregnancy due to a lack of guidance. An adolescent mother, interviewed in the Regional Referral Hospital, said:

"I had an uncle the one, who follows my dad. So that uncle later also married a woman. That woman also became an issue. […] I could go work as a house girl for three months, then come back, the situation becomes worse. […] Yeah, the situation I was in also caused me to get pregnant at a young age. Because there was no one care, no one to put actions like: you should not do this." [P22 translated by local translator]

At the same time, many adolescent mothers were not the first caregiver of their child(ren). Adolescent mothers especially tend to shift the responsibility of their children to their mother or another relative. Reasons to leave children with non-parental caregivers can be stress, work, or cultural values. For instance, according to patriarchal cultural values, a child belongs to the family of the father. Thus, the child can be "claimed" by the father and taken away from the mother against her wishes. At the house of the father of the child, a female household member; the grandmother or stepmother takes upon the responsibility of the day to day raising of a child. The mother can also choose to leave the child with her own family or the family of the father. One grandmother was the primary caregiver of six grandchildren next to her own children, she explained:

"I have four children. The first born is a boy, he's making 26 years this year and that boy has four children already. OK, but I am the one who is staying with those four children. Plus, the two of this one [pointing to her adolescent daughter]. He got those four children from 2 ladies. And after he ran away. He doesn't stay at home with me. And they're not schooling, the children. The grandchildren are not schooling." [Mother of P16, translated by local translator]

These non-parental caregivers often struggled to provide the basic necessities for the children. This can be due to insufficient finances, old age, or the attitude that someone dumped the child with them. Caregivers may feel ashamed when the child is not in a healthy condition. To deflect the blame, they might say that the child was just left with them. Sometimes mothers had taken their child back from non-parental caregiver after finding the child in an unhealthy condition. P22 stated:

"I was staying with the child. Then the father came demanding for the child. I was able to deliver the child to the man. The child has spent three months with the father, but the situation of the child is not that good. The father has not been able to take care of the child. The situation just within three months had just worsened. […] The baby has been staying with the stepmother. And you know, some of the stepmothers, how they don't mind about the co-wives' children. I think the child has been neglected by the stepmother. And the dad also not minding." [P22 translated by local translator]

Leaving the responsibility of raising a child to non-parental caregivers is a socially approved practice in the Kabarole and Bundibugyo districts. However, it can have adverse consequences for the child in terms of nutritional outcomes and sexual behavior.

5.2 Adolescents create unsustainable relationships

Furthermore, many adolescent mothers did not have a stable relationship with the father of the child. The adolescent mothers mostly did enter a relationship, some of them indicated to be in love. However, after the pregnancy or after the birth many break up. The boys were adolescents as well, although they were generally a few years older than the girls. There are also cases of pregnancies by older married men, in which cases the men will likely deny their involvement. Dissatisfaction with the behavior of the partner was a common reason for a breakup or divorce.

For instance, the partner was accused of being a drunkard, misbehaving or not providing financial support. The family of the partner could also introduce challenges in a relationship or marriage. An adolescent mother said:

"If I had found a man with good manners, good discipline. I would still be there at his home, but the man was misbehaving. It's not their wish to give birth at a young age, but because of the situation." [P22 translated by local translator].

The main reason to stay in a relationship or marriage and be satisfied with a partner, was if he was able to provide financial support. Many adolescent mothers were married to the father of their child before the age of 19. Some adolescents married, because of their pregnancy. Some of them choose to get married others were forced by their family members. For instance, P1 an adolescent mother who lives alone with her child, said:

"We were in the same village. So, after us having the night, we slept together. I got pregnant, then my uncles imprisoned him. They forced him to marry me." [P1 translated by local translator]

Other adolescent mothers married before their pregnancy. In some cases, this marriage was initiated by a family member, for instance, a grandparent caregiver gave them away to a man. In other cases, the adolescents choose to get married, because they felt that it was the best option to gain financial stability. P19, age 28, explained:

"The situation, like I tried looking for jobs, jobs could not surface, then I could see those in marriage. They could seem as if they were somehow OK, so I got impressed. I admired those in marriage, so I also resorted into getting married and reaching there. When I did, I found different stories." [P19 translated by local translator]

For one participant, who gave birth to twins at 15 years, two options were given by her mother, she said:

"Then my mother was very tired of me and told me that if you want to hear what I'm talking. You sit down and settle (get married). If you don't want to, go back to Kampala, start working. Those two, to get married or to start working. Choose one." [P12 translated by local translator]

Two adolescents did not have a relationship, but said that they had experienced unwanted sexual activities. One had been raped by men in the village, the mother of the girl reported it to the local authorities, however the perpetrator fled and was not found. The other adolescent did not go into the specific details of the event, but hinted at it happening, because of her mental issues.

Early marriages and unplanned pregnancies are stimulated by an unstable family situation, poverty, and lack of education. They can lead to unstable relationships. Adolescents are still developing their sense of identity; it takes time and life experience to screen potential partners for their qualities and to know how to build a sustainable relationship.

5.3 Poverty drives transactional sex

All participants described experiences of poverty. Examples of experiences that were described are the lacking support from their care givers or partners, not having access to food, taking only one meal a day, no money being there for school fees, and children needing to work to survive. Poverty within a household can be caused by a loss of a parent, having many children, young age of the parents, low education, or a lack of income generating activities. These factors lead to inadequate income to provide for basic necessities. Poverty can lead directly to adolescent pregnancy; some participants became pregnant when 'looking for survival'. This is a way of saying that they felt forced to have a relationship or sex in exchange for money to meet their basic needs. P1 described how poverty in the household lead to her pregnancy:

"They didn't pay for my school fees; we were just idle at home. Reason being that our dad was also not taking care of us. They were just feeding us, that's all. So, in that process, that's when I ended up looking for survival. I ended up getting pregnant. […] I didn't like it. It was hard time because I needed to eat, but I couldn't get access to food, so it was a challenge." [P1 translated by local translator]

There are three ways in which poverty contributes to adolescent pregnancy. First, some men offer food, money, or gifts to girls in return for sex. Girls that come from a poor household are more vulnerable to these offers. One participant admitted that men had offered her 20.000 or 30.000 Ugandan shillings ($5-$6,5) to have sex. A key informant mentioned that there are 'sugar daddies'; older men that buy different items on a regular basis for their adolescent girlfriend. Secondly, becoming pregnant or marrying can be seen as a strategy towards long term financial support for either the adolescent or their parents. Parents receive a bride prize when one of their daughters marries, which encourages early marriage, especially during financial difficulties. Thirdly, poverty can cause an adolescent to drop out of school, which will then lead to pregnancy.

At the same time, poverty and lack of financial means are crucial aspects contributing to child undernutrition. The caregivers indicated that it their most pressing constrain in taking care of children. Many caregivers do not have the financial resources to afford nutritious food for their children. They indicated that they are just trying to survive and they are not able to provide enough. For example, the mother of P16 below said:

"When they're falling sick. Food is not enough. Maybe school fees. You see, they're not schooling. The last one is supposed to report to school, but she has not reported. School fees are not there, books are not there. School sweater is not there, he is just there. So, the challenges of taking care of the children are there." [Mother of P16 translated by local translator]

Poverty influences the health of children on various levels. For instance, because of poverty children are living in poor housing condition. Financial stress can cause violence in a household and pose a barrier to access health care. All these issues add to child undernutrition and make it harder to improve the nutritional status of the child. People can grow the right foods on their

farms, however there is always a need for money to provide household items, clean water, clothes, linen, and additional food items, such as meat, egg, or soya.

Poverty is a driver for both adolescent pregnancies and child undernutrition, additionally it has been identified as an important link between adolescent pregnancies and child undernutrition. It seemed that poverty is worse in adolescent mothers, since they did not have the time to get work experience, save money, or build a network. Adolescent mothers usually come from poor families, and they have no inheritance. One key informant said:

"Some of them cannot support themselves. You know, you become a parent at 16. What can you possibly do at 16? What skills do you have? Who can employ you at 16? So, you lack a lot, you lack on everything. You lack on childcare, child support, everything. And nutrition becomes the end result, children being malnourished, children falling sick, children die. So, there is a connection." [K3]

Older mothers have already established a home, a place to sleep and some source of income for food. They have already been independent, so even when they become single mothers, they will have a strategy for how to manage it. An adolescent mother, interviewed in Nyahuka, thought her young age contributed to the undernutrition of her child. She said:

"Maybe it's because I involved myself at that early age. I, at times, see those who did it at an older age, when at times they are a bit somewhat stable." [P8 translated by local translator]

Additionally, poverty and stress that adolescent mothers experience can influence their eating patterns, influencing their pregnancy outcomes and their breastmilk. A key informant had observed that adolescents more often give birth to low weight babies. Thus, poverty majorly influences adolescent pregnancy and child nutrition outcomes. A caregivers' income is dependent on the financial support received from others and their own income generating activities. The following sections further elaborate on these two subjects.

5.3.1 Additional support is essential

The caregivers are in many cases financially dependent on other people to provide for themselves and their children. Some caregivers do not receive any support from anyone and are taking care of their child(ren) alone. Almost all caregivers stressed that the support that they got was not enough and they needed more support. P3 said that a lack of support caused her child to be undernourished:

"What is likely to cause disease, is that I never got some good support from my husband, the father to the kid. So, the little I try as a woman is what tries to bring up to that. So that one (father of child) does not support 100%. Just once in a while. I feel that's why. So, what I have been improvising with, it has not been enough to take full control and care. That is why the child is in this condition." [P3 translated by local translator]

For some mothers, the father of their child was the one that supports them. Support from the father of the child is an important indicator for nutritional outcomes (Kansiime et al., 2017).

The support from the father of the child, however, is reliant on his income, the relationship with the mother, and connection to the child. There were cases in which the support was retracted, for instance, after finding out that the child was disabled. A lot of mothers expressed that the father of their child did not support in any way. Some husbands had run away from their marriage, others denied being the father of the child.

Several adolescent mothers receive financial support from their mother. They expressed that they did not like to put this extra burden on their mothers, they would like to become financially independent if they can. Other relatives did also provide financial support, such as grandmothers, sisters, brothers, and uncles. Nonrelative support could come from neighbors or friends. Next to financial support, did caregivers receive support in the form of advice, accompanying to the hospital, or giving a piece of land.

One caregiver, who takes care of her nephew, had used the photovoice method to show her neighbor that supports her in taking care of the children (see figure 13).

[Image withheld for privacy reasons]

Figure 13: "Whenever I'm looking for work to do, these are the people that look after the baby, so she can look for money. It is a neighbor. Whenever I go there, and they pay me then I come with small things to appreciate them that's the end." [P18 translated by local translator]

Inadequate social and financial support is a major cause of undernutrition in children. It is exceedingly difficult for an individual caregiver to take care of a child alone. When the father of the child is not supportive, this poses a major challenge, which can cause a lot of stress. During pregnancy a mother will not take adequate nutrition, the stress can influence her ability to breastfeed. The stress can also lead to the mother bringing the child to a relative or abandoning it, which will then increase the risk of undernutrition. One key informant had had many experiences with children that had been abandoned, for example, in a lodge or hotel, on the roadside, or one baby was left at the X-ray unit of the hospital.

Adolescent mothers have an increased need for support, since they mostly do not have experience or stable source of income. They are in need of both financial assistance and mentorship on childcare. However, the adolescents receive less support. Due to stigma and cultural believes, they can get rejected by their family members, friends, and their community. In many cases, the fathers of children born to adolescent mothers are young and either unable to properly support their child or unwilling to take on this responsibility. Older mothers generally have more stability in their relationship with the father of the child and more support from their families. During their lifetime, they have had the time to make friends that can advise and support them. An adolescent mother, age 19, said:

"I think, if I had given birth at, at least 20 or above, the baby would be healthier. Because I gave birth at a younger age, no one was there to take care of me." [P1 translated by local translator]

One key informant described a story of an adolescent that was impregnated and abandoned by the father of the child. He said:

"One of the patients was 19 when she was pregnant. The husband abandoned her. The child died of AIDS. She became positive during pregnancy, did not go for antenatal. She did not know. She gave birth. By the time she came here malnutrition, TB, HIV. The thing started with the husband not minding." [K2]

Moreover, can inadequate support also lead to unfavorable practices or advice. If an adolescent mother is supported by an old grandmother, she might not know which health care services are currently available and significant. Many adolescent mothers are wrongly informed by their caregivers which results in delayed healthcare seeking.

5.3.2 Working in the informal sector poses challenges

Most of the caregivers engage in an activity that provides income for themselves and their child(ren). They have not completed secondary education or pursued further studies, leading them to work in the informal sector. They are involved in activities such as selling food items, washing clothes, plaiting hair, or small-scale farming. Their choice of income-generating activity is influenced by their skills, available opportunities, and initial capital. Due to their informal employment, their income is unstable and depends on seasonal changes and customer availability. Many caregivers experience financial restrains to start their desired business.

The participants spend the earned money on food for their children, medical bills, and school fees for the children. For example, P20, interviewed at Regional Referral Hospital, said:

"I don't have much work. I do only digging (farming). I can go dig somewhere and they pay me 5000 ($1,25) for a day. Then I get money to buy food for the babies." [P20 translated by local translator]

The work activities or caregivers are highly linked to child nutrition. With the photovoice method the participants had taken pictures of the activities that bring in money, which they use to buy food for their children. Money generation activities can be an important way for caregivers to become more financially independent. It is necessary especially for single caregivers. Furthermore, it provides a sense of achievement and can boost self-confidence.

One participant took a picture of the beads on the door of her saloon (figure 14).

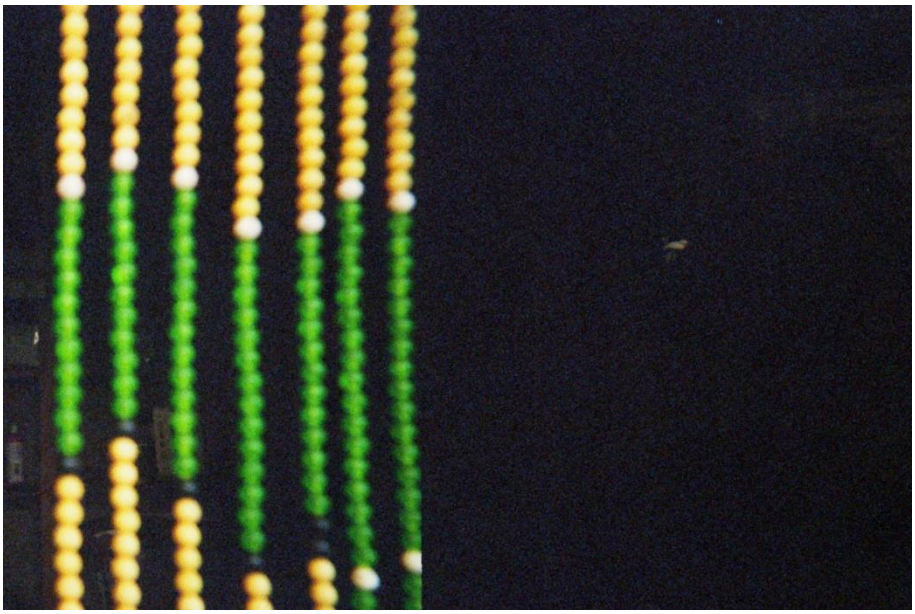

Figure 14: "The picture I'm showing is the salon, I have a salon. It helps me to support and get money, to support the child. The salon has supported me, I am not a farmer. I am trying to do things that I can be able to support the child to buy milk and all that, I get it from this salon." [P17 translated by local translator]

The same participant had other businesses as well, shown in figure 15.

Figure 15: "I have also another business of frying mandaze and I supply to the local community and also the schools. On Saturdays, I always go for different functions, I'm an entertainer for cultural events. So, I have a variety of activities that I do to earn a living." [P17 translated by local translator]

One participant took a picture of her Katogo business (figure 16).

Figure 16: "This is my business that I make, where I get money to cater to the baby. I cook Katogo, I sell that food and keep the money in case of an emergency, if the baby gets sick, I can take it." [P19 translated by local translator]

By sharing their work activities, the participants inspired each other. They shared tips on how to acquire a starting capital and motivated each other to create their own business. The participants wanted to empower each other, to not see it as something small, and to keep up the spirit to continue. They were also encouraging each other to develop multiple different types of income sources, so that they would not depend on one.

The participant, who owned a hair saloon, said:

"They only way we can support each other as women is these hand craft skills, plaiting. I cook mandaze. The moment you support each other in hand craft skilling it can help other people to also get that knowledge." [P17 translated by local translator]

An important idea that came up, was that of a saving group. Saving together is a way to accumulate more money and create capital. The caregivers shared advice on how to expand their business and to join multiple saving groups. Moreover, the caregivers voiced their desire to learn skills such as hair plaiting and making bags. The main barrier to these initiatives was lack of finances. Vocational schools charge fees, so are not accessible if someone does not have any savings or outside support. Another barrier was the raising of children, the caregivers cannot leave their children when they are young.

One participant took a photo of her matooke plantation (see figure 17).

Figure 17: "When these bananas get ready, I am able to sell them. Some of them, I eat them. After selling, I get money, pay school fees, and meet other home needs." [P11 translated by local translator]

In rural areas matooke farming is a common source of income. Sharing their experiences with the matooke plantations lead to exchange of advice on how to maintain the farm through for example weeding and intercropping with beans. One participant advised that when the matooke is ready and help is needed to harvest them, the help can be paid for with bunches of matooke instead of money.

