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**The Prevalence and Determinants of Short Stature
among First Graders in UNRWA Schools in the
Gaza Strip.**

Yazed Jamil Abed El Raziq Kollab

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Gaza Strip.**

Prepared By:
Yazed Jamil Abed El Raziq Kollab

BSc. Degree in Human Medicine (Diploma de Licenta)
University of Medicine and Pharmacology Vector Babes,
Timisoara, Romania

Supervisor: Prof. Dr. Yehia Abed

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Deanship of Graduate Studies
School of Public Health



Thesis Approval

**The Prevalence and Determinants of Short Stature among First Graders
in UNRWA Schools in the Gaza Strip.**

Prepared by: Yazed Jamil Abed El Raziq Kollab
Registration No.: 21912463

Supervisor: Prof. Yehia Abed

Master thesis submitted and accepted. Date: 27/ 05 /2023

The names of signatures of the examining committee members are as follows:

1. Head of the committee: Prof. Yehia Abed

Signature 

2. Internal examiner: Dr. Nuha El Sharif

Signature 

3. External examiner: Dr. Yousef Abu Al-Rish

Signature 

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Dedication

- I would like to express my sincere gratitude to all those who have supported me throughout my journey of completing this thesis.
- First and foremost, I would like to thank my late father Dr. Jamil Kollab, who always encouraged me to pursue higher education and instilled in me the value of hard work and perseverance. Although he is no longer with us, his memory continues to inspire me every day.
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- I would like to extend my appreciation to my brothers for their support and guidance throughout my entire life, their unwavering support has been invaluable in helping me achieve this milestone especially Eng. Yamen Jamil Kollab.
- I am also thankful for my best friends who have supported me along the way. Their encouragement, advice, and feedback have been instrumental in shaping this thesis.
- Finally, I would like to dedicate this thesis to the martyrs who sacrificed their lives for our country's freedom. Their bravery and sacrifice will never be forgotten. I also dedicate this thesis to my community, whose unwavering support has helped shape the person I am today.

Declaration

"I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it does not contain any material that has been previously published or written by another person, nor does it contain any material that has in significant part been accepted for the award of any other higher degree or diploma of the university or other institute of higher learning, except where proper acknowledgment is made in the text."

Signed

A handwritten signature in blue ink, appearing to be 'Yazed Jamil', written in a cursive style.

Yazed Jamil Abed El Raziq Kollab

Date: 27/05/2023

Acknowledgment

In the name of Allah, the Most Merciful, the Most Compassionate, all praise be to Allah, the Lord of the worlds, and prayers and peace be upon Mohamed, His servant and messenger. First and last, I must acknowledge my limitless thanks to Allah, the Ever-Magnificent. All the praise and thanks are for Almighty Allah, the Most Gracious and Merciful, for helping me complete this study. I am totally sure that this work would have never become the truth without his guidance.

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Abstract

Background: Normal child growth is an ongoing process, relatively slow in pattern, and depends on many factors including intrinsic and extrinsic determinants at the individual or societal level.

Objectives: The study aims to ascertain the magnitude of the short stature (Stunting) among first graders in UNRWA schools in the Gaza Strip and to determine the possible determinants.

Methods: study adopted the descriptive, triangulated, cross-sectional methodology. The sample was 488 respondents. For quantitative part; 448 pupils randomly been selected from UNRWA schools first graders, aged 6-7 years old. While the qualitative part, a non-probability purposive sample was drawn and 10 healthcare key informants and managers been selected, in addition to 30 stunted children mothers.

Results: This study revealed that 3.6 % of children were ≤ -2 SD, and were suffering from short stature, whereby 20.5 % were $\leq -1 - \geq -2$ SD, thus 24.1 % of children were ≤ -1 SD. Furthermore, the anemia prevalence (hemoglobin, HBG below 11.5 g/dl) among the selected sample was 50 %. Meanwhile, the weight (Wt.) for age Z-score categorization among children was as follows: 6.3% were equal or below -2 SD, while 18.5 % were below -1 SD and greater than -2 SD. Through the results of this study, it was found that a statistically higher prevalence of stunting among children above 6 years (p-value of 0.014). Regarding to the psychological and mental assessment of children, the total difficulties score was 23.2. And there was a statistical association between stunting and abnormal conduct children groups, with a p-value of 0.016) in comparison with normal categorized children. Whereby, by the economic status, the rates of stunting among families who receive regular food assistance were higher (25%) than families who don't receive this kind of support (7%) where the p-value was 0.016 (fisher test). After finishing the immunization program, the families' adherence to continue growth and development monitoring was relatively low, whereby as one mother stated " *not linked with vaccine or vitamin, why should I attend*". The study showed that the prevalence of stunting among children with chronic diseases is statistically higher (52.1%) when compared with healthy children (20.8%) with a p-value of 0.001. The study showed the presence of statistical associations between stunting with either mother's or father's height (Ht.) status, with higher prevalence among short-statured parents, with a p-value of 0.004 and of 0.001 consecutively. Furthermore, the study showed statistical associations between stunting and child's birth weight and height (p-values of 0.003 and 0.001 consecutively). In addition, in the multivariate analysis, women with good nutrition status, children with no chronic illnesses, and less anemia were less likely to have stunting at 6 years of age.

Conclusion: The present study concluded that a statistically higher prevalence of stunting among children above 6 years, which can be attributed to the possibility that stunting makes families compelled to delay their children's entry to school. Else more stunting and growth abnormalities need more attention and support by the healthcare system, whereby the interventions should be designed according to our economic circumstances, and management process.

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List of Abbreviations

AGA	Acceptable (Growth) for Gestational Age
ARI	Acute Respiratory Infections
BMI	Body Mass Index
CDGP	Constitutional Delay of Growth and Puberty
CI	confidence interval
DFM	Dual Forms of Malnutrition
EMR	Eastern Mediterranean Region
FSS	Familial Short Stature
GS	Gaza Strip
HC	Health Centre
HGB	Haemoglobin
Ht.	Height
HV	Height Velocity
IHFD	Intra-Household Food Distribution
ISA	Inter-Sectoral Actions
IUGR	Intra Uterine Growth Retard
MO	medical officer (general physician)
NECC	Near East Council of Churches /DSPR-Gaza
OCHA	The United Nations Office for the Coordination of Humanitarian Affairs
PCBS	Palestinian Central Bureau of Statistics
PCC	Preconception Care
PHC	Primary Health Care
PN	practical nurse
SD	Standard Deviations
SDG`s	Sustainable Development Goals
SDS	Standard Deviation Score
SGA	Short for Gestational Age
SMO	senior medical officer (head of health care facility)
SS	Short Stature
SSN	senior staff nurse
UNICEF	The United Nations International Children's Emergency Fund (The United Nations Children's Fund)
UNRWA	United Nations Relief and Works Agency
WASH	Water, Sanitation and Hygiene
WB	West Bank
WFP	The World Food Programme
WHO	World Health Organization
Wt.	weight

Chapter One

Introduction

1.1 Background

Normal child growth is an ongoing process, relatively slow in pattern, and depends on many factors, including intrinsic and extrinsic determinants at the individual or social level. Therefore monitoring and intervention to manage deviations of this process, especially in the first 1000 days of life, will be highly valuable, especially if the causes were due to malnutrition (Best et al., 2010; Woodruff & Martorell, 2017).

From these deviations, short stature (SS), that is defined as a height (Ht.) two standard deviations (SD) or more below the mean height for people of equivalent sex and chronologic age during a given population (WHO, 2014^b) is a very quick and easy indicator for abnormal child growth.

Many factors are implicated in developing SS, whether at the child or micro level, like lower enrolment weight-for-age, a higher incidence of recurrent infections like diarrhoea or recurrent episodes of acute respiratory infections (ARI) (Arini et al., 2020; CDC, 2013; Checkley et al., 2008; Guerrant et al., 2013; Modern et al., 2020; Prendergast & Humphrey, 2014), a lower protein intake and animal sourced food including milk products (Eaton et al., 2019; Headey et al., 2018) or at extrinsic or macro levels, including family and household factors like living in a household with lower socioeconomic status (Barstow & Rerucha, 2015; Bommer et al., 2019; El-Shafie et al., 2020; Prendergast & Humphrey, 2014), or health care service related factors, therefore it is important to distinguish whether these factors are modifiable or unmodifiable (Investigators, 2017; Kozuki et al., 2015).

Through years of Israeli occupation and blockade, in addition, to continuing intra-Palestinian divisions, the deteriorating economic status in the Gaza Strip (GS) together with the humanitarian and service delivery crisis on the ground, resulted in 80 per cent of the population dependent on international assistance with increasing of impoverishment and unemployment rate reaching 49 percent (one of the highest in the world) (UNRWA, 2021^b).

Therefore, in the Gaza Strip (GS) context, aiming to enhance child health status, many services were adopted at the primary health care (PHC) levels by the United Nations Relief and Works Agency (UNRWA) and the ministry of health (MoH), where the UNRWA is one

of the main health service providers serving the Palestinian refugees in the GS (MoH, 2017; UNICEF, 2019; UNRWA, 2020^a).

The number of Palestine refugees relying on UNRWA for food assistance has increased from fewer than 80,000 in 2000 to more than a million today (UNRWA, 2021^b); moreover, with the appearance of the COVID-19 pandemic, many Palestine refugees were plunged into abject poverty, making them more dependent on UNRWA essential services: health, education, as well as food and cash support (UNRWA, 2020^a).

Therefore, UNRWA adopts many health services whether at the PHC level or at the level of school health service aiming to monitor properly the growth and development of refugee children to meet the challenges and the needs of children in their early childhood life (UNRWA, 2020^a).

At the level of school health service, measuring of height (Ht.) by medical examination of new school entrants is a requirement for acceptance at UNRWA schools, and involves other medical and screening tasks (UNRWA, 2013, 2020^a). While at the level of the PHC the Ht. measurement is integrated through regular child growth checks for children 0-5 years old (UNRWA, 2020^a), but the adherence to this service remain questionable after finishing immunization program that ends at child age of 18 months (DeVoor & Tartir, 2009; UNICEF, 2019). Especially through COVID-19 pandemic.

Ht. measurement is a powerful tool that can sensitively detect disease states or comorbidities and can be used to diagnose growth disorders or to address children's nutritional needs regardless of their ethnicity, socioeconomic status, and type of feeding (de Onis & Branca, 2016; Warrier, V., Krishan, K., Shedge, R., & Kanchan, 2022).

Children affected by stunting can suffer irreversible physical, intellectual and cognitive impacts (Aguayo & Menon, 2016; Alamy & Bengelloun, 2012; Best et al., 2010; de Onis & Branca, 2016; Edward A. Frongillo & Habicht, 2005; Prado & Dewey, 2014; A. D. Rogol, 2020; Sanou et al., 2018; Soliman et al., 2021; Tia Tampy et al., 2020), that accompanies stunted growth. The devastating consequences of stunting can last a lifetime like reduction in adult body size and, subsequently, reduced work capacity and obstetric complications (Soliman et al., 2021), and even affect the next generation (Best et al., 2010; Soliman et al., 2021; UNICEF, 2021^a). So early detection of stunting is of great importance. Where stunting can somehow be manageable and or at least will prevent unpleasant consequences and uncorrectable complications (Best et al., 2010; Woodruff & Martorell, 2017).

High levels of stunting in a country are associated with poor socioeconomic conditions (Jonah et al., 2018), and malnutrition (UNICEF, 2021a), and through COVID-19, these indicators were negatively affected as many others starting from health sectors and the provided services and adherence to these services, in addition to other environmental and socioeconomic indicators and sectors (UNRWA, 2020^a). Furthermore, with the deterioration of the humanitarian, political and economic situation in the GS, malnutrition and stunting indicators are expected to rise, especially by the impact of the pandemic (UNICEF, 2021^a).

Regardless of the type of malnutrition, especially with the spread of the culture of fast food, and increasing pattern of children's favourite salted snacks consumption, that are rich in salt and sodium content and at low prices, which in turn have negative physiological and metabolic effects that may contribute to increasing of SS and stunting rates. Where scientifically known, Food rich in salt and sodium increases the rates of calcium expulsion in the urine (Ticinesi et al., 2016), where calcium is one of the essential compounds in the proper and healthy growth of bones (Skalova et al., 2005), but there is a lack of such studies and researches in the GS.

SS in children is one of the common reasons for referral and seeking medical care services (Allen & Cuttler, 2013; El Mouzan et al., 2011), Thus, SS diagnostic approach, referral system and the medical setting should be properly provided (Maghnie et al., 2018; Oostdijk et al., 2009) by our health care system components.

Evaluation, management processes, and identifying the possible causes of SS are depending on adherence, referral and follow up process and system, which of course will require commitment and wiliness of all stakeholders including the paternal part.

Other than mortality and morbidity among children with bad nutrition and poor growth, the impacts can be classified into short and long-term consequences (de Onis & Branca, 2016; Dewey & Begum, 2011; Soliman et al., 2021), but the nutritional risk is modifiable and can be reduced by the provision of proper nutritional support (de Onis & Branca, 2016; Hersberger et al., 2020) if identified.

In addition to poor nutrition and repeated infection; the inadequate psychosocial stimulation can affect the child's growth and causing stunting (Bogin, 2021). Where, The Gaza Strip (GS), has a history of violence, political armed conflicts, siege, current-day social and economic consequences, making the GS a good environment for fear, and the increasing pattern of anxiety, post-traumatic stress disorders, depression (Veronese et al., 2021), where

emotionally deprived infants and children have slowed growth but are not clearly malnourished (A. D. Rogol, 2020).

Though stunting is not only a physical measure, rather it has multiple purposes at the individual level and also at the public health level, medically, SS can be associated with chronic diseases, and it is also an important indicator that are used to face this problem.

1.2 Problem statement

Stunting remains a major public health problem, particularly in developing countries (de Onis & Branca, 2016; Leroy & Frongillo, 2019), with prevalence ranging from 20 to 30%, with large SS prevalence disparities observed in comparison to other countries in the Middle East or globally, because it has decreased in some countries in the Middle East like Jordan and Lebanon to below 10%, while it is below 2.5% in developed countries (UNICEF, 2021^a; WHO, 2020^a).

It is not matter how tall children can grow, but whether one fails to grow as expected. More than 149 million of the world's under-fives children are stunted. 53% of children are stunted in Asia, and 41% in Africa (UNICEF, 2021^a).

Moreover, it is one of the important risk factors for morbidity and mortality during childhood in Palestine (El Kishawi et al., 2017), which is related and interdependent with other interfering factors, especially factors that could be correctable like nutrition and socioeconomic risk determinants, that can be managed especially if the interventions are directed proactively in the early childhood life (de Onis & Branca, 2016; UNICEF, 2021^a).

The magnitude in the Gaza strip is known about the stunting among children but it was varied by the various studies. Risk factors for stunting in the age group 6-7 years were not studied before. The risk for stunting in children 2-5 years of age was shown to be mother's height and consanguinity (El Kishawi et al., 2017) but not investigated in the age group 6-7 years including their food habits and nutritional status.

1.3 Justification of the study

Short stature in children is a significant public health issue with implications for their overall health, development, and quality of life. Understanding the prevalence and determinants of short stature in specific populations, such as first graders in UNRWA schools in the Gaza Strip, is crucial for identifying at-risk children and implementing targeted interventions to address their needs (Kamath et al., 2010; Kozuki et al., 2015; Maghnie et al., 2018).

The focus on first graders attending UNRWA schools in the Gaza Strip is justified by the unique characteristics of this population. UNRWA schools cater to Palestinian refugee children, who may face specific social, economic, and environmental challenges that can impact their growth and development. Assessing the prevalence and determinants of short stature in this population can provide valuable insights into the health needs and disparities among refugee children in the Gaza Strip (Smith, 1998; UNICEF, 2021a). Where 70% of the population is registered as refugees, with high poverty, food insecurity, and unemployment (Ahmadi & Melgar-Quiñonez, 2019; UNICEF, 2021a; UNRWA, 2020a, 2021b; WFP, 2021a; WHO, 2015), and all of these factors will contribute directly or indirectly in shaping the health status of the child and society.

Despite the importance of short stature as a health indicator, there is a lack of comprehensive data on its prevalence and determinants specifically among first graders in UNRWA schools in the Gaza Strip. By conducting this research, the study aims to bridge this evidence gap and contribute to the existing body of knowledge on short stature in refugee populations, thereby informing future interventions and policies.

By UNRWA reports, the prevalence of stunting among children 0-5 years during 2018, 2019 and 2020 was as follows: 9.17%, 11.0%, and 8.9% consecutively, among 4 UNRWA fields (UNRWA, 2020^a). In the GS the prevalence among children aged <5 years was 8.2%, which makes it the lowest than the average of the other 4 fields (UNRWA, 2020^a). but in other studies, conducted in the GS in 2017 among pre-schooler children 2-5 years, the prevalence of stunting was 19.6% (El Kishawi et al., 2017), supported by other research conducted also in the GS among primary school children with a prevalence of 20.4% (Fanoona, 2019). While in 2014 it was reported 7.4% (PCBS, 2020^b). However, these results indicate an increasing pattern regardless of the range and disparities.

The research findings can inform the development of evidence-based interventions and strategies to address short stature among first graders in UNRWA schools in the Gaza Strip. By identifying the determinants associated with short stature, such as socioeconomic factors, nutritional status, and access to healthcare, the research can guide the design and implementation of targeted interventions aimed at improving growth and overall health outcomes among these children.

The research outcomes can have implications for policy development and decision-making at the regional and national levels. The findings can guide policymakers and stakeholders in

allocating resources, implementing interventions, and addressing the determinants of short stature in UNRWA schools, ultimately leading to improved health outcomes and well-being among first graders in the Gaza Strip.

Overall, conducting research on the prevalence and determinants of short stature among first graders in UNRWA schools in the Gaza Strip is justified by the public health significance, the unique characteristics of the population, the existing evidence gap, the potential for targeted interventions, and the policy implications it holds.

1.4 Overall aim and objectives of the study

1.4.1 Aim

In the GS, few studies have been conducted on stunting among scholar children. Thus, this study aimed to ascertain the magnitude of the short stature represented by the prevalence of SS among first graders in UNRWA schools in the Gaza Strip and to determine the possible associated risk factors.

1.4.2 Objectives of the study

- To estimate the prevalence of short stature (SS) among first graders in UNRWA schools in the Gaza Strip
- To explore determinants (parenteral and childhood) of SS among first graders in UNRWA schools in the Gaza Strip.
- To examine the relationships between socio-demographic, household, family, and health care determinants and SS among first graders in UNRWA schools in the GS.
- To explore the nutritional status among Palestine first grader refugee children in the GS including the food habits, intra and non-intra household food security.
- To propose a group of recommendations to prevent and to improve the status of SS among Palestine refugee children in the GS.

1.5 Research questions

1. What is the prevalence of SS among the first graders by UNRWA schools in the GS?
2. What are the possible determinants of SS?
3. Is there an association between SS and politico-socio-economic status among Palestinian refugee pupils in the GS?

4. Is there an association between SS and food insecurity among Palestinian refugee pupils in the GS?
5. How wide is the gap of assessing the children's anthropometric parameters since finishing their vaccination program? In other words, how far was the adherence of the families to continue seeking this health evaluating issue from PHC?
6. Is there an association between SS and high salted diet (snacks abuse) among Palestinian refugee pupils in the GS?
7. Is there a gap in the referral system?
8. Is there an association between SS and mental and psychological status among Palestinian refugee pupils in the GS?
9. What is the nutrition status among Palestinian refugee pupils in the GS?
10. In households below the poverty/deep poverty line how does SS effect girls vs. boys?

1.6 Context of the study

1.6.1 Gaza Strip and its socio-demographic characteristic

GS is a small piece of land located on the eastern coast of the Mediterranean Sea that borders Egypt on the southwest for 11 kilometres and Israel on the east and north along a 51 km border. Within the southern area of Palestine with more than 2.1 million inhabitants. Divided into five governorates: North Gaza, Gaza City, Mid Zone, Khan Younis, and Rafah (PCBS, 2020^a).

The GS is characterized by high population density with a narrow territory. And is home to a population of roughly 2.1 million people (PCBS, 2020^a), including over 1.4 million Palestine refugees (UNRWA, 2021^b). Moreover, as a sitting, GS has one of the world's greatest population densities. Furthermore, the Strip's extensive Israeli buffer zone keeps much of Gaza's terrain off-limits to Palestinians (UNRWA, 2021^b).

The GS population pyramid is characterized by equally gendered components, male and female, where the Percentage of the Population Below 15 Years is 41.4%, with an Unemployment Rate of 45.1 % for the Population Participated in the labour force Aged 15 Years and over (PCBS, 2017^a).

Years of conflict and blockade have left 80% of the Palestinian population dependent on international aid; whereas continuing intra-Palestinian divisions with superimposing impacts

of the ongoing COVID-19 pandemic have deepened the humanitarian and economic situation (UNRWA, 2021^b).

The GS's economic status and ability to create jobs have been severely harmed, resulting in the impoverishment and marginalization of a highly trained and educated society. According to the World Bank, the average percentage of unemployment in 2018 and before the COVID pandemic was more than 50%, making it one of the greatest in the world (PCBS, 2020^a; UNRWA, 2021^b).

According to the Palestinian Central Bureau of Statistics 2019, one out of three individuals in Palestine were living below the poverty level, which accounts for 29.9%, GS contributed to 53.2%, including GS camps the percentage of poverty is 45.5 %, while, in the West Bank contributed to 13.9 % to the national poverty. Moreover, one out of three individuals in the GS were living below deep poverty (PCBS, 2020^a).

Moreover, Gaza's weak economy, particularly the manufacturing and agriculture sectors, has been badly affected by the continuous power shortage, which has significantly hindered the supply of basic services, particularly health, water, and sanitation services (UNRWA, 2021^b).

1.6.2 United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA):

Since the 1950s, the UNRWA has assisted Palestine refugees in Jordan, Lebanon, Syria, the Gaza Strip, and, the West Bank. Providing essential services like education, sanitation in the camps and health services.

UNRWA Health Programme (HP) continues to deliver comprehensive primary health care (PHC) services to Palestine refugees through its network of 140 Health Centres (HCs) in Jordan, Lebanon, Syria, West Bank, and Gaza (UNRWA, 2020^a), Where refugees represent 70 percent of the GS population, that reached 2.1 million people (UNRWA, 2021^b). And children are an essential part of this population representing 41 percent (PCBS, 2021^c).

Conflict and violence, occupation, high levels of poverty, and pandemics, contribute to the deterioration of the other socioeconomic determinants of health that together threaten the well-being of Palestine refugees in the GS (UNRWA, 2021^b). Where the children are vulnerable.

UNRWA continues to improve school pupils' academic progress, behaviour, and morals. Provide essential primary health care to patients, including psychosocial support, non-

communicable disease screening and treatment, and healthy lifestyle education. Construct essential infrastructure, such as schools and shelters. Improve the quality of its food and financial assistance to the lowest of the poor (UNRWA, 2021^b)

1.6.3 The Situation of Palestinian Refugees in the State of Palestine:

Apart from poverty and unemployment indicators attributable to regional/area variables, where refugees account for roughly two-thirds of the population of GS, there have been no noticeable differences in the demographic and social characteristics of refugees and non-refugees in general (PCBS, 2020^a; WFP, 2021^a).

Almost 40 % of Palestine refugees in Gaza live inside eight recognized Palestine refugee camps known for Poor housing conditions, as well as a lack of infrastructure such as sanitation roads, and power (Anera, 2019; UNRWA, 2020^b).

The GS refugees receive main essential health services by UNRWA PHC centres that are distributed among the five GS provinces, and counting 22 PHC clinics, 11 inside the camps, and the others outside the camps (UNRWA, 2020^b, 2020^a).

In 2017, the poverty rate among refugees was over 39% based on monthly spending habits. This indicates that their monthly household spending was less than the poverty line, which for a Palestinian family of five (two adults and three children) was 2,470 NIS as opposed to 22% for non-refugees. The high unemployment rate in Gaza, where refugees make up two-thirds of the population, is the key factor contributing to the higher poverty rate among refugees than among non-refugees. Whereas just 15.7% of refugees in the West Bank were poor, 54.1% of refugees in Gaza were (PCBS, 2019^a).

The proportion of refugees who were extremely poor was (23 percent). This indicates that, compared to the non-refugee rate of about 12%, their monthly consumption was below the level of extreme poverty, which for a Palestinian family of five (two adults and three youngsters) was 1,974 NIS. In Gaza, 33.5% of refugees lived in extreme poverty, compared to 7.6% of refugees in the West Bank. (PCBS, 2019^a). Which is higher than the national average. Whereas in Palestine, over 29% of the population lived in poverty in 2017 and over 17% of the population lived in extreme poverty (PCBS, 2019^a).

1.6.4 Gaza Strip: brief about health care system and services

Israeli occupation as well as the Palestinian division have weakened and fragmented our Palestinian Healthcare system (PHCS), and divided it into 2 separated systems (West Bank

and Gaza Strip), where gaps and challenges are increased especially in the GS where political, economic, social, and humanitarian conditions are more deteriorated, with limited coordination between its main players (Maghnie et al., 2018; Oostdijk et al., 2009; Slan, 2021).

The main four providers for healthcare services in the GS are as following: Minister of health (MoH), United Nations Relief and Works Agency (UNRWA), Non-Governmental Organizations (NGO) and the private for-profit service providers. In addition to the military medical services that provide some basic health services.

MOH is the main healthcare provider within the governorates; it provides PHC (MoH, 2017), secondary and tertiary services for the whole population. It purchases advanced medical services through referring patients to the neighbouring countries, other private and NGO health care facilities. While UNRWA provides PHC services to the refugee population (UNRWA, 2020^b, 2020^a), and purchases secondary and tertiary care services when enabled. The Palestinian healthcare system is financed by donor contributions, governmental health insurance, and taxes. However, these funding sources have been unable to supply enough revenues to finance the current and developing needs.

Currently, along with limited resources, fragmented health system, dynamic political conditions, and gaps in the coordination between the main health care service providers. The vast majority of donors have shifted most development projects to emergency relief (Pfeiffer, 2001). Serving in under development of health information system and referral system at both regional and national levels (Pfeiffer, 2001).

Due to financial constraints, this economic downturn may have a significant effect on people's ability to obtain healthcare services. In addition, diseases linked to poverty such as malnutrition, iron deficiency anaemia, and sanitation infections would become more prevalent (DeVoor & Tartir, 2009), As a result, there was an increase in the need for UNRWA health services, particularly UNRWA PHC services, which provide primary health care. Or by referring them for additional treatments when they need more complex medical care (UNRWA, 2021^b).

The electronic health records (e-Health) system was developed by UNRWA as part of its private network to enhance the administration and facilitation of healthcare provided to Palestinian refugees. The system was first implemented in 2009 (UNRWA, 2020^a), and by the end of 2017, it had been set up in 129 health facilities, included 3 million patient records,

and processed more than 8 million visits annually. In all 5 UNRWA fields. Where this network has improved the delivery of healthcare (Ballout et al., 2021).

Due to the political situation in Palestine, particularly in the GS, a number of non-governmental organizations (NGOs) are essential in improving children's health and nutrition, such as The Palestinian Territory of Human Charity Association (Ard El Insan Association), which is one of the main organizations in the Gaza strip focusing on nutrition, community health, and common childhood illnesses. Via its two locations in Gaza and Khan Younis, it offers family counselling, preventative and curative care, as well as health education (Ard El Insan, 2021). Also, the Near East Council of Churches/DSPR-Gaza (NECC), provides medical assistance in the GS. At the present, it runs three primary medical clinics in the districts of Shijaia, Darraj, and Kherbet al Adas, providing care to more than 160,000 people. The primary objective of NECC clinics is to offer women and children with health care (NECC, 2021).

1.6.5 The political conflict

The majority of political and military conflicts have significant negative effects on public health, both in terms of population health and the structure, policies, and funding of the healthcare system (Yumnam & Dasgupta, 2017). Since 1948, where the Israeli-Palestinian conflict is.

Geographical access restrictions between Gaza, the West Bank, and East Jerusalem, three of the Palestinian Territories, have an adverse effect on health and wellbeing.

Whereas, given the current geopolitical and demographic circumstances in the GS and its paralyzed economic situation, which is primarily supported by humanitarian and international aid, puts the GS and decision-makers in a greater position to tackle numerous deeply embedded issues and congested situations at all levels, especially following division.

1.6.6 Food

Around a third of the population of Palestine experienced food insecurity prior to the COVID-19 epidemic, with differences between the Gaza Strip and the West Bank. This situation was further exacerbated by rising rates of unemployment and poverty (WFP, 2021^a). Due to the fact that high levels of poverty, high food costs, and economic shocks all have an impact on food insecurity (Ahmadi & Melgar-Quiñonez, 2019).

Food insecurity affects almost similar numbers of Palestinians in the refugee and non-refugee populations, with the number of Palestine refugees getting food help from UNRWA increasing from less than 80,000 in 2000 to more than a million in 2021 (UNRWA, 2021^b), GS, with 70%, and the West Bank, with 11% (PCBS, 2018).

The world community has placed a higher emphasis on nutrition and increased funding for it ever since 2000. UNRWA, NGOs, and USAID all contribute significantly to enhancing maternal and child health, and nutrition, by supporting fortification, as well as micronutrient supplementation. Due to the GS situation as a result of the humanitarian situation. Interventional measures were adopted to prevent and treat micronutrient deficiencies, such as wheat fortification or salt iodization, are included, but there are still gaps and obstacles, such as the lack of a national nutrition surveillance system and a national school meals program (Ard El Insan, 2021; MoH, 2008; NECC, 2021; UNRWA, 2016; USAID, 2021; WFP, 2021^b).

1.7 Operational definitions

SS is defined as height below the third percentile or greater than two standard deviations (SD) below the mean height for chronologic age.

Below the poverty level: This suggests that the monthly consumption of their households was below 2,470 NIS for a Palestinian household of 5 (2 adults and three children) (PCBS, 2017^b).

Below the deep poverty level: this suggests that the monthly consumption of their households was below 1,974 NIS for a Palestinian household of 5 (2 adults and three children) (PCBS, 2017^b).

Intra-household food distribution (IHFD): is defined as inappropriate allocation of food within the household, leading to effects on certain family members. Thus, some individuals may suffer from malnutrition due to the pattern of food distribution within the household.

Dual forms of malnutrition (DFM): coexistence of dual forms of malnutrition (DFM), in the same household, (ex. households with a malnourished child and overweight mother were categorized as DFM).

Exclusive breastfeeding: defined as the practice of only giving an infant breast-milk for the first 6 months of life (no other food or water), as per WHO definition (WHO, 2014a).

Intrinsic determinants (child`s health related factors): the researcher referred to factors that are being or relating to the child himself and causing or manifested by stunting.

Chapters Content:

The first chapter included Background, problem statement, justification, overall aims and objectives, research questions, context of the study, and operational definitions. Where the second chapter included Conceptual framework and Literature Review, while the third chapter contains the methodology. Otherwise the forth chapter included the results combined with discussion as descriptive and inferential results, and was triangulated by the qualitative findings, and was added a small category for rest of the qualitative part findings that the researcher found that these findings are important to mention. Finally the fifth chapter included the conclusions and recommendations.

Chapter Two

Conceptual framework and Literature Review

2.1 Conceptual framework

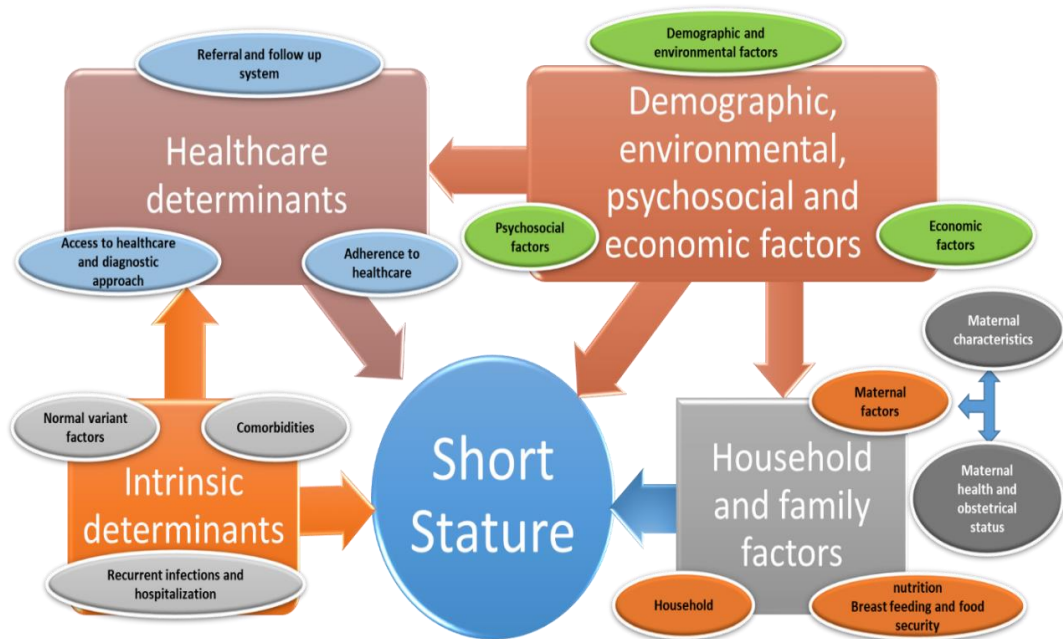


Figure 2.1: This picture summarizes the conceptual framework

2.1.1 Short stature:

Short stature (SS) is defined as having a height (Ht) that is two standard deviations (SD) or less below the mean height for persons of similar sex and chronological age in a given group. Severe SS (stunting) is defined as having a Ht. that is three SD below the mean height for people (WHO, 2015).

2.1.2 Demographic, environmental, psychosocial and economic factors:

* Demographic and environmental factors: age in months, gender, Residency (inside refugee camp, rural area, urban area), water source, sewage system, sanitation system.

* Psychosocial factors: social factors represented by Norms, women status, and psychological and mental assessment (The Strengths and Difficulties Questionnaire (SDQ) will be added to the self-developed questionnaire), exposure to societal violence.

* Economic factors: social support, food assistance and food security, including micronutrients, fruits, milk and its products meat and eggs, support, involvement of the child

in economic activities (while other economic factors will be integrated in the family and household factors).

2.1.3 Healthcare determinants:

Accessibility and availability of health care service, information, diagnostic approach, and the follow up are important for both tracking and managing the SS process; thus this domain was categorized in three essential elements aiming to address the possible gaps in this domain, especially with our known fragmented health care system(the researcher focused mainly on the tracking stunted children who were belonging to UNRWA PHC centres because of availability of electronic medical record and information system where possible and specific answers could be tracked):

- * Factors related to the access to health care system and the diagnostic approach.
- * Referral system including factors related to the sender represented by UNRWA health care MO, factors related to the family actions, factors related to the receiver represented by the specialist or advanced centre MO, and follow up progress.
- * Factors related to the child and his family like adherence to health care service and follow up.

2.1.4 Intrinsic determinants:

Intrinsic determinants include these traits that are “intrinsic” to the child himself rather than being determined by that child’s environment. Including:

- * If he was addressed as a normal variant SS regardless of the type like FSS, CDGP, or idiopathic.
- * Presence of chronic comorbidities not merely the medical ones, rather the mental and psychological disorders.
- * Deviations of child growth could also be affected by recurrent infections and hospitalizations.

2.1.5 Household and family factors:

Household and family factors are those related to the household and family of the child and are his environment where he lives and grow. These factors have an impact on the

child's life progress and development, either increasing or decreasing his likelihood of experiencing growth problems, malnutrition and care practice.

Family factors including mainly maternal factors in addition to the family determinants, including:

2.1.5.1 Maternal factors:

Were categorized in two subgroups:

* First group includes mother's characteristics like: Ht. age, education, knowledge of the mother on malnutrition, occupation.

* And maternal health and obstetric factors, like poor nutrition during preconception (PCC) care and antenatal care (ANC), presence of comorbidities, mental health, ANC complications like Intra uterine growth retard (IUGR) and preterm birth, short birth spacing, delivery number, and breast-feeding status.

2.1.5.2 Household related factors:

Including size of family, and total family income, consanguinity of parents, and place of residence, father characteristics, inappropriate intra-household food allocation that can be manifested or correlated with coexistence of dual forms of malnutrition (DFM) in the same household, poor care practices.

2.1.5.3 Nutrition, Breast feeding and food security:

Including, food and nutrition status, starting from breast feeding and weaning reaching the nutrition practice and behaviours, availability of micronutrients, vitamins, animal food products.

2.2 Literature review

2.2.1 Short stature

Short stature (SS) is defined as having a height (Ht) that is two standard deviations (SD) or less below the mean height for persons of similar sex and chronological age in a given group. Severe SS (stunting) is defined as having a Ht. that is three SD below the mean height for people (WHO, 2015). It shows that the child's growth process isn't going correctly, which might hinder physical and mental growth and development and have long-lasting effects on both the child and the community (Soliman et al., 2021; WHO, 2015). Therefore, in some settings, below -1 SD is addressed as mild stunting assuring to get more attention.

In particular, if a child's height Standard deviation score (SDS) is less than -2 and deviates from the familial background, it will alarm us to look for or to rule out the pathological causes (Grote et al., 2008; Hermanussen & Cole, 2003). It is important to ensure consistent, accurate height measurements and monitoring for children in order to identify the pattern of the (Ht.) growth that could guide us to consider if the cause of SS is due to Not just at the height level (Collett-Solberg et al., 2019).

Further work is needed on the causes, prevention, and early diagnosis, treatment, and management of stunted children due to the increased risk of potentially irreversible loss of development and cognitive capacities as well as increased morbidity and death (Soliman et al., 2021). In order to prevent the effects, it is crucial to determine if the causes of stunting are pathologic or not (de Onis & Branca, 2016).

In the absence of pathological causes, stunting as a process can be regarded as a normal variant, particularly when it is detected after the first year or two of life, such as in familial short stature (FSS), which is genetic, or constitutional short stature (also known as constitutional delay of growth and puberty-CDGP), which are normal non-pathologic variants of growth (Almutairi, 2018). Where the chance of correction remain relatively limited (Collett-Solberg et al., 2019; Rajkumar & Waseem, 2021; A. Rogol, 2016; WHO, 2015).

The most prevalent symptom of child malnutrition is stunting. It perfectly describes social differences and is one of the best overall indicators of a child's wellbeing in childhood (de Onis & Branca, 2016). As a result, managing under nutrition has received more attention in recent years, and eliminating child stunting has been made a worldwide development goal (UNICEF, 2021^a; WHO, 2020^a).

Stunting affects 144.0 million children under the age of five worldwide. Additionally, the frequency and burden of stunting continue to decline. Stunting prevalence decreased from 33 percent to 21.3 percent between 2000 and 2019 (UNICEF, 2021^a; WHO, 2020^a). Furthermore, these figures and the decline in the prevalence of stunting show that this problem is reversible and manageable.

However, despite the decline in the prevalence of stunting worldwide, previous studies in Palestine found that stunting rates through 1996, 2000, and 2004 were rising as follows: Children 2 to 5 years old were subject to rates of 8.2%, 8.3%, and 11.0% (PCBS, 2004), and in 2017 this rate was raised to 19.6% (El Kishawi et al., 2017) among children 2-5 years old, However, the frequency of SS has increased by 17.6% in 2019 since 2014, with moderate and severe SS increasing from 7.4 to 8.7 percent (PCBS, 2021^a). Nonetheless, there were discrepancies in the SS prevalence, with estimates showing a drop from 10.3 to 7.8 since 2012 (UNICEF, 2021^a). Where, it is expected that, the SS prevalence is still increasing in the GS. Especially by the increase of deterioration of the economic status, increased Unemployment, poverty, food insecurity, COVID-19 pandemic...etc.

Stunting is very prevalent in many parts of the world. According to our understanding, SS prevalence ranged from 29–34% in low-income and lower-middle-income countries in 2020. The prevalence of SS was lowest in high-income countries, where it was 3.4%, while it was 10.4% in higher middle-income countries (UNICEF, 2021^a).

According to other recently completed studies in both countries, among school children in Egypt and Jordan, the prevalence was as follows: 17.1% and 4.9% (El-Shafie et al., 2020; Zayed et al., 2016), respectively. In comparison with regional parameters, in Egypt and Jordan, the rate of SS among children under 5 was as follows: 22.3 and 7.3 percent consecutively, with a striking difference in SS percentage among children of both countries (UNICEF, 2021^a).

In Jordan, Variations in height and among school children might be affected by socioeconomic status (Zayed et al., 2016). While in Egypt, the main aetiologies of short stature were considered as FSS (40.8%) and CDGP (24.2%) (El-Shafie et al., 2020). While in GS, the prevalence rate reached 19.6% (El Kishawi et al., 2017) through the same period with still increasing pattern since 1996 where the prevalence was around 8.2% (PCBS, 2004). But in contrast, according to a recently conducted study at the level of UNRWA fields

among first graders by new entrance examination was the prevalence of Stunting 4.3 % (AbuKishk et al., 2020).

Overall, SS is still believed to be a direct result of chronic malnutrition (Engle et al., 2007; E. A. Frongillo & Hanson, 1995), making it a reliable indicator of childhood health and a reliable reflection of a child's nutritional and environmental background (de Onis & Branca, 2016; Soliman et al., 2021). So, it may be thought of as the first step in managing problems with children's health to understand the prevalence of SS.

Furthermore, at the public health level, stunting should take proper priority, where many long term consequences at the level of community will be expected. However, Non-stunted children are also likely to be impacted in communities where stunting is prevalent, meaning that they have not reached their full potential despite their length being above the threshold that classifies them as "stunted" (Bloem, 2013).

2.2.2 Determinants of short stature SS

Brazil's socioeconomic inequality has declined between 1996 and 2007. The percentage of stunted children reduced from 37% to 7.5% between 1974 and 2006-2007. Two-thirds of the decrease can be attributed to advancements in maternal education, family purchasing power, maternity and infant healthcare, as well as access to water supply and sanitary facilities (Monteiro et al., 2010; WHO, 2018). Due to the fact that this successful management, which is not just limited to Brazilian stakeholders, provides a window of opportunity for SS to be managed, it is crucial to identify its prevalence and potential determinants as well as to distinguish between modifiable and non-modifiable factors in order to design interventional programs that will ultimately improve the health status of the community, mother, and child that are also a part of the Sustainable Development Goals (SDG`s) (WHO, 2018).

2.2.2.1 Demographic, environmental, psychosocial and economic factors:

- **Demographic and environmental factors**

Infants aged 6-23 months who reside in rural areas or originate from impoverished households are far more likely than their urban or wealthy peers to be fed a poor diet, according to studies and UNICEF data. For instance, in 2020, the percentage of kids who received the minimum amount of recommended food categories in urban areas (39%) was twice as high as the percentage of kids who received the necessary amount in rural areas

(12%). (23 percent) (Barstow & Rerucha, 2015; Bommer et al., 2019; El-Shafie et al., 2020; Motbainor et al., 2015; Prendergast & Humphrey, 2014; UNICEF, 2021^b; WHO, 2020^b).

Stunting is a prevalent and complicated issue having broad implications for those affected as well as for society at large. More efforts that go beyond the nutrition industry are needed to address the root causes of malnutrition in order to accelerate the process of eliminating stunting. In high-burden areas like South Asia and Sub-Saharan Africa, there is growing interest in the ways that water, sanitation, and hygiene (WASH) activities can help reduce stunting (Cumming & Cairncross, 2016; Roba et al., 2021; Torlesse et al., 2016). Indeed, studies show that poor WASH conditions have a significant negative impact on children's growth and development, not just because of prolonged exposure to intestinal infections but also because of larger social and economic reasons. Hereby, globally, there was a call for universal access to these services which was adopted by the SDGs, which should be achieved to optimize WASH's ability to reduce stunting (Cumming & Cairncross, 2016).

Since the 1950s, the UNRWA has provided essential services to camp residents, including education, camp sanitation, and health care. However, focusing on the Gaza situation, the region's weak economy along with a persistent power interruption has severely harmed many industries, especially those in manufacturing and agriculture, and has led to a significant decrease in the provision of essential services, especially in the areas of health, water, and sanitation (UNRWA, 2021^b). Moreover, Palestinian refugees are among the most at risk since they live in congested camps with poor sanitation and are always in danger from political unrest, protracted wars, and service blockades. Especially through the COVID-19 outbreak (UNRWA, 2020^a).

There are several causes of nutritional problems, and they differ by country and socioeconomic status. Poor eating habits, poverty, ignorance, and lack of access to clean water and medical care are the main causes of under nutrition. (Musaiger et al., 2011).

- **Psychosocial factors**

There were also a paradox relationship between stunting and the mental status of children, in this way, the first part; insufficient psychosocial stimulation can affect the child's growth and cause stunting (Bogin, 2021), especially in our context (GS), with history of violence, political armed conflicts, siege, current-day social and economic consequences, making the GS a good environment for fear, and the increasing pattern of anxiety, post-traumatic stress disorders, depression (Veronese et al., 2021), and also, emotionally deprived infants and children have stunted growth (A. D. Rogol, 2020). While in the second part, Children

affected by stunting might experience irreparable physical, intellectual and cognitive consequences (Best et al., 2010; de Onis & Branca, 2016; Edward A. Frongillo & Habicht, 2005; Prado & Dewey, 2014; A. D. Rogol, 2020; Soliman et al., 2021) that follows stunted growth.

- **Economic factors:**

Food systems, supply, affordability, diet quality, and safety are influencing human health in direct or indirect ways and can result in malnutrition, which can be seen in children's growth stunting (Fanzo et al., 2021) This is especially relevant in the actual GS circumstances, at the level of the economic, political, pandemic, and environmental determinants that are interrelated and affecting food and nutrition.

Particularly in low- and middle-income nations, the availability and cost of food within a certain geographic region are examples of external (non-intra-household) factors that affect access to food. The food environment can be summed up as the diversity of foods that are offered, their cost, ease of use, and desirability. Not just "quality," but also "convenience" and "desirability." Consumption is influenced by these four factors. Policy and sociocultural variables have an impact on these four aspects of the food environment. (Fanzo et al., 2021; Herforth & Ahmed, 2015; Turner et al., 2018).

Living in a household with lower socioeconomic status (Barstow & Rerucha, 2015; Bommer et al., 2019; El-Shafie et al., 2020; Prendergast & Humphrey, 2014), or consuming less animal-sourced food, or milk products (Dickin et al., 2021; Eaton et al., 2019; Headey et al., 2018; UNICEF, 2016), increases the risk of developing stunted growth. In the GS, where these parameters are still progressing due to years of conflict and blockade, as well as ongoing intra-Palestinian divisions, this will exacerbate the humanitarian and service delivery crisis on the ground. As a result, 80% of the population is now dependent on aid from abroad, poverty is growing, and the unemployment rate has reached 49% (one of the highest in the world) (UNRWA, 2021^b).

More than a million Palestine refugees now depend on UNRWA for food assistance, up from less than a million in 2000 (UNRWA, 2021^b); in addition, the COVID-19 pandemic caused many Palestine refugees to become extremely poor, increasing their reliance on UNRWA's essential services, including food, health care, and education (UNRWA, 2020^a).

To stop population spread during a coronavirus outbreak, strict lockdown protocols were put in place. A tense environment has resulted from this. After the increase, shorter lockdowns were instituted, but because the community is not provided with any economic protection, this has led to protests. The country as a whole has been decimated as a result of the financial and social ramifications (Hammoudeh et al., 2020).

More than a million Palestinian refugees are currently receiving food aid from UNRWA (UNRWA, 2021^b), where the levels of food insecurity reached 11% in the West Bank and 70% in the GS (PCBS, 2018). With an economy that is becoming more unstable and a weaker, and families' capacity for resilience is deteriorating, which increase the vulnerability of certain populations, particularly children. In its turn, Child labour has become a common means of escaping poverty and obtaining daily essentials, especially for children who work in dangerous industries (OCHA, 2019).

2.2.2.2 Healthcare determinants:

This domain was categorized in three essential elements aiming to address the possible gaps in this domain, especially with our known fragmented health care system (Slan, 2021; WHO, 2019) where majority of new entrants children were refugees, and belonging to UNRWA PHC centres where the availability of electronic medical record (E-health) will give the possibility to researcher for some kinds of data validation like birth wt., and ht. :

- **Factors related to the access to health care system and the diagnostic approach.**

A comprehensive multi-disciplinary, multi-integrated, and multi-interacted system and institutions that should work with a distinct vision under the public health umbrella to serve the Palestinian citizen while taking into consideration equity, equality, efficiency, effectiveness, accessibility, and affordability, where a lack of resources and effective coordination between the health sectors and providers will affect the goals of the health care system and its effectiveness (Giacaman et al., 2009; WHO, 2007, 2019).

A health system includes all the activities whose primary purpose is to promote, restore or maintain health (WHO, 2007). Therefore accessibility and availability of health care service, information, diagnostic approach, and the follow up are important (WHO, 2007) for both tracking and managing the stunting process (Collett-Solberg et al., 2019).

Stunting as a health issue requires investigations, assessments, referrals in some cases, effective follow-up, and medications that cannot be provided by all health service providers

including public, UNRWA, and NGO's health services. The quality of health services that can be provided for children, especially when needed in the GS, remains in question (Giacaman et al., 2009; Waterston & Nasser, 2017).

Regarding spatial and physical access in the GS to the health care service providers is expected to be relatively well, especially for growth monitoring, because the growth monitoring is integrated together with the immunization program, especially at the level of UNRWA PHC service until the age of 5 years (UNRWA, 2020^a), while at the level of MoH PHC system; monitoring of growth is integrated to the age of 18 months where last immunization dose should be administered, but recently the closure of 23 out of 49 MoH PHC clinics has raised the demand for remaining primary healthcare services, particularly from UNRWA and national non-governmental organizations (NGOs) (OCHA, 2020). but the adherence to this service remains questionable after finishing the immunization program that ends at child age of 18 months (DeVoir & Tartir, 2009; MoH, 2017; UNICEF, 2019). Especially trough COVID-19 pandemic.

The well-known fragmented Palestinian health-care system (Slan, 2021) as a whole is heavily reliant on donors, with disparities in service delivery between public providers, UNRWA's primary-care delivery to refugees, non-governmental organizations, and private organizations. with lack of coordination between these health care providers, and with limitation in providing some health care service, whereby the Palestinian Ministry of Health spends more than a third of its budget (34%), on non-State healthcare providers (Maghnie et al., 2018; Oostdijk et al., 2009).

Due to the ongoing discovery of numerous novel genetic disorders linked to SS, the differential diagnosis of stunting is dynamic; however, fundamental diagnostic protocols and systems, such as medical history, physical examination, assessment of the growth curve, radiological assessment, and laboratory screening, should be developed. that was suggested to be created as a step-by-step, systematic diagnostic approach, consisting of gathering diagnostic information and clues, radiological and laboratory tests, interpretation of the information and results (Grimberg et al., 2017; Wit et al., 2019). And may need, more advanced biochemical testing, additional genetic or hormonal study, which are afforded by private sectors or advanced centres beyond the GS borders.

Basically; at the level of PHC sitting, stunting should be assessed in order to determine its severity in addition to rule out the pathological causes, starting with the planning of the necessary intervention measures. including medical history, initial interpretation of the expansion chart and growth potential (based on measured heights of the child's parents), calculation of height velocity (HV), nutrition status and basic laboratory investigations, before referral for further management and investigations especially if systemic or endocrine disease are suspected, that can all be done within the PHC setting (Richmond et al., 2019; A. Rogol, 2016), or at the public level where the well-directed interventions will benefit the household and socio-demographical causes (WHO, 2020^a). However; The most significant methods for determining the causes of short stature are history, physical examination, and auxology (Collett-Solberg et al., 2019).

- **Referral system, follow up system:**

SS is the most common cause of a referral to a paediatric endocrinologist. Stunted children should be referred to a professional to get the cause of their stunted growth diagnosed. Referral policies differ depending on the country, the organization, and the patient's characteristics, but they must be appropriate to prevent overtaxing healthcare systems. SS should be diagnosed, and if necessary, GH or non-GH treatment should start as soon as feasible. Regardless of the cause of SS, it should be identified whether it is treatable or not. (Grimberg et al., 2017; Labarta et al., 2021; Maghnie et al., 2018; Oostdijk et al., 2009).

In order to give the proper management, clinicians must rely on a variety of parameters for referral and diagnosis of causes of short stature in children (Grimberg et al., 2017; Labarta et al., 2021; Maghnie et al., 2018; Oostdijk et al., 2009). Therefore this process necessitates presence of clear track for referral and follow up especially in absence of a unique medical electronic health care system (Labarta et al., 2021; Maghnie et al., 2018) where public health system did not integrate this issue despite the UNRWA has developed its own medical electronic system (Ballout et al., 2021), in addition; disparities in service delivery between Palestinian health care service providers and lack of coordination between them (Giacaman et al., 2009; Slan, 2021) make the diagnosis and referral process difficult to track to the end.

- **Factors related to the child and his family like adherence to health care service and instructions:**

Monitoring a child's growth and development is combined with the immunization program, particularly at the level of UNRWA PHC service until the age of 5 years (UNRWA, 2020^a), while at the level of the MoH-PHC system, monitoring of growth is combined with the immunization program until the age of 18 months, when the last dose of immunization should be administered. However, the closure of 23 out of 49 MoH-PHC clinics recently has increased demand for the remaining primary (OCHA, 2020). nonetheless, the continuation of this service is still in doubt following the completion of the child's 18-month-old immunization schedule (DeVoir & Tartir, 2009; UNICEF, 2019). Particularly during the COVID-19 pandemic. Furthermore, tracking of the adherence can be estimated by regular child`s annual assessment adherence, where also exploring of the adherence to the follow up as detected stunted child is important, because it is a crucial part of the management process especially in child`s early life (Best et al., 2010; Collett-Solberg et al., 2019; WHO, 2007; Woodruff & Martorell, 2017).

2.2.2.3 Intrinsic determinants:

- **Normal variants SS: If he was addressed as a normal variant stunting regardless of the type like FSS, CDGP, or idiopathic:**

In the absence of pathological causes, stunting can be regarded as a normal variant, especially if it is discovered after the first year or two of life. Examples of such normal non-pathologic growth variants include familial short stature (FSS), which is a genetic condition, and constitutional short stature, also known as constitutional delay of growth and puberty (CDGP) (Almutairi, 2018). Despite the little likelihood of correction (Collett-Solberg et al., 2019; Rajkumar & Waseem, 2021; A. Rogol, 2016; WHO, 2015). However it will be useful to know how big the determinants are.

Numerous reports and studies are keeping an eye on a variety of public health issues, such as stunting and malnutrition, both globally and in the Palestinian territories, including the GS context (El Kishawi et al., 2017; Fanoona, 2019; PCBS, 2020^b; UNRWA, 2020^a), but a complete picture of the potential causes and determinates of stunting is not specifically described. As a result, determining the prevalence of stunting as a public health issue is important Whatever the causes of SS, whether they are correctable or not, both can be improved (Kamath et al., 2010; Kozuki et al., 2015; Maghnie et al., 2018).

Early detection of stunting is crucial, especially in the early years of a child's life when it may be possible to manage it and/or at least raise the likelihood of preventing unpleasant outcomes and/or irreversible issues (Best et al., 2010; Woodruff & Martorell, 2017). Both on an individual (kid) and a collective level.

Regardless of the cause of the stunted growth, modifiable or non-modifiable intrinsic or extrinsic factors, the child can find himself as a victim for unhealthy diets or practices; that can aggravate manifesting of SS, whereby with the development of the culture of fast food, and expanding pattern of children's favourite salty snacks consumption, at low costs, where scientifically thought the metabolic mechanism of sodium (Na) help in raising calcium expulsion in the urine (Ticinesi et al., 2016), Calcium is a vital component in bone formation and development (Skalova et al., 2005; Skálová & Chládek, 2004), leading to the increase in the incidence of SS and stunting. However, in the GS, there is a lack of such studies and investigations.

At the level of our region, the prevalence rates of stunting in Egypt and Jordan among children below 5, were as following 22.3 and 7.3 percent consecutively, with remarkable disparities (UNICEF, 2021a), and according to other recently conducted studies in both countries, among school children in Egypt and Jordan; the prevalence of stunting was as following 17.1 % and 4.9 % respectively (El-Shafie et al., 2020; Zayed et al., 2016).

In Jordan, Variations in height and among school children might be affected by socioeconomic status (Zayed et al., 2016). While in Egypt, the main aetiologies of short stature were considered as FSS (40.8%) and CDGP (24.2%) (El-Shafie et al., 2020).

- **Presence of chronic comorbidities not merely the medical ones, rather the mental and psychological disorders:**

Almost any major condition is one of the main reasons for development failure. Children with acute or chronic illnesses were found to have issues with growth and development due to higher energy requirements or nutrition (e.g., decreased intake or malabsorption). The normal development rate is affected by radiation therapy, glucocorticoids, and stimulants used to treat attention deficit disorder (mostly transient and it may have a small lasting impact if treatment is prolonged).

As a result, the child must get regular, accurate height measures and monitoring to detect the pattern of height growth and ascertain whether or not the reason for stunting is pathological. For instance, if the child's height Standard Deviation Score (SDS) is less than -2 and it differs

from what is expected based on their family history, it will prompt us to investigate or rule out pathological causes (Grote et al., 2008; Hermanussen & Cole, 2003). The benefit and chance of interventions succeeding at the level of the child's health state, not just at the Ht. correction level will increase with the identification of these pathological causes (Collett-Solberg et al., 2019).

Because linear growth retardation (also known as stunting) is linked to chronic diseases, reduced adult earnings, and delayed infant development, it can be used to predict these and other outcomes. where stunting may result from or be a symptom of chronic conditions (Leroy & Frongillo, 2019). However, in addition to the normal forms of stunting, such as familial (genetic) short stature and CDGP, a variety of pathological conditions, such as cancer, gastrointestinal disorders, immunologic disorders, pulmonary disorders, cardiac diseases, and gastrointestinal disorders, can also result in stunting (Almutairi, 2018; Leroy & Frongillo, 2019).

In the GS context, there is a lack of studies that studying the coexistence of relationship between the chronic comorbidities and stunting of growth by children, may be due to absence of health electronic medical record and health information system, where data can be stored and studied. However in recent research about cystic fibrosis (CF) was revealed close correlation of this autosomal recessive disorder with SS, whereby the anthropometric measurements most CF cases who had short stature (86%) (F. A. Sharif et al., 2014), while in another research conducted also in the GS, the children who were known with chronic comorbidities were excluded from the study`s population (El Kishawi et al., 2017).

There was also a paradox relationship between stunting and the mental status of children, in this way, the first part; insufficient psychosocial stimulation can affect the child's growth and cause stunting (Bogin, 2021), especially in our context (GS), with history of violence, political armed conflicts, siege, current-day social and economic consequences, making the GS a good environment for fear, and the increasing pattern of anxiety, post-traumatic stress disorders, depression (Veronese et al., 2021), and also, emotionally deprived infants and children have stunted growth (A. D. Rogol, 2020). While in the second part, Children affected by stunting can suffer irreversible physical, intellectual and cognitive impacts (Best et al., 2010; de Onis & Branca, 2016; Edward A. Frongillo & Habicht, 2005; Prado & Dewey, 2014; A. D. Rogol, 2020; Soliman et al., 2021) that accompanies stunted growth.

- **Deviations of child growth could also be affected by recurrent infections and hospitalizations:**

Malnutrition, a lack of psychosocial stimulation, or an illness can all lead to stunting, (Bogin, 2021; Checkley et al., 2008; WHO, 2018). According to studies, recurring infections like diarrhoea and ARI cause toddlers to become stunted (Checkley et al., 2008; Modern et al., 2020). Where stunting, ARI, and diarrhoea are linked in children under five years old (Checkley et al., 2008; Guerrant et al., 2013; Modern et al., 2020).

This growth limitation is now one of the dietary issues facing children worldwide. Where globally, 144.0 million children under 5 suffer from stunting. That decreased as a prevalence from 33 percent to 21.3 percent between 2000 and 2019 (UNICEF, 2021a; WHO, 2020a). where diarrhoea was mentioned in 2013 as the global killer, where more than 800 thousands child die every year (CDC, 2013). And in 2017 was decreased from 11 % to 8 % and was considered as a leading killer of young children (UNICEF, 2017). However, higher incidence or recurrent infections represented by for example: 3 times or more diarrhoea episodes per annum (WHO, 2017), or more than 2 recurrent urinary tract infection per year (Larcombe, 2015), 6 respiratory infections per annum, or ≥ 1 respiratory infections per month involving the upper airways, or ≥ 3 respiratory infections per annum involving the lower airways (Jesenak et al., 2011), are related to stunting and is dependent on the frequency and duration of these episodes of infection (Arini et al., 2020).