Not all work activities have a positive impact. One caregiver worked unpaid on a matooke plantation. She does the work to pay off her dept that followed the hospital expenses from the treatment her baby received by being born prematurely. Unpaid work or poorly paid work can have adverse effects and cause someone to stay trapped in poverty.

5.4 No or low education leads to pregnancy or marriage

All of the adolescent mothers, except one, dropped out of school prior to becoming pregnant. None of the adolescent mothers had completed their secondary education, most had not completed their primary education, and some had not had any education at all. Not going to school clearly poses to be a risk of becoming pregnant during adolescence. The covid pandemic was a well-defined period in which more adolescents became pregnant, due to the closing of schools. If a girl is doing nothing around the house, they become a burden to the family, and it is likely for them to get married or get pregnant. One key informant said:

"Of course, now when you out of school and you're 14, 15, 16 you know, you're growing, you're looking nice. And then they're man around so. You're lured in to do sex, probably, and then you end up being pregnant." [K1]

All adolescent mothers indicated that they liked going to school. They liked reading books, to speak English, report early, and to make friends at school. Most of them had future plans when they were in school, for example they wanted to become a nurse or a teacher. One adolescent mother said that she was a particularly good student and she had high hopes when she was in school. One participant dreamed of studying, saying:

"I needed studies so that in the future, if I happen to get a job, I work, then I can take care of myself. Yes, that's that was my dream." [P11 translated by local translator]

The reason for dropping out was mostly due to lack of financial power to pay school fees. The caregivers were not able to pay the school fees or the additional costs of uniforms and books, as a consequence they dropped out of school. The lack of finances could be due to the death of a parent. For instance, P1 said:

"I stopped in P3 (primary 3). When my mum died, they stopped paying for the school fees because my dad was also not minding, and the other family didn't." [P1 translated by local translator]

Gender inequality still plays a role and it can be another reason for low education in girls. For instance, one participant did not attend school at all because she said that her father refused to take her. However, her male siblings were allowed to attend school. Other reasons for girls to drop out of school could be an unstable family situation, pregnancy, sickness, or mental disabilities. An adolescent mother explained why she stopped schooling:

"I believe it's because of the sickness that I even got out of school. At the level of primary 5. […] I used to get some generalized body swelling. And my hair could turn some bit of brownish during that time, it was it was on and off." [P6 translated by local translator]

After dropping out of school, many adolescent mothers would work. Some worked in the farm at home, others went to work as housemaids. Some expressed that they did not like their work or though it was too much. For instance, P12, age 17, said:

"I went to Kampala to work as a housemaid for one year. The boss used to mistreat me. That's why I didn't like it there." [P12 translated by local translator]

Children that go to school have a different mindset and are occupied, which makes them less susceptible to pregnancy. They are more exposed to different views and information and are therefore eager to learn more. They will want to work and to be independent. Once they drop out of school, they feel like they lose their opportunities for a good future. Moreover, they have a lot of time, which can be used to hang around in the village or streets, where they can meet men. The options for adolescents from poor household are limited, if education is no longer a possibility, working or marriage are seen as the only remaining alternatives.

Education is highly valued by the participants. For all caregivers, their first priority was making sure that their child is able to go to school. They wished that their child would be able to

complete their education. Their number one advice for other young people was to focus on their studies. The caregivers believe that education is the only way for people to get a good job and to escape poverty. One adolescent mother said:

"[Speaking about the future of her daughter] OK, so in case she gets married, she gets married that time when she has completed the education, she has gotten a job. That's when I wish her to get married. […] After someone has gotten a job, she cannot suffer in the family or in marriage. Like how we are suffering when we are not educated. Meaning the person who has gotten education does not suffer, like someone who didn't go to school." [P12 translated by local translator]

Another adolescent mother supported this statement by saying:

"I'm advising those young ladies who have not yet gotten into marriage to first protect themselves, and if they still have chances of going to school and let them go to school. Then they should also focus getting a better man. They should take time to find those. Because for me, I didn't go to school. That's why I'm facing all these challenges. But for them they should first focus on education." [P22 translated by local translator]

The caregivers had an extremely positive view of the power of education. They used terms such as "a bright future" and "everything will be perfect". They wanted their children to have jobs that required education, such as becoming a doctor, lawyer, teacher, or nurse. The caregivers wished for a better future for their children. They advised girls to finish school before getting married. Adolescents should not rush to get married; they should finish their school and take their time to find a responsible partner. One key informant said:

"We have to tackle from down, keep their children in school, we educate more, these girls and boys, of course, also make sure they stay in school, they don't drop out. So, when they drop out, they get more likely to get pregnant. When they get pregnant, they will not provide the care the child needs, so it could get malnourished." [K1]

Education is linked to early pregnancy and undernutrition of children. Empowering young people with knowledge and skills through education aids in preventing adolescent pregnancy, poverty, and child undernutrition. Educating men is as important as the education of women. It is crucial as well to provide support for adolescent mothers to return to school.

5.5 Caregivers have inadequate knowledge about sexual health, general health, nutrition, and childcare

This research found that one of the main barriers is inadequate knowledge about sexual health, general health, nutrition, and childcare among adolescents and caregivers. The lack in knowledge impacts the ability to make informed decisions, practice healthy behaviors, and ensure their and their families well-being. The following sections speak on the lack of sex education, knowledge on undernutrition and feeding practices, knowledge on childcare, breastfeeding and hygiene.

5.5.1 There is a lack of sex education

An important topic that came up was the knowledge on sex and sex education. Some adolescent mothers indicated that they did not know that they could get pregnant. No one had told them about it. As a result, they did not recognize the signs of pregnancy and it was someone else that advised them to do a test. One participant only realized that she was pregnant after seven months of pregnancy, when they checked at the boarding school that she was in. She said:

"I was unaware. Then even the pregnancy made around seven months when I was unaware. Then I even did papers to go to Senior 2. That's when the school checked, and they found that I was pregnant." [P10 translated by local translator]

Lack of knowledge on sex and misconceptions can contribute to unwanted pregnancies. An example of such a misconception is the belief that it is not possible to become pregnant after giving birth. Many adolescents have no knowledge of what is happening with their bodies, are not aware of the fact that they can get pregnant and have no knowledge of family planning methods. Combined with their natural curiosity, which is stimulated by changing bodies and the impact of sex hormones during puberty, as well as potential financial or social pressures, this can lead to pregnancies. A key informant said:

"I think another major issue could be the lack of proper sexual education, maybe they don't know what could happen. They are not counseled well." [K1]

Additionally, adolescents can experience barriers to access family planning. One participant was denied family planning at the hospital, she said:

"We went to the hospital, but we were told that we were still young." [P22 translated by local translator]

Interviewer:

"So, you didn't get it [family planning]?"

Participant:

"We didn't get the help." [P22 translated by local translator]

Providing sex education can be an important method to empower the youth and avoid adolescent pregnancies. It is crucial to include boys as well, so they can learn about their bodies and to know how they can be responsible for pregnancies. The caregivers stated that they would start sex education at home with their children when they reach an appropriate age. An adolescent mother, with three children, said:

"I will teach her (my daughter, about sex). And where need be, I will put her on family planning. Because I don't want her to also produce a kid. I need her to go to school." [P10 translated by local translator]

Some caregivers and the key informants pointed out that only speaking about abstinence is insufficient. When a society tells children to just abstain, in many cases, they will still have sex. So, it is better if they at least have the knowledge on how to protect themselves against STD's, especially HIV, and pregnancy. Additionally, it is crucial for adolescents to know how to go for medical checkups.

Another intervention that repeatedly came up was making family planning accessible and acceptable for adolescent girls. An adolescent mother, interviewed in Nyahuka, advised girls to start family planning:

"What I can only say that these girls should join family planning. If it so happens that she has failed to control and she has found herself in [a situation], then she is assisted not to get pregnant. I can only advise on family planning." [P8 translated by local translator]

Being able to prevent pregnancies through family planning methods, empowers adolescents and enables them to focus on their own development. According to the key informants, the conversations about family planning can start at primary 6 or primary 7 level in schools. The adolescents should have the knowledge before they go to secondary school. These conversations about family planning can also be held within homes and communities. It can be a valuable tool to make sure that people have a wanted number of children. If people plan for their children, they will be able to take better care of them and afford to send them to school. The prospects of the child will improve if they receive adequate support from their parents.

5.5.2 Caregivers have insufficient knowledge on undernutrition and feeding practices

One of the most important barriers for health improvement in children is the lack of knowledge on undernutrition among the communities. The caregivers that come to the facilities do not know that their child is undernourished, they bring the children with complaints of cough, fever, diarrhea, or vomiting. Many people do not believe that there could be an issue with nutrition, they think that it is a normal way for children to grow. It is emphasized that providing knowledge on undernutrition is the first step into treating it. Figure 18 shows caregivers waiting for nutritional assessment.

Figure 18: Picture of caregivers waiting for nutritional assessment of their children.

The caregivers said that they only realized that their child was undernourished when they came to the facility for other medical complaints or for vaccination. Some adolescent mothers still did not seem to know what the problem was with their child at the moment of the interview. One of the mothers thought that her child just grew that way at the grandmother's house. Other caregivers were aware that their child was undernourished but had no idea what the cause of it could be. One adolescent mother, age 18, said:

"I never knew the reason why the child was reducing because she was having good appetite and she was eating well, so I couldn't know where the problem came from. […] In case I get someone, who can help assist the child properly and get to understand the reason why the weight is not increasing, it could be of value." [P6 translated by local translator].

Moreover, there is a lack of knowledge on good feeding practices. All key informants teach caregivers with undernourished children on appropriate feeding practices as their daily work. One key informant stated:

"So, when you interact with them, you realize that their lifestyle is about waking up, going to the garden, cook it. So that's all. If they get some money, they can support themselves with a few things, so they don't understand why certain things it's supposed to be done a certain way. They have food. Actually, those villages feed the towns that have plenty of food, but the knowledge lacks on what to eat in what amount, what is needed and when. So that is what the problem is. "[K3]

Some participants agreed that they did not have the knowledge of how to feed their children and were eager to learn more. They did not have anyone within their environment that could help them or advise them on this issue. Health clinics form an important source of information

on nutrition. They for example teach people how to prepare food for children and explain to add vegetables, fruits, and proteins to the meals.

Due to limited resources, caregivers of children that are moderately malnourished are assisted with nutritional counseling. Nutritionists, doctors, or nurses give them advice on how to feed their children, they advise adding local vegetables and fruits to their diets and, for example, add an egg to porridge. This counseling is an effective way of treating moderate undernutrition. One key informant pointed out that the effectiveness is proven by the fact that the children, whose caregivers received counseling, do not return to the nutritional clinic.

The desire to learn more on nutrition became apparent during the photovoice focus groups, where the primary discussion centered on appropriate feeding practices for children. The participants took photographs of different fruits and vegetables within their homes and used these Image to explain their feeding practices. For example, referring to figure 19, P19 said:

Figure 19: "The picture that I took shows the kind of food I am supposed to give the child. There is an egg, there is Irish potato, there is banana, there is dodo, there is g-nuts and cabbage. I was told to be giving the baby dodo, so she could get nutrients. Also to give the baby an egg. The food that I took the picture of was to show the type of life that I am living for the baby to grow well." [P19 translated by local translator].

During the discussion advice was exchanged on food preparation methods and how to feed a child. For instance, the frequency of feeding the child was discussed and whether the food should all be taken at the same time or in parts. Furthermore, the discussion provided a save space to dissect myths and believes. For example, one participant thought that oranges could cause to much gas (see figure 20). Another example was a participant that had learned that mangos can cause malaria in young children.

Figure 20: "Picture of oranges, a tree of orange. The reason I planted this orange tree is to mix it with passionfruit when I am making juice for the baby." [P19 translated by local translator].

The picture in figure 21 provided a new discovery.

[Image withheld for privacy reasons]

Figure 21: "I took this photo for a reason. It is called "susooti", it is a form of pumpkin. I used to look at it as something that was not useful. I have discovered a lot from this susooti. If you get that fruit and cut it, you can peel it off, slice it, you mix it with tomatoes and onion. You eat it when it is raw. They help in avoiding higher pressure and diabetes. You can cut it like cabbage. You can also eat it as sauce. You can sundry it. After drying them, you can put it in g-nuts. It is also good for children. You can also fry it. It is even good for women." [P17 translated by local translator].

The other participants knew the vegetable, which is growing on the streets and seen as a weed. After seeing the picture, they became curious and wanted to taste it as well. One participant said that she had been seeing it, but never knew that it had other values. Now that she learned that it is a medicine for diabetes and high blood pressure, she is going to advise her mother to use it.

Figures 22 and 23 show the pictures of fruit and vegetables that were discussed taken by P11.

[Image withheld for privacy reasons]

Figure 22: "I am showing the jackfruit and the mango tree. That I give to the children. The doctors advised me to give the children fruits, jackfruit, and mango. I have them at home, I don't buy." [P11 translated by local translator]

Figure 23: "This one is showing greens: dodo. I was advised: in every meal you prepare for the kids; it has to contain some greens such as dodo, cabbage. This dodo also helps the skin of the kid to look shiny." [P11 translated by local translator]

The discussion concerned how to best give the dodo to the children, since not all children like to eat it. It was advised to grind it and mix it with other food, so the child would not recognize that it is there. Another point that came up was how to grow vegetables when you are not owning land. One participant suggested that it can be grown in tins with soil. Another came with the advice to ask the landlord of commercial houses, whether you can use part of their gardens.

By sharing pictures, practices, and advice, the participants could exchange knowledge that is relevant to their context of living. They can draw inspiration from each other, rethink their own approaches, and contribute to the collective knowledge base. This collaborative process fosters innovation, empowerment, and a sense of belonging within the community. It emphasizes the importance of knowledge regarding nutritional practices and the strong motivation of caregivers to seek further knowledge.

5.5.3 Inadequate knowledge influences the attitudes towards childcare

Childcare practices play a crucial role in the development of undernutrition. Care taking practices include child feeding practices in frequency, quantity, and quality, and providing the child with the necessary time and attention. The attitude towards the child highly influences childcare practices. Not prioritizing a child's health can be an underlying cause for undernutrition. Several mothers indicated that non-parental caregivers, such as stepmothers or extended family, had poor childcare practices and did not pay enough attention to the child which was the cause of their undernutrition. A key informant believed many people prioritize earning money over taking good care of their children. For example, people would sell their best produce in the markets and let their children eat the low-quality food. This was also an issue in cash growing communities, such as cocoa and tea plantations, where too little land is

used for the cultivation of food products for own consumption. One caregiver, who worked at a banana plantation, said:

"Most of the mistakes we encounter in life, most of them start from their parents. You find a parent has given birth to you; she has put you to the world. But the parents have not mind to put something where you can start from. Like how can this girl or this child survive? They just give birth to you. They put you there. You hustle on your own. At least parents should give a way how these people can be fine. […] Imagine you're born, you have no land. You rent. Everything is just bum. So, life becomes hard. I am advising the parents to do something at least." [P15 translated by local translator]

A key informant said:

"You know our people, it's like they have not prioritized children or feeding of children. They have not given it the first priority. For them, they feel looking for money is much better than looking after their children. So, you find a woman wakes up in the morning, leaves the young children at home with maybe leftovers of the previous day. She goes to the garden (farm) and spends 8 hours in the garden. She only comes back maybe around 4:00 to prepare them supper. The whole day, they spent the whole day on the leftover food. So that also has contributed a lot to the high prevalence of malnutrition. […] By the way, on addition to that, for us in in this region, people dig. They plant very nice food, they grow groundnuts, they grow Irish, they grow beans. They have yams, pumpkins. But what is left home for the children are these, the tiniest, the poor-quality food. Then the rest is taken to the market." [K4].

Having knowledge on childcare directly influences an individual's capacity to support their child. Just as there is a lack of knowledge about sex and nutrition, there is also a lack of knowledge about childcare. Adolescent parents, especially, have less experience and therefore less knowledge on childcare. One caregiver, age 29, explained:

"When you're old, you've been knowing each and every most of the things, how to take care of the baby. But when you're young, some of the things you don't know. Meaning an older person knows how to take care of the baby better than the young one." [P14 translated by local translator]

Knowledge on childcare can be gained from other caregivers. Another important source for childcare knowledge is school, in Uganda schools offer lessons on childcare. When an adolescent drops out of school, they miss out on this knowledge.

5.5.4 Suboptimal breastfeeding practices lead to child undernutrition

Poor breastfeeding practices came up as a cause of undernutrition among young children. International guidelines advise exclusive breastfeeding for the initial six months, followed by continued breastfeeding for up to one year. Issues with undernutrition can occur when children are given other foods instead of breastmilk. This can be harmful since the baby's digestive system is not yet ready to process these foods, which can contain external microorganisms.

Additionally, a baby may not receive the important nutritional components found in breastmilk, such as proteins and immunoglobulins. Therefore, a lack of breastmilk can lead to undernutrition. Since most mothers are not able to buy the appropriate substitute milk, they give porridge to their children instead. This porridge is low in nutrients and can be contaminated if produced with unsafe water, which will cause the baby to have gut infections and/or undernutrition. One key informant highlighted that undernutrition is increasingly seen in babies from middle class backgrounds, due to poor breastfeeding practices caused by their mothers working lifestyle.

Some adolescent mothers said that the fact that they were pregnant at the time of breastfeeding had an effect on their child. Other reasons for inadequate breastfeeding that were brought up are experiencing a lot of stress, domestic violence, and the poor nutritional status of the mother.