2.2.2.4 Household and family factors:

Family factors including mainly maternal factors in addition to the family determinants, including:

- **Maternal factors:**

Were categorized in two subgroups:

- **First group includes mother`s characteristics like: Ht., age, education, knowledge of the mother on malnutrition, occupation.**

The importance of maternal factors in the development of malnutrition features, including SS, has been well documented in the literature, particularly in low- and middle-income countries. These factors include the mother's status as a mother along with her obstetrical and medical health status, as well as her role as the primary household caregiver beginning

with preconception care, antenatal care, her educational status, her height and nutrition status, care practices, and breastfeeding (Bommer et al., 2019; Investigators, 2017; Motbainor et al., 2015; Roba et al., 2021; Sanou et al., 2018; Vollmer et al., 2017; Wibowo et al., 2015; Wolde et al., 2015).

Children born to short mothers are more likely to develop stunting, due to many factors that can be related to genetic origin, but also linear growth retardation and stunting are intrinsically linked to difficult births and poor birth outcomes where short mothers can develop them (Leroy & Frongillo, 2019). However, through one study conducted in the GS, the overall incidence of stunting was 19.6%, whereby shorter women were found having increase the risk of stunting in preschool children. Children born to moms who were 1.55–1.60 m or 1.55 m tall were more likely to be stunted ($p = 0.008$) or ($p 0.001$) than children born to mothers who were >1.60 m tall (El Kishawi et al., 2017).

Studies suggesting high importance of the mother's nutrition status and her knowledge and awareness about the nutrition that can be linked to her education level, and their relationship with Stunting and child's growth progress and nutritional status, (Bommer et al., 2019; Motbainor et al., 2015; Sanou et al., 2018; Vollmer et al., 2017; Wolde et al., 2015). Because mother is the main player in enhancing the intra-household food security or at least in my view point. Whereby presence of dual forms of malnutrition (DFM) especially in presence of over weighted or obese mothers with stunted children, or others in the same household may reflect inefficient intra-household food distribution (IHFD), indicating the importance and/or gaps in nutritional education and awareness at the household level (Roba et al., 2021; Wibowo et al., 2015).

Increased maternal education status reduces malnutrition and stunting disorders either directly by raising maternal awareness and information levels, which will undoubtedly improve the quality of life as a mother and a woman, or indirectly by reducing the likelihood of early marriage or increasing her chance of getting a job. Studies have shown the importance of mothers' education levels and nutrition status in relation to stunting (Bommer et al., 2019; Motbainor et al., 2015; Sanou et al., 2018; Vollmer et al., 2017; Wolde et al., 2015).

*** And maternal health and obstetric factors, like poor nutrition during preconception (PCC) care and antenatal care (ANC), presence of comorbidities, mental health, ANC complications like Intra uterine growth retard (IUGR) and preterm birth, short birth spacing, delivery number, and breast-feeding status.**

linear growth retardation is a cause of difficult births and poor birth outcomes (Leroy & Frongillo, 2019). Where Stunting is the largely irreversible outcome of poor nutrition and infection during the first 1000 days from conception to a child's second birthday (Best et al., 2010; Woodruff & Martorell, 2017).

Stunting is a problem in low- and middle-income countries, as is widely known. Moreover, prenatal growth restriction and low birth weight are frequent in these areas, which adds to the malnutrition of children. Whereas, according to a study done in 2014, there is a strong link between short for gestational age (SGA) and premature delivery (Christian, 2014; Investigators, 2017), as well as the ensuing stunting and wasting in infants. In comparison to term adequate growth for gestational age, the odds ratio (OR) for stunting related to AGA-preterm, SGA-term, and SGA-preterm was 1.94 (1.59-2.36), 2.82 (2.40-3.32), and 4.98 (3.79-6.55), respectively (AGA). Therefore, these relationships suggest that childhood malnutrition may have its origins in part during the foetal stage, indicating the need for intervention throughout pregnancy and maybe even before conception (Christian, 2014).

Prenatal supplementation with a balanced calorie and protein intake, iron-folic acid, and a variety of micronutrients have all been shown to have an impact on foetal growth. These interventions, as well as adolescent nutrition in general and adolescent nutrition in particular before marriage, are highly regarded for their positive impacts and benefits (Christian, 2014). because a child's nutritional state begins throughout pregnancy rather than at delivery (Best et al., 2010; Woodruff & Martorell, 2017).

- **Home environment:**

Including the size of the family, total family income, consanguinity of parents, place of residence, father characteristics, inappropriate intra-household food allocation that can be manifested or correlated with the coexistence of dual forms of malnutrition (DFM) in the same household, poor care practices

Water, sanitation, and hygiene are some of the essentials for childcare (WASH), Therefore, the lack of these factors would significantly harm a child's growth and development,

beginning with continual exposure to enteric infections and ending with a delay in the growth parameters, as shown by previous studies (Cumming & Cairncross, 2016; Torlesse et al., 2016).

Many families, particularly in Gaza, continued to use unhealthy coping mechanisms to deal with ongoing food shortages. In Gaza, 82% of people consumed less appetizing or inferior food, 66% bought food on credit, and 49% borrowed money from family or friends or asked for assistance. In contrast, the situation in the West Bank was better than it was in the GS, with only 21% of households borrowing or begging for food and 31% of households consuming less palatable or inferior food. While just 12% of people in Gaza and 11% of people in the West Bank claimed to have increased their use of food credit recently (WFP, 2021^a).

Unfortunately, given the lack of a nutrition monitoring system and little research on food intake and nutritional condition of family members. The effectiveness of food security remains ambiguous, as the presence of dual forms of malnutrition (DFM) in the same household may reflect inefficient intra-household food distribution (IHFD), as previous research has demonstrated a coexistence of IHFD and DFM, indicating the importance and/or gaps in nutritional education and awareness at the household level (Wibowo et al., 2015). Additionally, the mechanism for ensuring intra-household security.

In the GS context, with increasing pattern of poverty and unemployment rates (WFP, 2021^a), where food insecurity is influenced by high poverty rates, high food prices, and economic shocks (Ahmadi & Melgar-Quiñonez, 2019). The percentage of refugees living in deep poverty was (23 percent). This means that their monthly consumption was below the deep poverty threshold, which was 1,974 NIS for a Palestinian family of five (two adults and three children), whereas the rate of non-refugees was around 12%. In the West Bank, 7.6% of refugees lived in extreme poverty, whereas in Gaza, 33.5 percent lived in extreme poverty (PCBS, 2019^a). Which contribute together with other risk factors such paternal consanguinity, this combined increases the likelihood of having stunted development and other malnutrition-related characteristics in offspring ($p = 0.015$) (El Kishawi et al., 2017). Social norms may be relevant in this case. To determine the services and interventions that may be offered, however, the GS context urgently has to be re-evaluated at all levels and sectors. This is especially true given the limited resources and the deteriorating political and economic circumstances.

- **Nutrition, Breast feeding and food security:**

One of the most effective tools available to policymakers for enhancing the health of their populations and economies is increased rates of exclusive breastfeeding, which can help accelerate progress toward other global nutrition targets (stunting, anaemia in women of reproductive age, low birth weight, childhood obesity, and wasting) (WHO, 2014a). In contrast, practically all children in the GS were nursed, with just 24.4% receiving breast milk exclusively for up to 6 months, according to the most recent study that addressed breastfeeding in the setting (El Kishawi et al., 2017).

The global nutritional crisis has not significantly improved in the last ten years as a result of increasing poverty, inequality, violence, climatically-related disasters, and health emergencies like the COVID-19 pandemic. However, "the life-threatening effects of insufficient and poor nutrition affect millions of children worldwide. About a third of children aged 6 to 23 months ingest the minimum number of food groups required for growth, according to the report's survey of 91 nations. Hardly half of these youngsters receive the minimum number of meals per day that are advised (UNICEF, 2021^b; WHO, 2020^b).

Several families have persisted in using unhealthy coping techniques to deal with their food poverty, especially in Gaza. In Gaza, 82% of people consumed inferior or low-quality food, 66% bought food on credit, and 49% either borrowed money from family or friends or asked for assistance with food support. In contrast, the situation was better on the West Bank, where 31% of households consumed inferior or less favoured food, 32% financed their food purchases, and 21% turned to borrowing or begging. While 11% and 12%, respectively, of West Bank and Gaza residents reported a rise in recent food credit purchases (WFP, 2021^a).

Regrettably, there is a lack of research on family members' food intake and nutritional health, as well as a lack of a nutrition surveillance system. The effectiveness of food security is still debatable, and the coexistence of dual forms of malnutrition (DFM) in the same household can be a sign of improper intra-household food distribution (IHFD). Previous research has shown that IHFD and DFM are related, highlighting the significance of and/or the gaps in nutritional education and awareness at the household level (Wibowo et al., 2015). Also, there is a system in place to ensure intra-household security.

The report urges governments, donors, civil society groups, and development actors to work together to transform the food, health, and social protection systems by carrying out crucial actions like boosting the availability and affordability of nutritious foods, such as fruits, vegetables, eggs, fish meat, and fortified foods, by incentivizing their production, distribution, and retailing. Establishing national laws and regulations to protect kids from dangerously processed and ultra-processed foods and drinks, as well as to stop damaging marketing strategies aimed at kids and their families. increasing the attractiveness of wholesome foods by reaching out to parents and kids through a range of media, including digital media, with straightforward (UNICEF, 2021^b). Many studies have found that food variety and residential area strongly predict stunting (P 0.05). The average increase in child height-for-age predicted by an increase in dietary diversity of one unit was 0.039 (confidence interval [CI]: 0.007, 0.070) (Motbainor et al., 2015).

There are two categories of nutrition-related diseases: those associated with poor nutrient intakes and unhealthy eating patterns, such as micronutrient deficiencies and early childhood growth retardation (Motbainor et al., 2015), and those associated with alterations in lifestyle, such as osteoporosis and obesity (diet-related non-communicable diseases). There are several causes of nutritional problems, and they differ by country and socioeconomic status. Poor eating habits, poverty, ignorance, and lack of access to clean water and medical care are the main causes of under nutrition (Musaiger et al., 2011).

One of the most important nutritional problems facing the Arab world and the Eastern Mediterranean Region (EMR) is micronutrient deficiency. Many EMR countries have been shown to have low amounts of iron, iodine, zinc, calcium, folate, and vitamins A and D, especially in children and women of reproductive age (WHO, 2020^b). While some micronutrients, but not all, are fortified in wheat flour and salt in Palestine in response to this public health issue, and this has significantly improved the micronutrient status of Palestinian children, more intensive programs and ambitious methods are still needed (Hammoudeh et al., 2020).

As a result, additional complementary and additive actions such as research promotion, dietary diversity, supplementation, and monitoring of school canteens, and the phenomenon of vendors at school doors are still required. Also, ministries work together with the local food industry and agriculture system to direct food production and provide nutritious food items (Bernal et al., 2014; Motbainor et al., 2015). Before adolescent girls start having

children, these programs should also incorporate dietary interventions for them (Hammoudeh et al., 2020). Also, whether pre-schoolers or school-age youngsters, at both levels. when early dietary interventions for remedial or preventative purposes are very valuable (Best et al., 2010; Woodruff & Martorell, 2017). In contrast, this intervention can stop the negative effects on a child's physical, mental health, and school performance (Bernal et al., 2014; Zhang & Yang, 2019).

Chapter Three

Methodology

This study was conducted in the five GS governorates, namely North Gaza, Gaza City, Middle Area, Khan Younis, and Rafah among refugee first graders in all UNRWA schools in these governorates. The classification of areas was based on the UNRWA education program classification that contains eleven education areas, namely as follows: B/Hanon & B/Lahia, Jabalia, South Gaza, East Gaza, West Gaza, East Middle, West Middle, East Khan Younis, West Khan Younis, North Rafah, and South Rafah.

The study included around 33,000 first-grader pupils, in all Gaza UNRWA education areas and selected a randomly proportional sample, from randomly selected first-grader UNRWA schools in each area after gender-based stratification. The study protocol was analysed and approved by the Institutional ethical committee and review board. Study protocol was explained to the pupil's families and written consent will be obtained before enrolment.

3.1 Study Design

The design of the study is a descriptive, analytic, and triangulated cross-sectional design. Cross-sectional studies have several characteristics that can be advantageous: time savings, low cost, and the ability to explain a phenomenon and its variations. In addition, if the sample of cross-sectional designs is drawn in a representative way, the findings of the study could be generalized.

The stunting manifest is interdependent with many mutual interfering factors, thus aiming to explore this process, it was necessary to use the methodological triangulation method, to find out the possible gaps and to assess possible determinants that are associated with stunting by the combination of quantitative paradigm using interviews and mothers self-administered questionnaires with child's mother; and qualitative paradigms using key informants interviews with stunted children's parents (mother is preferable) and health care service providers at different managerial levels and positions in UNRWA health program.

3.2 Study Setting

The study took place at the UNRWA schools distributed across the 5 governorates of the GS in eleven education areas and at UNRWA health care centres distributed in five GS governorates with 11 PHCs inside the refugee camps, and the others outside the camps.

3.3 Study Population

The study has two aspects (quantitative and qualitative) and it will include three populations:

3.3.1 Quantitative target population

A representative sample was taken from the schools according to multistage proportional stratified sampling. The target population included nearly 33.000 first-grader pupils, aged 6-7 years old, registered, and attending UNRWA schools during the scholastic year 2022-2023 that were examined through new entrants' examination by UNRWA school health teams. The distribution of pupils should be provided by the UNRWA education program:

Table 3.1: distribution of first grader UNRWA schools and pupils among education areas.

	Name of education area	Number of schools	Number of pupils
1	B/Hanon & B/Lahia	10	3584
2	Jabalia	14	2495
3	South Gaza	13	3533
4	West Gaza	14	2505
5	East Gaza	10	2123
6	West Middle	14	3584
7	East Middle	15	2981
8	West Khan Younis	14	3049
9	East Khan Younis	14	3535
10	South Rafah	11	2844
11	North Rafah	10	2828
	Total	139	33061

3.3.2 Qualitative target population

The qualitative target population included two populations: UNRWA health care service providers (at PHC and school health teams) and stunting children's Mothers.

3.3.2.1 Health care service providers at UNRWA health care system,

At the level of UNRWA PHC centres and health program:

Distributed in five GS governorates, 10 PHC are inside the refugee camps and the others are outside the camps. The key informants included 2 senior medical officers (SMOs), one SMO deputy, 2 medical officers (MO), 2 school medical officers, 2 practical nurses (PN), and one senior staff nurse (SSN), who have either experience and working in the stations of child growth and development monitoring which is linked with immunization or face the outcomes represented by early school-aged children.

Stunting children's Mothers:

The key informants included Mothers of already detected stunted child.

3.4 Study period

The study was performed in 12 months: starting in April 2022 and finalized through March 2023. Annex (1) describes the activities of the research and expected duration for each activity.

3.5 Sampling

3.5.1 Sample calculation

3.5.1.1 Quantitative part

The researcher used an online Open-epi sample size statistical calculator Version: Build 7.2.5 (last update was November 23, 2021) that is an open-source collection of interoperable software tools for epidemiologic statistics, public health practitioners, and researchers around the world. The quantitative sample size equals 380 at a 95% confidence interval and a default prevalence of 50%. (Annex 2). Accounting for an attrition rate of 20.0%, the total number of participants was calculated as follows: $380 + (0.20 \times 380) = 456$, Therefore the sample size was increased to 456 participants, supposed to be recruited for the study from the five different geographical areas in the GS, represented by 11 UNRWA education areas. Whereby the collected sample was 448 where 8 cases did not continue the quantitative part.

Table 3.2: Estimated sample size per education area:

	Name of education area	Number of pupils	Sample size
1	B/Hanon & B/Lahia	3584	49
2	Jabalia	2495	34
3	South Gaza	3533	49
4	West Gaza	2505	35
5	East Gaza	2123	29
6	West Middle	3584	49
7	East Middle	2981	42
8	West Khan Younis	3049	42
9	East Khan Younis	3535	49
10	South Rafah	2844	39
11	North Rafah	2828	39
	Total	33061	456

3.5.1.2 Qualitative part

3.5.1.2.1 Health care service providers at UNRWA health care system

The researcher conducted interviews with key informants represented by 2 senior medical officers (SMOs), one SMO deputy, 4 medical officers (MO), 2 practical nurse (PN), and one senior staff nurse (SSN), according to their experience in managing and tracking researcher's problem (SS) and working in the stations of child growth and development. Including, two medical officers from school health teams and one practical nurse were interviewed. The total recruited participants in these interviews was 10 persons.

3.5.1.2.2 Stunting children's parents

The researcher conducted interviews with selected stunted children's key informants represented by 2-3 mothers from each education area. Where after collecting the data, the researcher reached the saturation where no updated answers could be found. Therefore the sample reached 30 participants that had been recruited was 30 mothers.

3.5.2 Sampling process

3.5.2.1 Quantitative part

A representative sample was taken from the schools according to multistage proportional stratified sampling. Thus; after determining the sample size (456), the recruitment of children and their mothers were weighted for each UNRWA education area in proportion to the total first graders in each area from all eleven education areas, followed by a stratified

multistage sampling according to gender for each education area (total: 52.3% boys: 47.7% girls), as follows:

Multistage sampling:

- 1st stage: proportional sampling per education area, stratified based on gender and was considered as 1:1 (47.3 girls: 52.7 boys), where in the study's sample was (48.4 girls: 51.6 boys). Where the study sample was 448 (Boys 231, Girls 217) out of 456.
- 2nd stage: at the level of each area random school was drawn, and taking into account if one school was chosen with only one gender (for example boys) in an education area, the next draw was randomly either on the other gender or on combined schools (for example girls), step after this, third education area was chosen from the remaining school type (for example: combined).

The selected pupils were assessed regarding their anthropometric measurement. In addition, an interviewed questionnaires were administered to the mothers to assess the different risk factors or determinants.

3.5.2.2 Qualitative part

At the level of the UNRWA health care system, a non-probability purposive sample was selected; 10 key informants and managers (current or former managers). Where the sample included 2 senior medical officers (SMOs), one SMO deputy, 4 medical officers (2 from PHC centres and 2 from school health teams), 1 senior staff nurse (SSN), and 2 practical nurses (one of them from school health teams). In addition, 30 stunted children's mothers were enrolled, intending to dig deeper and understand in-depth the possible gaps and factors that could be related to the SS.

The qualitative component was carried out after the quantitative one in order to explore issues that emerge from the quantitative study.

3.6 Eligibility criteria

3.6.1 Inclusion

Recruitment for the study was based on the following inclusion criteria: all first-time registered first graders refugees, in UNRWA schools with an age window as adopted by the UNRWA regulations, of both sexes. And came for the new entrance examination with his mother.

3.6.2 Exclusion

The exclusion criteria was: children whose mothers refused medical examination and interview, children receiving drugs known to cause short stature including chronic use of steroids, attention-deficit/hyperactivity disorder medications and anticonvulsants during the time of examination, children who came from abroad less than 2 years before, and children who suffer from acute severe illnesses, psychomotor retardation, physical disability, and chronic debilitating diseases like malignancy or on chemotherapy.

3.7 Study instruments

The tools that were used by researcher are 4 as follows: two questionnaires for quantitative part (one of which included also SDQ 25-questions) and two for the qualitative part.

For the quantitative part of data collection: following a literature analysis, two study tools were adopted from other studies (Aguayo & Menon, 2016; Ahmad et al., 2022; Alim et al., 2019; Arini et al., 2020; Assaf & Juan, 2020; Bernal et al., 2014; Bevis et al., 2023; Bogin, 2021; Bommer et al., 2019; Christian et al., 2013; Danaei et al., 2016; de Onis & Branca, 2016; Derso et al., 2017; Dhaded et al., 2020; El-Shafie et al., 2020; El Kishawi et al., 2017; Fantay Gebru et al., 2019; Gupta & Santhya, 2020; Haile et al., 2016; Headey et al., 2018; Investigators, 2017; Jehn & Brewis, 2009; Krebs et al., 2022; Kuhnt & Vollmer, 2017; Larsen et al., 2017; Li et al., 2020; Lisanu Mazengia & Andargie Biks, 2018; Martorell & Young, 2012; Massad et al., 2016; McGovern et al., 2017; Mediani, 2020; Modern et al., 2020; Nachvak et al., 2020; Nayoan et al., 2023; Neufeld & Osendarp, 2014; Nshimiyiryo et al., 2019; Ode et al., 2022; Prendergast & Humphrey, 2014; Roba et al., 2021; Sanou et al., 2018; Shapiro et al., 2019; Y. Sharif et al., 2020; Simelane et al., 2020; Syahril et al., 2020; Tia Tampy et al., 2020; Torlesse et al., 2016; Vaivada et al., 2020; Vishwakarma et al., 2021; Vollmer et al., 2017; Wemakor et al., 2018; Wolde et al., 2015), the first tool was self-administered by the mothers (which integrates 25-SDQ questions questionnaire for mental health status assessment of the child (Goodman, 1997)), and reviewed by the researcher with mothers after finishing them, and the second tool was as interviewed questionnaire that was completed by the researcher. While for the qualitative part data collection; semi-structured questions for interviews either with mothers or for healthcare key informants, where these qualitative tools were developed after the quantitative part results, thus the researcher utilized the following tools.

The Strengths and Difficulties Questionnaire (SDQ) is a brief emotional and behavioural screening questionnaire for children and young people. The tool can capture the perspective of children and young people, their parents, and teachers. Where the SDQ is one of the most widely and internationally used measures of child mental health and has been translated into more than 80 languages including the Arabic language. And used for various purposes, including clinical assessment, evaluation of outcomes, research, and screening (Goodman, 1997).

The Quantitative part questionnaires comprised the following elements:

A. Demographic, environmental, psychosocial, and economic factors

- Demographic and environmental factors: age in months, gender, residency (inside a refugee camp, rural area, urban area), water source, sewage system, sanitation system.
- Psychosocial factors: social factors represented by norms that can affect women's status, and psychological and mental assessment including exposure to societal violence.
- The Strengths and Difficulties Questionnaire (SDQ) was added to the self-developed questionnaire to assess this.
- Economic factors: food policy assistance and food security, including micronutrients, fruits, milk and its products, meat and eggs, food support, and involvement of the child in economic activities.

B. Health care determinants

- Access to the healthcare system and diagnostic approach, including accessibility either physical or non-physical, stunting detection process, and availability of proper information.
- Adherence to healthcare service, which is calculated by compliance with fixed follow-up from birth until 5 years old for growth and development monitoring visits, which is provided in the UNRWA healthcare centres and reported in the electronic medical records E-health.
- Referral system including factors that can be related to the sender, receiver, family action, and feedback, where the majority of mothers denied that they have received referrals. So this subject was targeted in the qualitative part with both mothers and healthcare key informants.

C. Intrinsic factors that are related to the child himself, by the presence of pathological causes like chronic comorbidities, or recurrent history of infections and hospitalization, or if the child's stunting was considered as a normal variant stunting or not (targeting the final diagnosis if addressed due to its importance)

D. Household and family factors

- Maternal factors:
 - Maternal characteristics: age, height, weight (Wt.), marital status, education, occupation, nutrition awareness, and practice, marital status.
 - Maternal health and obstetrical status: chronic comorbidities including physical and psychological and mental disorders, depression, nutrition during preconception care (PCC) and antenatal care (ANC), besides the obstetrical attitudes including ANC, PCC, and birth spacing history, in addition, the outcome of the pregnancy with the child of the sample as preterm birth, short delivery number, parity, born child's Ht. and Wt.
- Household factors: father's education level, work status, and age, housing category divided in extended family and share same building with relatives or nuclear family and live in their own entity, size of family, home space, consanguinity of parents, poor care practices (being outdoors, excessive smart phone use).
- Nutrition and breastfeeding: infant's age of weaning, breastfeeding, and child nutrition practice (salted snacks), availability of micronutrients, animal food products, inappropriate intra-household food allocation, that can result and or be associated by the coexistence of dual forms of malnutrition (DFM) in the same household with specification for mothers.

Meanwhile, also for the quantitative part, as a direct data collection, the anthropometric measurements was conducted by the researcher and include the following: Height is obtained with the child standing by a stadiometer, the instrument of choice for those over two years old. The anthropometric data transformed into Z-scores using the program WHO ANTHRO. The height taken for at least the mother of the child (if the mother agrees) and the father, if possible.

The researcher used a suitable weight balance measuring to the nearest 0.5 kg (seca type). This scale was standardized and calibrated at the beginning of every session of measurement by using a standard five kg weight. Participants, the child, and the child's parents will be weighted (if they agree) in their light clothing without shoes and after the removal of handbags, jackets, mobile phones, and any other personal accessories.

Furthermore, the haemoglobin was measured by spectrophotometer, by taking a small blood sample. That may be conducted by pricking the heel or finger of the child, by a medical professional in a healthcare setting through the new entrant's examination. Where in this technique, Spectrophotometers measure the absorbance and transmittance of the light. Where the intensity of light measures photons per second. When light passes through a sample, where the intensity of light absorbance is the way to estimate the HGB level(Da Silva Pereira et al., 2020; Mills & Meadows, 1989; Neogi et al., 2016).

The qualitative component was carried out after the quantitative one in order to explore issues that emerged from the quantitative study. Where 2 short semi-structured question lists were developed; which were used to collect data from key informant interviews to explore how the stunting problem is detected, perceived and managed within the healthcare system and in the community. In addition to cover the gaps that raised by the quantitative part like referral process. Where these questions were asked to the key informants through interviews with 2 categories of key informants; 10 healthcare personnel and 30 mothers.

3.8 Data collection

The data has been collected through direct and indirect methods. For the quantitative part, the researcher has collected the data through face-to-face interviews and through the mother's self-administer questionnaire using adopted questionnaires from other studies, after obtaining consent from the study participant's families (mothers). The indirect data validation of collected data, which was conducted by using of E-Health system (UNRWA medical electronic record), whereby for validation and abstraction of selected variables as birth date, the weight and height of child at birth, family adherence for growth monitoring, registration for ANC (antenatal care) and PCC (preconception care). Also, we measured direct method that included anthropometric measurements of weight, and height of the child and his father and mother if applicable. After the calibration of the used tools and standardization of the practice, where the average time for filling out the interview questionnaires was about 30 minutes.

About the qualitative part, the researcher collected the data by himself through two self-developed semi-structured lists of questions for health personnel and stunted children's mothers. Notes were taken through the interviews and they were recorded to allow further capturing of information. Key informant interviews were conducted after the end of quantitative data collection and analysis. All the participants were informed whether they are free to participate or not and that they can stop anytime during the interview.

3.9 Data entry and analysis

3.9.1 Quantitative part

Using the Statistical Package of Social Science (SPSS) tool for data entry and analysis, a data entry model was created, and questionnaires and variables were coded as follows: as dichotomous variables like stunting status as the dependent variable, type of child's delivery, registration for ANC (antenatal care) or PCC (preconception care), or in 3 categorical variables like mother nutritional status and child's consumption of food items, and recurrent occurrence of fever. Moreover, the continuous variables were coded in ordinal groups like parents' age categories, and the rank of the child. However, the collected data were entered into the generated database. The data was cleaned by looking for nonsensical values or outliers and confirming the frequencies of all variables.

As descriptive variables, measurements of central tendency, normality of distribution, and variability was used. In addition, frequency tables and histograms were created to highlight the frequency distribution of sample characteristics like Ht. and Wt., and display disparities between different enrolled children and the specified determinants and factors looking for the presence of relationships between the dependent variables of interest (stunting) and other independent variables like socioeconomic and demographic variables, health care related determinants, and household, family and maternal factors.

The researcher used inferential analysis to explore the significant statistical differences, where cross tabulations and Chi-squared tests were used for main findings, aiming to detect the possible relationships and the variation patterns between presence of stunting as the dependent variable with the other variables and findings as independent variables. In addition to the cross tabulations, it was used also the Odds Ratio and Confidence interval to explore the relationships between variables. Furthermore, the Chi square test was used to compare categorical variables, like studying the relationships between stunting and categorical variables like mother education status, socioeconomic class, place of residence, antenatal care registration.

A logistic regression test was used to study the relationships between the variables of interest (stunting yes or no) with the independent variables, which can be decoded sub multiple forms like ordinal or scale data. When the P value is equal to or less than 0.05, the statistical difference is considered significant.

Calculating the height and weight for age Z-score and categorizing the stunted growth children was done by a tool called WHO (world health organization) AnthroPlus, which is used to track the growth of school-age children and adolescents around the world in accordance with the WHO Reference 2007 for 5–19 years.

3.9.2 Qualitative Part

The transcripts, voice recordings, and notes gathered during the key informant interviews provided the researcher with the major results. Interview debriefing reports were completed immediately following the completion of each interview. During the interviews, notes were taken to document non-prompted intimations, personal dynamics, and nonverbal clues, among other things. Then each of them (transcripts, recordings, and notes) was looked at least three times to allow immersion, conceptualization, and categorization of the ideas mentioned openly or implicitly in the key informant interviews.

The transcripts of the key informant interviews were subsequently analysed using an open coding thematic analysis technique, which involves coding each sentence in the transcript, leaving it for 2-3 days, and then recoding without going back to the previous one. To develop rich items for discussion and representation, categorization of similar ideas was done, as well as comparison and integration between quantitative and qualitative data.

3.10 Scientific rigor

3.10.1 Quantitative part (questionnaire)

3.10.1.1 Validity

As mentioned in the study instruments, the tools were adopted from previously conducted studies. In addition, experts (as listed in Annex 3) examined the questionnaire's relevancy and provided feedback. Where also, prior to the real data collection, a pilot study was undertaken to assess clients' responses to the questionnaire and their understanding of it. After that the questionnaire was revised to make it more understandable, and to increase its validity.

3.10.1.2 Reliability

To ensure instrument reliability, the following procedures were taken:

- Almost all Data were collected by the researcher himself except the direct anthropometric measures which were collected by 5 school health practical nurses

after standardization of tools and practice after receiving small training sessions to assure unifying the modality of taking the measurements and under the supervision of the researcher.

- The data entry on the same day as the data collection allowed for possible actions such as data quality checks or re-filling the questionnaire if needed.
- After concluding data entry, 5% of the data was re-entered to ensure correct entry technique and reduce entry errors.

3.10.2 Qualitative part (key informant interviews)

A peer review was conducted by health specialists to ensure that the key informant interview questions cover all of the needed dimensions. The transcripts were then checked by members to ensure accuracy and transparency during the meetings. The researcher engaged the participants for an extended time to probe for responses and cover all of the session elements. Furthermore, recording the interviews helped with fact-checking and re-checking the accuracy of the transcripts. Finally, all transcripts and recordings were retained for others to track the material at any time (Audit trail).