When mothers leave the care of their children to non-parental caregivers, this could cause them to switch too early from breastfeeding to solid food, for example at three or four months. Another reason can be the lack of knowledge. A key informant found that the health status of the children improves when the benefits of exclusive breastfeeding are well explained to the mothers.

5.5.5 Hygiene is important for child undernutrition

The importance of hygiene was highlighted as a factor in maintaining children's health. Inadequate hygiene can be caused by lack of knowledge, poverty, and lack of clean water sources. Maintaining good hygiene practices can avoid sickness and undernutrition. K3 said:

"You find others which are even worse but like it is housing like four or five people. So, you can imagine what they're doing inside, what they're going through inside. Some are sleeping with animals. And so, the whole environment may not allow this child to have a good health. Even if you teach them how to feed them. So, there are those limitations." [K3]

In support of this statement by K3, another key informant said that by implementing hygiene improvements in a village, their undernutrition rates also dropped.

5.6 Stress has an impact on pregnancy outcomes and child nutrition

Stress can highly influence health outcomes during pregnancy, the attitude towards a child and its nutritional status. Many adolescent mothers experienced stress from their unplanned pregnancy. Due to stigma, parents, caregivers, or friends can react very harshly when they get to know about the pregnancy. Some parents do not want their daughter to live with them anymore, but instead go to the family of the father of the child.

Some participants said that they were 'chased to their husbands house', meaning that they were forced to live with the husband and/or his family members. For some adolescents this led to stress. One adolescent mother expressed that during that time she used to cry all day. Other adolescent mothers were left by the father of their child during the pregnancy, which caused them to feel lonely and depressed. For instance, P1 said:

"Yeah, after bringing me, he left me in the room where we were renting, and then he got lost. After that time, I have never seen him again. I didn't have anything for survival. Now after that, after the guy getting lost, I again decided to go back to the uncles where I was staying when I was young, but they then chased me to go to the man's place." [P1 translated by local translator]

The key informants had seen similar cases where parents would withdraw their support when the adolescent gets pregnant. This can lead to isolation and stress. A key informant stated:

"So, when this girl gets this pregnancy and that's how the first aspect of that affects even affects the baby when it's still in the womb is the support given. Because we are seeing in most circumstances this person that is making her pregnant. Many of them will deny a pregnancy. Men are denying it. Now this girl is going back to their parents' homes. Some parents are right after the fact that they will not allow this girl on their compound. So, the only survival this young girl having is this man who impregnated her or a person with a group that has decided to go and find a very small room in the slum area, for example. And is maybe providing her with two meals. Not eating well already started in the pregnancy." [K2]

Cultural norms and values lead to stigma. A key informant described how pregnancy before marriage is culturally seen as a bad thing, she said:

"In our culture, even if you're not a teenager by the way, if you get pregnant, when you are not officially married. It's like it's not a good thing. The society looks at you like you're not a good person. Like you are bad mannered. You get? It is quite a bad thing, to get pregnant when you're not officially married. Even if you are grown up and you are not a teenager. They will look at you maybe as if you are a failure, you're not responsible for your life. So that one brings out stigma. And since they're teenagers, they don't know how to handle it best." [K1]

Furthermore, the task of raising a child can be stressful. This stress could arise from the daily tasks such as waking up to feed the child, breastfeeding, and nursing sick children. One participant, with three children, said:

"I felt like I didn't have peace. Yeah, like now, I'm sleeping, the baby is crying, I have to wake up to breastfeed and do this to comfort the baby. And then in the long run I had gotten again pregnant for the second time, so I felt not comfortable. I felt desperate." [P10 translated by local translator]

Another factor is the high financial pressure experienced by caregivers. Adolescent mothers, especially, experience a heavy burden when they are not adequately supported. They alone are responsible to financially provide for themselves and their children; buying food, clothes, medicine, etc. Also, having the responsibility over many children can cause a lot of stress, which can lead to neglect of the children. Some mothers said that they lost weight because of the stress of raising children.

5.7 Disease has a bidirectional relationship with child undernutrition

The connection between disease and undernutrition is strong and recognized by all key informants and almost all participants. In many cases disease was identified as the cause to undernutrition of their children. Most caregivers did not know the exact cause of the sickness of their children. The described symptoms included vomiting, fever, diarrhea, visibility of the backbone, wounds in the rectum and esophagus, and cough. The interaction between disease and undernutrition is complex. Some children that come to the clinics with undernutrition have underlying diseases such as HIV, tuberculosis, cerebral palsy, or malaria. These infections can cause the child to be undernourished, because the absorptive capacity of the digestive tract is compromised. Simultaneously, undernutrition makes children more prone to infections. K5 elaborated:

"I realize good nutrition is a very good component in disease prevention. Because we realize if this client community can practice good nutritional practices, they get good immunity because we get immunity from the food we eat. If we can get good immunity from good nutrition, good feeding, and then not end up with conditions that result from poor feeding. They will know malnutrition is such a kind of disease that reduces body immunity too much and it affects the child development." [K5]

Children with underlying diseases require more care and attention when it comes to feeding, which can be stressful and challenging for the caregiver. However, for these children good nutrition is of essential importance. A key informant stated that most of the children with HIV that die, do not die from AIDS directly, however they often die from undernutrition or tuberculosis exacerbated by undernutrition. This notion is supported by the literature finding accelerated HIV progression in children with inadequate nutrition, lack of clean water, and exposure to tuberculosis (Chakraborty, 2004; Onyango et al., 2022).

Caring for a sick child poses additional challenges for caregivers, since they have to go to the hospital, pay for the hospital bills and for medication. Sickness can even cause a mother to leave her child with a non-parental caregiver. One participant said that the sickness of her child caused her to separate from her husband, since he did not support her taking the child to the hospital.

Two mothers had children with cerebral palsy, and they both found it incredibly challenging to provide enough (nutritional) care. One mother did not understand what was wrong with her child. Despite visiting various health facilities, she still could not determine the cause of the illness or how to help her child. Another mother shared her challenges in taking care of her child, saying:

"I am finding difficulties in taking care of the baby. Eating, feeding him, it is not every parent who can be responsible for that kind of kid. I have to spoon feed the baby. Because I cannot get food and then he feeds himself. I have to be near the baby. I have to pamper the baby even now. Now the baby is 7 years, but still putting on pampers. The beddings also get spoiled because of urine." [P17 translated by local translator]

A preterm or low weight birth are other medical conditions that contribute to child undernutrition. Because of lack of financial means and lack of knowledge, it is increasingly challenging to take adequate care of a child with special nutritional needs. One caregiver, who gave birth prematurely, said:

"The situation is still worse. I am not earning daily and the baby needs the money. I was told, like after the baby was released from the hospital, I was advised to be feeding her on Latomilk, this packed milk. And I don't have the money. Because of the situation, I cannot handle that packed milk. The baby is OK, but he's not gaining weight because he's not feeding on how like he's supposed to feed." [P15 translated by local translator]

5.8 Health care services are lacking and not accessible enough

Sufficient and accessible health care services are crucial factors for the health of children. The participants stressed the importance of a capable health system. Barriers to the quality and accessible healthcare were: poor infrastructure, a lack of (medical) supplies, such as medication and medical equipment, and fluctuations in financial resources. For example, during the covid pandemic, the financial resources declined. This had a great impact on the capacities of the health facilities. It is important to have appropriate healthcare services in all regions to ensure that transportation does not become a barrier. It was pointed out that without the financial means to reach a hospital, people often forego healthcare and resort to using local herbs instead. One key informant explained:

"But if the coverage is not there and where they are coming from, they don't have access to the services for malnutrition, it becomes a challenge. They end up relapsing then they come back when they are worse. So, coverage of the IMAM (Integrated Management of Acute Malnutrition) services is very crucial. We have had issues in some places where the coverage is low, then they are still issues of management. If the coverage is good, then there the management is good." [K1]

Other aspects of good health care services that were highlighted are the availability of feeds and adequate training of the health care workers. One participant had had a negative experience at a health facility and recommends the hospitals to make sure that the nurses and doctors on ward are sufficiently competent in their work. She said:

"The doctors, nurses should be responsible to the parents or to the mothers giving birth, but not letting these students who are learning to be the ones to take care of them. They should learn, but in line with the doctors in support. With the doctors not just going away and leaving the student with the mother who's giving birth at the moment." [P17 translated by local translator]

The topic of illegal abortions was brought up. Sometimes adolescents try to use herbs to abort the baby. These abortions bring serious health risks for both the mother and the baby. A key informant described that some mothers come to the hospital bleeding and with the children in

bad conditions. It is known within the communities that illegal abortion poses a serious risk of death for the mother. If the baby survives, it can be seriously affected.

5.9 Big families, inadequate child spacing and family planning contribute to child undernutrition

Poor child spacing and family planning are factors that contribute to the burden of undernutrition. Big families are common, especially in the rural areas of the Kabarole and Bundibugyo district, where families can have six to ten children per woman and count even more in polygamous families. Having big families can lead to child undernutrition, when he caregivers are able to provide money and food, however it is not enough for the number of children that they have.

Therefore, talking about family planning is an important part of the treatment for undernutrition. However, some of the mothers are not open to the information, saying that their husbands do not allow them to use family planning. Nonetheless, most of the mothers are recipient to the information if they are well counseled. Barriers include not thinking about the number of children they want to have or lacking knowledge on family planning. Some women do not use family planning because of cultural believes. Having many children can be viewed as a sign of prosperity and wealth and can enhance a family's status. Moreover, on family farms children contribute to the work and having many children means having more labor forces for the farm and household chores. A key informant said:

"They will be like: my husband stopped me from using family planning. Why? You know, like he will tell you children are blessings. So, the basic needs of a child them it's not a big deal. The thing is to have a child." [K3]

Inadequate child spacing can lead to undernutrition if a mother is pregnant while breastfeeding. A child will not receive enough breastmilk from the mother, if she is pregnant (Conde-Agudelo et al., 2012). Then, when the second child is born, the mother needs to breastfeed two children, which is challenging. One participant, who was in such a situation, said:

"I got pregnant when the other one was just eight months. I could not breastfeed well, yeah, because I'm already pregnant. So, I couldn't continue with breastfeeding. So, I think that's why the case of malnutrition then started." [P10 translated by local translator]

Several mothers indicated that their method of family planning had failed, they got pregnant while using it. Other mothers successfully used family planning methods. They were content about it and liked to be able to plan for a next child when they would be able to provide for it. Family planning, when of good quality and used properly, can be a powerful tool for families, women, and girls to make sure they are well prepared for their pregnancy and parenthood.

5.10 Adolescent behavior can adversely impact child heath

It was observed that adolescent mothers have a different attitude compared to adult mothers. Key informants said that adolescent mothers do not adhere as well to the advice given to them

as adult mothers. Adult mothers tend to listen to the information given to them, are active and ask questions. They make sure to understand the instructions. At the nutritional clinics, the adolescent mothers behave more shyly, as if they feel ashamed or watched. It was noticed that children of adult mothers recover faster than those of adolescent mothers. For instance, K5 said:

"They (adolescent mothers) give it to a relative; will you take my child to the nutritional clinic. Because they fear that kind of shame. Over no good reason. When we are giving them information. We notice that difference. The old mother makes sure that she gets the information, give the child food, and she minds about the appointment date, she can never miss any date." [K5]

Perhaps the adolescent mothers find it more challenging to follow the instructions due to a lack of agency within the household. Another explanation could be a lack of knowledge or lack of life experience. Additionally, it was noted that adolescents face greater difficulties in managing emotional challenges and stress. A participant said:

"Like when you give birth at a young age, most of the things you face are not good things. Challenges are too many. And you don't know how to handle them." [P15 translated by local translator]

It was observed that the interviews with adolescents progressed with more difficulty than those with older caregivers. They were more reluctant to answer questions, did not elaborate much on their answers, and generally appeared more passive. The same was observed in the photovoice focus group with pictures of adolescent mothers. They were struggling to present their photographs, they seemed insecure and hurried to complete their moment in the attention. Whereas the adult mothers were confident, presented their pictures with elaborate stories, and were more open about their challenges.

It seems like adolescents experience more feelings of insecurity, shame, and dependance which influences their actions or lack thereof. Adolescence is characterized by increased self-focus and higher susceptibility to socials pressures (Pfeifer & Berkman, 2018). Raising a child during this period can cause conflicts between the mothers developments during adolescence and the needs of the child.

6. Discussion

In this chapter, the key findings are analyzed in the light of existing literature. It was chosen to focus on how the factors poverty, education, knowledge on sex and nutrition, and non-parental caregivers influence adolescent pregnancy and child undernutrition. These factors were chosen due to their influence or novelty within this context. By discussing these factors through the lens of existing literature, their complex interactions are highlighted. It becomes clear that none of the factors stands independently, all are highly connected to their context and produce chains of actions or vicious circles (see figure 24). Through the analysis, areas of interest for future research are proposed and suggestions are made on possible interventions.

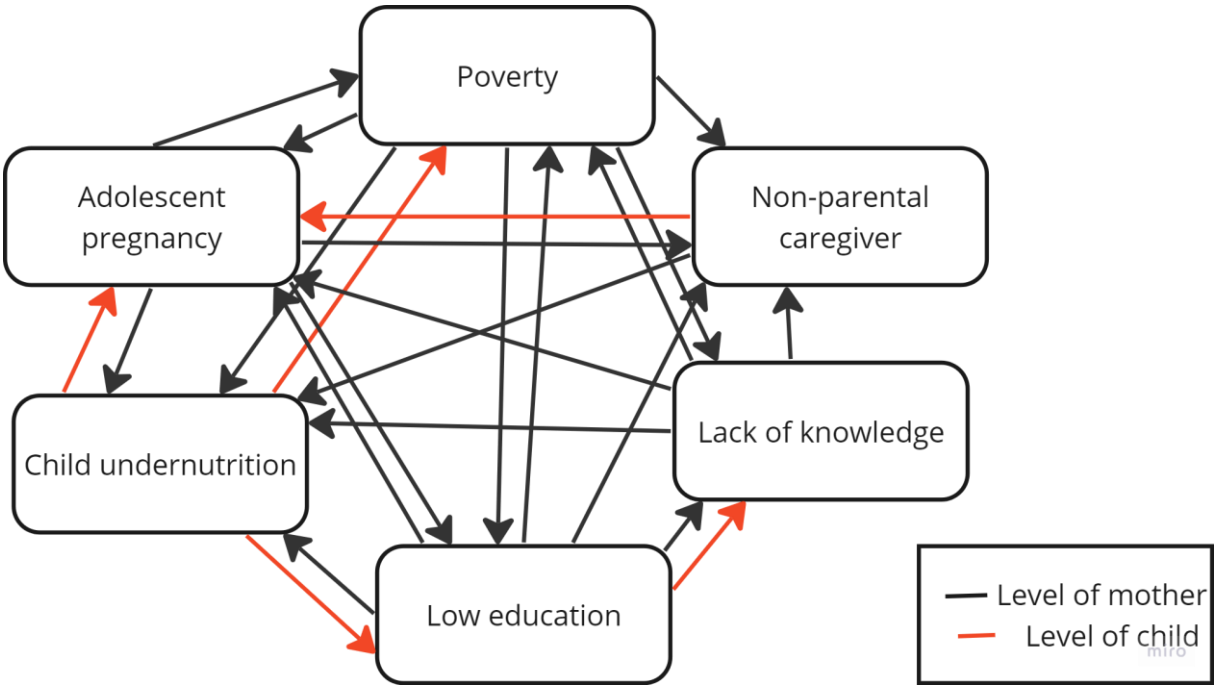

Figure 24: Important interactions that connect adolescent pregnancy to child undernutrition. Source: author.

6.1 The multiple dimensions of poverty

This research found that poverty plays a major role in the prevalence of adolescent pregnancies. According to the participants, adolescents that grow up in poverty are more likely to become pregnant at an early age. The link between low-economic status and adolescent pregnancies has been established in previous studies (Akombi-Inyang et al., 2022; Poudel et al., 2023; Mbabazi et al., 2021; Madise et al., 2007; Pires et al., 2021; Nguyen et al., 2019; Byonanebye et al., 2020). This connection is explained by fewer opportunities, less autonomy, and lack of access to contraceptives (Akombi-Inyang et al., 2022).

Another reason that was mentioned is that adolescent girls of low economic status are more vulnerable to transactional sex; men offer gifts, money, or food in return for a sexual relationship. One participant indicated that she became pregnant, when she tried to provide for herself, one participant said that men would offer her money. This finding aligns with the data

found in literature (November & Sandall, 2018; Kyegombe et al. 2020). A study by November & Sandall (2018) conducted in Sierra Leone found that transactional sex is a social norm that is tolerated by parents and the communities. Girls are expected to provide for their own financial needs for which they use their body, their only available resource (November & Sandall, 2018). A study conducted by Kyegombe et al. (2020) in central region of Uganda also reported a general perception of men coercing young women and adolescents into sex with money. The most vulnerable to this coercing are the adolescents that come from poor households to which small amounts of money are most attractive (Kyegombe et al. 2020). Parents turn a blind eye to their daughters' activities, especially when girls are expected to contribute to the household income (Kyegombe et al. 2020).