To ensure that participants' rights are protected, a cover letter stating that participation is optional and that confidentiality would be maintained for all of them was provided. The volunteers were asked to sign a consent form indicating their willingness to participate in the study. Managers and decision-makers were also requested to consent to the recording of key informant interviews.

3.11 Pilot study

Before data collection, a pilot study of 20 UNRWA first-graders and their family caregivers was conducted to determine the appropriateness of questionnaires including test clarity, point out wording flaws, predict response rates, and determine the real-time required to fill out the questionnaire and identify areas of ambiguity, as well as test the questionnaire's reliability, validity, and suitability. Where some questions were rephrased without remarkable changes, and the questions were understood by participants.

3.12 Ethical and administrative considerations

In order to start this study, ethical permission from the Helsinki Committee was requested, and this proposal was presented to the Al Quds University School of Public Health Research Committee for discussion and academic approval. Another administrative approval was

obtained from UNRWA's Research Review Board (RRB) with support from the health and education department at the field level. All participants will be informed of the study's goals and objectives before the start of the study, and a special consent form will be created. Furthermore, all participants will be informed whether they are free to participate or not and that they can stop anytime during the interview.

3.13 Data security and management

All data and records were treated confidentially, and findings were anonymised to ensure that no participant can be identified in any reports from the study. After initial capture on a password-protected laptop, data will be stored on One Drive in a folder accessible only to the research team (the researcher and supervisor). The data will only be accessed by the research team before being destroyed by the completion of the study.

3.14 Limitations of the study

- Financial limitation, therefore essential lab investigations or x-rays to determine the bone age were not fulfilled for those who are not diagnosed as what type of stunting (normal or pathological variant)
- Current situation in the GS: political, economic blockade, power shortage, COVID-19 pandemic affected many sectors especially the health sector where accessibility remain questionable.
- Inability to find out causality chain because it is cross-sectional study.
- Health care system status because it is fragmented, with absence of a unique health information system, especially in the MoH PHC centres.
- Scarcity of the same studies in this wide approach, and the researcher tried to guide this study depending on literature, where the determinants especially the intrinsic determinants were not previewed because of many causes like the absence of a database.
- The study included only refugee pupils who are attending the UNRWA schools while the other pupils who may attend private schools or governmental schools were not included, thus it would be important to reflect better image for reality.
- The study used a purposive sample in the qualitative part, to analyse the viewpoints of key health care professionals, rather than a representative sample of all health care providers.
- According to the type of study and the manifest that the researcher try to explore, recall bias could affect the results.

Chapter Four:

Results and Discussion

Introduction:

This chapter illustrated the results of statistical analysis of the data of the quantitative part, including descriptive analysis that presents the socio-demographic characteristics of the study sample and the answers to the questions of the study. The researcher used statistical tests including frequencies, percentages, and using mean, median and standard deviation to analyze the variables questionnaire. In addition to the qualitative part that was designed according to the quantitative part's results, where key informants' interviews were conducted with 30 mothers and 10 healthcare providers from the UNRWA health care sector.

4.1 Descriptive Results and Discussion

4.1.1 Personal Data

4.1.1.1 4.1.1.1 Distribution of the study participants according to Child Information

The sample population characteristics were as follows: the total collected sample was 448 students (231 boys, 217 girls = boys 51.6%: girls 48, 4%), aged 71.52 (SD 4.126) months, whereby around 91% of my population were between 5.5-6.5 years old (66 months-78 months), where children who were below 5.5 years 4.5%, and above 6.5 years 4.2 %, above 7 years 0.9% (Mean 71.52, MD 71, SD 4.126), distributed as discussed in the methodology part, and the child's age was categorized as in two categories, below 6 years, and 6 years old or above, where the rates were 52.9% and 47.1% consecutively, whereby the sample was taken from 11 education areas that represent 5 geographic areas as shown in the table 4.1.

Regarding children's height distribution, the height mean was 114 CM (MD 114, SD 5.02), and the range was 97-129 CM, whereby after calculating the Z score; the child's height categorization according to the height for age Z-score, was determined and revealed that 3.6 % of children were below -2 SD, and were suffering from short stature (including one child below -3 SD), whereby 20.5 % were below -1 SD, thus 24.1 % of children were below -1 SD, and they were classified as stunted growth children, and comparing the prevalence rate of stunting with literature, many studies and reports were found with clear discrepancies, whereby this study's rate (3.6%) was consistent with a previously conducted study in the Gaza strip among UNRWA first graders where the rate was 4.3% (AbuKishk et al., 2020).

While in another study among 5-6 years old children was 9% (Jalambo et al., 2020), and by looking at the younger ages (0- 5 years), it was mentioned in the UNRWA reports how the growth pattern changed through 3 consecutive years in 2018, 2019 and 2020, where the rates were 9.17%, 11.0%, 8.9 % consecutively (UNRWA, 2020^a), supported with PCBS and WHO reports where the rates were 9%, and 10.8 consecutively (PCBS, 2020b; WHO, 2019), where also the rates of stunting among below 24 months children were 20%, and below 6 months were 9% (Albelbeisi et al., 2018), supported also with appropriate rates of stunting but among 2-5 years children where stunting rated 19.6% (El Kishawi et al., 2017), meanwhile, the prevalence of stunting among 5-16 years old children in Palestine was 8.7% (PCBS, 2020^b), and in WB among same age category was 7% (Massad et al., 2016).

Table 4.1: Distribution of the study participants according to Child Information

Item	No	%	
1. Child Information			
Child age (n= 448)			
Below 6 years	237	52.9	
6 years or above	211	47.1	
Mean 5.96 , Median = 5.92 , 0.344			
Gender (n= 448)			
Male	231	51.6	
Female	217	48.4	
Rank of the child (n= 448)			
First	123	27.5	
2nd-3ed	160	35.7	
4th-5 th	122	27.2	
6th or after	43	9.6	
Child Height Status (Stunted with Height-for-Age Z score (HAZ) below -1 SD) (n= 448)			
Yes	108	24.1	
No	340	75.9	
Height for age (n= 448)			
-2 Z Score and less	Stunted : Below ≤ -1 SD HAZ	16	3.6
-1 Z Score to -1.99		92	20.5
Above -1 Z score	normal and above HAZ ≥ -0.99 SD	340	75.9
Weight for age (n= 448)			
-2 Z Score and less	Below normal (< -1 SD WAZ)	28	6.3
-1 Z Score to -1.99		83	18.5
Above -1 Z score	normal and above : WAZ ≥ - 0.99 SD	337	75.2

Furthermore, the weight for age Z-score categorization among children was as following 6.3% were moderately underweight (below-2 SD), while 18.5 % were below -1 SD. Furthermore, in comparison with a recently conducted study in the Gaza strip, that covered the new entrance examination in the UNRWA schools, where the prevalence of stunting was

4.3, which is around my results, while the underweight prevalence of this study (6.3%) was twice more than the previously conducted study (3.1 %) (AbuKishk et al., 2020).

4.1.1.2 4.1.1.2 Distribution of the study participants according to Parents Information

Regarding the mothers' education levels, as shown in table 4.2, 47.3 % of the mothers were considered highly educated, and had finished at least a bachelor's degree. Whereby mother's working status; 50 (11.2%) were employees, regardless of their income level.

Table 4.2: Distribution of the study participants according to Parents Information

1. Mother Information		
Age (n= 448)- Mean 32.61 , Median = 32.00 , 5.103		
29 years and below	119	26.6
30 to 35	222	49.6
36 – 40	68	15.2
above 40	39	8.7
Mother Education (n= 448)		
Primary	19	4.2
Preparatory	57	12.7
Secondary	160	35.7
College/University	212	47.3
Working (n= 448)		
Yes	50	11.2
No	398	88.8
2. Father Information		
Age (n= 448)- Mean 37.39 , Median = 36.00 , 6.915		
29 years and below	30	6.7
30 to 35	176	39.3
36 – 40	129	28.8
above 40	113	25.2
Education (n= 448)		
Primary	53	11.8
Preparatory	94	21.0
Secondary	131	29.2
College/University	170	37.9
Working (n= 448)		
Yes	287	64.1
No	161	35.9
Poverty line according to monthly income (n= 292) missing 156		
Above poverty line	82	28.1
Below poverty line	210	71.9
Consanguinity between mother and father (n= 448)		
Relative	161	35.9
No	287	64.1
Consanguinity between mother and father (n= 448)		
First degree	74	16.5
Second degree	87	19.4
No	287	64.1

Furthermore, the father's characteristics that were explored in the research, starting from their age groups. Where around 68% of them were 30-40 years old, whereby fathers above 40 years were 25%, meanwhile, 37.9% of fathers were highly educated and 29% finished secondary level, where the education level among mothers was higher; besides that, the employment status rated 64.1 % among them while the unemployment rate was 35.9%, whereas according to the Palestinian statistics was mentioned that the unemployment rate reached 42 % (PCBS, 2021c), whereby in other reports were mentioned that the unemployment rates reached 50% (PCBS, 2020^a; UNRWA, 2021^b), thereafter total family income was estimated, where around 71 % of the families lie below the poverty line (below 1974 NIS), whereas in other official Palestinian statistics, the rates of families who lie in the below deep poverty line 33.8 % and 53 % lie in poverty in 2017. Where also, according to the Palestinian Central Bureau of Statistics 2019, one out of three individuals in Palestine were living below the poverty level, which accounts for 29.9%, GS contributed to 53.2%, including GS camps the percentage of poverty is 45.5 %, while, in the West Bank contributed to 13.9 % to the national poverty. Moreover, one out of three individuals in the GS were living below deep poverty (PCBS, 2020^a).

4.1.2 Distribution of the study participants according to their Household Information

Regarding the household information, which belongs also to demographic parameters, starting from the residency place category, that was according to the randomly selected schools, where for example Gaza city, 84 % of its sample were urban, whereby Khan Younis had the chance of 64 % of its sample from rural areas, while in the middle area, 84 % live in the camp. So; the distribution was as follows: inside camps, rural areas, and urban areas with percentages of 39.7%, 19.2%, and 41.1% consecutively, from 5 geographic areas (North Gaza, Gaza city, Middle area, Khan Younis and Rafah as following 17.2%, 25.2%, 20.3%, 19.9%, and 17.4% consecutively). Thus, the sample geographic areas were divided into 2 categories; North & Gaza and the rest of the governorates (42.4%, and 57.6% consecutively).

At the level of the infrastructure, 77% of my population had a chance to get purified water, 4% were drinking tap water, and the availability of Garbage and sewage systems were 83.3% and 75.7% consecutively.

Around 80 % of families consisted of 4-7 family members including both parents, and 35% of families were more than 6 members, furthermore, the mean household size was 6.05

family members, which is somehow close to other official reports where the average size of the household was estimated to be 5.0 individuals (OCHA, 2021; PCBS, 2019b). Moreover, 65 % of families were living in the extended families category or were living in the same building with relatives and performing some or many common daily life activities together including sometimes meals, while 34.5 % were living as nuclear families and in their separate entities and had their habits as a family. This can be implicated in some poor care practices, like being outdoors or excessive smartphone use where the rates of daily practice were 34.6 and, 63.8% consecutively.

Hence the number of family members were ranging from 3-13 members, whereby the house spacing was also ranging from 12 to over 200 quadrante meters (mean 110 m², median 100 m², and SD 53 m²). Therefore, it was also calculated the home space per person (home density where the house size divided by the number of family members) to be more logical and to understand if the house space has a role in a child's growth, whether directly or indirectly. Thus, the categorization of the housing density was according to the British housing standards (DCLG/gov.uk, 2013), that also adopted in housing projects by UNRWA, where the range of supposed affordable housing spaces was dependent on the number of bedrooms and persons, where the minimal space that should be provided for each person of a family of 8 members was 14 m², while the maximal space that should be provided for every person was 24.3 m² for a family of 3 members. Whereby 38% of families were living within the accepted household space standards as shown in table 4.3, while 36% were in a crowded household.

Hence, food insecurity affects almost similar numbers of Palestinians in the refugee and non-refugee populations, with the number of Palestine refugees getting food help from UNRWA increasing from less than 80,000 in 2000 to more than a million in 2021 (UNRWA, 2021^b), GS, with 70%, and the West Bank, with 11% (PCBS, 2018).

The study explored the economic status and household food security which more specifically, non-intra household food security, as classified in the literature (Herforth & Ahmed, 2015), families find embarrassment in informing the community of their economic status, or even if they receive social or financial support, where they tend to hide these details, thus; the accuracy of numbers remains not 100% guaranteed, thereby, 42.5% of families agreed that they receive social or financial support, 79.4 % of them agreed that they receive regular Social support as food package, or financial support.

Table 4.3: Distribution of the study participants according to Their Household Information

Item	No	%
Residency (n= 448)		
Inside refugee camp	178	39.7
Rural area	86	19.2
Urban area	184	41.1
Geographic area (n= 448)		
North and Gaza	190	42.4
Other Governorates	258	57.6
Housing Category (n= 446)		
Extended family and share same building with relatives	292	65.5
Nuclear family and live in their own entity	154	34.5
House Size By Square Metter (n= 436)- Mean 110.50 m²Median 100.0, SD = 53.70		
50 m ² and less	52	11.9
51 to 100 m ²	190	43.6
101 to 150 m ²	126	28.9
Above 150 m ²	68	15.6
Family Size (n= 448)- Mean 6.05 Median 6.0, SD = 1.71		
6 and less	291	65.0
Above 6	157	35.0
House Density (n= 436)		
Crowded house below 14 m ² per person	157	36.0
Modest house 14-24 m ² per person	167	38.3
Comfortable house 25m ² or above per person	112	25.7
Do you receive any kind of social support (n=445)		
Yes	189	42.5
No	256	57.5
If Yes		
Kind of support (n=189)	Agreed	
Regular Social support as food package, or financial support (all of them from UNRWA)	150	79.4
Micronutrient support except Iron	82	43.9
Fruits and vegetables support	33	17.6
Meat, egg, milk and liver (animal products) support	44	23.5
Is the child involved in economic activities (n= 448)		
Yes	25	5.6
No	423	94.4
Sewage System (n= 448)		
Yes	339	75.7
No	109	24.3
Garbage System (n= 448)		
Yes	373	83.3
No	75	16.7
Drinking water Sources (n= 448)		
Purify water	345	77.0
Water point	85	19.0
Tap water	18	4.0

However, as found in local reports; around a third of the population of Palestine experienced food insecurity prior to the COVID-19 epidemic, with differences between the Gaza Strip and the West Bank. This situation was further exacerbated by rising rates of unemployment and poverty (WFP, 2021^a). Due to the fact that high levels of poverty, high food costs, and economic shocks all have an impact on food insecurity (Ahmadi & Melgar-Quiñonez, 2019). Furthermore, the involvement of selected children in the economic enhancement of their families reached 5.6 %, where in comparison with local reports, there was a clear increase of children involvement in the labor market from 2 % of children`s age category 10-17 years old to 5.6 % at this earlier age category, as reported by OCHA in 2019, regardless if they were working full time or not (OCHA, 2019).

Moreover; exploring the other kinds of social support, if include micronutrients (except Iron which is usually provided by the PHC system), from outside the primary care sector, agriculture, and animal products, where mothers who agreed as follows: 43.9, 17.6, 23.5% consecutively. While in other reports, it was mentioned that 51 % of overall households (HHs) that reported having received aid in the Gaza strip, and 73% of refugee households received assistance through 2021. (OCHA, 2022; OHCA, 2018). Whereby At the level of macronutrients, it was observed that, the supported families don't receive these kinds of items like animal products (Meat, Egg or others) and vegetarian products (fruits and vegetables), with percentage of 76.5% and 82.4 % consecutively.

4.1.3 Distribution of the study participants according to their Mothers and fathers Parameters

Starting with fathers' anthropometric measurements; they were grouped according to WHO standards (WHO, 2022). Where their height range was between 150-192 cm (as in the table 4.4), thereby 63% were in the normal range or above normal, whereby below normal and short-statured fathers (below -1 SD according to WHO standards at age of 19 years old) were 37%, Moreover, the BMI of fathers was also calculated and obesity status was estimated, where the prevalence of over weighted and obese fathers 65% (obesity among them 23.8 %), which is below their wife's (obesity among mothers 39% as in the table 4.4), and are logic in comparison with other researches results (El Kishawi et al., 2020; Elessi & Albaraqouni, 2019).

Regarding mothers' anthropometric measurements, and their awareness about their measures, the height and weight were collected as stated by mothers and by measuring their

weight and height, and the BMI after that was estimated consecutively as stated BMI and measured BMI (table 4.4). Where there were disparities between overweight and obese categories among stated and measured BMI, whereby the stated BMI, or as mothers believed were smaller than the measured BMI (stated overweight and obese BMI was 53% while measured overweight and obesity was 73%).

The stated percentage of overweight and obesity among mothers; according to the mothers' beliefs, was near to previously conducted research in the Gaza strip, where the prevalence of these categories were around 64% (El Kishawi et al., 2020; Elessi & Albaraqouni, 2019), but after measuring the height and weight of my population's mothers, the total of overweighed and obese mothers percentage was higher (73%). Moreover, the majority of mothers stated heights greater than their actual heights and stated weights less than reality.

However, the height categorization for parents was based on the WHO standards at the age of 19 years where adults reach their maximal height, and below normal height category of parents was considered as below -1 SD height for age Z-score (WHO, 2022).

Table 4.4: Distribution of the study participants according to their mothers and fathers Parameters

Item	No	%	
Father Height Status in CM (n= 441) missing 7			
Below normal \leq 169.2 cm below -1 SD HAZ	163	37	
Normal or above \geq 169.3 cm	278	63	
Mean 171.71 , Median = 170.00 , SD 7.31			
Mother Height (CM) as measured -Status (n= 394) missing 54			
Below normal \leq 156.6 cm below -1 SD HAZ	121	30.7	
Normal or above \geq 156.7	273	69.3	
Mean 159.34 (140-176 CM) , Median = 159.00 , SD 5.36			
Father BMI Classification (n= 440) missing 7			
Underweight < 18.5	Normal and below group	5	1.1
Normal range 18.5-24.9		151	34.2
Over weight 25-29.9	Over weight and obese	180	40.8
Obese \geq 30		105	23.8
Mother Stated BMI Classification (n= 371) missing 77 *(Does not know Ht. or Wt.)			
Underweight < 18.5	Normal and below group	11	2.5
Normal range 18.5-24.9		122	27.2
Over weight 25-29.9	Over weight and obese	146	32.6
Obese \geq 30		92	20.5
Mother Measured BMI Classification (n= 373) Missing 75 * (Refused ht. or wt. measurement.)			
Underweight < 18.5	Normal and below group	5	1.3
Normal range 18.5-24.9		96	25.7
Over weight 25-29.9	Over weight and obese	127	34.0
Obese \geq 30		145	38.9

4.1.4 Distribution of the study participants according to mother's Health

Mother's age at the delivery of the sample's child was as follows: 75 % were between 20-30 years old while 5.4 % were younger and 19.7 % were older as shown in table 4.5a. Whereby, the first delivery age of mothers was 31.5% below or 19 years old, and 55 % were 20-25 years old mothers while 12.7% were 26 years old or above (percentage of women who became a mother at age 31-40 years were 1.8 %), which means, nearly one of each three women became a mother at early ages with age range at the first delivery 15-19 years old (where the percentage of mothers whose first delivery was 18 years or below 20.3 %) that reflects also the percentage of early marriage of my targeted population which is logic with previously mentioned numbers, where it reached 21% of the females' registered marriages in 2018 in the Gaza Strip (PCBS, 2021^b).

Table 4.5a: Distribution of the study participants according to Mother Health

Item	No	%
Age of mother at first birth Groups (n= 448) Mean 21.45 , Median = 21.0 , SD 3.47		
Less than 20 years old	141	31.5
20-25 years old	250	55.8
26- and above including (8 over 31 years old)	57	12.7
Age of mother at birth of this child Groups (n= 448)		
Less than 20 years old	40	8.9
21-25 years old	163	36.4
26-30 years old	157	35
31-35 years old	57	12.7
36 years or above	31	6.9
Number of children those mothers taking care about at the present time (n= 448)		
Alone	14	3.1
2-3 children	173	38.6
4-5 children	186	41.5
6 or more	75	16.7
Spacing or time span between this child & older Brother or sister (n= 448) Mean 25.15 , Median = 24.0 , SD 22.22		
he is the older child	125	27.9
10-18 months	50	11.2
19-24 months	61	13.6
25 months or greater	212	47.3
Spacing or time span between this child & younger Brother or sister (n= 448) Mean 21.96 , Median = 22.00 , SD 18.13		
he is the younger child	127	28.3
10-18 months	59	13.2
19-24 months	81	18.1
25 months or greater	181	40.4
Was the mother registered for ANC (n= 448)		
Yes	425	94.9
No	23	5.1
Number of ANC visits (n= 425) Mean 6.23 , Median = 6.00 , SD 2.55		
4 visits or less	108	25.4
5-8 visits	248	58.4
9 or more visits	69	16.2

Obstetrical history was also investigated (table 4.5b), exploring the mother's obstetrical behavior, whereas 38.6% of the study's mothers had 2-3 children, 41.5% had 4-5 children, and 16.7% of mothers had 6 children or more. Which is consistent with other reports (OCHA, 2021; PCBS, 2019^b). Regardless of the time span or spacing between them. But the number of children those mothers taking care of can reflect the magnitude of mothers' responsibilities. Therefore their obstetrical history was investigated starting from the main maternal and obstetrical health services that are adopted by the primary health care system, especially by UNRWA, represented by preconception and antenatal care in addition to family planning.

Table 4.5b: Distribution of the study participants according to Mother Health

Was the mother registered for PCC (n= 447)		
Yes	202	45.2
No	245	54.8
Number of PCC visits (n= 202) missing 96- Mean 4.03 , Median = 3.00 , SD 3.43		
2 and less	31	29.2
From 3 to 4	48	45.3
More than 4	27	25.5
Presence of Maternal chronic comorbidities(n=448)		
Yes	65	14.5
No	383	85.5
Type of Maternal chronic comorbidities (n=65)		
Cardiovascular diseases including HTN	22	33.8
obstetric problems including infertility	15	23.1
Respiratory including ASTHMA	9	13.8
endocrine problems including DM	8	12.3
blood disorders including thalassemia trait and anaemia	6	9.2
mental disorders including depression	5	7.7
Vascular problems (LLVV,PE)	4	7
Digestive	3	4.6
neurologic disorders including disc prolapse	3	4.5
kidney problems	1	1.5
malignant problem	1	1.5

The demand for registration for antenatal care is greater than the registration for preconception care (table 4.5b), and the rates were as follows: 94.9 % for antenatal care while the preconception rate was 45.2 %. Moreover, nearly 75 % of registered mothers for antenatal care, had 5 or more antenatal care visits. But regarding the family planning attitude or behavior among the study's mothers, which was estimated by the time spacing between this child and the older and younger brother or sister, whereby 31.3 % of these children have a younger sibling, while 24.8 % have an older sibling within less than 24 months.

Mothers' previous medical history, was also triggered if they were known with chronic comorbidities, whereby 14.5 % of these mothers had at least one medical condition that need

medical care, management, and regular follow-up. Moreover; through data collection, around 9 % of the mothers were pregnant.

4.1.5 Distribution of the study participants according to Child Health

Starting from the type of child's delivery type, where 81.2 % of them were a product of normal delivery, while by caesarean section 18.8 %, which is near to recently conducted studies and reports regarding the CS rate where this rate ranging between 14 % to 30% (UNRWA, 2020a; Zimmo et al., 2022).

Regardless of the type of deliveries, the outcomes of these deliveries are represented as 11.6 % preterm (< 37weeks) delivered, 84.6 % were full term (37.1-41.6 weeks), while 3.8 % postdate (> 42 weeks), and these rates match with previous reports (UNICEF, 2019). In addition to that, the child's birth weight mean was 3.32 Kg, and the Median was 3.40 Kg. So the birth weight was categorized into two categories: low birth weight < 2.5 kg, and normal and above (overweight) birth weight > 2.5 kg (including n=24 over 4 Kg. 5.4%) as shown in table 4.6a where the percentage of low birth weight group was 7.4 % which matches with other previous reports (Blencowe et al., 2019; UNICEF, 2019). Moreover, the birth length also was abstracted from E-health (except 2 children) for children (n=446), and revealed a Mean of 49,89 CM, a Median of 50,0 CM, and categorized into two groups: the first group was considered as stunted born baby (< 46 cm), and the second group was categorized as normal length and above (> 46 cm), where the rates were 4.5% and 95.5 % (the second group were including 2 children with a length above 56 cm and counted 0.4%) consecutively, where childbirth length and weight are important determinants of stunting as detected in the literature (Alim et al., 2019; Blencowe et al., 2019; Christian et al., 2013; Fantay Gebru et al., 2019; Jalambo et al., 2020; Krebs et al., 2022; Ode et al., 2022; Santosa et al., 2022; Sartika et al., 2021).

However, Anemia prevalence (HGB below 11.5 g/dl) as shown in table 4.6a, among the selected population was 49.5 % (and if the cut of the point below 11.0 g/dl as adopted by some institutions and reports the prevalence will become 24.3% especially if the HGB test was made by spectrophotometers), which is around other reports where the ranging of anemia prevalence whether at our region or globally; was between 23-60% (AbuKishk et al., 2020; El Kishawi et al., 2015; Harding et al., 2018; Jalambo et al., 2020; UNRWA, 2020^a, 2021^a).

Table 4.6a: Distribution of the study participants according to Child Health

Item	No	%	
Gestational age (GA) of Child at birth (GA was abstracted from E-health) (n= 448)			
Preterm < 37 W	52	11.6	
Full term 37.1-41.6 W	379	84.6	
Post term >42 W	17	3.8	
Mean 39.26 , Median = 40.0 , SD 1.64			
Type of Delivery of this Child (n= 448)			
Normal	364	81.2	
Caesarean section	84	18.8	
Birth weight classification *(Birth weights were abstracted from E-health) (n= 448)			
low birth weight < 2.5 kg	33	7.4	
normal and above birth weight \geq 2.5 Kg	415	92.6	
Mean 3,32 Kg , Median 3,40 Kg, Sd 0,535			
Birth height classification*(Birth heights were abstracted from E-health) (n= 446)			
Stunted new-born. < 46 Cm	20	4.5	
normal and above new-born Ht. \geq 46 CM	426	95.5	
Mean 49,89 CM, Median 50,0 CM, SD 2,52			
Anemia classification according to WHO criteria (n= 448)			
Anaemia HGB below 11.5 g/dl	222	49.5	
Non Anaemic 11.5 g/dl or greater	226	50.5	
Anemia classification according to WHO criteria (n= 448)			
Moderate anemia HGB < 11	Anaemia HGB below 11.5 g/dl	109	24.3
Mild anemia HGB 11-11.4		113	25.2
Non anemic HGB > 11.5 or greater		226	50.5

Regarding the previous medical history of the children (table 4.6b), where 10.7 % of children were known or suffered from at least one prolonged medical condition including prolonged anemia, while the mentally disordered children were around 1.3 % (n=6, 5 out of them epilepsy). Moreover, the number of children who were operated on at least once was 65 (14.5%), including removal of tonsils and or nasal adenoids, which rated 63 % of operated children and followed by hernia repair the rated 20 %.

Regarding hospitalization (more than 2 days admission) of children, 88 of them had a history of at least one hospitalization (more than 2 days admission) (19.6%), where around 46.6 % of them were admitted to hospitals 3 times or more, whereby the main reasons for hospitalizations were acute respiratory infections (ARI), surgical interventions, gastroenteritis, or meningitis and the rates were 68%, 28%, 18%, and 17% consecutively as shown in table 4.6b.

Regarding the recurrent suffering of acute illnesses or infections, 18.5% of children had a history of recurrent fever episodes (on monthly basis), regardless of the cause, meanwhile, 20.5% of children had complained of recurrent episodes of acute respiratory infection (including tonsillitis and upper airway infections), meanwhile, the history of recurrent diarrhea and recurrent urinary tract infection was less 3.1% and 2.0 % consecutively as shown in table 4.6b.

Table 4.6b: Distribution of the study participants according to Child Morbidities

Item	No	%
Child medical chronic illnesses (n= 448)		
Yes	48	10.7
No	400	89.3
Child mental illnesses (n= 448)		
Yes	6	1.3
No	442	98.7
Child surgical history (n= 448)		
Yes	65	14.5
No	383	85.5
Type of surgery (n=65)		
ENT (tonsillectomy, and adenectomy)	41	63
hernia	13	20
urogenital	9	14
Congenital & Heart & orbital	6	10
digestive	3	5
Is there a history of hospitalizations (n= 448)		
Yes	88	19.6
No	360	80.4
hospitalization numbers (n= 88)		
Once	10	11.4
Twice	37	42.0
Three times	24	27.3
More than 3	16	19.3
Mean 2.95 , Median = 2.00 , SD 2.05		
Reasons of hospitalization (n= 88)		
ARI	60	68
surgical interventions	25	28
gastro-enteritis	16	18
Meningitis	15	17
BA	3	3
others	3	3
blood disorders	3	3
urinary tract causes	2	2
The Child Complain from Diarrhoea (n= 448)		
No	396	88.4
Sometimes	38	8.5
Always	14	3.1
The Child Complain from fever (n= 448)		
No	274	61.2
Sometimes	91	20.3
Always	83	18.5
The Child Complain from Acute Respiratory Infection (n= 448)		
No	248	55.4
Sometimes	108	24.1
Always	92	20.5
The Child Complain from Urinary Tract Infections (n= 448)		
No	422	94.2
Sometimes	17	3.8
Always	9	2.0

4.1.6 Distribution of the study participants according to Adherence to the child's Growth and Development monitoring

Regarding the adherence to the child health care service, that is provided by primary health care nets and maybe, according to the nature of the study's sample, which was drawn from UNRWA schools, where the majority were refugees, the families lean to attend the UNRWA PHC system (96.7%), to get the health care services, including the child's immunization and growth and development.

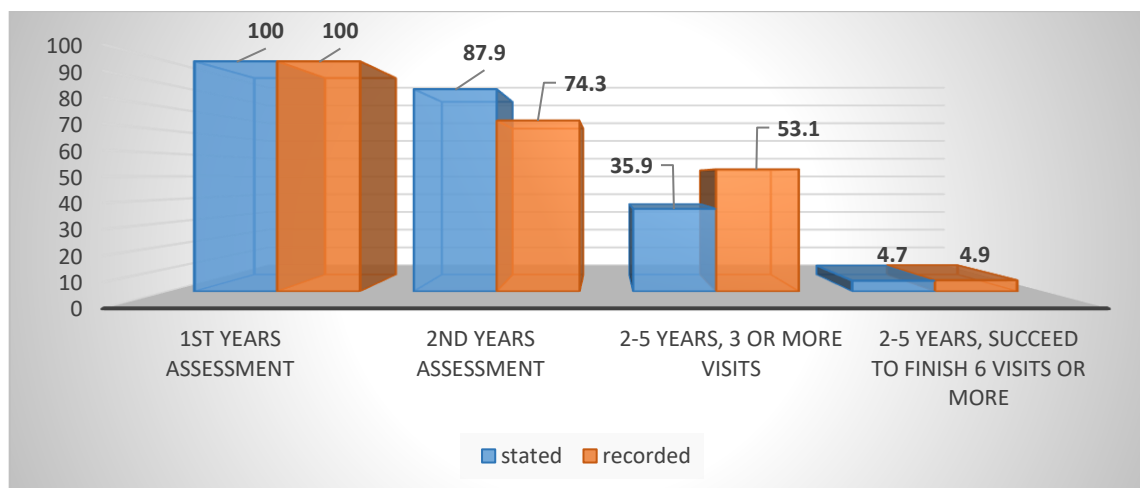


Figure 4.1: Comparison between stated and recorded (as abstracted from e-health) adherence to the child's health care

As shown in the figure 4.1 and table 4.7, the commitment to the child's growth and development monitoring, whether as stated by the mother or as recorded in the electronic medical records until the age of one year is 100 %, whereby the immunization process is still ongoing where the last immunization is given at 18 months, thus at the age of 2 years, starts the adherence to decrease to 87.9 % as stated by mothers, and 74.3% as recorded where Vitamin A is given to the child according to immunization and child health care charts, thereafter the adherence level continue to decrease to 35.9 % as stated by the mothers and 53.1 % as recorded (3 or more visits after the age of 2 years was relatively considered as there is still adherence to child's growth follow up and lasted at least one year).And the disparities between the stated and recorded adherence prevalence remain questionable and may be related to the recall bias, COVID-19 outbreak or to their beliefs regarding the importance of the growth monitoring. Moreover, the adherence decrease is easily observable after the age of 2 years. Where could be supposed by estimating those children, who have succeeded to finish 6 visits or more after the age of 2 years where it is expected to receive each child 2 visits every year after the age of 2 years if the child has no growth or abnormal

nutritional status. Thus, the commitment decreased to less than 5% of children. And besides that, the last recorded attendance child's age for growth and development monitoring can also reflect how far the child got the chance to fulfill the growth monitoring, where 18.1 % of children had their last visit at age 24 months or below, and 30% at age 36 month or below, that means, around 50 % of children did not attend or did not seek this service after age 3 years old.

In the mothers' qualitative part; exploring the gap and adherence to the growth and development monitoring, starting with mothers' knowledge about this service that is provided in the primary healthcare centers and the purpose of taking the anthropometric measures, where the majority of mothers reported as the following: 86% think that is routinely integrated into the child health services. Meanwhile, 43 % were aware of the importance of early detection of growth abnormality or anemia, where it could be properly managed. However, just 50 % were knowing that they should continue until the age of 5 years, 46% thought that until the age of 2 years, and one mother thought until 3 years old. Moreover, they were asked about their adherence, where 86% reported that they attended the clinic until the second child's assessment which is consistent with the quantitative results, however, 60% of mothers reported their commitment to the given appointment. And as one of the mothers stated "*Once I receive an appointment I will commit*", while 50% commented in the same context of as one mother mentioned "*we finished all immunizations, what is remaining?*".

Also in the mothers' qualitative part, the study explored the possible impeding factors, where 90% attributed to the family size and mothers' responsibilities, 86% financial factors, 80% of mothers stated that COVID-19 and political events, 60% crowdedness and long waiting time, 33% mentioned the mothers' health status, while 5 mothers (16.6%) mentioned the electricity "*I have to wash the clothes, Sweep the house and fill barrels of water*", and 10% to social factors.

Accordingly, this matter was explored from the healthcare providers' qualitative part (UNRWA primary healthcare system), where almost all key informants were convinced that this adherence is mostly fulfilled by healthcare providers, but the challenge is the decrease of family adherence to continue growth and development monitoring after the last immunization dose, or after the second year's assessment of the child, and they attributed the decrease of adherence to the following: growth follow-up service is not associated or

Unpaired with something tangible like vaccinations or vitamins (also mothers had the same comments), COVID-19, political clashes, long waiting time, and families perception, in addition to that, stunted children's families are aware of the lack of additional services and tangible interventions in this regard (stunting), except for medical referral to other authorities.

One of the key informants (SMO) briefed: "*the adherence (quantitative) is relatively okay, but proper (qualitative) remains challenging, where we are stressing on, and enhancing the qualitative adherence will reflect positively on the quantitative adherence*". Where this opinion in the same context was expressed by the majority of key informants.

However, possible gaps in the provision of a child's health care service in proper way (qualitative), can be in several forms, whether by the detection of stunted cases that depends on the measurements tools, and tools standardization, as the majority think, and on the health care provider technique, the commitment of practicing taking the anthropometric measures and recording the measures on the E-health and the child's handbook properly, as expressed 8 out of 10. Or commitment of the health care providers for follow-up and giving appointments to track the stunted child management process (almost the majority). In addition to that, qualitative adherence can be touched also by the provision of proper information and counseling (all key informants stressed counseling).

Finally, by qualitative part, the referral of the detected cases, whether internal or external for proper management and excluding the medical causes, is agreed upon by all. Meanwhile, 50% of the key informants expressed their concerns about, after detecting the stunted cases, addressing the growth abnormality, and starting the basic management requirements (what are available at the primary health care facility), rise a question as 2 SMOs mentioned "*what are the further steps, especially under absents of the responsible body to track this health regard*", whereby, after it becomes clear that the case (stunted child) needs to be referred to other advance directions, the chances of intervention begin to decrease (whether as diagnostic requirements like immunological or hormonal analysis, x-ray bone age identification, or treatments an or micronutrients). However, the rest of the key informants think that UNRWA's comprehensive child health care service includes monitoring (as mentioned by a SMO "*it is monitoring, not screening*") the growth, detecting abnormality, addressing this health problem by E-health and by the child's parents, and directing them toward the proper pathway. Otherwise, as one SMO mentioned "*other interventions are beyond capabilities*".

Table 4.7: Distribution of the study participants according to Adherence to Child's Growth and Development monitoring (abstracted from e health as recorded)

status	No	%	No	%
Item	Stated by mother		Recorded in E health	
Did the child perform the one year assessment	448	100	448	100
Did the child perform the 2 years assessment	394	87.9	333	74.3
committed and continued to make periodic growth and development after age of 2 years (at least one visit)	232	51.8	366	81.7
Number of visits after the second year annual growth assessment as in e-health				
Status (n=366) 82 missing	No		%	
low commitment level (1-2 visits)	128		35.0	
moderate commitment level (3-5 visits)	216		59	
Relatively well commitment level (6 or more visits) (supposed the child finished the all required visits from age 2 to 5 years)	22		6.0	
Mean 2.65, MD 3, SD 1.96 (Range 0-15)				
Last recorded visit age (n=448) 14 case (3.1 %) were not recorded on e-health				
Below or = 24 months	81		18.1	
25-36 months	136		30.4	
37-48 months	208		46.4	
equal or > 49 months	23		5.1	
Mean 36.08, MD 38, SD 9.64 (Range 18-63)				

4.1.7 Distribution of the study participants according to the Factors related to Health Care System

SS in children is one of the common reasons for referral and seeking medical care services (Allen & Cuttler, 2013; El Mouzan et al., 2011), Thus, stunting diagnostic approach, referral system and the medical setting should be properly provided (Maghnie et al., 2018; Oostdijk et al., 2009) by our health care system components. Whereby, exploring accessibility to the health care facility or centre, 83.7% of the selected population (table 4.8) were able to reach the nearest primary health care centres on their feet in less than 30 minutes (2.2% need more than one hour to reach the nearest health care facility if the go on foot).

Regarding the affordability or accessibility to get the micronutrients like Calcium-vitamin D or Zinc and Phosphorus (table 4.8), mothers who agreed 26.8%, and 8.0% consecutively, and the denial percentage of Zinc and Phosphorus was higher because they have lack of knowledge regarding this item. However, as revealed in some local studies in West Bank

and in the Gaza strip, there are multiple micronutrient deficiencies (Horino et al., 2020; Massad et al., 2020).

Besides that, exploring the affordability of appropriate information (counselling) about growth service, abnormalities, and its consequences as in the table 4.8, was poor as 75.2% of mothers did not have enough knowledge about its importance and it could be related to the counselling status. Thus, it could justify the poor adherence to growth follow-up appointment visits, especially after the age of two years. Therefore, this topic was chosen to be included in the qualitative part digging more deeply to find some answers about knowledge and adherence to growth and development monitoring.

Thus, in the mothers' qualitative part, interviews with key informant's mothers (30 mothers) were conducted, triggering their knowledge about causes, consequences, and manageability. Where most mothers think that the most common causes of stunting are genetic and nutritional causes, also 60% reported that hormones, vitamins, and micronutrients have a role in the child's growth, while 25% of all mothers were aware that the child's health status can affect the growth, in the other hand, a minority of mothers think that the economic status and mother psychological status can play a role, in addition to one mother think that While, their knowledge about possible consequences, most mothers think that their children will face psychological impacts which were confined to bullying, while 50 % added social consequences " my daughter will hardly find a groom", in addition, to delay of puppetry. Otherwise, 60-70% of mother believe that the stunting is not correctable.

Regarding the diagnostic approach starting from the detection of the stunted child. Whereby the total recorded number of case detection was 65 (14.5 %) out of 448 (at least was recorded once in the medical electronic record as stunting), while in comparison to the mothers' answers, just 29 cases agreed that their child was detected as stunting and it could be related to recall bias. Moreover, it can reflect the lack of the mother's awareness or knowledge of the growth abnormality, which can relate to the counseling approach.

Thus. To clarify the detection process and variation, where the total number of considered stunted children was 108 (below -1 SD HAZ). Therefore, by the qualitative part with the healthcare key informants, the detection process was explored, where the majority of them

reported that there are 2 detection pathways, by which the stunted child is detected and then, is recorded in the child's growth follow-up file. Where the first pathway is through routine growth and development monitoring, where measures are taken and recorded on the E-health, whereby, once the flattened measures according to the chronological child's age are entered on the E-health, automatically it will be addressed as growth abnormality as stunting and giving alarming regarding this growth abnormality, but in our study's case of interest (stunting), this alarming is linked with HAZ below -2 SD, and this can explain the presence of variation between the number of detected stunted cases in this study and the recorded cases in the E-health system. Furthermore, the second detection pathway is by families complaining of the remarkable height difference of their child in comparison with his peers, whereby, measures should be taken and registered on the E-health in the same process as mentioned in the first pathway. So, the second pathway is usually met when the family did not complete the growth and development monitoring service that should be provided for children from birth until the age of 5 years old. *"Without ignoring the measurement variations by the health staff, who are sometimes under work pressure, as they may improperly measure the length or weight of a child. Whereby the standardization is closely monitored"* as triggered by a SSN.

However, only three out of ten health key informants believe that the children continue to attend the growth and development monitoring until the age of 5 years, while the rest of the key informants believe that the follow-up begins to decline after the end of the child vaccination program, whereby they attributed the decrease of adherence to many reasons including family attitude 4 out of seven, and the rest attributed also this to special events like COVID-19 and political clashes.

Regarding the diagnosis process, almost all healthcare key informants find that family recruitment is very important and is the first step toward managing stunting cases and growth abnormalities, and as mentioned by one medical officer: *"The stunting management requires the time factor, and the close follow-up of the child's family, and this will only be done when the family understands the importance of this health issue and is convinced of the necessity of follow-up"*.

Table 4.8: Distribution of the study participants according to the Factors related to Health Care System

Item	No	%				
1. Access to health care system: to reach nearest health care facility (n=448)						
Within 30 minutes	375	83.7				
More than 30 minutes	73	16.3				
Mean 22.53, MD 15, SD 16.9						
2. Affordability or accessibility to get (n=448)						
Micronutrients- of Calcium-vitamin D	120	26.8				
Micronutrients- of Zinc and Phosphorus	36	8.0				
The appropriate information regarding SS and growth delay consequences?	111	24.8				
3. Was the child ever detected as short stature (n=448)						
Recorded: in E-health						
Yes	65	14.5				
No	383	85.5				
Stated by mothers						
Yes	29	6.5				
No	419	93.5				
4. Age of 1st time detection (n=65) as abstracted from e-health						
since birth	20	30.8				
within 1st year of life	28	43.1				
within 2nd year of life	13	20.0				
After age 2 years old	4	6.2				
Mean 8.12, MD 4, SD 10.7 (Range 0-60), 383 case was never detected as short stature						
5. Diagnostic-management and follow up process (n=65)	Disagree		Some how		Agree	
	No.	%	No.	%	No.	%
Appropriate information regarding SS causes and managements	18	27.7	19	29.2	28	43.1
prescribed medications or micronutrients	42	64.6	10	15.4	13	20
The medical officer started the management process	21	32.3	23	35.4	21	32.3
medical personnel tracking and follow up process	4	6.2	20	30.8	41	63.1
family commitment to continue follow up	15	23.1	14	21.5	36	55.4
6. Supposed diagnosis for detected SS cases (n=65)						
FSS	2		3.1			
not diagnosed yet	28		43.1			
Others	35		53.8			

Digging more deeply into the diagnosis process at the level of primary health care facilities and available standards, the majority reported the presence of clear procedures that are taken in case of detection of growth abnormalities, starting from an internal referral from the practical nurse to the medical officer, follow up process, basic laboratory investigations at the level of the primary health care (CBC, urine and stool analysis), and ending with the external referral, but no one mentioned that, the parents' height or child's height velocity are included in the diagnosis process.

furthermore, exploring the first-time detection age from the total recorded cases 65 (14.5%), was as follows: 30.8 % since birth, which could be related to previously intrauterine life, while 43.1 % were detected at the first year of life, in addition to 20 % at the second year of life, which means, more than 90 % of detected cases were detected within the first two years of life.

For those who were ever detected and recorded as stunting (n=65), the affordability of appropriate information (counseling) about possible causes and management, is an important step, toward establishing the follow-up and management process, increasing parents' awareness, and increasing their commitment and adherence to clarify this condition if it is a normal or pathological condition. Where 27.7% denied that they have received any information about this issue, while the others agreed that they had the chance to get appropriate information (at least 43.1% were satisfied)

So, by the mothers' qualitative part, digging deep in this regard. Mothers were asked about counselling, and the provision of information, whereby 80 % of mothers reported that the medical staff stresses usually on the vaccine and breastfeeding, while 33 % stated that the counselling covers the growth monitoring importance and stunting consequences, which is consistent with the quantitative results. On other hand, once the child was detected as stunting, more attention is provided and more explanation (80% of mothers); which is consistent with the quantitative results (assumed that mothers who stated that they described the level of getting the information somehow 29.9 % and well 43.1 are considered that they could find the information).

Aiming to have a complete view of the counselling status and possible gaps, the healthcare providers were also triggered in the qualitative part. Whereby, all key informants acknowledged its necessity, covering the nutrition practices, increasing the mothers' awareness, and stressing the family's adherence to the growth and development monitoring. *" Most mothers don't have enough knowledge about the breastfeeding and nutrition of their children, and the importance of continuing growth follow up, and I believe that these factors are crucial in managing the growth abnormalities".* As mentioned SSN. And another said (SMO), supporting this context: *" one of the main tasks that we assure, is that the health care provider should be equipped and trained with proper information to change family attitude and behaviors even with available resources of families".* And he followed up by saying *"counseling is the cornerstone especially if the cause of stunting is not genetic".*

Exploring the possible causes of the gaps in providing the proper information about a child's growth, " *that is included in the child health care service within comprehensive child health care service that include also vaccination, mental health, anemia follow up, growth and development monitoring and health education* ", as most key informants mentioned, where possible challenges can rise in developing gaps and they attribute these gaps to " *overloading 6/10, overwhelming of the staff 4/10, presence of multitasks 2/10, the attitude of some health care providers 2/10, and mother related factors 2/10*". And some of the key informants continued by saying " *which in turn may make the nature of work something routine*", and one key informant described this pattern can lead to " *decreases the health care provider attention and become working as robot*".

Possibility to get prescribed medications or micronutrients that are not afforded by the primary health care system (MoH and UNRWA) for this detected group (n=65) is relatively low (20%), where 64.6% were unable to get them, and 15.4% could find the required items or medications from private sectors or had the chance to get them from others NGOs nets systems.

Regarding the detected group (n=65), and the further management steps that were conducted or needed, according to mother's beliefs, 32.3% of mothers think that the medical officer started a management process that could include: instructions, lab investigation, and asking about mothers' and fathers' heights, meanwhile 32.3% expressed that nothing was done in this regard, 35.4% think that some management procedures were done but these can include routine investigations like HGB test. Furthermore, these rates could not reflect the reality and what occurred, but rather what mothers believes and this off course can correlate also with the counseling's approach and recall bias. Therefore, by reminding mothers in the qualitative part about some laboratory investigations that were conducted through the growth follow up, they answered that, these lab investigations are routinely conducted.

Medical personnel tracking and follow-up process together with family commitment to continue follow-up were relatively higher, 63.1% and 55.4 % consecutively, while just 6 % and 23% consecutively denied, also in the mother's qualitative part, the majority of mothers agreed that the health personnel continued commitment for follow-up.

Moreover, aiming to explore if final diagnosis was addressed for the detected stunting cases (n=65), or at least normal variant, pathologic or idiopathic, which means a long cycle of diagnostic process and referrals were conducted, and final diagnosis was suggested, where

the prevalence of clearly diagnosed or at least the family were informed that the cause of SS, is familial (3.1 % from the detected cases), while the not diagnosed cases or at least no final diagnosis was done yet (43.1 % from the detected cases), and rest of detected cases were categorized as other causes or at least the family was informed about one reason of growth stunting like preterm babies, twines. Where this context was supported by the qualitative part by the healthcare key informants and as one SMO mentioned " *the follow-up and managing the stunting is very expensive and this is why we and families lose the follow-up*". While other SMO commented in this regard: " *It is a long journey to be able to diagnose or reach to distinguish the pathological causes from the non-pathological reasons, thus, there is a long series of actions, investigation and consultations that may not usually be available in hospitals and primary health care clinics, and this, in turn, means need for money and not a little*".

Furthermore, all mothers reported in the quantitative part, that they did not receive any referral for further management, and that was not logical, so by the qualitative part the researcher tried to find an answer for this issue, where 100% of mothers reported that when their children are detected with any growth abnormality or anemia, they receive an internal referral to the doctor in the same clinic while triggering the external referral, 76% of mothers stated that they received a referral to MoH hospitals for further management. And 53% reported that they received a referral to NGOs especially Ard Al-Ensan, despite there being no formal channel known between UNRWA and other entities except MoH hospitals for child health and growth status.

The referral pathway was also triggered in the qualitative part with healthcare key informants, therefore this study has triggered the referral pathway, which was distinguished into 2 types of referrals: internal and external referrals, whereby the internal referral refers to the referral of the stunted child who was detected at the daily child health Care unit by the practical nurse PN, where anthropometric measurements should be taken and addressed as a stunted child and referred to the medical officer MO in the same clinic, whereby almost all of healthcare key informants were agreed that, once the child measurements are recorded in E-health and addressed as a stunted child or has growth abnormalities, the referral to the medical officer in the same clinic will be done.

So, exploring the possible gaps in the internal referral process according to the health care key informants, they were classified into 2 categories: the first category is related to the

health care providers whether the sender (represented by the PN) or receiver (represented by the MO), where the sender can miss referral of some cases, while how the receiver treats the referred case which can be in a proper way, or with underestimation without tangible action, or with overestimation and refer the child to other entities or directions (external referrals) without starting the supposed first steps of managing process.

While the second category is linked to the family reaction, where they did not continue the assessment and didn't attend to the MO, which is attributed to the overloading of health workers, long waiting time, and families' attitudes as most key informants reported, in addition to the health care provider attitude where one of the key informants reported this kind of behavior, while the others were convinced that the internal referral process work properly, but they denied the presence of a clear monitoring process.

In stunting cases, an external referral is one of the diagnostic and management steps where the child should be referred to an advanced health care facility to at least rule out the pathological causes and to make the final diagnosis of stunting. So, theoretically the referral to other directions exists, but practically tracking the referral can be lost, and the benefit cannot be guaranteed, whether because of the lack of knowledge of the parents and their limited financial capabilities; or because of the receiving part (the entity to which the child was referred.) and the extent of the capabilities available to them.

The targeted directions, where the stunted child should be referred, are the MoH secondary health care facilities, and approach is the only formal pathway for external referral, as all health key informants addressed, and when they were poked about NGOs like Ard Al-Ensan, they answered definitely that we do not refer to them, but it is possible informally, especially if the cause of the stunting appears to be nutritional.

Some challenges in the external referral process, as the key informants mentioned, absence of a common or unique health information system between primary and secondary healthcare nets, make tracking of cases not easy, especially with growth abnormalities, where many steps and investigations should be taken whether in the hospital or by private labs, whereby, also the absence of a responsible body who track the progress of the referral and management process has a role in the lack of effectiveness of the external referral and child's management. Furthermore, the feedback process is almost non-existent. Thus, management of the stunted child remains stuck in many cases, re-transferring the child to

the hospital, and re-doing some procedures are not the optimal solution. Without ignoring the role of families in the feedback process.

4.1.8 Distribution of the study participants according to Decision making inside family

Regarding head of household, decision making and responsibility of daily life activities of families (table 4.9), the mothers had an important role in seeking their child's medical care and daily meals where 39.5 % and 42.9% consecutively, where mothers were taking care of their children of what should they eat and have the responsibility of attending the health care centers for child growth follow up, while the minimal role was recorded for mothers (around 6.7 %) in daily expenditures where men had the responsibility to take decisions where could they expend the money and the making the financial issues and rated 42.7%; eventually they both could share and participate in managing these three issues, use of money, daily meals and child's medical care with the consecutive rates 47.4%, 41.3%, and 53.3%. where in previous reports, the households maintained by females were around 10 %, regarding economic and financial issues (PCBS, 2017^b). This can reflect that; mothers are important players to be targeted toward effectively directing the child's health status.

Table 4.9: Distribution of the study participants according to Decision making

	use of money- expenditure (n=447)		daily meals (n=448)		Child's medical care (n=448)	
	Nu	%	Nu	%	Nu	%
Mainly the wife	30	6.7	192	42.9	177	39.5
Mainly the husband	191	42.7	45	10.0	26	5.8
Both	212	47.4	185	41.3	239	53.3
Others	14	3.1	26	5.8	6	1.3

4.1.9 Distribution of the study participants according to Social factors-woman status

Regarding the social factors represented by social norms that can affect the woman's status whether the acceptance to continue the mother her education, to attend family and household related issues or training courses, or child nutrition sessions, or even to attend the primary health care for her child growth monitoring as shown in the table 4.10, around 80 % (77.2%, 80.4% 81.5%, and 83% consecutively), while in the mothers' qualitative part, 2 mothers stated that they cannot attend the clinic without taking permission or acceptance by their husbands. Otherwise, where no previous studies were found regarding social norms especially those that could impact or hinder women to participate in such activities regarding a child's health or education. Whereby the role of the mother in decision-making regarding children's nutrition and or health needs was around 40 % (42.9 %, 39.5% consecutively),

and in participation with the father 41.3 % and 53.3 % consecutively, while the influence of Grandparents on the type of nutrition for baby or child reached 43.3 %, especially in the extended families context.

Table 4.10: Distribution of the study participants according to Social factors in regard with woman status

Social woman status (n=448)	Not		To Some Extent		Yes to High extent	
	No	%	No	%	No	%
Acceptance to continue education	38	8.5	64	14.3	346	77.2
Acceptance to attend the mother family and house hold related issues training courses?	29	6.5	59	13.2	360	80.4
social acceptance for mother to attend child nutrition training	28	6.3	55	12.3	365	81.5
social acceptance for mother to attend PHC Grow Development of the child	26	5.8	50	11.2	372	83.0
Does the grandmother, grandfather has influence on the diet style and nutrition or breastfeeding for children?	194	43.3	127	28.3	127	28.3

4.1.10 Distribution of the study participants according to Nutrition Status

Starting from mothers, the nutrition status of the mothers during different maternal periods was triggered, and how mothers can describe their nutrition status (referring to the healthy food, micronutrients, vitamins, presence of animal products, and regularity of these items in their food scale) during the preconception, pregnancy, and lactation periods. Where around 60% of the mothers described that their nutrition scale was relatively well especially during the lactation period (69%), while around 10% of the mothers described the scale as bad during pregnancy.

Moreover, regarding the child's food and nutrition status, starting from breastfeeding and weaning age, reaching the nutrition practice and behaviors, and availability of micronutrients, vitamins, and animal food products, where mothers are playing an important role in this field (El Bilbeisi et al., 2022; Fanzo et al., 2021; Nayoan et al., 2023; Shaban et al., 2021) as was found also in this study in table 4.11. Therefore, mother's awareness about children's nutrition is crucial, whereby, mothers, who stated or believe that their Nutrition awareness level about healthy nutrition practices for children and their age categories was well, rated 61.2 %, while 6 % were not sure and thought that their awareness level is not well, and these rates were according to their beliefs, because of no specific questionnaire was conducted for this field.

Table 4.11: Distribution of the study participants according to Nutrition Status

Item	No	%				
Description of Nutrition status through Pre Pregnancy period (n=448)						
Not Well	24	5.4				
Moderate	153	34.2				
Good	271	60.5				
Description of Nutrition status through Pregnancy period (n=448)						
Not Well	41	9.2				
Moderate	132	29.5				
Good	275	61.4				
Description of Nutrition System through Lactation period (n=448)						
Not Well	21	4.7				
Moderate	118	26.3				
Good	309	69.0				
Mother believe about her nutritional awareness about healthy feeding practices needed for the child (n=448)						
Not Well	29	6.5				
Moderate	145	32.4				
Good	274	61.2				
Exclusive breastfeeding until the age (n=448)						
One month and less	114	25.4				
Above one month to less six months	203	45.3				
6 months and more	131	29.2				
Complementary feeding at which age was started (n=448)						
One month and less	91	20.3				
Above one month to less six months	134	29.9				
6 months and more	223	49.8				
Complementary feeding items (n=448)						
feeding Formula Milk	298	66.5				
Cow's milk and its products	73	16.3				
Green vegetables	334	74.6				
Fish, meat, liver products	92	20.5				
Egg	244	54.5				
Sugar solution	83	18.5				
Fruits	292	65.2				
Weaning age (from mother breast feeding) (n=448)						
Never breastfed	14	3.1				
Breastfed less than 6 months	15	3.3				
Breastfed 6-12 months	184	41.1				
Breastfed exceed one year	235	52.5				
presence of the following items in the family menu (n=448)	Occasionally		1-3 per week		Regularly integrated	
	No	%	No	%	No	%
Fruits	60	13.4	354	79	34	7.6
Animal proteins products milk and its products	35	7.8	394	87.9	19	4.2
Egg	43	9.6	262	58.5	143	31.9
Snacks- salted	42	9.4	282	62.9	124	27.7
	61	13.6	248	55.4	139	31

The first rock in the child's life and nutrition is breastfeeding. Where exclusive breastfeeding age was followed by the researcher, where 25.4 % of children did not get the chance for exclusive breastfeeding at least in their first month of life. Hereby these rates are below the international standards that should continue for up to 6 months (Long et al., 2021; UNICEF,

2016; WHO, 2014a). Whereby they needed complementary feeding support regardless of reasons that can be related to the mothers themselves or to the children, in addition to that, the babies who lost the exclusivity of breastfeeding within their first 5 months of life were 45.3 %, so they together, reaching 70.8 % of children did not have the chance for exclusive breastfeeding for 6 months which is higher than global reports, Just over 40%, or two out of every five newborns under the age of six months, are breastfed exclusively worldwide (UNICEF, 2016).

On other hand, complementary feeding among 20.3 % of children was in the first 30 days of life, while other mothers started complementary feeding at the age of 6 months or above and rated 49.8%. which is less than the global records, where the prevalence of complementary feeding among children 6-8 months and above was 66% (UNICEF, 2016). However, the child's weaning (weaning from breastfeeding) age was categorized into 4 groups. Where 3.1 % had never breastfed, and 52.5 % of children exceeded one year of breastfeeding. Whereby breastfeeding should last optimally up to 2 years old (UNICEF, 2016).

Regarding the complementary feeding items (table 4.11), regardless of the age of starting, were also triggered, where 66.5 % of the children, the milk formula was the complementary feeding item, which usually started at the early age stage (within the first months of life), where the demand on other types of milk like cow milk was low and rated 16.3 %, moreover, after the age of 6 months, mothers start with vegetables (74%) and or fruits (65%) whether cooked or not, together with egg prepared items were also used as complimentary feeding item in 50 % of children, where the demand on animal protein sourced items like fish, meat, or liver products was around 20 %.

As the child grows and started to take his nutritional needs under prepared meals forms, where around 10% of children have 2 or fewer regular meals, whereby the majority of children have 3-4 or more divided meals, and exploring if these meals have the healthy components that are related or may have a role in the child's growth (Dickin et al., 2021; Eaton et al., 2019; Headey et al., 2018; UNICEF, 2016), therefore some items were included in the data collection tools as in table 4.11. Whereby; the regular children's consumption of fruits, animal products, milk, and its derivatives, eggs, and salted snakes rated 7.6%, 4.2%, 31.9%, 27.7%, and 31% consecutively, and the rational consumers (1-3 per week) were 79%, 87.9%, 58.5%, 62.9%, and 55.4% consecutively, contributing together to be appropriate to a previous study finding conducted in the Gaza strip in 2020 (Jalambo et al., 2020). But in some kinds were 10% lower.