The same silent acceptance of transactional sex was found in this study. The key informants had knowledge about practices, such as "sugar daddies" that provide financial support on a regular basis. However, the participants were not explicit about it. The question can be asked whether they perceive transactional relationships as normal relationships. In a context in which gender roles are highly patriarchal, it is the role of the man to provide for the financial needs and for a woman to be submissive and focus on household activities (Ninsiima et al., 2018). The participants in this study primarily expected their partner to provide for their financial needs. In this context there is a minimal difference between what is expected of a relationship between a man and woman, and what is called 'transactional sex', since it is always expected of a man to give presents and money. Nevertheless, unequal power relations are known to reduce a girl's sexual agency and make it difficult for a girl to negotiate save sex (Ninsiima et al., 2018). It would be interesting to further investigate how adolescents define transactional sex and distinguish it from a normal relationship.

The ideas that adolescents have about love and relationships influence their sexual behavior and are connected to early pregnancies (Moyano et al, 2021). Two thirds of adolescent mothers in this study separated from the father of their child or did not enter a relationship with him. Adolescents living in rural areas, who lack access to media and education due to poverty, have a limited frame of reference to develop their ideas on love and relationships. Perhaps not thinking about what characteristics are desired in a partner and what is needed in a relationship influences the quality of the relationship and induces transactional relationships. Self-esteem could also be a significant factor, which is known to be reduced by poverty (Li et al., 2019; Mikulášková & Adamkovič, 2018; Bradley & Corwyn, 2002; Doi et al., 2019). This study did an exercise in the workshop for girls, in which they could draw their desired future. Differences were seen between the girls, some had specified their occupation, that of their husband, and had added a car or a gate. Others had only drawn their garden and did not include specific characteristics of a husband. Two different drawings are shown in figure 25.

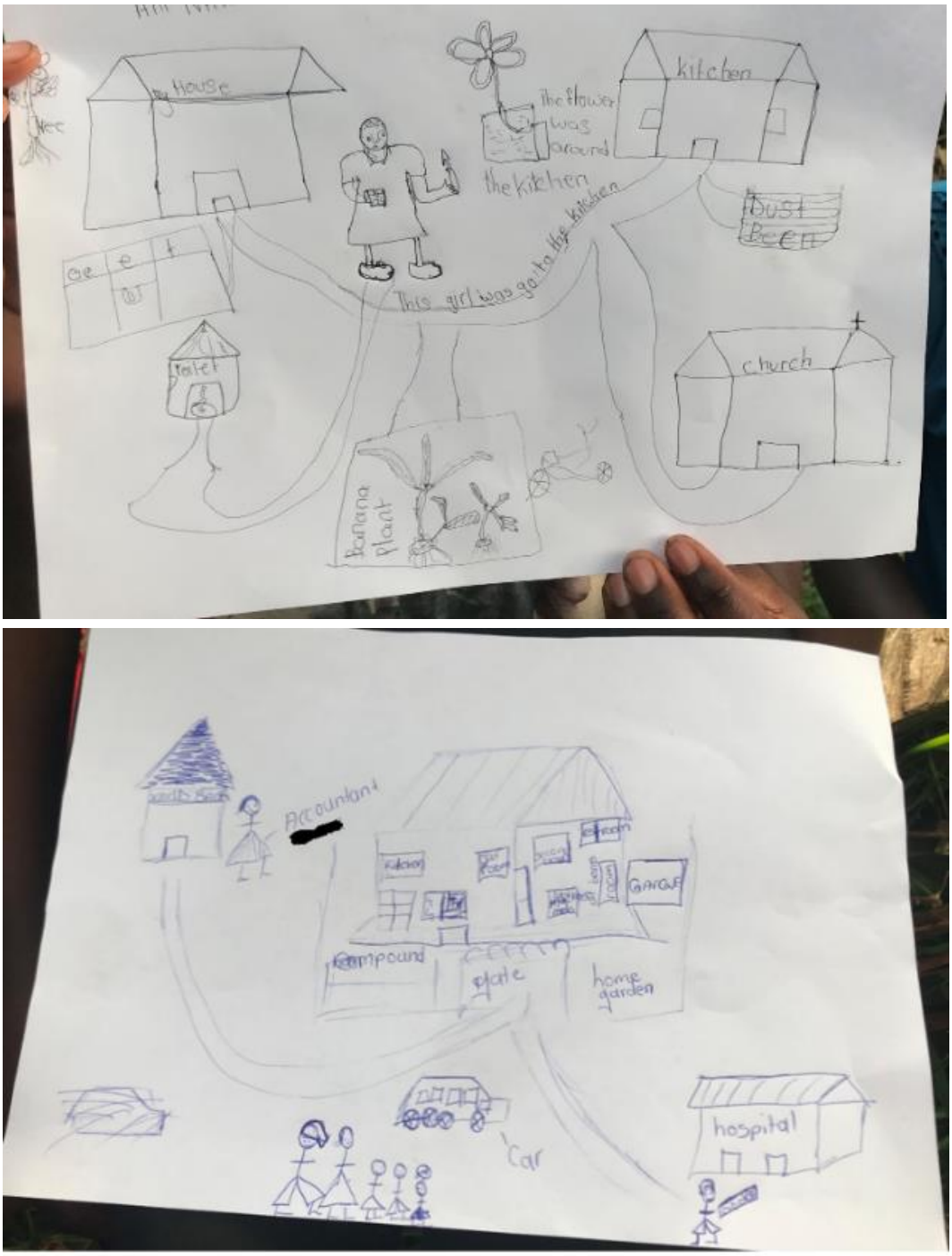

Figure 25: Pictures of drawings made by adolescent girls showing their future.

Further research is needed to evaluate how ideas on relationships, love, self-esteem, culture, and gender norms are related to accepting transactional sex and the success or failure of (adolescent) relationships.

This study found a bidirectional connection between poverty and adolescent pregnancy. The results showed that apart from the influence of poverty on the risk of adolescent pregnancies, adolescent pregnancy can increase financial pressure on a household. Having a child was

repeatedly described as a burden, especially an unplanned child. This finding is in line with the literature describing that adolescent pregnancy leads to poverty and insecure insertion in the labor market (Moyano et al., 2021; Nguyen et al., 2019). The study by Nguyen et al. (2019) mentioned that adolescent mothers are less likely to earn money for their work, to own money, to make household decisions, and to travel without permission (Nguyen et al., 2019). A study in Nicaragua by Müller (2020) explained similar mechanisms, where adolescent mothers experienced a lack of investment in their future, inadequate capital accumulations, and an increased dependence on others.

Through this, adolescent motherhood can worsen poverty or trap someone into a cycle of poverty. This poverty trap consists of the extra costs of the medical bills, medication, supplies needed for a child, and not having the time to continue studies or invest in work activities. This finding highlights the importance of addressing issues within their context, the different determinants are very closely interlinked. Without looking at (adolescent) pregnancies, efforts on poverty alleviation will more likely fail, since adolescents without children have other capacities and needs than those that have an additional burden of raising a child. The reverse holds true as well; research or interventions targeting adolescent pregnancies may overlook the underlying pressure of poverty. For example, since 2007 Uganda enforced The Penal Code, a law which prohibits sexual acts with persons under the age of 18 years, with violations punishable by death (Sexual Rights Database, 2020). However, this law has been unsuccessful in reducing the number of early marriages, adolescent pregnancies, or cases of rape and sexual violence (Ariong, 2013). In his study Ariong (2013) names poverty as one of the causes for the failure of the law in addressing the problem. This example illustrates why it is crucial to acknowledge the intersectionality within issues in order to answer with appropriate policies.

The results show that undernutrition is highly associated with poverty for the obvious reason that poor people cannot afford to buy enough nutritious food. Some participants were farmers and were able to grow their own food. However as they explained, for a varied meal with all nutrition components, money is always needed to buy additional food items. Additionally, poverty is connected to poor household hygiene and domestic violence, which contributes to the burden of undernutrition. The participants and key informants agreed that interventions on undernutrition will be useless as long as the burden of poverty within the communities is not addressed. This result is consistent with the existing literature on undernutrition (Burgess, 2008; Black et al., 2008; Heidkamp et al., 2021). For instance, literature describing the broad drivers of undernutrition name poverty as one of the underlying causes for food insecurity, inappropriate care for children, inadequate hygiene, and lack of health services (Burgess, 2008; Black et al., 2008). International large surveys on the link between poverty and child undernutrition find a significant increase in the risk of undernutrition for children living in poverty (Petrou & Kupek, 2010; Klasen, 2008). Studies in the Ugandan contexts also underline the impact of income for nutritional status of children (Kirk et al., 2018; Nakabo-Ssewanyana, 2003). Nakabo-Ssewanyana (2003) conducted a quantitative study in Kampala among the urban

population, she found that protein consumption especially increased with a growing household income. The study conducted by Kirk et al. (2018) found a small correlation between income and height for age, with differences between the various sectors. The biggest correlation was found in the self-employment sector. Klasen (2008) notes that there are regional differences in the link between poverty and undernutrition that cannot be easily explained. While poverty appears to be an important contributor to child undernutrition, other factors, such as own food production, family size, and food prices, also play a role and can mitigate or aggravate the relation (Kirk et al., 2018; Nakabo-Ssewanyana, 2003). Again, the underlying fact is that these factors cannot be seen as independent contributors to the problem, but are closely interconnected.

Poverty was identified in this study as a major pathway that connects adolescent pregnancy to child undernutrition. Nguyen et al. (2019) and Nguyen et al. (2021) also described socio-economic status as one of the pathways with a strong link between adolescent pregnancy and child undernutrition. Nguyen et al. (2019) found that adolescent mothers lived in poorer households with poorer sanitation. Adolescent mothers seem to experience a lower socio-economic status, due to their lack of education, savings, and work experience. A lack of support, stigma, and isolation increases poverty in adolescent mothers. This has an influence on their capacity to provide the needed food for their child. Future interventions addressing child undernutrition should integrate strategies that focus on poverty reduction through skill development, saving circles, entrepreneurship, and agricultural training, particularly prioritizing adolescent mothers who are disproportionately affected.

Furthermore, poverty plays a significant role in access to health care, according to the findings. To come to the health facilities, money is needed for transportation and the financial freedom to take days off work. Other studies found that adolescent mothers experience restrictions in their access to health care which has an impact on their health and that of their children (Owolabi et al., 2017; Mekonnen et al., 2019; Nguyen et al., 2019; Nguyen et al., 2021). In their research, Mekonnen et al. (2019) mention that socio-economic status, poor knowledge of the benefits the health care checks, level of education, social and cultural beliefs, and attitude of health care providers, are barriers for adolescent mothers to access health care. The findings of the current study support these outcomes, highlighting the significance of having enough quality health care facilities across all regions. National investments in health care accessibility and quality of health care should therefore not be underestimated. Furthermore, training sessions for healthcare professionals in patient interaction could serve as a beneficial intervention.

6.2 Formal education

This study found that education is a second important factor connected to adolescent pregnancies. Low level of education has been connected to adolescent pregnancies in previous research (Pires et al., 2021; Nguyen et al., 2019; Paudel et al., 2023; Mbabazi et al., 2021; Akombi-Inyang et al., 2022). The study by Akombi-Inyang et al. (2022), conducted in Nigeria, found that girls with low education are more susceptible to pregnancy than girls with higher education. Programs with conditional cash transfers in Brazil, Columbia, Mexico, and Nicaragua have successfully increased enrollment in schools and consequently postponed marriages and pregnancies (Goli et al., 2015). However, since these are mostly quantitative studies, the mechanism of this relationship was somewhat unclear. This study found that in the Kabarole and Bundibugyo districts, lack of financial resources is the major reason for adolescents to drop out of school. Thus, in most cases low education leads to adolescent pregnancy and not the other way around. After dropping out of school, the chances for a girl to become pregnant or get married are high. Girls that do not go to school are seen as a burden to the household, to prove themselves useful their alternative is to either work or get married.

However, this finding is contradictory to other studies that propose that adolescent pregnancies are the cause for female school dropouts (Nguyen et al., 2019; le Roux et al., 2019; Mohr et al., 2019). Mohr et al. (2019) and le Roux et al. (2019) did not specify how they arrived at this conclusion. Nguyen et al., (2019) references to another study, that then references to a study conducted in rural Bangladesh that finds that 41% of their participants dropped out of school because of marriage (Field & Ambrus, 2008). A study from South-Africa by Stoner et al. (2019) concluded that adolescent pregnancies were associated with subsequent school dropout and school dropout was associated with a higher prevalence of adolescent pregnancies. Scientific evidence from Ugandan context is limited. Only two qualitative studies name pregnancy as a factor contributing to school drop-out amongst others (Kayaga, 2019; Nabugoomu, 2019). Therefore, the evidence suggesting that pregnancies typically result in students leaving school is not convincing. There may be differences between nations or urban and rural areas, depending on the accessibility of education and cultural practices. Nevertheless, it is imperative to know whether adolescent pregnancies are caused or a consequence of school dropout, in order to implement effective interventions. Should policies focus on keeping children in school or should they focus on appropriate sexual education in schools to prevent adolescent pregnancies? Hence, more research is needed to look at the extent and direction of the causal relationship, including a comparison between rural, urban, and national regions.

In this study, most parents are motivated to send their children to school because the majority of the caregivers did go to school at a certain point in their life. Furthermore, education is highly valued and esteemed by participants. They have a very positive attitude towards education, and they view it as the only way out of poverty. This idea is reflected by the National Development Plan of Uganda that sees education as one of the key antidotes for poverty alleviation (Datzberger, 2018). However, it is questionable to what extend this promise holds true. In

Uganda, political reforms and investments on education have not yielded any significant decrease in poverty levels (Datzberger, 2018). This can be explained by various barriers experienced, such as hidden costs, the poor quality of education, and the limited employment opportunities (Datzberger, 2018; Wedgwood, 2007). The first barrier was highlighted as well in this study. Nevertheless, there is an apparent impact of education on an individual level, when looking at health outcomes. As mentioned before, lower levels of education are linked to higher rates of adolescent pregnancies (Pires et al., 2021; Nguyen et al., 2019; Paudel et al., 2023; Mbabazi et al., 2021; Akombi-Inyang et al., 2022). Education increases autonomy, the power to make decisions, economic independence, and knowledge on contraception (Akombi-Inyang et al., 2022). Lower education is related to lower cognitive abilities and lack of knowledge, which influences adolescent sexual risk behavior (Pires et al., 2021). Higher educational levels correspond to better nutritional status of adolescent mothers (Sagalova et al., 2021; Sherer & Trujillo, 2023). In their study, Sagalova et al. (2021) point out that this correlation is already found when looking at 'any formal education', which suggests that an essential threshold is reached in the early stages of education. Moreover, the level of education of parents influences the nutritional status of children (Turyashemererwa et al., 2009; Nguyen et al., 2019). According to analysis of stunting declines in various countries, parental education is an important predictor for child stunting (Heidkamp et al, 2021).

Even though neither the participants nor the key informants noted a direct link between level of education and child nutrition, it can be argued that this research supports this connection by the mere fact that none of the caregivers of undernourished children in this research had finished their education. During the interviews, differences could be observed in the attitudes of those with little or no education compared to those that had reached secondary school levels. The latter were literate, seemed to have a more active attitude towards their children's health, were more vocal, and had more concrete ideas about their future. Whether lack of education directly connects adolescent motherhood to child undernutrition cannot be determined from this research. It is probable that there are a range of contributing factors, such as socioeconomic status, nutritional knowledge, economic independence, and attitude of the mother. Furthermore, it seems quite challenging to escape poverty through education in Uganda due to the social and economic power systems that are in place. However, there are valuable lessons learned early on in school with a lifelong positive impact, including the skills to learn, to read and write, and to make long term plans. School provides an environment where a child can assume autonomy from their families and expand their perspectives. Moreover, children in school create important social connections, which can be the foundation of their future social network. Future national initiatives should extend beyond enrollment rates and focus on educational quality and decreasing dropout rates. Efforts should aim to increase access to education and teaching life competences and practical skills within schools.

6.3 Knowledge on sex and nutrition

Knowledge on sex and nutrition is another crucial factor that plays a role both in adolescent pregnancies and child undernutrition. Participants (including key informants) acknowledged their own lack of knowledge. Knowledge was insufficient on undernutrition, childcare practices, hygiene practices, sex and the biology of an adolescent body, and family planning and child spacing. The factor of knowledge has not yet been individually analyzed in previous research that look at the relation between adolescent pregnancy and child undernutrition (Nguyen et al., 2019; Nguyen et al., 2021; Welch et al., 2023; Wemakor et al., 2018; Fall et al., 2015; le Roux et al., 2019; Yu et al., 2016; Fuada et al., 2020). In their study, Fuada et al. (2020), discovered that adolescent mothers practice less clean and healthy behaviors compared to adult mothers, they hypothesize that this is due lack of awareness. Controversially, a study conducted in Ghana found that adolescent mothers had more knowledge on nutrition, due to easy access to health and nutrition information through schools, recreational activities, and mass media (Quarshie, 2014). Although lack of knowledge is closely related to level of education, in this study it is seen as a separate factor, since knowledge can be acquired from various sources. The source for knowledge can be a school, other important sources are health institutions, public campaigns, communities, parents, and life experience. Adolescent mothers miss out on all means of gaining knowledge, especially when they drop out of school early and are not raised by their parents. Furthermore, poverty further influences exposure to information through isolation in desolate, rural living places and lack of access to media, such as radio, television or phones.