It is worth mentioning that exploring the presence of these items in the child's nutrition is aimed to explore the intra-household food security and distribution, especially complementary feeding, but through the findings and our economic status in the GS, the presence of these items is linked to the non-intra-household factors (food access or food security). Whereby, several families have persisted in using unhealthy coping techniques to deal with their food poverty, especially in Gaza. In Gaza, 82% of people consumed inferior or low-quality food, 66% bought food on credit, and 49% either borrowed money from family or friends or asked for assistance with food support. In contrast, the situation was better on the West Bank, where 31% of households consumed inferior or less favoured food, 32% financed their food purchases, and 21% turned to borrowing or begging. While 11% and 12%, respectively, of West Bank and Gaza residents reported a rise in recent food credit purchases (WFP, 2021^a)

4.1.11 Distribution of the study participants according to the Strengths and Difficulties Questionnaire SDQ

Regarding the psychological and mental assessment of the child, a 25-item screening tool for children aged three to seventeen called the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997), looks for prosocial behavior strengths as well as weaknesses in four different areas: emotional symptoms, conduct issues, hyperactivity/inattention, and peer relationship issues. Where 10% of kids should score borderline, 10% abnormal, and 80% of kids should score normally. Whereby in the literature found that the child's growth problems and malnutrition are implicated in the brain, mental, psychological, and emotional progress, and development (Aguayo & Menon, 2016; Alamy & Bengelloun, 2012; de Onis & Branca, 2016; A. D. Rogol, 2020; Sanou et al., 2018; Tia Tampy et al., 2020). Meanwhile in this study's sample, the abnormality scores exceeded 10 % in all scales except the prosocial behavior.

Table 4.12 shows, the total difficulties score was 23.2 %, which means; one child from every 4 kids has at least one of the following four areas or domains: emotional, conduct, hyperactivity, and peer relationship problems which is consistent with other studies conducted in the Gaza strip among 7-11 years old children (El-Khodary & Samara, 2020) and another study among children with special needs with finding higher than these study findings except the conduct abnormality was the same as stunting children (Thabet, 2017). And these findings are higher than global standards, especially the conduct problems that should be below 10% (Mohammadi et al., 2021). in addition to that, the child has a relatively high chance of experiencing violence that reached 61.8 % whether physical (20.5%) or at

least verbal (41.3%), which is consistent with a previously conducted study about child violence experience that rated 64.5% (El-Khodary & Samara, 2020). While the prosocial score was above 80% as shown in table 4.12

Table 4.12: Distribution of the study participants according to SDQ

Item	No		%			
politeness methods: Nonviolence (dialogue)-violence exposing scale (n=448)						
Nonviolent treatment – discussion and dialogue	171		38.2			
Child may experience some kind of violence like verbal, or mild physical punishment	185		41.3			
Child experience violence like verbal, psychological or physical discipline abuse	92		20.5			
SDQ analysis (n=448)						
Categorising SDQ scores	Normal		Borderline		Abnormal	
Status	No	%	No	%	No	%
Emotional problems scores	284	63.4	58	12.9	106	23.7
Conduct problems scores	216	48.2	108	24.1	124	27.7
Hyperactivity scores	343	76.6	46	10.3	59	13.2
Peer-problem scores	208	46.4	115	25.7	125	27.9
Total difficulties scores	275	61.4	69	15.4	104	23.2
Prosocial score	397	88.6	28	6.3	23	5.1

4.2 Inferential results and discussion

4.2.1 Association between Stunting and Child Information

Exploring the association between the presence of stunting and child information as shown in table 5.1, where there was no statistically significant difference in the presence of stunting among both genders males and females where the OR was 0.967 with a confidence interval (CI) of 0.627-1.491 with a p-value of 0.879. Else more, the child's rank has no statistical relationship with stunting, but it was observed that the prevalence of stunting among first-ranked children was higher where the prevalence was 27.6%. However, it could be explained as the first child being born to an inexperienced mother but it is not statistically significant. The study showed that the rate of stunting among children whose age exceeds six years is higher than in younger age groups, with a p-value of 0.014 and OR 0.579 (CI 0.374 - 0.896), with a rate of stunting reaching 29.4%. This may reflect that families are compelled to delay their children's entry to the first grade if their children are stunting. Without marking or being fully aware of the reason.

Table 5.1: Association between Stunting and Child Information

Personal Data	Items	Stunting		Not Stunting		Total		OR (CI)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Gender	Male	55	23.8	176	76.2	231	100.0	0.967 (0.627, 1.491)	0.879
	Female	53	24.4	164	75.6	217	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Child age	Below 6 years	46	19.4	191	80.6	237	100.0	0.579 (0.374, 0.896)	0.014
	6 years or above	62	29.4	149	70.6	211	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Rank of the child	First [®]	34	27.6	89	72.4	123	100.0		
	2nd-3ed	34	21.3	126	78.8	160	100.0	1.415 (0.819, 2.447)	0.212
	4th-5 th	29	23.8	93	76.2	122	100.0	1.225 (0.689, 2.176)	0.488
	6th or after	11	25.6	32	74.4	43	100.0	1.111 (0.504, 2.451)	0.794
	Total	108	24.1	340	75.9	448	100.0		
Weight status-weight for age	Below normal (< -1 SD WAZ)	68	61.3	43	38.7	111	100.0	11.742 (7.088,19.452)	0.000
	Normal & above > -0.99 SD WAZ	40	11.9	297	88.1	337	100.0		
	Total	108	24.1	340	75.9	448	100.0		

Moreover, 61.3% of children, who's their weight for age Z-score below -1 SD, were stunted, thus, an association of stunting with being underweight could be a logical reflection of malnutrition of those subjects who live under the same circumstances. And the association was statistically significant with a P value below 0.001 and OR 11.742 (CI7.088- 19.452).

4.2.2 Association between Stunting and Parents Information

The researcher found that there is no relationship between both parents' age, education level, work status, consanguinity, and poverty status with stunting (table 5.2a), despite these factors could play role in a child's stunting and were detected in other studies (Astuti et al., 2022; Jonah et al., 2018; Sanou et al., 2018; Simelane et al., 2020; Vaivada et al., 2020; Vishwakarma et al., 2021; Vollmer et al., 2017), even also, is known that societies with low economic status and high poverty rates, where stunting frequently is considered and goes as one of the poverty features, and it is thought to be a cyclical process, resulting in an intergenerational cycle of poverty that is challenging to break (Barstow & Rerucha, 2015; Bommer et al., 2019; El-Shafie et al., 2020; Prendergast & Humphrey, 2014).

The table 5.2a shows, that the rates of stunting among old age mothers (over 35 years old on the day of data collection) reached 30%, while fathers' age had no clear difference in the stunting rates among children, with no statistically significant associations.

Table 5.2a: Association between Stunting and Parents Information

Personal Data	Items	Stunting		Not Stunting		Total		OR (CI)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Mother Age	29 Years & less [®]	27	22.7	92	77.3	119	100.0	1	
	30 to 35	49	22.1	173	77.9	222	100.0	1.036 (0.608, 1.767)	0.896
	36 – 40	21	30.9	47	69.1	68	100.0	0.656 (0.336, 1.283)	0.217
	above 40	11	28.2	28	71.8	39	100.0	0.747 (0.329, 1.694)	0.484
	Total	108	24.1	340	75.9	448	100.0		0.441
Father Age	29 Years & less [®]	6	20.0	24	80.0	30	100.0	1	
	30 to 35	42	23.9	134	76.1	176	100.0	0.797 (0.305, 2.081)	0.643
	36 – 40	32	24.8	97	75.2	129	100.0	0.758 (0.284, 2.018)	0.578
	above 40	28	24.8	85	75.2	113	100.0	0.759 (0.282, 2.045)	0.584
	Total	108	24.1	340	75.9	448	100.0		0.951
Mother Education	Primary	7	36.8	12	63.2	19	100.0	0.586 (0.219- 1.564)	0.281
	Preparatory	13	22.8	44	77.2	57	100.0	1.156 (0.579, 2.310)	0.680
	Secondary	34	21.3	126	78.8	160	100.0	1.267 (0.777, 2.065)	0.342
	College/University [®]	54	25.5	158	74.5	212	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.446
Work status for mother	Yes	11	22.0	39	78.0	50	100.0	0.875 (0.432, 1.775)	0.712
	No	97	24.4	301	75.6	398	100.0		
	Total	108	24.1	340	75.9	448	100.0		

Additionally as detected in table 5.2b, there were disparities in the stunting rates between mother education categories, with the highest prevalence being over 36% among low educated mothers, followed by high educated mothers. Whereby it can be argued that less educated mothers had poor knowledge, but highly educated mothers had a better chance of working. While consanguinity had no statistical effect on stunting prevalence, which is not consistent with previously conducted research in the Gaza strip, where the consanguinity was more implicated or associated with stunting (El Kishawi et al., 2017).

Table 5.2b: Association between Stunting and Parents Information

Father education	Primary	16	30.2	37	69.8	53	100.0	0.666 (0.334, 1.325)	0.245
	Preparatory	20	21.3	74	78.7	94	100.0	1.065 (0.578- 1.964)	0.840
	Secondary	34	26.0	97	74.0	131	100.0	0.821 (0.483- 1.398)	0.468
	College/University [®]	38	22.4	132	77.6	170	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.570
Work status for father	Yes	64	22.3	223	77.7	287	100.0	0.763 (0.489, 1.190)	0.232
	No	44	27.3	117	72.7	161	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Poverty Line	Above poverty line	18	22.0	64	78.0	82	100.0	0.975 (0.527, 1.805)	0.937
	Under Poverty Line	47	22.4	163	77.6	210	100.0		
	Total	65	24.1	127	75.9	292	100.0		
Consanguinity between mother and father	Yes	36	22.4	125	77.6	161	100.0	0.860 (0.545, 1.358)	0.517
	No	72	25.1	215	74.9	287	100.0		
	Total	108	24.1	340	75.9	448	100.0		

4.2.3 Association between Stunting and Household Information

Table 5.3 shows the relationship between the stunting and the household information, Where stunting Prevalence variation among the residential categories were detected, where the highest rate was in the rural area and rated 29% while the lowest rates were in the urban area but this variation was not statistically significant with a p-value 0.35; where consistency with other researches was fluctuating between statistical detected effects or not (Assaf & Juan, 2020; El-Shafie et al., 2020; El Kishawi et al., 2017), but in comparison with other studies conducted in the Gaza strip, there were higher statistical stunting rates among children who live outside the camps including those who live in the rural area (AbuKishk et al., 2020). Thus, children who live in rural areas are more disadvantaged (AbuKishk et al., 2020; Beal et al., 2018; El-Shafie et al., 2020; Zayed et al., 2016).

Also, there was no statistically significant relationship between stunting and house density despite the lower rate in the comfortable houses with a rate of 20% but the p-value was 0.46, whereby this variable was adjusted to estimate the wealth status that can affect the growth status of the child, as detected in other studies (Bommer et al., 2019; Headey et al., 2018; Jonah et al., 2018; Monteiro et al., 2010; Torlesse et al., 2016; Vollmer et al., 2017).

On the other hand, Obvious statically significant association between stunting and residency place, where the North and Gaza provinces rated the lowest rates which reached 13% while the other provinces rated 32% with p-value 0.00, OR 0.34 (CI 0.209 - 0.555), whereby previously conducted cross-sectional study in the Gaza strip in 2017, the geographical allocation has no statistical association with stunting(El Kishawi et al., 2017), and this can be attributed to the chance of the sample draw where in the north 2 governorates where the higher chance to be the sample drawn from an urban area, while middle and south governorates had the chance to include higher proportion from refugee camps, rural and marginal areas.

Marginal statistical relationships between stunting with both housing category and family size, where the highest rates in the housing category were among nuclear families (29%), while was 28% among families with six members or above and the p-value was 0.06, 0.09 consecutively, whereby for consistency, there were no previous researches to detect these factor`s implication in stunting in the Gaza strip, meanwhile, in literature, these factors were implicated (Grasgruber & Hrazdíra, 2020; Lisanu Mazengia & Andargie Biks, 2018; Simelane et al., 2020; Wolde et al., 2015). However, the higher rates among nuclear families can be attributed to the probability that mothers don't find support whether as information about relatively good feeding practices or as availability of food security under the economic circumstances that the Gaza strip live. Moreover, the higher rates among large families can be attributed to the higher mother burdens and responsibilities of proper fulfillment of intra-household food distribution, besides the economic facts that the family will face by increasing financial demands.

Regarding household food security (non-intra household security). There was no statistically significant relationship between stunting and social assistance (p-value of 0.27), despite the rate of stunting being higher among the families who don't receive any social support and rated 26.2%, which is consistent with other studies conducted in middle-income countries (Bernal et al., 2014; Jonah et al., 2018; Leroy & Frongillo, 2019; Motbainor et al., 2015), it could be attributed to the lean of families to uncertainty in such issues, or find these kinds of questions embarrassing; on the opposite, out of these 189 families who reported that they

receive this support, 150 families receive regular food packages or financial support for this regard, where the rates of stunting among families who receive this regular food support were higher than families who don't receive this kind of support where the prevalence of stunting was 25% with p-value 0.016 (fisher test) and OR 0.246 (CI: 0.07-0.84), which can reflect that, families who live under critical or bad economic conditions and receive food assistance have at least one family member malnutrition feature. Otherwise, the researcher didn't find any statistical relationship between stunting and micronutrient support and security among those families who receive any social support, which can be related to the absence of a unique child's health record to find exactly their provision.

However, continuing exploring non-intra household food security (Herforth & Ahmed, 2015), the number of families who receive fruits, vegetables, animal or protein products, and eggs was not high enough to detect exactly, if these issues are implicated in developing stunting, where the total number of these families who receive this kind of support was ranging between 33 and 44 families, maybe this kind of social support is not known or adopted buy social supportive Nets, but even though the relationship between these kinds of supports and stunting was not statistically significant as shown in the table 5.3.

Additionally, the relationship between stunting and the child's involvement in economic activities was not statistically significant, which is not consistent with other studies in similar economic circumstances, where children found themselves involved in labor market (Bernal et al., 2014; Iqbal et al., 2020), but in comparison with local reports, there was a clear increase of involved younger children in the labor market from 2 % to nearly 6 % as reported by OCHA regardless if they were working full time or not (OCHA, 2019). However, the total number of families who reported that their child is directly or indirectly involved in this kind of activity was 25 families and the p-value was 0.621.

Table 5.3: Association between Stunting and Household Information

Personal Data	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Residency	Refugee camp®	44	24.7	134	75.3	178	100.0	1	
	Rural area	25	29.1	61	70.9	86	100.0	0.801 (0.450-1.426)	0.451
	Urban area	39	21.2	145	78.8	184	100.0	1.221 (0.747-1.994)	0.425
	Total	108	24.1	340	75.9	448	100.0		0.359
Geographic area	North and Gaza	26	13.7	164	86.3	190	100.0	0.340 (0.209, 0.555)	0.000
	Other Governorates	82	31.8	176	68.2	258	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Housing Category	Extended	62	21.2	230	78.8	292	100.0	0.653 (0.418, 1.020)	0.060
	Nuclear	45	29.2	109	70.8	154	100.0		
	Total	108	24.1	340	75.9	446	100.0		
Family Size	6 and less	63	21.6	228	78.4	291	100.0	0.688 (0.441, 1.073)	0.098
	Above 6	45	28.7	112	71.3	157	100.0		
	Total	108	24.1	340	75.9	448	100.0		
House Density	Crowded	37	23.6	120	76.4	157	100.0	0.838 (0.465-1.509)	0.556
	Modest	45	26.9	122	73.1	167	100.0	0.701 (0.395-1.241)	0.221
	Comfortable®	23	20.5	89	79.5	112	100.0	1	
	Total	108	24.1	340	75.9	436	100.0		0.462
Drinking water Sources	Purify water®	81	23.5	264	76.5	345	100.0	1	
	Water point	23	27.1	62	72.9	85	100.0	0.827 (0.482-1.418)	0.490
	Tap water	4	22.2	14	77.8	18	100.0	1.074 (0.325-4.605)	F0.582
	Total	108	24.1	340	75.9	448	100.0		0.773
Do you receive any kind of social support	Yes	41	21.7	148	78.3	189	100.0	0.781 (0.501, 1.218)	0.276
	No	67	26.2	189	73.8	256	100.0		
	Total	108	24.3	337	75.7	445	100.0		
Regular Social support as food package, or financial support	Yes	38	25.3	112	74.7	150	100.0	0.246 (0.072, 0.844)	f0.016
	No	3	7.7	36	92.3	39	100.0		
	Total	41	21.7	148	78.3	189	100.0		
Micronutrient support except Iron	Yes	19	23.2	63	76.8	82	100.0	0.879 (0.438, 1.762)	0.716
	No	22	21.0	83	79.0	105	100.0		
	Total	41	21.9	146	78.1	187	100.0		
Fruits and vegetables support	Yes	8	24.2	25	75.8	33	100.0	0.852 (0.352, 2.064)	0.723
	No	33	21.4	121	78.6	154	100.0		
	Total	41	21.9	146	78.1	187	100.0		
Meat, egg, milk and liver	Yes	10	22.7	34	77.3	44	100.0	0.941 (0.419, 2.114)	0.883
	No	31	21.7	112	78.3	143	100.0		
	Total	41	21.9	146	78.1	187	100.0		
Is the child involved in economic activities	Yes	5	20.0	20	80.0	25	100.0	1.288 (0.471, 3.517)	0.621
	No	103	24.3	320	75.7	423	100.0		
	Total	108	24.1	340	75.9	448	100.0		

4.2.4 Association between Stunting and Mothers and Fathers Parameters

In the absence of any pathogenic causes, whether they be dietary, hormonal, acquired, or iatrogenic. Familial short stature (FSS), where the child's height growth is consistent with the parental height, is one of the most common causes of short stature (Rajkumar & Waseem, 2021). Whereas as shown in table 5.4, there were statistical associations between stunting and the low height status of fathers and mothers and the p-values were 0.001, 0.004 consecutively, where the stunting prevalence was 37% by below normal height fathers, while 34% by short mothers. However, these findings are consistent with different local and or global studies, that found children born to short at least one of the parents, were more likely to be stunted (Almutairi, 2018; Collett-Solberg et al., 2019; El-Shafie et al., 2020; El Kishawi et al., 2017; Kozuki et al., 2015; Rajkumar & Waseem, 2021).

After exploring household food security (non-intra household security), a question was raised about how food is distributed among family members, and whether it is distributed appropriately among family members, each according to their needs. Therefore, assessing the extent of paradoxical or dual forms of malnutrition in the same household will reflect somehow the intra-household food distribution, whereby is also detected in the literature (Jehn & Brewis, 2009; Krismanita et al., 2022; Roba et al., 2021; Varghese & Stein, 2019; Wibowo et al., 2015), even if the household food security is secured; accordingly, from these features of inappropriate intra-household food distribution, presence of obesity and overweight among mothers or other family members, where it was found that 25% of overweighted mothers have stunted children, but not statistically significant with a p-value of 0.6, meanwhile over weighted fathers have a positive statistical effect on the presence of stunting among their child, with a p-value of 0.023, and rated 21 % in comparison with normal or below normal weighted fathers, who rates of stunting were over 30%. It could be related to the nutrition culture of families that is linked somehow to fathers, otherwise in comparison with a previously conducted cross-sectional study on Palestinian schoolchildren in the west bank found a double burden of under nutrition and obesity among families (Massad et al., 2016). And it is worth mentioning that measuring or exploring dual forms of malnutrition in the same household includes many paradoxical features of malnutrition like associations between anemia, underweight, and stunting of children with overweight or obesity among the other family members because it is important enough for special attention and intervention (Sassi et al., 2019). Where in this study, the prevalence of stunting among over-weighted and obese mothers was 25.4%, which can reflect some kind of paradoxical nutritional features in families. However, the association was not statistically significant with a p-value of 0.605, whereby this subject can be covered by other future studies.

Table 5.4: Association between Stunting and Mothers and Fathers Parameters

Personal Data	Items	Stunting		Not Stunting		Total		OR (CI)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Father Height Status	Below normal	61	37.4	102	62.6	163	100.0	2.939 (1.882,4.592)	0.001
	Normal	47	16.9	231	83.1	278	100.0		
	Total	108	24.5	333	75.5	441	100.0		
Mother Height Status	Below normal	41	33.9	80	66.1	121	100.0	1.986 (1.232,3.201)	0.004
	Normal	56	20.5	217	79.5	273	100.0		
	Total	97	24.6	297	75.4	394	100.0		
Father BMI Classification 2 groups	Normal and below	48	30.8	108	69.2	156	100.0	1.667 (1.070,2597)	0.023
	Over weight and obese	60	21.1	225	78.9	285	100.0		
	Total	108	24.5	333	75.7	441	100.0		
Mother (Measured) BMI	Normal and below	23	22.8	78	77.2	101	100.0	0.868(0.506,1.488)	0.605
	Over weight and obese	69	25.4	203	74.6	272	100.0		
	Total	92	24.7	281	75.3	373	100.0		

However, in the mothers' qualitative part, the intra-household food distribution was triggered, where the majority of mothers agreed that the intra-household food is regularly distributed among family members with mild disparities to meet the different ages and their requirements, but boys eat more than girls especially meat and animal products. However, the economic status and size of the family affect the distribution either quantitative or qualitative (90% of mothers). Meanwhile, 43% of mothers reported that sometimes there is some kind of preference for boys in animal products because they are more active and being longer time outdoors." *All day long the child is outside the house and in the streets or at his grandfather's house, so I pity him and would like to keep some delicious food items for him*" as one mother mentioned.

4.2.5 Association between Stunting and Mother Health

Determining the possible influence of maternal health and obstetrical factors and habits on stunting incidence, this study explored the possibility of the presence of an association between the mother's age and stunting, whether at first birth or at this child's birth, as detected in previously conducted researches (Simelane et al., 2020; Wemakor et al., 2018), where the prevalence of stunting among mothers who born their first child at an age above 26 years old was 31.6 % with a p-value of 0.058 in comparison to mothers who born their first child

below the age of 20 years old, it could be explained as women how became mothers at the early stage of their life got chance for more support and attention by her family or her husband's family, and have the possibility to collect more experience. Moreover, there was no statistical association between stunting and the mother's pregnancy age with a p-value 0.83, which is consistent also with other conducted studies (Roba et al., 2021; Santosa et al., 2022).

The association between stunting and birth spacing was not statistically significant with p-values of 0.83 and 0.46 (prior or after this child consecutively), despite the higher incidence among children who got a younger and an older sibling within 18 months, whereby is not consistent with other studies that found the family planning and birth spacing were associated with stunting (Abul-Fadl et al., 2019; Santosa et al., 2022; Vaivada et al., 2020). In addition to family planning and birth spacing, maternal obstetric behaviors such as registration for preconception care and for antenatal care were also explored, because of their role in the child's health outcomes (Gupta & Santhya, 2020; Kozuki et al., 2015; Kuhnt & Vollmer, 2017; Santosa et al., 2022; Torlesse et al., 2016; Vaivada et al., 2020). whereby no statistical association was detected between stunting with registration for both preconception and antenatal care with p-values 0.78 and 0.96 consecutively, and it could be attributed to other implicated factors where all mothers are affected despite presence of this kind of maternal health service.

Table 5.5 shows a higher stunting rate among mothers who are known with at least one chronic medical condition and reached 29 %, but was not statistically significant with a p-value of 0.29, which is not consistent with some studies (Gupta & Santhya, 2020), while no effects of the maternal comorbidities on stunting were detected in other studies (Syahril et al., 2020). Besides that, in the qualitative part, through the interviews with key informant mothers, who supported the importance of the mothers' health status, Whereby, 40% of mothers linked stunting, or low birth weight with psychosocial factors (social problems), especially through the mothers who live in the extended families.

Table 5.5: Association between Stunting and Mother Health

Personal Data	Items	Stunting		Not Stunting		Total		OR (CI)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Age of mother at first birth Groups	Less 20 Years [®]	27	19.1	114	80.9	141	100.0	1	
	20-25 years	63	25.2	187	74.8	250	100.0	0.703 (0.423, 1.168)	0.172
	26 above	18	31.6	39	68.4	57	100.0	0.513 (0.255, 1.032)	0.058
	Total	108	24.1	340	75.9	448	100.0		0.150
Age of mother at this child birth in years	20 years or less [®]	9	22.5	31	77.5	40	100.0	1	
	21-25 years	37	22.7	126	77.3	163	100.0	0.989 (0.432, 2.262)	0.978
	26-30 years	39	24.8	118	75.2	157	100.0	0.878 (0.385, 2.006)	0.758
	31-35 years	13	22.8	44	77.2	57	100.0	0.983 (0.374, 2.582)	0.971
	36 and above	10	32.3	21	67.7	31	100.0	0.610 (0.212, 1.755)	0.357
	Total	108	24.1	340	75.9	448	100.0		0.834
Spacing or time span between this child & Older Bro or sister by Months	He is the older	34	27.2	91	72.8	125	100.0	0.742 (0.445, 1.237)	0.251
	10-18 months	15	30.0	35	70.0	50	100.0	0.647 (0.325, 1.286)	0.211
	19-24 months	13	21.3	48	87.7	61	100.0	1.023 (0.511, 2.049)	0.948
	25 or greater [®]	46	21.7	166	78.3	212	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.469
Spacing or time span between this child & younger Bro or sister by Months	He is the Younger	24	18.9	103	81.1	127	100.0	1.462 (0.838, 2.550)	0.179
	10-18 months	19	32.2	40	67.8	59	100.0	0.717 (0.378, 1.361)	0.308
	19-24 months	19	23.5	62	76.5	81	100.0	1.112 (0.602, 2.053)	0.734
	25 or greater [®]	46	25.4	135	74.6	181	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.242
Was the mother registered for ANC	Yes	103	24.2	322	75.8	425	100.0	1.15 (0.42, 3.18)	0.785
	No	5	21.7	18	78.3	23	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Was the mother registered for PCC	Yes	49	24.3	153	75.7	202	100.0	1.01 (0.65, 1.56)	0.966
	No	59	24.1	186	75.9	245	100.0		
	Total	108	24.2	339	75.8	447	100.0		
Presence of Maternal chronic comorbidities	Yes	19	29.2	46	70.8	65	100.0	1.36 (0.76, 2.45)	0.296
	No	89	23.2	294	76.8	383	100.0		
	Total	108	24.1	340	75.9	448	100.0		

4.2.6 Association between Stunting and Child Health

Table 5.6a shows that preterm-born children have the highest rates of stunting and reaching 30.8 % and decreasing to 23.5 % by full termed children and still decreasing to 17.6 % by postdate children, which is consistent with literature globally (Christian et al., 2013; Collett-Solberg et al., 2019; Ode et al., 2022; Santosa et al., 2022; Sartika et al., 2021) or locally as mention in one study conducted in the Gaza strip (Jalambo et al., 2020), but in this research, these differences were not statistically significant. Regardless of the type of delivery that was also not statistically associated with stunting with a p-value of 0.94.

Table 5.6a shows a statistically significant association between the low birth weight of children and stunting with a p-value of 0.003 and OR 2.885 (CI 1.4-5.946), where the prevalence of stunting among the low birth weight children was 45.5 %, which is consistent with the literature (Blencowe et al., 2019; Christian et al., 2013; Fantay Gebru et al., 2019; Ode et al., 2022; Santosa et al., 2022; Sartika et al., 2021). Even more, this association was also detected in previously conducted research in the Gaza strip (Jalambo et al., 2020).

Exploring the birth height association with stunting, because of its implication and influence on the child's growth as detected in the literature (Alim et al., 2019; Krebs et al., 2022), the association was statistically significant with a p-value of 0.001 and OR 4.145 (CI 669,10.294), where the prevalence of stunting among children whose born with less than 46 CM length was 55 % while the advantage was for children who were born with a length above 46 CM, with no previously conducted studies in the Gaza strip for comparison or consistency at the local level.

Table 5.6a: Association between Stunting and Child Health

Personal Data	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Gestational age of this Child at birth	Preterm < 37 W	16	30.8	36	69.2	52	100.0	0.69 (0.365, 1.303)	0.251
	Full term 37.1-41.6 W®	89	23.5	290	76.5	379	100.0	1	
	Post term > 42 W	3	17.6	14	82.4	17	100.0	1.431(0.387, 7.939)	0.772
	Total	108	24.1	340	75.9	448	100.0		0.421
Type of Delivery	Normal	88	24.2	276	75.8	364	100.0	1.020 (0.585, 1.780)	0.944
	CS	20	23.8	64	76.2	84	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Birth weight in KG	low birth weight < 2.5	15	45.5	18	54.5	33	100.0	2.885 (1.4,5.946)	0.003
	Normal and above birth weight ≥ 2.5	93	22.4	322	77.6	415	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Birth height in CM	Stunted < 46	11	55.0	9	45.0	20	100.0	4.145 (1.669,10.294)	0.001
	46 CM or above	97	22.8	329	77.2	426	100.0		
	Total	108	24.2	338	75.8	446	100.0		
Anemia as classified by WHO	Moderate anemia HGB < 11	41	37.6	68	62.4	109	100.0	0.401 (0.241,0.666)	0.000
	Mild anemia HGB 11- 11.4	23	20.4	90	79.6	113	100.0	0.946 (0.538,1.662)	0.847
	Non anemic HGB > 11.5 ®	44	19.5	182	80.5	226	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.001

Anemia (the cut of the point was considered as WHO classification 11.5 g/dl) is also one of the malnutrition features, which can be manifested among the same subjects, where they face the same nutritional circumstances, whereby both anemia and stunting can be parallel manifested (Assaf & Juan, 2020; Jalambo et al., 2020). Thus, the association between anemia and stunting was also explored and was statistically significant with higher prevalence rates among moderately anemic children (table 5.6a), and the stunting rates reached 37.6 % in comparison with non-anemic children that rated 19.5 %, with a p-value of 0.000 and OR 0.401 (CI 0.241-0.666), and this association is consistent with the literature globally (Allali et al., 2017; Rahman et al., 2019; Varghese & Stein, 2019; Wang et al., 2020), and at the level of the neighbor settings like in Egypt (El-Shafie et al., 2020). However, the association pattern between Anemia and stunting as found in the table 5.6a, can reflect dose response relationship between them, where the stunting prevalence decreases through the 3 Anemia status categories, where the prevalence of stunting was 37.6% among children with HGB below 11.0 g/dl, and become 20.4% among children with mild anemia (HGB 11-11.4 g/dl),

besides that, the prevalence of stunting among non-anemic children was 19.5%. However, by these findings, it is clearly detected the presence of dual burdens (Anemia, below normal WAZ and stunting) among children.

Chronic child illnesses and recurrent hospitalization can impair the growth of the child, as known in the literature (Arini et al., 2020; CDC, 2013; Checkley et al., 2008; Guerrant et al., 2013; Modern et al., 2020; Prendergast & Humphrey, 2014), where the prevalence of stunting among well-known children with chronic comorbidities reached 52% , where they were 4 folds at risk to be stunted with a p-value 0.001 (OR, 4.151 and CI, 2.243-7.684), while the marginal statistical association was detected by the children who were known with recurrent hospitalization where the rates reached 31.8 %, but the p-value was 0.059 (OR, 1.633 and CI, 0.978-2.728) as shown table 5.6b.

Despite the presence of a statistical association between stunting and child medical chronic illness and a marginal statistical relationship with recurrent hospitalization, there were no statistical associations between stunting and all of the following; child mental illness, child surgical history, recurrent complaint of diarrhea, fever, respiratory infections, and recurrent complain of urinary tract infections with p-values as following 0.154f, 0.601, 0.541, 0.135, 0.253 and 0.472f consecutively, but when the comparative analysis was conducted between the frequency of occurrence of recurrent fever and recurrent respiratory infection groups (rarely, sometimes, and always groups) and stunting prevalence, they revealed a statistical difference in the stunting prevalence between always complain of fever children in comparison to rarely complain of fever children where the rates were 32.5 and 21.9% consecutively with p-value 0.048 and OR 0.581 (CI 0.338-0.999), meanwhile the difference between both same groups in the recurrent respiratory infection was marginal with a p-value 0.097, and OR 0.636 (CI 0.372-1.088). Otherwise, no other statistical associations were detected as shown table 5.6b.

In my opinion; it could be attributed to two factors; the first factor is the low number of cases who reported the recurrence or presence of these events (especially mental illness and recurrent urinary tract infection), and the second factor is the kind of information collection, where it was based on interviews with mothers instead of electronic medical records, whereby there is a high possibility of recall bias, where the chance of recall bias is relatively low by remembering the child chronic illnesses and hospitalization events. However, difficulties in exploring these determinants were met in the literature; As one Meta-analysis

that explored the stunting determinants, these factors were tried to be explored but did not fulfilled because gathering these high-quality data on a country level was not easy because it is related to the presence of the electronic records and health information system that support presenting these high-quality of data (Danaei et al., 2016); otherwise. as mentioned before, recurrent hospitalizations (more than 2 days admission), illnesses and infections are implicated in the child's growth abnormalities (Arini et al., 2020; Babikako et al., 2022; CDC, 2013; Checkley et al., 2008; Guerrant et al., 2013; Modern et al., 2020; Prendergast & Humphrey, 2014; Ritvika et al., 2023).

Table 5.6b: Association between Stunting and Child Morbidity

Personal Data	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Child medical chronic illnesses	Yes	25	52.1	23	47.9	48	100.0	4.151 (2.243, 7.684)	0.001
	No	83	20.8	317	79.3	400	100.0		
	Total	108	24.1	339	75.9	448	100.0		
Child mental illnesses	Yes	3	50.0	3	50.0	6	100.0	3.210 (0.638, 16.141)	f0.154
	No	105	23.8	337	76.2	442	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Child surgical history	Yes	14	21.5	51	78.5	65	100.0	0.844 (0.447, 1.593)	0.601
	No	94	24.5	289	75.5	383	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Is there a history of recurrent hospitalizations	Yes	28	31.8	60	68.2	88	100.0	1.633 (0.978, 2.728)	0.059
	No	80	22.2	280	77.8	360	100.0		
	Total	108	24.1	340	75.9	448	100.0		
The Child Complain from Diarrhea	No®	95	24.0	301	76.0	396	100.0	1	
	Sometimes	8	21.1	30	78.9	38	100.0	1.184(0.525, 2.669)	0.684
	Always	5	35.7	9	64.3	14	100.0	0.569(0.186, 1.736)	0.315
	Total	108	24.1	340	75.9	448	100.0		0.541
The Child Complain from fever	No®	60	21.9	214	78.1	274	100.0	1	
	Sometimes	21	23.1	70	76.9	91	100.0	0.935(0.531, 1.645)	0.814
	Always	27	32.5	56	67.5	83	100.0	0.581(0.338, 0.999)	0.048
	Total	108	24.1	340	75.9	448	100.0		0.135
The Child Complain from Acute Respiratory Infection	No®	54	21.8	194	78.2	248	100.0	1	
	Sometimes	26	24.1	82	75.9	108	100.0	0.878(0.514, 1.498)	0.632
	Always	28	30.4	64	69.6	92	100.0	0.636(0.372, 1.088)	0.097
	Total	108	24.1	340	75.9	448	100.0		0.253
The Child Complain from Urinary Tract Infections	No®	104	24.6	318	75.4	422	100.0	1	
	Sometimes	2	11.8	15	88.2	17	100.0	2.45(0.63, 16.06)	f0.383
	Always	2	22.2	7	77.8	9	100.0	1.14(0.25,8.14)	NS
	Total	108	24.1	340	75.9	448	100.0		f0.472

4.2.7 Association between Stunting and Access to Health Care System

Regarding healthcare system-related factors that can affect the pattern of stunting, the proportion of families who can attend the nearest primary healthcare facility within 30 minutes is 83 %, with no statistical association (p-value 0.67). Despite the higher probability

of adherence to the child's growth monitoring of families. However, the Gaza strip is 365 km² wide, with no direct physical barriers, Excepting special cases such as political events (Waterston & Nasser, 2017) and epidemics, therefore the non-physical access was also explored; As in table 5.7, where accessibility to Micronutrients such as calcium and vitamin D (26.8 %), zinc, and phosphorus (8.0%) or to get the appropriate information regarding stunting and growth delay consequences (24.8%), had no statistical association with stunting with p-values of 0.986, 0.135, and 0.278. Whilst these factors are scientifically and in the literature approved that can play role (Bevis et al., 2023; de Onis & Branca, 2016; El Bilbeisi et al., 2022; Massad et al., 2020; Song et al., 2021). And at the level of our region, as mentioned in the Egyptian studies that revealed the important role of health education and the provision of the appropriate information in stunting development (El-Shafie et al., 2020). in addition to the role of zinc and micronutrients (Ahmad et al., 2022). While in one of the Iranian studies has found that Zinc and vitamin D had no role in stunting (Y. Sharif et al., 2020).

Table 5.7: Association between Stunting and Access to Health Care System

	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Micronutrients- of Calcium- vitamin D	No	79	24.1	249	75.9	328	100.0	0.995 (0.611, 1.623)	0.986
	Yes	29	24.2	91	75.8	120	100.0		
	Total	108	24.1	340	75.9	448	100.0		
Micronutrients- of Zinc and Phosphorus	No	103	25.0	309	75.0	412	100.0	2.067 (0.783, 5.455)	0.135
	Yes	5	13.9	31	86.1	36	100.0		
	Total	108	24.1	340	75.9	448	100.0		
The appropriate information regarding SS and growth delay consequences?	No	77	22.8	260	77.2	337	100.0	0.764 (0.470, 1.243)	0.278
	Yes	31	27.9	80	72.1	111	100.0		
	Total	108	24.1	340	75.9	448	100.0		
ever detected as short stature as recorded in E-health	Yes	44	67.7	21	32.3	65	100.0	10.443 (5.818, 18.747)	0.000
	No	64	16.7	319	83.3	383	100.0		
	Total	108	24.1	340	75.9	448	100.0		

Table 5.7 shows also a statistical relationship between stunting and the detection of this health problem through the child's growth and development monitoring by the primary health care system, with a p-value of 0.00 (OR 10.44 CI 5.82-18.75), Regardless of what age the child's growth has been monitored. However, this association can reflect somehow that stunting is detected in early childhood ages (where the adherence of most families lasted 2-3 years as found in this study), where 68 % of children who ever were detected as stunting are still stunted, and 32 % were recovered, whilst 16.7% of children who were never detected

as stunting before, were stunted at present and 83.3 % of children continued their growth process without stunting since birth until now, this association cannot reflect what extent is the sensitivity of stunting detection, whereas discussed in the descriptive part either by quantitative or qualitative data interpretation. Where the variation is attributed to the level of SD (below -2), by which the child is addressed stunted in the E-health system.

4.2.8 Association between Stunting and Nutrition Status

Table 5.8a shows the possible associations between stunting with nutrition status of the child, and his mother and her knowledge of the best feeding behaviors and practices for them both, as these factors are important enough in the child's growth and development, as mentioned in the literature (Dhaded et al., 2020; Fanzo et al., 2021; Nayoan et al., 2023; Prendergast & Humphrey, 2014; Santosa et al., 2022; Shaban et al., 2021), particularly the growth faltering starts when the child is still in utero and lasts for at least the first two years after birth (de Onis & Branca, 2016; Long et al., 2021; Prendergast & Humphrey, 2014; WHO, 2014a), Where the disturbance of these issues had a clear effect on the growth abnormalities and defects (Aguayo & Menon, 2016; Jonah et al., 2018; Wells et al., 2019). Whether in the short or the long term; or in other words, directly or indirectly they can affect the child's growth, where with malnutrition, the child has not enough chance to grow properly as a direct effect, while malnourished children are more liable for recurrent infections, hospitalization and long hospitalization periods as an indirect effect of malnutrition (Hersberger et al., 2020).

Furthermore. Mothers who described their nutritional status before pregnancy, through pregnancy, and through lactation as not well (table 5.8a), had higher rates of stunted children than those who described their diet as good. With p-values of 0.00 for these three categories (OR 0.177 and CI 0.075-0.422, OR 0.183 and CI 0.092-0.363, and OR 0.192 with CI 0.077-0.476 consecutively), where these findings are consistent with literature globally (Dhaded et al., 2020; Nayoan et al., 2023; Prendergast & Humphrey, 2014; Santosa et al., 2022), or at the level of our region like in Egypt (Shaban et al., 2021). Where also was described in the qualitative part of this research by the key informant mothers, where majority believe that nutrition status of mothers is important.

While the association between stunting and mothers' nutritional awareness about healthy feeding practices for the child or as they think (as in the table 5.8a), was marginal statistically significant with a p-value of 0.098, despite the higher prevalence (34%) was among poor knowledge mothers, while the rate of stunting was 20.4 % among the mothers who think that

they have good knowledge and awareness about this regard, while by the comparison of stunting rates between the groups, it was detected a statistical difference between moderately and good knowledge mothers with a p-value of 0.049, OR 0.63 (CI 0.396-1.001). furthermore; the literature supports this association between those variables globally and in previously conducted studies in the region (El Bilbeisi et al., 2022; Fanzo et al., 2021; Nayoan et al., 2023; Shaban et al., 2021).

The first step in the child's extra-uterine life is feeding which starts with breastfeeding. Where exclusive breastfeeding should be provided until the age of 6 months, and optimal breastfeeding should last up to 2 years old, with highly effective benefits for child growth and health (Long et al., 2021; WHO, 2014a), thus exploring the possible association between stunting and the breastfeeding, starting from exclusive breastfeeding where more than 70 % of children did not have the chance to fulfil 6 months, as mentioned in the literature (WHO, 2014^a), moreover the stunting prevalence was higher among children group who were fed less than one month (29.8 %) and with a p-value 0.098 in comparison with 6 months or above (20.6 %), which is consistent with the literature (Al Jawaldeh et al., 2020; Arini et al., 2020; Carolin et al., 2021; Mediani, 2020; Walters et al., 2019) despite the statistical association in this study was marginal.

Regarding complementary feeding and its importance in the child's growth as distinguished in the literature globally (Babys et al., 2022; Dickin et al., 2021; Krebs et al., 2022; Saaka et al., 2021; UNICEF, 2016), or at the regional level like in the Near East and North Africa (Al Jawaldeh et al., 2020), in addition to the importance of mother's knowledge about child feeding and proper practice (Nayoan et al., 2023), this study did not find a statistical association between starting complementary feeding age and stunting (as in the table 5.8a), despite the lowest stunting prevalence (20%) was among children who started to receive it at age of 6 months or greater, however, it could be attributed to the total percentage of children who got the chance to start complementary feeding at the proper age (was 49%).

Triggering the right practices of complementary feeding diversity were explored (as in the table 5.8a), where the proper items as distinguished by the literature that has great benefits on the growth were examined (Dickin et al., 2021; Headey et al., 2018; UNICEF, 2016) whereby feeding formula milk, cow's milk and its products, green vegetables, animal products and the fruits have no statistical association with stunting with p-values of 0.97, 0.90, 0.70, 0.96, and 0.31 consecutively which are not consistent with the literature (Dickin et al., 2021; Eaton et al., 2019; Headey et al., 2018; UNICEF, 2016), while these findings

were consistent with previously conducted study in the Gaza strip (Jalambo et al., 2020), but in another hand; the introduction of the eggs in the complimentary feeding had an advantageous effect of stunting prevalence where the OR of children who received eggs 0.559 (CI 0.361-0.866) and with a p-value of 0.009 which is consistent with one Iranian study (Nachvak et al., 2020) , on the other hand, the administration of the sugar solution as a substitute of milk components for child feeding had a disadvantageous effect on stunting with an OR 1.69 (CI 1.004-2.847) and with a p-value of 0.047, which reflect a bad child's feeding practice that can be attributed to the economic status of the population. Whereas, in other studies, there was a discrepancy in the relationship of stunting with these items, but they may agree on the necessity of diversity in the components of supplementary or complementary feeding for children (Nachvak et al., 2020; Shapiro et al., 2019).

After exploring breastfeeding and complementary feeding, rise the weaning practice as shown in the table 5.8b, which is related to and intertwined with them. Once early weaning means early stopping of exclusive breastfeeding and early starting with complementary feeding whether proper or not. However, the rate of children who succeed to be weaned after the age of one year was 52.5%, meanwhile breastfeeding should last up to two years, so the weaning ages is below the standards (UNICEF, 2016), otherwise as in the literature the breastfeeding and early weaning are implicated in the delay of the child's growth (Al Jawaldeh et al., 2020; Arini et al., 2020; Carolin et al., 2021; Long et al., 2021; Mediani, 2020; UNICEF, 2016; Walters et al., 2019; WHO, 2014a).

The association between stunting with weaning age was significant (p-value f 0.038) as shown in the table 5.8b, especially as the finding revealed the difference of the rates of stunting among children who got the chance to be breastfed greater than one year in comparison with children who were breastfed 6-12 months with p-value 0.010 and OR 0.555 (CI 0.353-0.874), furthermore the remaining 2 groups (never breastfed and less than 6 months breastfed), Their numbers were not sufficient and were not statistically significant even with Fisher's test use.

Once the child ends lactation, his feeding becomes limited to what is presented on the daily dishes in the household and what is available, from fruits, animal products, milk, and its derivatives, eggs, and salted snacks (Dickin et al., 2021; Eaton et al., 2019; Headey et al., 2018; UNICEF, 2016), where studying the relationship between stunting and these components or items of food, it turned out a change in statistical associations between these components and stunting (table 5.8b) in comparison with complementary feeding, where in

complementary feeding was only eggs and the starch solution had a role in stunting, whether it is positive or negative. So when the child's nutrition become based on what is presented on the table in the daily life inside the household, the relationships with stunting became statistically associated to other items to include Fruits (p-value 0.033, OR 0.533, CI 0.297-0.959), animal products (p-value 0.008, OR 0.39, CI 0.194-0.802) and eggs (p-value 0.003, OR 0.372, CI 0.188-0.736), especially when the comparison of stunting prevalence between children groups who occasionally got the chance for consumption of these items in comparison with the advantageous children groups who have access for these items 1-3 per week, in the opposite, the salted snacks consumption was marginal statistically associated with stunting with a p-value of 0.054 (OR 1.837, CI 0.983-3.434) where the stunting rates were higher by the occasionally consumers groups with rates reached 31.1 % and daily consumers with rates reached 28.8 % in comparison with rational consumers with rates 19.8 %. However regular consumption from one to three times a week was considered as the reference to conduct the logistic association because this classification was designed according to and to reflect the economic status healthier behavior except the salted snakes, where the occasional consumer were the reference group because lack of benefits of this item.

Moreover, milk and its derivatives were not implicated in the stunting pattern (table 5.8b), despite the higher prevalence was among rarely milk consumers, and the rate reached 32.6%, meanwhile the rate was 22.1 % was among rationale consumers, while children who regularly consume this item the rates slightly increase to 25.2 %, however, this pattern of the biphasic high rates among occasionally and regularly consumers, in comparison with the lowest rates among the rational consumers (1-3 per week), was met in all items except in animal products consumption, that could be attributed to, occasionally consumers are belonging to low economic or poor nutrition diversity households, while regularly consumers also have more chance for unhealthy nutrition habits.

However, multiple factors can influence a child's feeding practices. The literature suggests the feasibility and effectiveness of addressing mothers' knowledge and practice as an important component of programs to improve feeding practices and child growth (Nayoan et al., 2023; Shaban et al., 2021). Without ignoring the presence of these items in the child's nutrition is aimed to explore the intra-household food security and distribution, especially complementary feeding, but through the findings and our economic status in the GS, the presence of these items is linked to the non-intra-household factors (food access or food security).

Table 5.8a: Association between Stunting and Nutrition Status

	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Nutrition status through Pre Pregnancy	Not Well	14	58.3	10	41.7	24	100.0	0.177(0.075, 0.422)	0.000
	Moderate	40	26.1	113	73.9	153	100.0	0.703(0.440, 1.122)	0.139
	Good®	54	19.9	217	80.1	271	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.000
Nutrition status through Pregnancy period	Not Well	22	53.7	19	46.3	41	100.0	0.183(0.092, 0.363)	0.000
	Moderate	38	28.8	94	71.2	132	100.0	0.523(0.321, 0.853)	0.008
	Good®	48	17.5	227	82.5	275	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.000
Nutrition status during lactation period	Not Well	12	57.1	9	42.9	21	100.0	0.192(0.077, 0.476)	0.000
	Moderate	33	28.0	85	72.0	118	100.0	0.659(0.405, 1.075)	0.093
	Good®	63	20.4	246	79.6	309	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.000
Nutritional awareness about healthy feeding practices for the child	Not Well	10	34.5	19	65.5	29	100.0	0.488(0.215, 1.108)	0.081
	Moderate	42	29.0	103	71.0	145	100.0	0.63(0.396, 1.001)	0.049
	Well®	56	20.4	218	79.6	274	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.061
Exclusive breastfeeding until the age	≤ 1month	34	29.8	80	70.2	114	100.0	0.61(0.34,1.09)	0.098
	> 1 - < 6 months	47	23.2	156	76.8	203	100.0	0.86(0.51,1.47)	0.585
	≥ 6 months ®	27	20.6	104	79.4	131	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.222
Complementary feeding at which age was started	≤ 1month	27	29.7	64	70.3	91	100.0	0.599 (0.344,1.045)	0.71
	> 1-< 6months	36	26.9	98	73.1	134	100.0	0.688 (0.416,1.138)	0.145
	≥ 6 months ®	45	20.2	178	79.8	223	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		0.137
Complementary feeding items	feeding Formula Milk	72	24.2	226	75.8	298	100.0	1.009 (0.637, 1.597)	0.970
	Cow's milk and its products	18	24.7	55	75.3	73	100.0	1.036 (0.579, 1.859)	0.904
	Green vegetables	79	23.7	255	76.3	334	100.0	0.908 (0.556, 1.484)	0.700
	Fish, meat, liver products	22	23.9	70	76.1	92	100.0	0.987 (0.577, 1.688)	0.961
	Egg	47	19.3	197	80.7	244	100.0	0.559 (0.361, 0.866)	0.009
	Sugar solution	27	32.5	56	67.5	83	100.0	1.690 (1.004, 2.847)	0.047
	Fruits	66	22.6	226	77.4	292	100.0	0.793 (0.507, 1.240)	0.308

Table 5.8b: Association between Stunting and Nutrition Status

	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
Weaning age (from mother breast feeding)	Never breastfed	4	28.6	10	71.4	14	100.0	0.593(0.162, 2.712)	^t 0.485
	Breastfed less than 6 months	4	26.7	11	73.3	15	100.0	0.653(0.182, 2.940)	^F 0.503
	Breastfed 6-12 months	55	29.9	129	70.1	184	100.0	0.555(0.353, 0.874)	0.010
	Breastfed exceed one year [®]	45	19.1	190	80.9	235	100.0	1	
	Total	108	24.1	340	75.9	448	100.0		^F 0.038
Availability and consumption of the following commodities									
Fruits	Occasionally	21	35.0	39	65.0	60	100.0	0.533 (0.297,0.959)	0.033
	1-3 per week [®]	79	22.3	275	77.7	354	100.0		
	Regularly integrated	8	23.5	26	76.5	34	100.0	0.933 (0.406, 2.143)	0.871
	Total	108	24.1	340	75.9	448	100.0		0.104
Animal proteins products	Occasionally	15	42.9	20	57.1	35	100.0	0.395 (0.194, 0.802)	0.008
	1-3 per week [®]	90	22.8	304	77.2	394	100.0		
	Regularly integrated	3	15.8	16	84.2	19	100.0	1.578 (0.45, 5.54)	0.472
	Total	108	24.1	340	75.9	448	100.0		0.020
Milk and its products	Occasionally	14	32.6	29	67.4	43	100.0	0.589 (0.292,1.188)	0.136
	1-3 per week [®]	58	22.1	204	77.9	262	100.0	1	
	Regularly integrated	36	25.2	107	74.8	143	100.0	0.845 (0.524,1.362)	0.489
	Total	108	24.1	340	75.9	448	100.0		0.313
Egg	Occasionally	17	40.5	25	59.5	42	100.0	0.372 (0.188,0.736)	0.003
	1-3 per week [®]	57	20.2	225	79.8	282	100.0	1	
	Regularly integrated	34	27.4	90	72.6	124	100.0	0.67 (0.410,1.094)	0.108
	Total	108	24.1	340	75.9	448	100.0		0.010
Snacks- salted	Occasionally [®]	19	31.1	42	68.9	61	100.0	1	
	1-3 per week	49	19.8	199	80.2	248	100.0	1.837 (0.983,3.434)	0.054
	Regularly integrated in the menu	40	28.8	99	71.2	139	100.0	1.120 (0.582,2.155)	0.735
	Total	108	24.1	340	75.9	448	100.0		0.053

Furthermore, through the interviews with key informant mothers in the qualitative part, digging more deeply to explore the healthy feeding practices. Majority of mothers believe that exclusive breastfeeding should extend 0-6 months, while just one mother (out of 30 mothers) was sure that optimally, the baby should be on exclusive breastfeeding for at least 6 months, while the level of awareness about the complimentary feeding starting age and weaning were optimal, while triggering the possible challenges that can impede applicability, where 86% of mothers reported that short spacing interfere with applicability, 60% attributed to the mothers if they are workers, 50 % attributed the poor applicability to the family size and increasing mothers' responsibilities. Where also majority of mothers strongly believe that, the economic status is one of the main factors.

4.2.9 Association between Stunting and SDQ

The psychological and mental assessment of the child was done by Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). To explore if these domains are associated with stunting as mention in the literature where child's growth problems and malnutrition are associated with brain, mental, psychological and emotional progress and development (Aguayo & Menon, 2016; Alamy & Bengelloun, 2012; de Onis & Branca, 2016; A. D. Rogol, 2020; Sanou et al., 2018; Tia Tampy et al., 2020). However; table 5.9 shows that stunting prevalence varies among these groups where higher prevalence was detected by the children with abnormal behavior or mental status. Whether as emotional problems, the conduct problems, hyperactivity/attention disorders or Total difficulties scores except prosocial and, peer problems but without statistically significant p-values (0.579, 0.057, 0.802, 0.469, and 0.694 consecutively). Furthermore, it worth to mention that, generally, the association between stunting and the conduct problems was marginally statistic with p-vale of 0.057, whereas 31.5% of children with this abnormality were stunting while normally assessed children had prevalence 19.9%, whereas the statistical difference was measured between these 2 groups and revealed presence of statistical difference with a p-value of 0.016, and OR 0.542 (CI 0.327-0.897), which means in my opinion, that stunted children are more disregard for others and lean to isolate themselves to avoid challenging the physical body differences with peers, and or are more liable for violent behaviors especially if the wee a victim for bullying.

Table 5.9: Association between Stunting and SDQ

SDQ	Items	Stunting		Not Stunting		Total		OR (C.I)	Sig.
		Nu.	%	Nu.	%	Nu.	%		
politeness methods: Nonviolence (dialogue)- violence exposing scale (n=448)	Nonviolent ®	41	24.0	130	76.0	171	100.0	1	
	some kind of violence	43	23.2	142	76.8	185	100.0	1.0415 (0.638, 1.699)	0.870
	violence	24	26.1	68	73.9	92	100.0	0.893 (0.499, 1.601)	0.705
	Total	108	24.1	340	75.9	448	100.0		0.872
Emotional problems	Normal®	64	22.5	220	77.5	284	100.0	1	
	Borderline	15	25.9	43	74.1	58	100.0	0.834 (0.435, 1.598)	0.584
	Abnormal	29	27.4	77	72.6	106	100.0	0.772 (0.463, 1.286)	0.320
	Total	108	24.1	340	75.9	448	100.0		0.579
Conduct problems	Normal®	43	19.9	173	80.1	216	100.0	1	
	Borderline	26	24.1	82	75.9	108	100.0	0.784 (0.451, 1.363)	0.388
	Abnormal	39	31.5	85	68.5	124	100.0	0.542 (0.327, 0.897)	0.016
	Total	108	24.1	340	75.9	448	100.0		0.057
Hyperactivity	Normal®	82	23.9	261	76.1	343	100.0		
	Borderline	10	21.7	36	78.3	46	100.0	1.131 (0.538, 2.378)	0.745
	Abnormal	16	27.1	43	72.9	59	100.0	0.844 (0.451, 1.578)	0.596
	Total	108	24.1	340	75.9	448	100.0		0.802
Peer-problem	Normal®	54	26.0	154	74.0	208	100.0	1	
	Borderline	26	22.6	89	77.4	115	100.0	1.200 (0.702, 2.051)	0.504
	Abnormal	28	22.4	97	77.6	125	100.0	1.215 (0.720, 2.481)	0.465
	Total	108	24.1	340	75.9	448	100.0		0.694
Total difficulties scores except prosocial	Normal®	61	22.2	214	77.8	275	100.0	1	
	Borderline	18	26.1	51	73.9	69	100.0	0.809 (0.440, 1.483)	0.490
	Abnormal	29	27.9	75	72.1	104	100.0	0.737 (0.440, 1.233)	0.244
	Total	108	24.1	340	75.9	448	100.0		0.469
Prosocial score	Normal®	97	24.4	300	75.6	397	100.0	1	
	Borderline	6	21.4	22	78.6	28	100.0	1.186 (0.467, 3.009)	0.720
	Abnormal	5	21.7	18	78.3	23	100.0	1.164 (0.421, 3.218)	0.769
	Total	108	24.1	340	75.9	448	100.0		0.903

Also, table 5.9 shows that there was no observable differences in the stunting prevalence regardless the politeness methods, whether just by discussion or even physical punishment, with a p-value 0.872, and in my opinion, families don't share this information so easy and lean to hide the reality.

4.2.10 Logistic regression between Stunting and birth height, Anemia, child medical chronic medical illness and nutrition status among mothers during pregnancy:

Aiming to Predict or explain to what extent the impact of changes in the independent variables on the dependent variable (stunting), Logistic regression was conducted, and many models were tried aiming to find the best model, whereby, as reported in the table 5.10.

Table 5.10: Model of the Study

Personal Data	Items	B	S.E.	Wald	OR (CI)	Sig.
Nutrition status during ANC (antenatal care) /pregnancy	Not well (R)					
	Moderate	.799	.404	3.920	2.224 (1.008, 4.907)	.048
	Well	1.516	.402	14.222	4.556 (2.072, 10.020)	.000
Child medical chronic illnesses	No	1.036	.358	8.382	2.819 (1.398, 5.686)	.004
Anaemia category group	Moderate (R)					
	Mild	.861	.336	6.582	2.366 (1.225, 4.568)	.010
	Non anaemic	.942	.288	10.718	2.565 (1.459, 4.509)	.001
Constant		-5.291	1.269	17.392	0.005	0.000

This model explored the impacts of all of the following independent categorical variables as follows, birth height and weight (binary), Anemia (3 categorical variables), child medical chronic illness (binary), and nutrition status among mothers during pregnancy and with average consumption of children of 2 food items (3 categorical variables) on Stunting as a dichotomous dependent variable.

After conducting forward regression methods. The results were similar (constant), then the significant impacts were selected to have the final model table, that shows, the children known as mild anemic or non-anemic were more likely to be not short statured where the Odds ratio increases to 2.366 and 2.565 with significant p values 0.010 and 0.001 with change values (B) 0.861 and 0,942. Which is consistent with the literature and previous conducted studies around the world (Assaf & Juan, 2020; El-Shafie et al., 2020; Halileh & Gordon, 2006; Jalambo et al., 2020; Larsen et al., 2017; Rahman et al., 2019; Sartika et al., 2021; Shapiro et al., 2019; Tia Tampy et al., 2020; Varghese & Stein, 2019; Wang et al.,

2020). In addition, healthy children without chronic illnesses, were more likely to be not stunted compared with unhealthy children known with chronic comorbidities, where the Odds ratio increases to 2.819 times and the p value 0.004. which is confirmed also by literature at the regional and global levels (Almutairi, 2018; Collett-Solberg et al., 2019; El Kishawi et al., 2017; Haile et al., 2016; Jesenak et al., 2011; Prendergast & Humphrey, 2014; Rahman et al., 2019; Watts & Siddiqi, 2008; Wit et al., 2019).

Furthermore, as the nutrition status during pregnancy becomes better, the chance of developing short stature by their children decreases, where the odds ration increases to 2.224, and 4.556 times when the comparison was taken between the mothers who described their nutrition status as not well, with mothers who described their nutrition status and moderate or well consecutively, with significant p values 0.048 and 0.000. Whereby this association between stunting with mother's nutrition status was confirmed also in the literature (Aguayo & Menon, 2016; Astuti et al., 2022; Christian, 2014; Christian et al., 2013; Gupta & Santhya, 2020; Heinrich, 1992; Krebs et al., 2022; Nshimiyiryo et al., 2019; Prado & Dewey, 2014; Syahril et al., 2020; Woodruff & Martorell, 2017).

4.3 Other qualitative results and discussion

4.3.1 Mothers key informants.

Mothers were asked about their opinions and suggestions that if adopted or implemented could serve the child's health and growth, where 86% of mothers find that counselling and contact time should be empowered, 86% of mothers find that hiring a Pediatric and nutrition specialist well be helpful, meanwhile, all mothers think that provision of vitamins and micronutrients is an important issue to support them, especially through their economic status which does not permit them to buy the proper micro and even macro-nutrients. "*Doctor! We eat red meat just in the El-Adha Eid and the fruits when are cheap, so it is impossible to buy the micronutrients*".