To gain better understanding of the magnitude of this knowledge gap, more research is needed. Assessing knowledge can pose difficulties as it does not adhere to strict quantitative measures and is not solely reliant on the correctness of answers. In his paper, Hunt (2003), proposes a methodology which includes certainty of a given answer. Interventions that target adolescent pregnancies and/or child undernutrition can consider through what means the targeted populations accesses information and how to increase their access. A study by Moyano et al. (2021) indicated that adolescents that received sexual rights and health information from teachers instead of family members, would have a reduced chance to engage in early sexual intercourse. Furthermore, the information should be adjusted to the local context, taking into account illiteracy, the spoken languages, social and cultural norms. Sexual education for adolescents should include reinforcement of self-esteem and sexual assertiveness (Moyano et al, 2021). For instance, during the workshop for adolescents, efforts were made to offer information on family planning in a socially accepted manner: within a marriage.

Moreover, the targeted groups for certain knowledge can be considered. In their research, Byonanebye et al. (2020), justifiably advocates for involvement of boys and men when it comes to knowledge on nutrition, health, childcare, and family planning. A lack of knowledge among male partners regarding maternal health issues has proven to be an obstacle to accessing antenatal care (Tweheyo et al., 2010). This research supports their argument. This research

highlighted that male partners hold decision-making power regarding access to healthcare and the use of family planning methods. Consequently, their knowledge and behavior are crucial factors in addressing adolescent pregnancies. Moreover, father involvement in childcare is a significant factor for child healthcare outcomes (Allport et al., 2018). Evidence from Uganda shows that men are culturally considered as providers of financial resources, but do not involve themselves in decision making concerning child feeding or attending child health clinics (Kansiime et al., 2017). Many men do not know or give an inappropriate message about breastfeeding and child feeding (Kansiime et al., 2017). Children of men that provided money for transportation to the health clinic had significantly better health outcomes, because of the nutritional counseling received by the mothers (Kansiime et al., 2017). However, if the male respondents engaged in more participating activities, the nutritional status of children under five also showed improvement (Kansiime et al., 2017). Involving and educating boys and men should therefore not be overlooked, future interventions can be specially designed to target educating this group.

6.4 Non-parental caregivers raise child

This study revealed that in the Kabarole and Bundibugyo districts, it is common for parents to shift the responsibility of raising children to other relatives. The findings suggest that this could have a significant impact on the risk of adolescent pregnancy and the health outcomes of the child. The participants and key informants point out that non-parental caregivers, such as grandparents or stepmothers, can face financial constraints, challenges of old age, or have a lower emotional attachment. Caregivers may perceive the child as a burden, leading to neglect in care and guidance, or they may arrange for the child to get married. Academic literature regarding this issue is sparse. However, studies reporting on non-parental primary caregivers raising children support the current findings. November & Sandall (2018) found that girls that live with extended family rather than with a parent are more vulnerable to adolescent pregnancy through the pressures of transactional sex and exploitation. A review on grandmothers that are primary caregivers to their grandchildren in South-Africa described that grandmothers often experience challenges to provide food and other necessities for their grandchildren, they are physically, socially, and economically vulnerable (Dolbin-MacNab & Yancura, 2018). Several studies indicate that due to the HIV/AIDS epidemic in sub-Saharan Africa, grandmothers were obligated to take up the responsibility of their orphaned grandchildren (Ice et al., 2011; Dolbin-MacNab & Yancura, 2018; Nyasani et al., 2009). The grandmothers are mostly single and have an additional burden to generate income. Also, conflicts with their grandchildren are more prevalent and can arise from poor discipline and a lack of communication (Nyasani et al., 2009).

However, the role of grandmothers in childcare may be more nuanced. Macdonald et al. (2019) explored family systems in Sierra Leone and concluded that grandmothers are culturally seen as advisors and supervisors of women on issues concerning maternal and child nutrition. Mothers do not make autonomous decisions and are highly influenced by grandmothers (Macdonald et al., 2019). According to the literature, the effect of including grandmothers in

childcare on the child's nutritional outcomes is ambiguous. According to Macdonald et al. (2019), the involvement of grandmothers has both beneficial and adverse impact on nutritional practices. A study by Sharma et al. (2006) researched the impact of grandmother involvement in childcare in India. They did not find any difference in calorie intake or undernutrition prevalence between the group with involved grandmothers and the one without involved grandmothers (Sharma et al., 2006). Aidam et al. (2020) did an experiment in Sierra Leone, in which they included grandmothers in their project that empowered and educated grandmothers alongside mothers. They found that the group with involved grandmothers adhered to better nutritional practices and had higher numbers of exclusive breastfeeding during the first week (Aidam et al., 2020). This group had more participants that achieved minimum dietary diversity and minimum acceptable diet (Aidam et al., 2020). Similar projects in Senegal and Kenya also had positive results on child feeding practices (Aubel et al., 2004; Mukuria et al., 2016).

Still, much is unknown concerning the practice of non-parental caregivers raising children, especially how this impacts the child's health outcomes. Considering the possible large extend of this practice in the African context and the potential impact on child undernutrition and perhaps adolescent pregnancies, it is an excellent area of interest for future research. Prospective studies can be of quantitative nature to measure to what extend children live with non-parental caregivers. Additionally, qualitative methods can include perceptions, motivations, and cultural beliefs to provide insights in the social value of the practice. If interventions are designed to address this issue, the (cultural) value of involving extended family in childcare should be taken into account. For instance, promoting collaboration between different caregivers by including fathers and grandmothers in health checks and education.

6.5 Relation between adolescent pregnancy and child undernutrition

This study found a relation between adolescent pregnancy and child undernutrition in the experiences of parents and healthcare workers. Important mediating factors include poverty, knowledge on nutrition, non-parental primary caregivers, and adolescent behavior. However, these factors never present themselves independently, but are rather components of a complex web. There are certain characteristics that all caregivers have, which were also described by the key informants: amongst others they come from poor households, are minimally or not educated, dependent on others for financial survival, and have a lack of agency. These and other characteristics are shown in figure 26, since they are highly related to each other they form a web. This web of precipitating factors creates a stimulating environment for adolescent pregnancies and contributes to child undernutrition. The web deviates from the pathways presented in the theoretic framework, in the sense that it highlights the complexity and interlinkages between all the components. Although many of the factors have also been identified in the literature, the web has some added components and interlinkages that are derived from the study. These will be highlighted in the next paragraph.

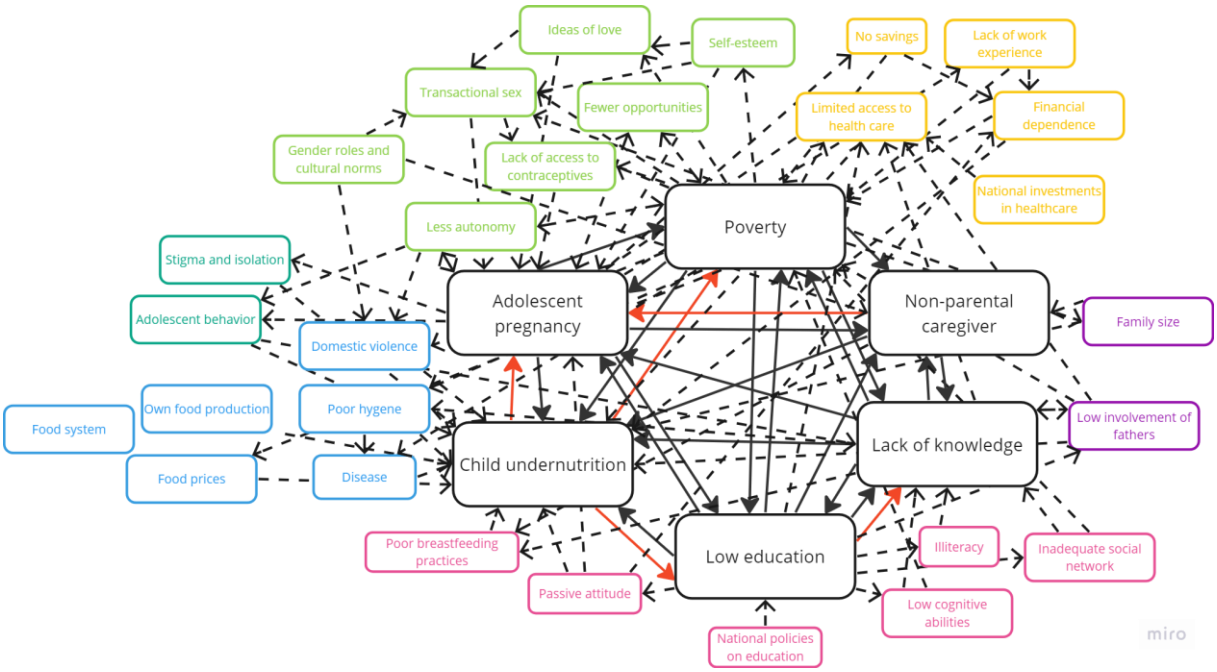

Figure 26: Web of precipitating factors. Source: author.

The web of precipitating factors web includes a series of vicious cycles, for instance of poverty causing adolescent pregnancy, adolescent pregnancy aggravating poverty. In many cases multiple factors are simultaneously contributing within these cycles. Diseases and undernutrition form their own vicious cycle that is reinforced in adolescent pregnancy by an increased risk of premature and low weight births, poverty, and inadequate support. Some vicious cycles transient generations (the so-called intergenerational cycles). For example, child undernutrition leads to school dropout through sickness, which then leads to poverty and undernutrition in the next generation. Another example, an adolescent that stays with a grandmother and becomes pregnant, now leaves her child with its grandmother, increasing the child's chances of becoming pregnant at a young age too. Müller (2020) refers to this phenomenon as transmission of disadvantage. It is known that having adolescent pregnancy in the family history increases the risk for adolescent pregnancy (Pires et al., 2021). However, these mechanisms have not been demonstrated before in relation to undernutrition. More research is needed to further analyze these intergenerational vicious cycles.

There are several factors that are intrinsically linked to pregnancy during adolescence. According to literature, adolescent mothers have a poorer nutritional status during pregnancy compared to adult mothers (Kalanda et al., 2006; Sherer & Trujillo, 2023, Nguyen et al., 2019; Workicho et al., 2019; Quarshie, 2014; Goli et al., 2015). In this study, one of the key informants mentioned that low weight births do occur more frequently in adolescent mothers. However, due to the qualitative nature of this study, no conclusions can be drawn regarding the nutritional status of adolescent mothers. This research did indicate that poor feeding practices during adolescent pregnancy can be linked to the high levels of stress that adolescents can experience during their pregnancy, caused by stigma, inadequate support, and isolation. A

review on adolescent pregnancy in West-Africa supports this finding, reporting higher rates of pregnancy-related stress, feeling of rejection, self-condemnation, and guilt (Lambonmung et al., 2023). Additionally, the behavior of adolescent mothers can be influenced by feelings of insecurity, shame, and dependency, which are inherent to adolescence. The findings suggest that adolescents can have more challenges to regulate their emotions and apply nutritional advice. Adolescents undergo dramatic emotional development (Silvers, 2022; Pfeifer & Berkman, 2018). Future research can further investigate whether emotional regulation is different in adolescent mothers and how it impacts child nutrition, considering mediating components such as autonomy and decision-making power.

Furthermore, this study suggests that due to the vicious cycles, the effects of adolescent pregnancies persist and continue to increase the risk of child undernutrition in later births. Although many adolescent mothers were interviewed after their adolescence, they still faced the same challenges as they had during adolescence. Factors such as educational level, knowledge on health and nutrition, lack of autonomy, and dependence on others do not necessarily change with time. The mothers become trapped in the web. Further research is needed to evaluate the long-term impact of adolescent pregnancies on the life outcomes of the mothers and all their children.

6.6 Limitations

There are several limitations to this study. First, the need for translation poses a serious limitation to the quality and the validity of the results. The translator, being a human being, does not perfectly translate the questions and answers. They could add their own assumptions or ask questions with a more suggestive approach that originates from their own cultural background or thoughts on desired behavior. In this research, participants spoke two different local languages, namely Rutooro and Rukiga, necessitating the use of two translators. The limitation of the interpreter was most apparent with the male translator, causing the participants to act more shyly as if they felt more restricted in their answers. Moreover, during the focus groups, the need for translation in between each statement significantly slowed the discussion down and drew the attention towards the researcher. This compromised the aim of the focus group to an extent because ideally the discussion should be led by the participants with the researcher as a supporting factor, not an active party.

Secondly, the topics that were discussed were extremely sensitive, especially in the Ugandan patriarchal and religious society. Participants had difficulty with providing personal information on their family situation, sex, and their relationship with the father of the child. They tended to give short and vague answers. For example, to answer the question ‘how did you meet the father of your child?’, many participants would answer with the place where they met. Further probing did not result in any elaboration. One participant said that she had difficulties at the house of the father of her child, but she could not specify the content of the problems.

Thirdly, many participants found it challenging to answer the questions. While some participants were more comfortable talking, misunderstandings or non sequiturs to the questions were still common. This could be due to the fact that the participants were not familiar with being involved in qualitative research. Another reason could be the mismatch between the perspectives of the interviewer and the participants. In the western world, especially in higher education, people learn to form and voice their own opinions. In other cultures, people just go with the flow of life without judging all situations. Questions such as 'what do you think about…', can therefore be more challenging to answer. Other difficult questions were those regarding the future and taking an active role. This can be explained by a difference in life context, one which is focused more on survival in the present within a collective society. People are highly dependent on each other, emphasis is not on the role and accomplishments of the individual, but rather on collective accomplishments. Furthermore, participants limited knowledge and different life priorities sometimes led to questionable answers. For instance, one participant said to be 28 years old said that she had her first child at 23, however her child was 9 years old.

Another major limitation is the failure to include fathers in the research. Considering their significant contribution to adolescent pregnancies and the health outcomes of their children, it was deemed highly interesting to include the perspectives of fathers. Unfortunately, the researcher did not find any father willing to participate in the research. A significant barrier was their absence from the health clinics through which the participants were recruited. Future research should explore alternative recruitment strategies to enhance their involvement in research studies and investigate methods to effectively engage fathers in healthcare settings.

A fifth constraint involves the limitations connected to cross-sectional, qualitative research. Due to the qualitative nature of this study, the results can be influenced by the researcher's biases, interpretations, and personal perspectives. The responses by the participants can also be biased to sound socially desirable or align with the researcher's expectations. Moreover, the sample size in this research is too small to generalize the findings to larger populations or different settings. The cross-sectional method poses limitations on the evolution of trends over time, as it captures only a snapshot of a particular moment rather than tracking changes longitudinally. Through the life history interviews, it was aimed to incorporate the component of evolvement through time. Yet, it was constrained by the quality and subjectivity of memories. Lastly, the limitations in time and financial resources restricted the scope of this research. For example, due to limited time during the focus groups, not all photos were discussed. Moreover, it would have been desirable to engage more participants in the photovoice method, as this would have enriched the data. However, constraints in time and finances restricted the number of participants that could be included, due to logistical obstacles.

Nevertheless, these limitations are closely linked to working qualitatively with a disadvantaged community in a country in the Global South. The findings of this research still provide unique insights on the perspectives on adolescent pregnancies and child undernutrition. To my

knowledge, this research is the first that investigates the connection between adolescent pregnancy and child undernutrition qualitatively. This research extended the current theories by describing how factors that influence both adolescent pregnancies and child undernutrition relate to one another. The photovoice method revealed how parents experience the issue of nutrition and what their priorities are. Through examining the influence of different individual, social, cultural, and environmental factors on parents lives and their decision-making regarding health, this study greatly contributes toward developing culturally sensitive and effective interventions. Examining undernutrition in relation to adolescent pregnancy, poverty, and gender inequality reveals significant potential for interventions that do not necessarily require intensification in the food system. They rather promote a systemic approach that will contribute to several SDG's simultaneously, namely those speaking on nutrition, healthcare, education, poverty, and reproductive health.

6.7 Reflection on methodologies

This research has made use of three different qualitative research methods namely, life history interviews, key informant interviews, and photovoice method. It was based on the rationale that these methods supplement each other in offering deeper insights into the challenges of adolescent motherhood and child undernutrition. In this section I reflect on the methodologies.

The life history interviews proved to be an appropriate method to gain more insight into the life context of the participants. When working with marginalized and illiterate participants through a translator, simplicity of the questions is crucial. With the life history interviews, the questions are easy to answer since they involve basic information, such as the number of siblings, who was the one that raised you, and what are important people in your life. This method provides opportunities for the participants to choose what they want to say. For instance, they can choose to focus on the positive aspects as well as the negative. Some participants started by talking about the issues that were on their minds at the time. Due to the wide interest shown in their lives, all the participants appreciated this interview method.

The key informant interviews were the least challenging research method. The key informants are used to speaking about their professional experiences and have extensive knowledge of the topics. Incorporating this research method provided valuable insights on the issues on a broader scale. The key informants had seen many cases in their profession and could say which situations occur often in the communities. Moreover, the key informants spoke more freely on sensitive topics such as abortion, child abandonment, and transactional sex. They did not need to speak on these topics from a personal perspective, which provided them with detachment from the subject making it easier to discuss.

The photovoice method was a highly participatory method. It was observed that this method greatly empowered the presenting participants. They had a stage on which they could teach others about their lives. The other participants would ask them questions and take their advice. The participants that had been telling stories about their challenges in life during the one-on-

one interviews, suddenly transformed into strong individuals preaching hope and collectively celebrating their accomplishments. However, this method is limited by the commitment and effort of the participants. In this research, the second focus group was less fruitful and effective. This was caused by the participant's uneasiness with public speaking on sensitive issues even if others in the group shared the same sensitive issues. Nonetheless, photovoice still provided interesting new insights into the context in which adolescent parents live and their experiences. Future research that uses the photovoice method can consider a more selective recruitment, a more elaborate explanation of the expectations of the method or repeating the focus groups. Figure 27 shows how a participant was selecting the pictures that she wanted to discuss.

[Image withheld for privacy reasons]

Figure 27: Picture of translator and participant with child, looking at the photographs.

7. Recommendations and conclusion

In this chapter, the key findings of this study are synthesized and recommendations are proposed aimed at addressing adolescent pregnancies and child undernutrition. The content of this chapter is based on the findings presented in the results and the discussion, it can serve as a guide for stakeholders to implement effective changes or design future research.

7.1 Recommendations

During the interviews, the participants were asked if they had any advice. Their advice was used as the basis for these recommendations. The most important aspect of the recommendations is that they are preventative measures. Issues of adolescent pregnancies and undernutrition should be addressed by their causes. Prevention is valued higher than treatment since it avoids relapse or reoccurrence. Another important aspect is that they are multisectoral. Interventions have to answer the causes of undernutrition which are highly interlinked and multidisciplinary. Interventions on nutrition that target the broader driving forces have been more effective (Heidkamp et al, 2021). The focus is on integrated interventions that address poverty, education, reproductive health, and nutrition simultaneously. This could include programs that provide economic support, educational opportunities, and access to healthcare services in tandem, recognizing the interconnectedness of these factors.

Empowerment trough formal education

The first recommendation is to prioritize increase of adherence to formal education. Interventions and programs should aim to encourage children to stay in school and support parents to keep their children in school. For example, this can be done by using conditional cash transfers (Goli et al., 2015). Adolescents who dropped out of school due to pregnancy should be encouraged to return to school. Interventions can be designed to support them with childcare and income when they return to school.

Promoting vocational training and microfinancing

Offering vocational training opportunities will stimulate financial independence, improving the autonomy and economic situation of a caregiver. It is recommended to empower young people with knowledge and skills about amongst others sowing, hair plaiting, agriculture, basket weaving, and general entrepreneurship. Moreover, can they be supported with micro financial schemes in the form of loans or saving circles that can be used as starting capitals to start a business. These interventions enable caregivers to provide financial resources for themselves and their children, avoid subsequent pregnancies, and breaking the cycle of poverty (November & Sandall, 2018).

Strengthen health institutions

It is recommended to improve access to reproductive healthcare services, including family planning, prenatal care, and postnatal support, especially in marginalized communities. Efforts

should focus on removing financial, geographical, and social barriers to ensure equitable access for all caregivers. The health institutions can implement programs that offer nutritional education and support to adolescent mothers, emphasizing the importance of breastfeeding, proper infant feeding practices, and balanced nutrition. This could be integrated into existing maternal and child health services. Other strategies include house visits and one-on-one counseling to tailor advice and support to the family situation. It is important to approach communities by engaging them, emphasizing the inclusion of fathers and grandmothers, leveraging existing social structures and cultural norms to promote positive behavior change. Community-based interventions, including peer education programs and participatory approaches, can empower families to make informed choices regarding reproductive health and nutrition. An example of such a community-based intervention is a cooking demonstration, where caregivers can participate in sharing their knowledge about healthy cooking practices. Figure 28 shows such a demonstration.

[Image withheld for privacy reasons]

Figure 28: Picture of cooking demonstration for vulnerable families by member of KRC.

Responsible parenting

Community-based interventions can serve as an effective approach to address the mindset of parents and communities towards raising children. In addition to discussing health, nutrition, and reproduction, these interventions can explore deeper values. Questions can be asked about the priorities in life, how much the wellbeing of children in valued, and how to share responsibility within communities (it takes a village to raise a child). Other questions that can come up are: what are the responsibilities of parents, mothers, fathers, single men, elderly, and the community? What behavior is accepted and what not?

Sex education and family planning

Starting conversations about sex, STD's, human bodies, puberty, what leads to pregnancies, and what family planning methods are available is an important proposed intervention. Sex education and information about family planning methods can be integrated in the school curriculums, community conventions, and at health facilities. Inclusion of men in family planning counseling is crucial. The accessibility of family planning methods should be addressed, by looking at social and cultural barriers as well as the logistic and financial barriers. Adolescents should be empowered to make decisions about their sexual and reproductive health at the beginning of adolescence (Mekonnen et al., 2019). Health institutions can integrate education on family planning on at multiple entry points. For instance, counseling all patients that come into departments of pediatrics and maternity.

Research and Monitoring

Further research is needed to better understand the nuanced drivers of adolescent pregnancy and child undernutrition, including the impact of specific interventions and contextual factors.

Particularly concerning the impact of other primary caregivers, intergenerational vicious cycles, and the long-term effects of adolescent pregnancy. Longitudinal studies and evaluation frameworks can inform evidence-based policies and interventions. The focus should be on ethical participation in research and giving the acquired knowledge back to the communities. For example, this research created a poster (see figure 29) that includes the key findings and advice targeted at caregivers. By making the research findings accessible for stakeholders and affected communities, the research increases its impact and becomes a part of the societal change that it wants to achieve.

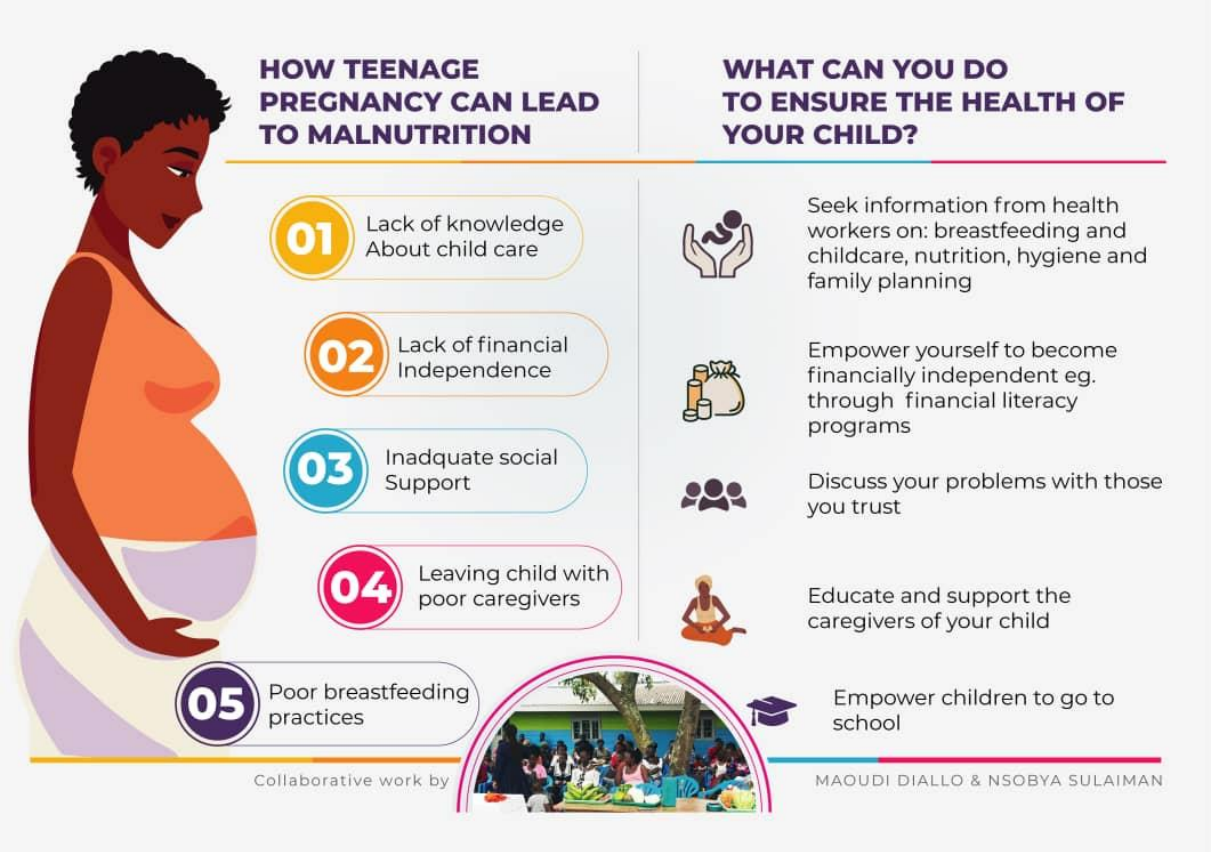

Figure 29: Posters with research findings. One version is in English, the other is in Rutooro, the most spoken language in the Kabarole district.

7.2 Conclusion

This study used life history interviews, key informant interviews, and photovoice focus groups with caregivers to undernourished children and healthcare workers to investigate the connection between adolescent pregnancy and child undernutrition. The findings indicate that there is a connection between adolescent pregnancy and child undernutrition. They are connected through multiple factors that have interlinking and confounding properties, in a highly complex cohesion. The key factors include poverty, inadequate social support, limited health knowledge, low educational levels, non-parental caregivers raising the child, and inadequate family planning. Poverty contributes to adolescent pregnancy, through increased vulnerability for transactional sex. This can lead to unsustainable relationships and has an impact on child nutrition especially by decreased ability to afford necessities for an adequate diet and proper hygiene. Adolescent mothers in particular experience a lower socioeconomic status due to a lack of savings, work experience, education, and support, which can stem from stigma and isolation. Furthermore, a lack of knowledge on sex causes adolescent pregnancies and a lack of knowledge on undernutrition and child feeding contributes to child undernutrition. Many adolescents drop out of school due to a lack of finances, this increases their risk of unwanted pregnancies and early marriage. This study found that it is common for parents to let other family members, such as grandmothers, raise their child. However, this has implications for the

health of the child and can increase the risk of an unwanted pregnancy. Lastly, inadequate accessibility and community acceptance of family planning methods leads to early pregnancy, big families, and poor child spacing. This affects the well-being of the child and undermines women empowerment.

All the aforementioned factors are strongly interlinked and cannot be addressed in research or interventions independently. There is a need for policies that tackle these issues through a multisectoral approach. This includes a simultaneous approach which addresses financial assistance, improved access to education, and informative programs on nutrition, health, sex, and family planning. Community-based programs should be designed to offer save spaces for community discussions, exchange of knowledge, social support, mentorship, and resources to caregivers. This will empower caregivers in ensuring the wellbeing of their children. These interventions stimulate progress towards achieving the SDGs by addressing systemic inequalities and promoting sustainable development.

8. References

Aidam, B., MacDonald, C., Wee, R., Simba, J., Aubel, J., Reinsma, K., & Girard, A. W. (2020). An Innovative Grandmother-Inclusive Approach for Addressing Suboptimal Infant and Young Child Feeding Practices in Sierra Leone. Current Developments in Nutrition, 4(12), nzaa174. https://doi.org/10.1093/cdn/nzaa174

Akombi-Inyang, B., Woolley, E., Iheanacho, C. O., Bayaraa, K., & Ghimire, P. R. (2022). Regional Trends and Socioeconomic Predictors of Adolescent Pregnancy in Nigeria: A Nationwide Study. International Journal of Environmental Research and Public Health, 19(13), 8222. https://doi.org/10.3390/ijerph19138222

Allport, B. S., Johnson, S., Aqil, A., Labrique, A. B., Nelson, T., Kc, A., Carabas, Y., & Marcell, A. V. (2018). Promoting Father Involvement for Child and Family Health. Academic pediatrics, 18(7), 746–753. https://doi.org/10.1016/j.acap.2018.03.011

Ariong, S. (2013). Failure of Criminal Law to Deter Sexual Offences in Uganda. Kampala International University; School Of Law. https://ir.kiu.ac.ug/handle/20.500.12306/10483

Aubel, J., Touré, I., & Diagne, M. L. (2004). Senegalese grandmothers promote improved maternal and child nutrition practices: the guardians of tradition are not averse to change. Social Science & Medicine, 59(5), 945–959. https://doi.org/10.1016/j.socscimed.2003.11.044

Bandauko, E., & Arku, G. (2023). The Power of a Camera: fieldwork experiences from using participatory photovoice. International Journal of Qualitative Methods, 22, 160940692311544. https://doi.org/10.1177/16094069231154437

Bhan, N. (2019). Preventing teenage pregnancy in India to end the cycle of undernutrition. The Lancet Child & Adolescent Health, 3(7), 439–440. https://doi.org/10.1016/s2352-4642(19)30111-7

Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., De Onís, M., Ezzati, M., Mathers, C., & Rivera, J. Á. (2008). Maternal and child undernutrition: global and regional exposures and health consequences. The Lancet, 371(9608), 243–260. https://doi.org/10.1016/s0140-6736(07)61690-0

Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., De Onís, M., Ezzati, M., Mathers, C., & Rivera, J. Á. (2008). Framework of the relations between poverty, food insecurity, and other underlying and immediate causes of maternal and child undernutrition and its short-term and long-term consequences. [Figure]. *The Lancet*, *371*(9608), 243–260. https://doi.org/10.1016/s0140-6736(07)61690-0

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic Status and Child Development. Annual Review Of Psychology, 53(1), 371–399. https://doi.org/10.1146/annurev.psych.53.100901.135233

Bundibugyo District. (2023). District Information Portal. http://www.bundibugyo.go.ug/

Burgess, A. (2008). Undernutrition in Adults and Children: causes, consequences and what we can do. South Sudan Medical Journal, 1(2), 18-22.

Bussink-Voorend, D., Bussink, A. P., Falama, A. M., & Stekelenburg, J. (2020). Health Indicators of Pregnant Women in Tonkolili District, Rural Sierra Leone. International

Journal of Environmental Research and Public Health, 17(11), 3918. https://doi.org/10.3390/ijerph17113918

Byonanebye, J., Brazauskas, R., Tumwesigye, N., Young, S., May, T., & Cassidy, L. (2020). Geographic variation and risk factors for teenage pregnancy in Uganda. African health sciences, 20(4), 1898–1907. https://doi.org/10.4314/ahs.v20i4.48

City population. (2020). Uganda: Administrative Division (Regions and Districts) -Population Statistics, Charts and Map. https://www.citypopulation.de/en/uganda/admin/

Conde-Agudelo, A., Rosas-Bermúdez, A., Castaño, F., & Norton, M. (2012). Effects of Birth Spacing on Maternal, Perinatal, Infant, and Child Health: A Systematic Review of Causal Mechanisms. Studies in Family Planning, 43(2), 93–114. https://doi.org/10.1111/j.1728-4465.2012.00308.x

Cullinan, K. (2022, September 26). African teen pregnancies skyrocketed during COVID lockdowns - but prevention is possible - Health Policy Watch. Health Policy Watch. https://healthpolicy-watch.news/african-teen-pregnancies-skyrocketed-during-covid-lockdowns-but-prevention-is-possible/

Datzberger, S. (2018). Why education is not helping the poor. Findings from Uganda. World Development, 110, 124–139. https://doi.org/10.1016/j.worlddev.2018.05.022

De La Calle, M., Bartha, J. L., López, C. M., Turiel, M., Martínez, N. A., Arribas, S. M., & Ramiro-Cortijo, D. (2021). Younger age in adolescent pregnancies is associated with higher risk of adverse outcomes. International Journal of Environmental Research and Public Health, 18(16), 8514. https://doi.org/10.3390/ijerph18168514

Doi, S., Fujiwara, T., Isumi, A., & Ochi, M. (2019). Pathway of the Association Between Child Poverty and Low Self-Esteem: Results From a Population-Based Study of Adolescents in Japan. Frontiers in Psychology, 10. https://doi.org/10.3389/fpsyg.2019.00937

Dolbin-MacNab, M.L. & Yancura, L.A. (2018). International Perspectives on Grandparents Raising Grandchildren: Contextual Considerations for Advancing Global Discourse. The International Journal of Aging and Human Development. 86(1):3-33. doi:10.1177/0091415016689565

Doorewaard, H., Kil, A., & van de Ven, A. (2019). Praktijkgericht Kwalitatief Onderzoek (2de editie). Boom uitgevers Amsterdam. 12.

Fall, C. H., Sachdev, H. S., Osmond, C., Restrepo-Méndez, M. C., Victora, C. G., Martorell, R., Stein, A., Sinha, S., Tandon, N., Adair, L. S., Bas, I., Norris, S. A., & Richter, L. (2015). Association between maternal age at childbirth and child and adult outcomes in the offspring: a prospective study in five low-income and middle-income countries (COHORTS Collaboration). The Lancet Global Health, 3(7), e366–e377. https://doi.org/10.1016/s2214-109x(15)00038-8

Field, E., & Ambrus, A. (2008). Early Marriage, Age of Menarche, and Female Schooling Attainment in Bangladesh. Journal Of Political Economy, 116(5), 881–930. https://doi.org/10.1086/593333

Fuada, N., Latifah, L., Yunitawat, D., & Ashar, H. (2020). Assessment of Nutritional Status of Children Under-Five in Families of adolescent Mothers in Indonesia 2013. Journal of Nutritional Science and Vitaminology, 66(Supplement), S425–S431. https://doi.org/10.3177/jnsv.66.s425

Goldman, R. E., Hunt, M. K., Allen, J. D., Hauser, S., Emmons, K. M., Maeda, M., & Sorensen, G. (2003). The Life History Interview Method: Applications to Intervention Development. Health Education & Behavior, 30(5), 564–581. https://doi.org/10.1177/1090198103254393

Goli, S., Rammohan, A. & Singh, D. (2015). The Effect of Early Marriages and Early Childbearing on Women's Nutritional Status in India. Matern Child Health J. 19, 1864–1880 https://doi.org/10.1007/s10995-015-1700-7

Haglund K. (2004). Conducting life history research with adolescents. Qualitative health research, 14(9), 1309–1319. https://doi.org/10.1177/1049732304268628

Health Journalists Network Uganda. (2022, January 5). Uganda parents demand sexuality education back in school curriculum. Health Journalism Network Uganda (HEJNU). https://hejnu.ug/uganda-parents-demand-sexuality-education-back-in-school-curriculums/

Heidkamp, R., Piwoz, E., Gillespie, S., Keats, E. C., D'Alimonte, M., Menon, P., Das, J. K., Flory, A., Clift, J. W., Ruel, M. T., Vosti, S. A., Akuoku, J. K., & Bhutta, Z. A. (2021). Mobilising evidence, data, and resources to achieve global maternal and child undernutrition targets and the Sustainable Development Goals: an agenda for action. The Lancet, 397(10282), 1400–1418. https://doi.org/10.1016/s0140-6736(21)00568-7

Heikens, G. T., Amadi, B., Manary, M., Rollins, N., & Tomkins, A. (2008). Nutrition interventions need improved operational capacity. Lancet, 371(9608), 181–182. https://doi.org/10.1016/s0140-6736(07)61691-2

Hunt, D. P. (2003). The concept of knowledge and how to measure it. Journal Of Intellectual Capital, 4(1), 100–113. https://doi.org/10.1108/14691930310455414

Ice, G. H., Heh, V., Yogo, J., & Juma, E. (2011). Caregiving, gender, and nutritional status in Nyanza Province, Kenya: Grandmothers gain, grandfathers lose. American Journal Of Human Biology, 23(4), 498–508. https://doi.org/10.1002/ajhb.21172

International Food Policy Research Institute (IFPRI). (2012). Background information on Masindi, Kabarole and Hoima districts. Foodnet. Geraadpleegd op 4 december 2023, van https://web.archive.org/web/20120905194829/http://www.foodnet.cgiar.org/scrip/docs%26databases/scrip_II_outputs2001/pdfs/Masindi%2C%20Kabarole%20and%20Hoima%20district%20summary.pdf

Jilcott, S. B., Masso, K. L., Ickes, S., Myhre, S. D., & Myhre, J. A. (2007). Surviving but Not Quite Thriving: Anthropometric Survey of Children Aged 6 to 59 Months in a Rural Western Uganda District. Journal Of The American Dietetic Association, 107(11), 1983–1988. https://doi.org/10.1016/j.jada.2007.08.002

Kabarole District. (2023). Welcome to Kabarole District. KDLG - Kabarole District Local Governemnet. https://kabarole.go.ug/

Kalanda, B., Verhoeff, F. H., & Brabin, B. (2006). Chronic malnutrition in pregnant adolescents in rural Malawi: an anthropometric study. Acta Obstetricia et Gynecologica Scandinavica, 85(1), 33–39. https://doi.org/10.1080/00016340500334869

Kansiime, N., Atwine, D., Nuwamanya, S., & Bagenda, F. (2017). Effect of Male Involvement on the Nutritional Status of Children Less Than 5 Years: A Cross Sectional Study in a

Rural Southwestern District of Uganda. Journal Of Nutrition And Metabolism, 2017, 1–9. https://doi.org/10.1155/2017/3427087

Kayaga, A. (2019). Factors contributing to students' drop out at ordinary level A case study of Mpigi District, Uganda. Kampala International University ,College Of Education. https://ir.kiu.ac.ug/items/0da33212-5deb-4f26-b959-fa2e919b8db0

Kirk, A., Kilic, T., & Carletto, C. (2018). Composition of Household Income and Child Nutrition Outcomes Evidence from Uganda. World Development, 109, 452–469. https://doi.org/10.1016/j.worlddev.2017.03.023

Klasen, S. Poverty, undernutrition, and child mortality: Some inter-regional puzzles and their implicationsfor research and policy. J Econ Inequal 6, 89–115 (2008). https://doi.org/10.1007/s10888-007-9056-x

Kramer, M. S., & Kakuma, R. (2012). Optimal duration of exclusive breastfeeding. The Cochrane library, 2012(8). https://doi.org/10.1002/14651858.cd003517.pub2

Krumeich, A., Weijts, W., Reddy, P., & Meijer-Weitz, A. (2001). The benefits of anthropological approaches for health promotion research and practice. Health education research, 16(2), 121–130. https://doi.org/10.1093/her/16.2.121

Kyegombe, N., Meiksin, R., Wamoyi, J., Heise, L., Stoebenau, K., & Buller, A. M. (2020). Sexual health of adolescent girls and young women in Central Uganda: exploring perceived coercive aspects of transactional sex. Sexual and Reproductive Health Matters, 28(1). https://doi.org/10.1080/26410397.2019.1700770

Lambonmung, A., Acheampong, C. A., & Langkulsen, U. (2022). The Effects of Pregnancy: A systematic review of adolescent pregnancy in Ghana, Liberia, and Nigeria. International Journal of Environmental Research and Public Health, 20(1), 605. https://doi.org/10.3390/ijerph20010605

Le Roux, K. L., Christodoulou, J., Stansert-Katzen, L., Dippenaar, E., Laurenzi, C., Roux, I. M. L., Tomlinson, M., & Rotheram-Borus, M. J. (2019). A longitudinal cohort study of rural adolescent vs adult South African mothers and their children from birth to 24 months. BMC Pregnancy and Childbirth, 19(1). https://doi.org/10.1186/s12884-018-2164-8

Li, C., Wu, Q. & Liang, Z. (2019) Effect of Poverty on Mental Health of Children in Rural China: The Mediating Role of Social Capital. Applied Research Quality Life 14, 131–153. https://doi.org/10.1007/s11482-017-9584-x

Liebenberg, L., Jamal, A., & Ikeda, J. (2020). Extending Youth Voices in a Participatory Thematic Analysis Approach. International Journal of Qualitative Methods, 19. https://doi-org.proxy.library.uu.nl/10.1177/1609406920934614

Lokot, M. (2021). Whose Voices? Whose Knowledge? A Feminist Analysis of the Value of Key Informant Interviews. International Journal Of Qualitative Methods, 20, 160940692094877. https://doi.org/10.1177/1609406920948775

Madise, N., Zulu, E., & Ciera, J. (2007). Is Poverty a Driver for Risky Sexual Behaviour? Evidence from National Surveys of Adolescents in Four African Countries. African Journal of Reproductive Health / La Revue Africaine de La Santé Reproductive, 11(3), 83–98. https://doi.org/10.2307/25549733

Maravilla, J. C., Betts, K., Adair, L., & Alati, R. (2020). Stunting of children under two from repeated pregnancy among young mothers. Scientific reports, 10(1), 14265. https://doi.org/10.1038/s41598-020-71106-7

Martins, V.J.B., Toledo Florêncio, T.M.M., Grillo, L.P., Do Carmo, P., Franco, M., Martins, P.A., Clemente, A.P.G., Santos, C.D.L., Vieira, M.F.A., & Sawaya, A.L. (2011). Long-Lasting Effects of Undernutrition. International Journal of Environmental Research and Public Health. 2011; 8(6):1817-1846. https://doi.org/10.3390/ijerph8061817

Mbabazi, C., Kintu, A., Asiimwe, J.B. et al. Proximate and distal factors associated with the stall in the decline of adolescent pregnancy in Uganda. BMC Public Health 21, 1875 (2021). https://doi.org/10.1186/s12889-021-11403-6

Meenar, M., & Mandarano, L. (2021). Using photovoice and emotional maps to understand transitional urban neighborhoods. Cities, 118, 103353. https://doi.org/10.1016/j.cities.2021.103353

Mekonnen, T., Dune, T., & Perz, J. (2019). Maternal Health service utilisation of adolescent women in Sub-Saharan Africa: A Systematic scoping review. BMC Pregnancy and Childbirth, 19(1). https://doi.org/10.1186/s12884-019-2501-6

Mikulášková, G., & Adamkovič, M. (2018). The relationship between self-esteem, aggression and poverty. Človek A Spoločnosť, 21(1). https://doi.org/10.31577/cas.2018.01.519

Mohr, R., Carbajal, J., & Sharma, B. B. (2019). The Influence of Educational Attainment on Teenage Pregnancy in Low-Income Countries: A Systematic Literature Review. Journal Of Social Work in The Global Community, 4(1). https://doi.org/10.5590/jswgc.2019.04.1.02

Morling, B., Carr, D., Boyle, E. H., Cornwell, B., Correll, S., Crosnoe, R., Freese, J., & Waters, M. C. (2018). Research Methods (Universiteit Utrecht; 3rd edition). W. W. Norton & Company. 347.

Moyano, N., Granados, R., Durán, C. A., & Galarza, C. O. B. (2021). Self-Esteem, attitudes toward love, and sexual assertiveness among pregnant adolescents. International Journal of Environmental Research and Public Health, 18(3), 1270. https://doi.org/10.3390/ijerph18031270

Muhindo, L., & Ashaba, A. (2023, 14 november). Over 1,000 Congolese refugees flee fresh ADF rebel attacks. Monitor. https://www.monitor.co.ug/uganda/news/national/over-1-000-congolese-refugees-flee-fresh-adf-rebel-attacks-4433134

Mukuria, A., Martin, S. L., Egondi, T., Bingham, A., & Thuita, F. (2016). Role of Social Support in Improving Infant Feeding Practices in Western Kenya: A Quasi-Experimental Study. Global Health Science And Practice, 4(1), 55–72. https://doi.org/10.9745/ghsp-d-15-00197

Müller, M. (2020). Decision-Making Process around Teenage Motherhood: A Qualitative Exploration of Early Childbearing in Nicaragua. https://openlibrary.org/books/OL28334334M/Decision-Making_Process_around_Teenage_Motherhood

Nabugoomu, J. (2019). School Dropout in Rural Uganda: Stakeholder Perceptions on Contributing Factors and Solutions. Education Journal, 8(5), 185. https://doi.org/10.11648/j.edu.20190805.13

Nakamori, M., Ninh, N. X., Khan, N. C., Huong, C. T., Tuấn, N. A., Bạch, L. T., Hiền, V. T., Nhung, B. T., Nakano, T., Yoshiike, N., Kusama, K., & Yamamoto, S. (2010). Nutritional status, feeding practice and incidence of infectious diseases among children aged 6 to 18 months in northern mountainous Vietnam. The Journal of Medical Investigation, 57(1,2), 45–53. https://doi.org/10.2152/jmi.57.45

Nguyen, P. H., Scott, S., Khuong, Q. L., Pramanik, P., Ahmed, A. U., Rashid, S. F., Afsana, K., & Menon, P. (2021). Adolescent birth and Child Undernutrition: An analysis of demographic and health surveys in Bangladesh, 1996–2017. Annals of the New York Academy of Sciences, 1500(1), 69–81. https://doi.org/10.1111/nyas.14608

Nguyen, P. H., Scott, S., Neupane, S., Tran, L. M., & Menon, P. (2019). Social, biological, and programmatic factors linking adolescent pregnancy and early childhood undernutrition: a path analysis of India's 2016 National Family and Health Survey. The Lancet. Child & adolescent health, 3(7), 463–473. https://doi.org/10.1016/S2352-4642(19)30110-5

Nitz, K. (1999). Adolescent Pregnancy Prevention A Review of Interventions and programs. Clinical Psychology Review, 19(4), 457–471. https://doi.org/10.1016/s0272-7358(98)00087-7

November, L., & Sandall, J. (2018). 'Just because she's young, it doesn't mean she has to die': Exploring the contributing factors to high maternal mortality in adolescents in Eastern Freetown; a qualitative study. Reproductive Health, 15(1). https://doi.org/10.1186/s12978-018-0475-x

Nyasani, E., Sterberg, E., & Smith, H. (2009). Fostering children affected by AIDS in Richards Bay, South Africa: a qualitative study of grandparents' experiences. African Journal Of AIDS Research, 8(2), 181–192. https://doi.org/10.2989/ajar.2009.8.2.6.858

Onyango, D. O., Akelo, V., van der Sande, M. A. B., Ridzon, R., Were, J. A., Agaya, J. A., Oele, E. A., Wandiga, S., Igunza, A. K., Young, P. W., Blau, D. M., Joseph, R. H., Yuen, C. M., Zielinski-Gutierrez, E., & Tippett-Barr, B. A. (2022). Causes of death in HIV-infected and HIV-uninfected children aged under-five years in western Kenya. AIDS (London, England), 36(1), 59–68. https://doi.org/10.1097/QAD.0000000000003086

Our Wolrld in Data. (n.d.). Adolescent birth rate, 15-19 year olds, 2021. The adolescent birth rate is the number of live births per 1,000 women aged 15 to 19 years old. [Map]. Retrieved on 12-04-2023. https://ourworldindata.org/grapher/adolescent-fertility-15-19?time=2021&country=EST~CHL~LCA~UGA.

Our World in Data. (2023). End hunger, achieve food security and improved nutrition and promote sustainable agriculture. Our World in Data. https://ourworldindata.org/sdgs/zero-hunger#sdg-indicator-2-1-1-prevalence-of-undernourishment

Owolabi, O., Wong, K. L. M., Dennis, M., Radovich, E., Cavallaro, F., Lynch, C. A., Fatusi, A. O., Sombié, I., & Beňová, L. (2017). Comparing the use and content of antenatal care in adolescent and older first-time mothers in 13 countries of west Africa: a cross-sectional analysis of Demographic and Health Surveys. The Lancet Child & Adolescent Health, 1(3), 203–212. https://doi.org/10.1016/s2352-4642(17)30025-1

Performance Report 2021-2022. (2022). Kaborole District Local Government. Magazine: 7. https://kabarole.go.ug/wp-content/uploads/2022/06/Kabarole-District-Annual-Perfomance-report-Magazine-2022.pdf

Petrou, S., & Kupek, E. (2010). Poverty and childhood undernutrition in developing countries: A multi-national cohort study. Social Science & Medicine, 71(7), 1366–1373. https://doi.org/10.1016/j.socscimed.2010.06.038

Pfeifer, J. H., & Berkman, E. T. (2018). The Development of Self and Identity in Adolescence: Neural Evidence and Implications for a Value-Based Choice Perspective on Motivated Behavior. Child development perspectives, 12(3), 158–164. https://doi.org/10.1111/cdep.12279Chakraborty, R. (2004). Infections and other causes of death in HIV-infected children in Africa. Paediatric Respiratory Reviews, 5(2), 132–139. https://doi.org/10.1016/j.prrv.2004.01.005

Pires, R., Araújo-Pedrosa, A., Pereira, J., & Canavarro, M. C. (2021). How can unintended pregnancies be prevented among adolescents who engaged in sexual intercourse at earlier ages? The role of female education and partner age difference. International Journal of Environmental Research and Public Health, 18(20), 10631. https://doi.org/10.3390/ijerph182010631

Poudel, S., Dobbins, T., Razee, H., & Akombi-Inyang, B. (2023). Adolescent Pregnancy in South Asia: A Pooled Analysis of Demographic and Health Surveys. International journal of environmental research and public health, 20(12), 6099. https://doi.org/10.3390/ijerph20126099

Pridmore, P., & Carr-Hill, R. (2009). Tackling the drivers of child undernutrition in developing countries: what works and how should interventions be designed? Public Health Nutrition, 14(4), 688–693. https://doi.org/10.1017/s1368980010001795

Quarshie, E. M. (2014). Comparative Nutritional Status of Adult and Adolescent Mothers and their Infants. http://ugspace.ug.edu.gh/bitstream/123456789/7425/1/Ethel%20Mannzamako%20Qurshie_%20%20Comparative%20Nutritional%20Status%20of%20Adult%20and%20Adolescent%20Mothers%20and%20their%20Infants_2014.pdf

Rah, J. H., Christian, P., Shamim, A. A., Arju, U. T., Labrique, A. B., & Rashid, M. (2008). Pregnancy and lactation hinder growth and nutritional status of adolescent girls in rural Bangladesh. The Journal of nutrition, 138(8), 1505–1511. https://doi.org/10.1093/jn/138.8.1505

Raj, A., Saggurti, N., Winter, M., Labonte, A., Decker, M. R., Donta, B., & Silverman, J. G. (2010). The effect of maternal child marriage on morbidity and mortality of children under 5 in India: cross sectional study of a nationally representative sample. The BMJ, 340(jan21 1), b4258. https://doi.org/10.1136/bmj.b4258

Rao, S., Gokhale, M., Joshi, S., & Kanade, A. (2010). Early life undernutrition and adolescent pregnancy outcome in rural India. Annals of human biology, 37(4), 475–487. https://doi.org/10.3109/03014460903434941

Sagalova, V., Vollmer, S., Ntambi, J., Sodjinou, R., Simen-Kapeu, A., Bärnighausen, T., Zagré, N. M., & Nanama, S. (2021). Socio-economic predictors of undernutrition and anaemia in adolescent mothers in West and Central Africa. Journal of Global Health, 11. https://doi.org/10.7189/jogh.11.13007

Sexual Rights Database (2020). Uganda Penal Code. Sexual Rights Database. https://sexualrightsdatabase.org/countries/457/Uganda#:~:text=The%20legal%20age%20for%20sexual,conviction%20liable%20to%20life%20imprisonment

Sezgin, A.U., & Punamäki, RL. (2020). Impacts of early marriage and adolescent pregnancy on mental and somatic health: the role of partner violence. Arch Womens Mental Health 23, 155–166. https://doi-org.proxy.library.uu.nl/10.1007/s00737-019-00960-w

Sharma, M., & Kanani, S. (2006). Grandmothers' influence on child care. Indian Journal Of Pediatrics/Indian Journal Of Pediatrics, 73(4), 295–298. https://doi.org/10.1007/bf02825822

Sherer, E. L., & Bello Trujillo, A. M. (2023). Barriers to adequate nutrition in pregnant adolescent Colombian females. International journal of adolescent medicine and health, 35(4), 291–297. https://doi.org/10.1515/ijamh-2023-0060

Silvers, J. A. (2022). Adolescence as a pivotal period for emotion regulation development. Current Opinion in Psychology, 44, 258–263. https://doi.org/10.1016/j.copsyc.2021.09.023

Soliman, A., De Sanctis, V., Alaaraj, N., Ahmed, S., Alyafei, F., & Hamed, N. (2021). Early and Long-term Consequences of Nutritional Stunting: From Childhood to Adulthood. Acta bio-medica: Atenei Parmensis, 92(1), e2021168. https://doi.org/10.23750/abm.v92i1.11346

Ssewanyana, S. (2003). Food Security and Child Nutrition Status among Urban Poor Households in Uganda: Implications for Poverty Alleviation. African Economic Research Consortium, Nairobi. https://www.africaportal.org/publications/food-security-and-child-nutrition-status-among-urban-poor-households-in-uganda-implications-for-poverty-alleviation/

Stoner, M. C. D., Rucinski, K. B., Edwards, J. K., Selin, A., Hughes, J. P., Wang, J., Agyei, Y., Gomez-Olive, F. X., MacPhail, C., Kahn, K., & Pettifor, A. (2019). The Relationship Between School Dropout and Pregnancy Among Adolescent Girls and Young Women in South Africa: A HPTN 068 Analysis. Health education & behavior : the official publication of the Society for Public Health Education, 46(4), 559–568. https://doi.org/10.1177/1090198119831755

Tesfaye, A., Gerbaba, M., Tamiru, D., & Belachew, T. (2021). Undernutrition among pregnant adolescent, a scoping review. Research Square (Research Square). https://doi.org/10.21203/rs.3.rs-912494/v1

Tierney, W. G., & Lanford, M. (2019). Life History Methods. SAGE Research Methods Foundations. http://dx.doi.org/10.4135/9781526421036

Tremblay M. A. (1982). The key informant technique: A non-ethnographic application. In Burgess R. (Ed.), Field research: A sourcebook and field manual (pp. 151–161). Routledge.

Turyashemererwa, F. M., Kikafunda, J. K., & Agaba, E. (2009). Prevalence of early childhood malnutrition and influencing factors in peri urban areas of Kabarole district, western Uganda. African Journal of Food, Agriculture, Nutrition and Development. https://doi.org/10.4314/ajfand.v9i4.43872

Tweheyo, R., Konde-Lule, J., Tumwesigye, N.M., & Sekandi, J.N. (2010). Male partner attendance of skilled antenatal care in peri-urban Gulu district, Northern Uganda. BMC Pregnancy Childbirth 10, 53. https://doi.org/10.1186/1471-2393-10-53

Uganda Bundibugyo Organic. (2024). Daarnhouwer. https://daarnhouwer.com/cocoa-boutique/cocoa-beans/uganda-organic-cocoa-beans/

Uganda, Africa (2022, 10 september). Population Movement - Emergency Appeal n° MDRUG045 - Operation Update #2 - Uganda. ReliefWeb. https://reliefweb.int/report/uganda/uganda-africa-population-movement-emergency-appeal-ndeg-mdrug045-operation-update-2

UN. (2023). Goal 2 | Department of Economic and Social Affairs. United Nations. https://sdgs.un.org/goals/goal2#progress_and_info

Unicef. (2023). Joint Child Malnutrition Estimates. UNICEF. https://www.who.int/data/gho/data/themes/topics/joint-child-malnutrition-estimates-unicef-who-wb#:~:text=In%202022%2C%20148.1%20million%20children,for%20their%20height%20(overweight) .

Unicef. (n.d.). Nutrition. UNICEF. https://www.unicef.org/nutrition

Wang, C., & Burris, M. A. (1997). Photovoice: concept, methodology, and use for participatory needs assessment. Health education & behavior: the official publication of the Society for Public Health Education, 24(3), 369–387. https://doi.org/10.1177/109019819702400309

Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. Health Education & Behavior, 24(3), 369–387. https://doi.org/10.1177/109019819702400309.

Wedgwood, R. (2007). Education and poverty reduction in Tanzania. International Journal Of Educational Development, 27(4), 383–396. https://doi.org/10.1016/j.ijedudev.2006.10.005

Welch, C., Wong, C. K., Lelijveld, N., Kerac, M., & Wrottesley, S. V. (2023). Adolescent pregnancy is associated with child undernutrition: Systematic review and meta-analysis. Maternal & child nutrition, e13569. Advance online publication. https://doi.org/10.1111/mcn.13569

Wemakor, A., Garti, H., Azongo, T. B., Garti, H. A., & Atosona, A. (2018). Young maternal age is a risk factor for child undernutrition in Tamale metropolis, Ghana. BMC Research Notes, 11(1). https://doi.org/10.1186/s13104-018-3980-7

Wikipedia. (n.d.). The location of Kabarole District in Uganda, showing district boundaries as they stood in June 2017. [Map]. Retrieved on 11-17-2023. https://en.wikipedia.org/wiki/Kabarole_District#/media/File:Kabarole_District_in_Uganda.svg

Wilson, N., Cleghorn, C. L., Cobiac, L. J., Mizdrak, A., & Nghiem, N. (2019). Achieving Sustainable and healthy Diets: A Review of the Results of Recent Mathematical Optimization Studies. Advances in Nutrition, 10(Supplement_4), S389–S403. https://doi.org/10.1093/advances/nmz037

Workicho, A., Belachew, T., Ghosh, S., Kershaw, M., Lachat, C., & Kolsteren, P. (2019). Burden and determinants of undernutrition among young pregnant women in Ethiopia. Maternal & child nutrition, 15(3), e12751. https://doi.org/10.1111/mcn.12751

World Health Organization: WHO. (2019, 26 November). Adolescent health. https://www.who.int/health-topics/adolescent-health#tab=tab_1

World Health Organization: WHO. (n.d.). Indicator Metadata Registry details. WHO. https://www.who.int/data/gho/indicator-metadata-registry/imr-details/3137

Yu, S. H., Mason, J., Crum, J., Cappa, C., & Hotchkiss, D. R. (2016). Differential effects of young maternal age on child growth. Global Health Action, 9(1), 31171. https://doi.org/10.3402/gha.v9.31171

9. Appendices

Appendix one: Interview guide caregivers

Introduction

Hello, thank you so much for meeting with me. It is very nice to meet you. My name is Maoudi Diallo, and I am a student from The Netherlands. I study the Master Sustainable Development at Utrecht University. This research is about the relationship between teenage pregnancies and child undernutrition. I would like to ask you some questions about this topic.

With regards to privacy, I'd like to already let you know that you can respond to any question you'd like and are free to not give an answer if you don't like to. Also, when finalizing the report, I will ensure you full anonymity: your name or any reference to you as a person will not be mentioned in the report. Finally, I would like to ask you permission to record this conversation to facilitate a better transcription of your testimonial in the later stages of the study.

- Do you agree to participate to this interview?
- Do you give consent for me recording this interview?
- Do you have any questions before we begin?

Opening question

- Could you introduce yourself?

Probes: age, work, daily life, children, living place.

Childhood

Can you tell me about your childhood?

Possible follow up questions:

- What was your family like? (size, occupation, character)
- How did you spend your days?
- How was your life as a teenager?
- What was important to you as a child?

School

What role did school play in your life?

Possible follow up questions:

- How did you feel about school?
- How many years did you attend school? Why?
- Can you recall any memorable events that happened in school?
- What is the most important thing that you learned in school?

Relationships

What relationships played a role in your life?

Possible follow up questions:

- Which people are the most important to you?
- How do they help you?
- What did you learn from them?

Father of child

How is your relationship with the father of your child(ren)?

Possible follow up questions:

- How did you meet the father of your child?
- What kind of relationship did you have?
- How long was your relationship?
- How do you feel about your relationship?

Pregnancy

How did you experience your pregnancy?

Possible follow up questions:

- At what age did you first get pregnant (or your partner)?
- What did your life look like at that time?
- How did you feel about your pregnancy?
- Did you have any difficulties during your pregnancy?
- How did others react to your pregnancy?

Own child

How do you experience your life with your child?

Possible follow up questions:

- How do you take care of your children? Who else is involved?
- What is important to keep your child healthy?
- What do you want to teach your child?
- What are the challenges in taking care of your child?

Relation adolescent pregnancy and child undernutrition

How do you view the possible relationship between teenage pregnancies and undernutrition of children?

Possible follow up questions:

- What are your personal experiences regarding the relationship of teenage pregnancy and child undernutrition?

Future

How do you see the future?

Possible follow up questions:
- What do you wish for yourself in the future?
- What do you wish for your child(ren) in the future?

Advice

Is there any advice you would like to give to fellow teenagers, government, NGO's, others?

Possible follow up questions:
- What is needed to help better your situation?
- What is needed to improve the situation for others?

Closing questions

We are now almost at the end of the interview.
- Is there anything more you would like to add?
- Do you have any questions for me?

Thanking the participant

I'm now stopping the recording. Thank you so much for your time. I really appreciate it. Have a nice day!

Appendix two: Focus group guide

Introduction:

Thank you all so much for joining this meeting. And thank you for taking the time and effort to take photos of your life. I really appreciate you very much.

For this meeting we are going to discuss your pictures by asking six questions. After discussing the questions, we will make a caption to the photo that tells its story. I will record the discussion if everyone is okay with that.

SHOWeD framework (Liebenberg et al., 2020):

1. What do you see here?
2. What is really happening here?
3. How does this relate to our lives?
4. Why does this concern, situation, or strength exist?
5. How can we become empowered through our new understanding?
6. And what can we do?

Additional questions to contain the flow of the focus group:

- Does anyone have questions about this?
- Is there someone that recognizes this situation?
- Can we give any advice?

Appendix three: Interview guide key informants

Introduction

Hello, thank you so much for meeting with me. It is very nice to meet you. My name is Maoudi Diallo, and I am a student from The Netherlands. I study the Master Sustainable Development at Utrecht University. This research is about the relationship between teenage pregnancies and child undernutrition. I would like to ask you some questions about this topic. The final result will be a report and a poster that I will send to you.
With regards to privacy, I'd like to already let you know that you can respond to any question you'd like and are free to not give an answer if you don't like to. Also, when finalizing the report, I will ensure you full anonymity: your name or any reference to you as a person will not be mentioned in the report. Finally, I would like to ask you permission to record this conversation to facilitate a better transcription of your testimonial in the later stages of the study.

Do you agree to participate to this interview?
Do you give consent for me recording this interview?
Do you have any questions before we begin?

Opening questions

- Can you tell me more about yourself?
  Probes: age, education, living place

- Can you tell me about your work?
  Probes: interests, place, function, hours, experience

Key questions

<u>Undernutrition children</u>

- What is your experience with child undernutrition?
  Probes: work, characteristics, economic, politics.

- How is undernutrition in children visible in this region?
  Probes: stunting, wasting, health children, activeness children, education.

- What explains the high prevalence of undernutrition in the region?
  Probes: culture, politics, economic, beliefs, environment.

- What are the causes of child undernutrition?
  Probes: diet, illness, food resources, culture, economic, education, beliefs.

<u>Adolescent pregnancies</u>

- What is your experience with teenage pregnancies?
  Probes: work, characteristics, culture, beliefs.

- Is teenage pregnancy common? Why?
  Probes: culture, finance, education, politics.

- What are the causes of teenage pregnancy in this region?
  Probes: sex education, education, contraceptive use, sexual activity, cultural practices, gender roles.
- What are the effects of teenage pregnancy?
  Probes: health, education, social, health children, abandonment, autonomy.

Relation adolescent pregnancy and child undernutrition

The topic for this research is the relation between teenage pregnancies and undernutrition of children.

- Do you think that there is a link between teenage pregnancies and undernutrition of children?
  Probes: reasons, individual factors, cultural, environmental, and socio-economic.

- What factors play a role in this relationship?
  Probes: biological, education, health care access, power.

- Can you describe how teenage pregnancy can lead to child undernutrition?
  Probes: biological, education, health care access, power, politics, culture.

- Do you have any stories of people you know that contribute to your opinion on this topic?
  Probes: work, personal, environment.

Interventions

- What could be possible solutions to these issues of undernutrition and teenage pregnancies?
  Probes: cultural, what people,

- Who should be playing a role in those interventions?
  Probes: government, health care, NGO's,

Closing questions
We are now almost at the end of the interview.
- Is there anything more you would like to add? Are there any topics that we still need to discuss?
- How do you feel about this interview?
- Do you have any questions for me?

Thanking the participant

I’m now stopping the recording. Thank you so much for your time. I really appreciate it. Have a nice day!

Appendix four: Informed consent form

Information about the study: Relation between adolescent pregnancies and child undernutrition.

Undernutrition is a big problem worldwide. From 2015, more and more people are struggling to get enough food. This has consequences for their health, and children especially can become too small, too skinny, or can get sick and die. That is why it is important to look at the causes of undernutrition, so we can think of good solutions.

Research has said that teenage pregnancy can play a role in the problem of undernutrition. Only, they do not know how exactly. That is why I want to investigate this relationship better. I will do this by talking to parents and asking them questions about their lives. I will also arrange a meeting with a group to talk about the photos that you take.

I am a student at Utrecht University, a city in the Netherlands. I am doing the masters Sustainable Development. To finish my study, I am doing this research. I do not get paid by anyone for this research.

I would like to ask you if I can interview you two times for the research. The interviews will take around an hour. Also, I want to ask you to take photos. We will discuss your photos with a group.

You are participating voluntarily, so you do not receive any money for it. You can choose to answer the questions how you like, if you do not want to continue, we can stop the interview immediately. To be able to remember all your answers to the questions, I will ask you if it is okey to record the interview.

After the interviews and group meeting, I will use your answers and photos for the research. In doing so, I will change your name and any other personal details, to make sure that the answers cannot be traced back to you. I will not share your personal information with anyone else.

You can at any time choose to retract your participation. If you have any questions, my contact details are Maoudi Diallo, m.h.diallo@students.uu.nl

DECLARATION OF CONSENT for participation in:

Relation between adolescent pregnancies and child undernutrition.

I hereby confirm:

- that I have been satisfactorily informed about the study through the information above.
- that I have been given the opportunity to ask questions about the study and that any questions I asked have been satisfactorily answered.
- that I have had the opportunity to carefully consider participation in this study.
- that I voluntarily consent to participating.

I consent to the following:

- The data collected will be obtained for scientific purposes and retained as stated in the information letter.
- the collected, coded/anonymized research data may be shared with other scientists and/or re-used to answer other research questions.
- audio recordings will be made for scientific purposes.

I understand that:

- I have the right to withdraw my consent to the use of data, as stated in the information letter.

Name of participant: _____

Signature: _____ Date, town/city: ___ / ___ / ____, _____

Appendix five: Code tree

Name	Files	References
Advice	5	8
Education	11	16
Family planning	7	8
Government	6	6
Health institutions	4	9
Independence	2	2
Legalize abortion	1	1
NGO	3	3
Preventive measures or addressing causes	4	7
Religious leaders	1	2
Responsible parenting	1	1
Society	2	2
Take time to get to know person	2	2
Talk about sex	4	7
Wait for marriage	7	8
Experiences teenage pregnancy	0	0
Behavior of men	1	1
Education	25	55
Poverty	9	18
Pregnancy phase	1	1
Ability to take care of self	1	1
Abortion	2	3
Relationship	13	23
Stigma	7	10
Stress	4	5
Support	9	12
Puberty behavior	2	4
Sex	1	1
Early marriage	12	19
Rape	2	3
Sex education or knowledge	8	16
Contraceptive use	2	2
Sexual activity	9	10
Support	1	1
Family	16	37
Not living with parents	12	19
Support outside family	2	2
Work	12	15
Experiences undernutrition	0	0
Care practices	1	2

Breastfeeding	8	12
Connection to child	2	2
Diet	1	1
Hygiene	3	4
Knowledge on care practices	11	22
School lunch	1	1
Cultural believes	1	1
Disease	14	23
HIV	1	3
Low weight at birth	2	4
Preterm delivery	3	6
Family planning	8	11
Poor child spacing	4	4
Government	1	2
Health care services	7	11
Many children	3	4
Poverty	16	29
Education of child	2	4
Work	7	10
Status of women	4	4
Stress	6	7
Support	25	59
Conflict	4	8
Father of child	18	37
Leaving child with others	11	28
Undernutrition	9	15
Knowledge on undernutrition	10	17
Future	12	19
Education	11	13
Independence	2	2
Intergenerational cycle	6	7
Relation between ap and cu	22	25
Difference teenage and adult mothers	2	7
Factors	0	0
Child care	8	10
Diet during pregnancy	3	3
Education	2	3
Late health care seeking	2	5
Life experience	3	3
Sence of responsibility	2	3
Socio-economic	8	12
Support	8	11