"I hope UNRWA finds a referral pathway to a specialized center or NGO like Ard El-Ensan, to take medical care more properly, because of financial status limitations, the referral is not enough useful, whereby, you will be asked for some expensive analysis from private laboratories, and I still remember that I waited for El-Feter Eid to receive presents (money from close relatives in Al-Eid as a present and it is called Eidiea or Al Eid money) to make one hormone and one immunological tests for my child".

4.3.2 Healthcare key informants.

Finding a responsible body to monitor this matter within or outside the institution, will give more importance and impetus to follow up and track the faltered growth cases, where also if the follow-up of the growth of children from birth to the age of five years is paired with some tangible services after finishing of vaccination. These will enhance the adherence of families and health providers to track the growth of the children in clinics more properly.

Supporting this context, as mentioned by one SMO: "*recruiting a specialist to track these cases is an important thing and gives this subject an impetus in terms of importance and care, like other specialties*". and another healthcare key informant commented: "*once mother get pregnant, an ANC file will be opened for them to follow her throughout their pregnancy properly, which may last up to the birth, while the follow-up of the child continues or is supposed to continue until the age of five years since his birth. Hence, in our current situation, where children are considered fragile and vulnerable to under-nutrition and developmental delay, herby, tracking modality can be improved on the priority approach*". Where the SMO referred to developing E-health to include something more specific to track the growth-delayed children.

Moreover, as one SMO stated: "*Developing the proper policies should be based on previously directed researches, where no previous studies were conducted on the most common causes of the stunting or growth abnormalities to be met by specific measures and policies*". Furthermore, more studies, surveillance, and indicators are needed to map the real magnitude and the causes of stunting and to develop the proper responses whether at the health care system level or the public health care system. And as one of the key informants (SMO) commented: "*Stunting is a reflection of a chronic condition that should be addressed, deeply investigated and managed by multifactorial approach; This is not limited to, the health sector and medical interventions only*". These 2 answers in this paragraph were of high quality in my opinion because both SMOs were highly qualified staff members (finished public health master's degree).

Regarding the same context, the key health informants were asked about the inter-sectorial action, and possible coordination with other directions like coordination with other entities that deal more specifically with malnutrition disorders, or with Social affairs, social relief, or the employment department, and even if it is temporary to enhance somehow the economic status, or to enhance the food package forms whether for families or the school children of these families and all of the key informants disagreed presence of such actions or communication channels or at least in a formal approach.

Lastly; one of the blind spots is the issue of external referrals, in which tracking and follow-up on the management progress of stunted children can be lost, besides the absence of a clear mechanism for feedback, where these issues need intervention and enhancement, because there is no common platform between the sender and receiver of the referral, therefore there is a need to establish a joint platform in this regard or to concern other medical matters.

Chapter Five

Conclusion and Recommendations

5.1 Conclusion

In this descriptive, triangulated, cross-sectional study, the researcher aimed to ascertain the magnitude of the short stature (Stunting) among first graders in UNRWA schools in the Gaza Strip and to determine the possible determinants. Where most of the participants in the quantitative part were refugees, and also the selected key informant mothers (30) in the qualitative part, in addition to that, 10 UNRWA healthcare key informants were targeted also in this study to dig more deeply to find some answers to some unclear or vague findings revealed in the quantitative part.

The total collected sample was 448 students (231 boys, 217 girls = boys 51.6%: girls 48, 4%), aged 71.52 (SD 4.126) months, whereby around 91% of my population were between 5.5-6.5 years old (66 months-78 months). However, the sample was taken from 11 education areas that represent 5 geographic areas of the Gaza strip.

This study revealed that 3.6 % of children were below -2 SD, and were suffering from short stature (including one child below -3 SD), whereby 20.5 % were below -1 SD, thus 24.1 % of children were below -1 SD, that was consistent with a previously conducted study in the Gaza strip among UNRWA first graders where the rate was 4.3% (AbuKishk et al., 2020). Otherwise, the anaemia prevalence (HGB below 11.5 g/dl) among the selected population was 49.6%, whereby if the cut of the point below 11.0 g/dl as adopted by some institutions and reports; the prevalence will become 24.3% especially if the HGB test was made by spectrophotometers. Meanwhile, the weight for age Z-score categorization among children was as follows 6.3% were moderately underweight (below -2 SD), while 18.5 % were below -1 SD. However, there were statistical associations between stunting and both WAZ status that is below -1 SD (p-value below 0.000, OR 11.74, CI 7.088-19.452) and moderate anaemia with HGB below 11.0 g/dl (p-value below 0.000, OR 0.401, CI 0.241-0.666). However, by these findings, it is clearly detected the presence of dual burdens (Anemia, below normal WAZ and stunting) among children.

However, regarding the other demographic and environmental factors, families who live inside refugee camps were counted around 40% while the rest in rural and urban areas (20% and 41 % consecutively), and at the level of the infrastructure, 77% of study's population had a chance to get purify water, and the availability of Garbage and sewage systems were 83.3% and 75.7% consecutively. Where these variables were not implicated in any significant changes in the stunting prevalence.

Else more, through the results of this study it was found that a statistically higher prevalence of stunting among children above 6 years (with a p-value of 0.014, OR 0.579 and CI 0.374-0.896), which can be attributed to the fact that stunting makes families compelled to delay their children's entry to school. Else more, a statistically higher prevalence of stunting was detected in the southern three governorates (Middle, Khan Younis, and Rafah) with a p-value of below 0.001 and OR 0.340 (CI 0.209-0.555), while gender was not implicated with a p-value of 0.879.

Regarding the Psychosocial factors, starting from social factors represented by social norms that can affect the women's status whether the acceptance to continue the mother her education, attend a health education session, or even attend primary health care for her child's growth monitoring were nearly minimal. This, in turn, reflects the absence of anything that prevents access to knowledge and the mother's follow-up to the child's growth in primary care clinics.

Regarding to the psychological and mental assessment of children, the total difficulties score was 23.2 % which means that one child from every 4 kids has at least one of the following four areas or domains: emotional, conduct, hyperactivity, and peer relationship problems and the rates of abnormality should not exceed 10 %, while in this study the rates were 23.7%, 27.7%, 13.2%, 27.9 % consecutively, while the prosaically score was acceptable with abnormality rate reached 5.1%. But in another hand, the chance of the child experiencing violence was relatively high and reached 61.8 % whether physical (20.5%) or at least verbal (41.3 %), Otherwise, these findings reflect the necessity of focusing on this regard and the proper intervention should be directed. However, from these findings, there was a statistical association between stunting and abnormal conduct children's groups, with a p-value of 0.016, and OR 0.542 (CI 0.327-0.897) in comparison with normal categorized children, which means in my opinion, that stunted children are more disregard for others and lean to isolate themselves to avoid challenging the physical body differences with peers, and or are

more liable for violent behaviors especially if the wee a victim for bullying. Otherwise, no other associations were detected in this domain.

Regarding the economic factors; this study showed that 42 % of families receive social support, out of them 80 % as food assistance, 43 % micronutrients, 17.6% fruits, 23.5 % milk, and animal products, exploring to what extent the families have non-intra household food security (quantitative and qualitative). Whereby, there was detected a statistically significant variation in stunting rates between families who receive regular food assistance (25.3%) and families who don't receive this kind of support (7.7%) with a p-value of 0.016 (fisher test) and OR 0.246 (CI: 0.07-0.84), which can reflect that families who live under bad economic conditions, suffer of food insecurity, and need the food assistance, where these families have at least one family member who is known with malnutrition feature. Besides that, the involvement of the child in economic activities reached 5.6 % which was not statistically implicated with stunting.

By the health care system factors, starting with accessibility, including physical, or non-physical access which include provision of appropriate information, and availability of micronutrients, where 83 % of families could reach the nearest primary health care system within 30 minutes, and 24 % of them could get the appropriate information about the growth and development of the child, 26 % had accessibility to vitamin D and calcium, and 8 % to zinc and phosphorous. Where no statistical associations with stunting were detected. Furthermore, in the qualitative part, stunted children's mothers stated that, once the child has a growth problem counselling is relatively well, while regarding the importance of a child's growth mentoring was 33%.

The study detected also a statistical relationship between stunting and the detection of this health problem through the child's growth and development monitoring by the primary health care system, with a p-value of 0.00 (OR 10.44 CI 5.82-18.75), Regardless of what age the child's growth has been monitored. However, this association can reflect somehow that stunting is detected in early childhood ages (where the adherence of most families lasted 2-3 years as found in this study), where 68 % of children who ever were detected as stunting are still stunted, and 32 % were recovered, whilst 16.7% of children who were never detected as stunting before, were stunted at present and 83.3 % of children continued their growth process without stunting since birth until now, this association cannot reflect what extent is the sensitivity of stunting detection, whereas discussed in the descriptive part either by

quantitative or qualitative data interpretation. Where the variation is attributed to the level of SD (below -2), by which the child is addressed stunted in the E-health system. Whereas the qualitative study showed that there is an effective process for stunting cases detection, once by recording the child's body measurements on the E-Health program, it will address the existence of growth measures that do not suit the age group. Where this means that these cases could be detected through growth and development monitoring, where enhancing the commitment of families will be valuable.

The families' adherence to continuing growth and development monitoring was relatively low, where among all sample populations, 18% of them finished their follow-up before the age of 2 years, in addition to 30% below the age of 3 years. Thus intervention is highly needed, where lack of knowledge of families of the importance of this service, as detected also in the qualitative where just 50 % were knowing that they should continue until the age of 5 years, in addition to other features of poor mothers' knowledge, where they think that this service is for immunization only (43%) and as one mother stated " *not linked with vaccine or vitamin, why should I attend*". Even more, in the qualitative part, the previously detected stunted children's families reported that they have committed to continue the follow-up just 55%. Which also reflects the lack of knowledge.

Furthermore, the absence of a responsible body in the primary health care system, which in turn specializes in dealing with cases of delayed growth in children. Make the track of diagnostic approach, the follow-up process, and the referral progress limited, as revealed in both quantitative and qualitative parts. And this can explain why 43% of the ever-detected stunted cases were not diagnosed (clear or final diagnosis is supposed) yet or at least according to families' knowledge.

Regarding the children's intrinsic factors, the study showed that the prevalence of stunting among children with chronic diseases is higher and statistically significant with a p-value of 0.001 (OR 4.151, CI 2.243-7.684) while there was no statistical association between stunting and mental illnesses or surgical interventions, furthermore, a marginal association between stunting and recurrent hospitalization history of the child with a p-value of 0.059 was detected. On the other hand, the stunting rates among children who periodically suffer from fever or respiratory tract infections, in comparison with children who do not have any of these health problems, were statistically higher with p-values of 0.048, and 0.097

(marginally) consecutively. While the association between stunting and either recurrent diarrhoea or recurrent urinary tract infection was not detected.

By the household and family factors, starting with general mother characteristics as any mother, the study showed no statistical association between the mother's age either at present or by the sample's childbirth, and stunting, while in contrast; the prevalence of stunting among mothers who born their first child at age above 26 years old was 31.6 % with a p-value of 0.058 in comparison to mothers who born the first child below the age of 20 years old. And it could be explained as women who became mothers at an early stage of their life got a chance for more support and attention from their family or their husband's family, and have the possibility to collect more experience. However, the education level of mothers and their work status were not statistically detected in the stunting prevalence variations.

Mother's burdens and responsibilities could be assumed somehow by the size of the family whereby in the qualitative research the family size was interfering with the lack of adherence to the growth and development of the child beside the lack of capability of practicing the proper nutritional practices for children, where also in the quantitative research the prevalence of stunting was 28.7% among above 6 members families in comparison with smaller families with a p-value 0.098, and OR 0.688 (CI 0.441-1.073).

The study showed the presence of statistical associations between stunting with either mother's or father's height status, with higher prevalence among short-statured parents, and the rates counted 33.9% by mothers with a p-value of 0.004, OR 1.986(CI 1.232-3.201) while by fathers heights the rates were counted 37.4% with a p-value of 0.001 and OR 2.939 (CI 1.882- 4.592) otherwise the overweight status of mothers was not statistically associated with stunting, where the presence of a maternal dual form of malnutrition was not significant, meanwhile, overweight father's status was significantly detected with the lowest stunting rates (21%) with a p-value 0.023 and OR 1.667 (CI 1.070-2.597).

Except for the marginal statistical association between the family size and stunting, the study didn't find any association between stunting and obstetrical practices and behaviors of mothers including the rank of children, birth spacing or family planning, registration for antenatal care, or preconception care. Where also the type of delivery was not implicated in the stunting pattern. In addition to that, the outcome gestational age was not statistically implicated or associated with the stunting pattern where the p-value was 0.251. Furthermore, regarding the pregnancy outcomes, high statistical associations were detected between

stunting and children's' birth weight and height, where the high prevalence of stunting was among the lowest weighted born children (below 2.5 kg) and stunted-born babies (below 46 cm) and rated 45 % and 55 % with p-values of 0.003 and 0.001 consecutively. Whereby it is worth mentioning that, the mothers' health status (chronic comorbidities) was not implicated in the stunting patterns with a p-value of 0.296.

Furthermore. Mothers who described their nutritional status before pregnancy, through pregnancy, and through lactation as not well, had higher rates of stunted children than those who described their diet as good. With p-values of 0.00 for these three categories (OR 0.177 and CI 0.075-0.422, OR 0.183 and CI 0.092-0.363, and OR 0.192 with CI 0.077-0.476 consecutively), While the association between stunting and mothers' nutritional awareness about healthy feeding practices for the child or as they think, was marginal statistically significant with a p-value of 0.098, despite the higher prevalence (34%) was among poor knowledge mothers, while the rate of stunting was 20.4 % among the mothers who think that they have good knowledge and awareness about this regard, while by the comparison of stunting rates between the groups, it was detected a statistical difference between moderately and good knowledge mothers with a p-value of 0.049, OR 0.63 (CI 0.396-1.001).

The first rock in the child's extra uterine life is feeding which starts with breastfeeding. Where exclusive breastfeeding should be provided until the age of 6 months, and optimal breastfeeding should last up to 2 years old, starting from exclusive breastfeeding where more than 70 % of children did not have the chance to fulfill 6 months, moreover the stunting prevalence was higher among children group who were fed less than one month (29.8 %) and with a p-value 0.098 in comparison with 6 months or above (20.6 %). However, children who got the chance to be breastfed for greater than one year had the lowest stunting prevalence of stunting (19.1%), in comparison with children groups whose lactation period was below 12 months (29.9%), with a p-value of 0.010 and OR 0.555 (CI 0.353-0.874).

While regarding starting age of complementary feeding, this study did not find a statistical association between it and stunting, despite the lowest stunting prevalence among children who started to receive it at age of 6 months or greater. But in the other hand, the statistical associations were detected between the stunting and some introduced items in the complementary feedings like the eggs (p-value of 0.009), and sugared (starched) solution (p-value of 0.047), where the advantage was for the consumption of eggs, while the disadvantage was for a sugared solution that being used as an alternative of milk. Otherwise,

feeding Formula Milk, Cow's milk and its products, Green vegetables, Fish, meat, liver products, and Fruits were not implicated.

when the child's nutrition become based on what is presented on the table in the daily life inside the household (intra-household food security and distribution), the relationships with stunting became statistically associated with other items including Fruits (p-value 0.033, OR 0.533, CI 0.297-0.959), animal products (p-value 0.008, OR 0.39, CI 0.194-0.802) and eggs (p-value 0.003, OR 0.372, CI 0.188-0.736), especially when the comparison of stunting prevalence between children groups who occasionally got the chance for consumption of these items in comparison with the advantageous children groups who have access for these items 1-3 per week, in the opposite, the salted snacks consumption was marginal statistically associated with stunting with a p-value of 0.054 (OR 1.837, CI 0.983-3.434) where the stunting rates were higher by the occasional consumer's groups with rates reached 31.1 % and daily consumers with rates reached 28.8 % in comparison with rational consumers with rates 19.8 %. So, through the findings and our economic status in the GS, the presence of these items in the child's nutrition (intra-household food distribution or security) is linked to the non-intra-household factors (food access or food security).

Other family household factors that were explored in this study, fathers' age, education level, work status, and also poverty status of the family, house density, and consanguinity of parents, were not statistically detected in the stunting variation patterns.

5.2 Recommendations

According to the study findings, the researcher recommends the following points regarding improving the child's health care and facing the stunting abnormality. Where it was detected in this study, a statistically higher prevalence of stunting among children above 6 years (with a p-value of 0.014, OR 0.579 and CI 0.374-0.896), which can be attributed to the fact that stunting makes families compelled to delay their children's entry to school. So close monitoring of the stunting prevalence through preschool age will be more representative to the age categories.

A. At the level of community

1. More efforts on the recruitment of social media, and UNRWA partners on the enhancing adherence of families for growth and development monitoring and increasing marketing to the service itself.

2. Supporting health messages using modern communication tools.
3. Working on increasing mothers' awareness about healthy nutrition practices, including in the pre-pregnancy and pregnancy lives, in addition to the importance of breastfeeding, Complementary feeding practices, and weaning.
4. Working on increasing mothers' awareness about proper obstetrical attitude, where the pregnancy outcome and born baby's health characteristics are linked with stunting and are based on the quality of their pre-pregnancy and pregnancy life and behaviors. Even more, big families are more likely to meet many challenges including poor growth of children.

B. Recommendations for Decision makers

Policies and strategies should take into consideration the short and long-term consequences of growth delay, which will impact negatively and increase the financial burdens of the fragile social classes, where poverty is still ongoing and, in its return, will impact the level of our society and organizations' resilience. Where proper and effective channels should be designed, especially through our fragmented healthcare system, where the current coordination and communication pathways facing this regard cannot prevent losing the track of these cases. However, in the absence of a unique electronic health system, other online tools or modalities remain good alternatives to be designed to increase connectivity between health care providers and institutions.

Else more, Decision makers must take, in a serious manner, the involvement of children in the economic enhancement of their families, whereby this study showed that 5.6 % of the sample were implicated directly (Collect metal and plastic cans from the trash) or indirectly (family business) in the labor market.

C. Recommendations for further studies

1. To conduct a similar study at the national level, to ascertain the real magnitude of stunting and its determinants among the children age category of 6 years and older (in the preparatory age), where non-medical reasons may be more obvious.
2. To conduct research to look at the practices, attitudes, and knowledge of healthcare providers in the Gaza Strip on the health of children's growth.
3. To conduct a study for referral process evaluation.

At the level of primary health care system in UNRWA

1. Providing in-service training on nutrition protocols, and also including growth monitoring for health care providers.
2. Regular and periodic standardization of measurement tools and practice.
3. Stressing on the health care providers on the importance of the proper adherence to the growth and development monitoring and refreshing their awareness about the consequences of the growth delay.
4. Support electronic medical records (E-health system) to give more attention to the growth of children in a similar way as dealing with pregnant mothers by opening antenatal care files. Furthermore, introducing a technical change could be helpful, which is decreasing the cut-off point value of distinguishing the stunting on the E-health system from -2 SD, to -1 SD, where it will recruit more attention, besides that, based on these values a growth delay file can be opened similar to mothers ANC files, were below -1 SD alert, and -2 SD high risk. And developing the proper protocols respectively.
5. Pairing of the growth and development monitoring with tangible issues like micronutrients may can enhance the adherence of families.
6. External referral should be reviewed either the process, direction, or its tracking.
7. Counselling and provision of the proper information needed to be strengthened, by working on staff training and equipping them on how to deliver information. Where many models are used globally, such as " The Health Belief Model", which is a theoretical model that can be used to guide health promotion and disease prevention programs, whereby adopting any model will be highly effective in enhancing the techniques of the healthcare providers on how effectively deliver the info.
8. Unifying the working mechanism, and tools, and giving information is an important thing and needs periodic follow-up, but I believe that dealing with these matters should not be intuitive, but continuous training is the most effective way to ensure the provision of proper monitoring and good services.
9. Under supporting monitoring and evaluation of a responsible body that should be specialized in tracking these cases will be of high benefit, especially in our fragmented healthcare system.
10. Inter-sectoral actions and interventions should be considered as one of the interventional approaches that should be adopted in managing the stunting and growth abnormalities.

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Annexes

Annex (1): Study activities time table

	2022											2023			
	4	5	6	7	8	9	10	11	12	1	2	3	4		
Proposal writing															
Proposal defense and approval from the university, Helsinki Committee															
administrative approval was obtained from UNRWA's Research Review Board (RRB)															
Approval to start data collection															
Development of instruments & check for validity															
Pilot Study & Modifications															
Data Collection															
Data Entry															
Data cleaning & Analysis															
Qualitative data collection and analysis															
Research writing															

Annexe (2): Quantitative part Sample calculation



StatCalc - Sample Size and Power

Population survey or descriptive study
For simple random sampling, leave design effect and clusters equal to 1.

Population size:

Expected frequency: %

Acceptable Margin of Error: %

Design effect:

Clusters:

Confidence Level	Cluster Size	Total Sample
80%	163	163
90%	268	268
95%	380	380
97%	464	464
99%	650	650
99.9%	1048	1048
99.99%	1448	1448

Annex (3): Map of Palestine



Annex (3): List of Arbitrators

1	Dr. Husam Abuolwan	Public Health Master- WHO
2	Dr. Imad Al-Qedra	Public Health Master- UNRWA
3	Dr. Imad Eltatory	Epidemiologist - Public Health Master- MoH
4	Dr. Mazen Abu Qamar	Doctor of Public Health – Al Azhar University
5	Dr. Mohammad Ubaid	Public Health Master - UNRWA
6	Dr. Shatha Elbaik	UNRWA's Research Review Board (RRB)- UNRWA
7	Dr. Taqriq Al-Asmar	Paediatrician- UNRWA
8	Dr. Zoheir Elkhatib	Dep Chief Field Health Program (General) Programme Health-UNRWA
9	Dr. Ziyad Eltatory	Paediatrician in MoH

Annex (4): Quantitative part data collection tools- Interviewed questionnaire for parents

الاستبانة

السادة والسيدات / أولياء الأمور الكرام

تحية طيبة وبعد،

أنا الطالب/ يزيد جميل عبد الرازق كلاب، طالب ماجستير في كلية الصحة العامة جامعة القدس/ مسار علم الأوبئة. أنا أعمل على أطروحة الماجستير الخاصة بي والتي تعد مطلبًا لإكمال برنامج الماجستير في الصحة العامة.

موضوع الدراسة/ محددات قصر القامة في طلبة المراحل الابتدائية – للصف الأول في مدارس وكالة الغوث الدولية بقطاع غزة

حيث تهدف هذه الدراسة الي تحديد مدى انتشار و محددات حدوث قصر القامة في طلبة وطالبات المرحلة الابتدائية , وتعتبر هذه الاستبانة جزءا هاما من الدراسة التي يقدمها الباحث لاستكمال متطلبات الحصول على درجة الماجستير في الصحة العامة من جامعة القدس أبو ديس – غزة .

و يرجى التكرم من سيادتكم بالإجابة على أسئلة الاستبانة, وإذ يلتزم الباحث بعدم استخدام هذه البيانات إلا لأغراض البحث العلمي فقط, وعدم نشر أي معلومات شخصية ولن يكون هناك أي عائد مالي أو التزام تجاه المشارك في ملئ الاستبيان سعيا من الباحث باستخراج نتائج عامة و علمية تهدف الى تحسين الرؤية , و السياسات الصحية الهادفة الى تحسين الوضع الصحي للطفل بشكل عام, ويشكركم الباحث على تعاونكم على الوقت الذي منحتموه في ملئ الاستبانة و الذي سيكون خلال عملية فحص الطلاب للصف الأول مع وقت من 20-40 دقيقة لإتمام هذه الاستبانة.

مع وافر التقدير الاحترام

غزة مايو 2022

الباحث: يزيد جميل عبد الرازق كلاب

Questionnaire

Ladies and Gentlemen/Dear Parents,

After Greetings,

This research is a graduation requirement for obtaining a master's degree in epidemiology from the College of Public Health - Al-Quds University.

The subject of the study: The Prevalence and Determinants of Short Stature among First Graders in UNRWA Schools in the Gaza Strip.

Where this study aims to determine the extent of the prevalence and determinants of the phenomenon of short stature in primary school students, and this questionnaire is an important part of the study presented by the researcher to complete the requirements for obtaining a master's degree in public health from Al-Quds University Abu Dis - Gaza.

You are kindly requested to answer the questions of the questionnaire, and the researcher is obligated not to use this data except for the purposes of scientific research only, and not to publish any personal information, and there will be no financial return or obligation towards the participant in filling out the questionnaire in an effort by the researcher to extract general and scientific results aimed at To improve vision, and health policies aimed at improving the health status of the child in general and addressing this phenomenon in particular, and the researcher thanks you for your cooperation for the time you gave in filling out the questionnaire, which will be during the process of examining students for the first grade with a time of 20-40 minutes to complete this questionnaire.

With much respect

Gaza May 2022

Yazed Jamil Abed El Raziq Kollab

1.	Education Area	School Name		
2.	Birthday of Child ___/___/___ age:	Gender:	1- <input type="checkbox"/> Male	2- <input type="checkbox"/> Female
3.	Number of brothers and sisters.....	Ranking among brothers & sisters th		
4.	Child Height _____ Cm	Child weight _____ Kg	Child HGB _____	
5.	level of education			
	Father		Mother	
	No formal schooling..... <input type="checkbox"/> 1	No formal schooling..... <input type="checkbox"/> 1	Less than primary school..... <input type="checkbox"/> 2	
	Less than primary school..... <input type="checkbox"/> 2	Primary school completed..... <input type="checkbox"/> 3	Preparatory school completed..... <input type="checkbox"/> 4	
	Primary school completed..... <input type="checkbox"/> 3	Secondary school completed	Secondary school completed	
	Preparatory school completed..... <input type="checkbox"/> 4	College/University completed	College/University completed	
	Secondary school completed	Postgraduate degree.....	Postgraduate degree.....	
	College/University completed			
	Postgraduate degree.....			
	<input type="checkbox"/> 7			
6.	Working status and Monthly income			
	Father		Mother	
	1- <input type="checkbox"/> Yes Working 2- <input type="checkbox"/> Not working <i>If father working: Monthly income is</i>		1- <input type="checkbox"/> Yes Working 2- <input type="checkbox"/> Not working <i>If Mather working: Monthly income is</i>	
	1- <input type="checkbox"/> Above poverty line (\geq 2470 NIS)		1- <input type="checkbox"/> Above poverty line (\geq 2470 NIS)	
	2- <input type="checkbox"/> Above deep poverty line (\geq 1974 NIS)		2- <input type="checkbox"/> Above deep poverty line (\leq 1974 NIS)	
	3- <input type="checkbox"/> Below deep poverty line (\leq 1974 NIS)		3- <input type="checkbox"/> Below deep poverty line (\leq 1974 NIS)	
7.	Father Birthday: age ___/___/___	Father weight _____Kg	Father height _____ Cm	
8.	Mother Birthday: age ___/___/___	Mother weight : as stated _____Kg	Mother height: as stated _____ Cm	
		Mother weight : as measured _____Kg	Mother height: as measured _____ Cm	
9.	Type of delivery of this child 1- <input type="checkbox"/> : Normal 2- <input type="checkbox"/> CS	Gestational age of child at birth _____ weeks		

10.	Weight of the child at age of 7 days (at new born examination) _____Kg	length of the child at age of 7 days (at new born examination) _____ Cm				
11.	Mother Marital Status 1- <input type="checkbox"/> : Married 2- <input type="checkbox"/> Divorced 3- <input type="checkbox"/> widow 4- <input type="checkbox"/> separated					
12.	Age of mother at first birth?-----Years old					
13.	Immunization					
	<ul style="list-style-type: none"> • Place of the immunization? 1-<input type="checkbox"/>:UNRWA 2-<input type="checkbox"/>:MOH 3-<input type="checkbox"/>: other_____ • Did the child perform the one year assessment? 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • Did the child perform the two years assessment? 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • After Completing immunization schedule: did you have a commitment to periodic growth and development monitoring visits up to 5 years of age? 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes how many visits from 2 years – 5 years _____Visits</i> 					
	Intrinsic factors (factors related to the child)					
14.	Is the child is known with chronic illness like DM, cardiovascular, hormonal, metabolic disorders that need chronic medication <ul style="list-style-type: none"> • 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes please clarify _____</i> 					
15.	Is the child is known with mental or psychological disorders and he/she is on chronic medications or he/she was on daily medication for 2 years or more. <ul style="list-style-type: none"> • 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes please clarify _____</i> 					
16.	Was the child surgically operated before? <ul style="list-style-type: none"> • 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes please clarify _____</i> 					
17.	Is there a history of recurrent hospitalizations (more than 2 days) <ul style="list-style-type: none"> • 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes please clarify how many times _____ and why _____</i> 					
	The child complain of recurrent	Strongly disagree	disagree	neutral	agree	Strongly agree
18.	Recurrent diarrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Fever regardless of the cause	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Acute respiratory infections including the upper tracts and tonsillitis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Urinary tract infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Health care determinants					

Access to health care system						
22.	How long does it take to reach nearest health facility on foot: _____ minutes					
	Affordability of micro nutrients except iron is easy	Strongly disagree	disagree	neutral	agree	Strongly agree
23.	The child got enough Calcium and vitamin D during his 5 years old growth monitoring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	The child got enough zinc or phosphor or other micronutrients during his 5 years old growth monitoring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	You could find the appropriate information regarding SS and growth delay consequences?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Was the child detected as SS? 1- <input type="checkbox"/> :Yes (if yes answer questions 27-33) 2- <input type="checkbox"/> :No (if No jump to Question 34)					
27.	How old was the child when he/she was detected _____ months					
	Once she/he was detected;	Strongly disagree	disagree	neutral	agree	Strongly agree
28.	You could find the appropriate information regarding SS possible causes and managements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.	Were you able to get the prescribed medications or micronutrients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostic approach						
30.	The medical officer started the management process (instructions, lab investigation, mother and father height requirement) (belongs also to sender 37 = Fulfillment of first steps evaluation like general examination, basic lab investigation,)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.	The medical personnel continued the follow up process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.	You have taken the follow up with your physician regularly and in serious manner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.	Was the child diagnosed as 1- <input type="checkbox"/> FSS 2- <input type="checkbox"/> CGD 3- <input type="checkbox"/> idiopathic short stature with no other pathological causes 4- <input type="checkbox"/> not diagnosed yet 5- <input type="checkbox"/> Others if other please clarify the cause_____					
Referral system						
The sender						

34.	Did the medical officer refer the child as SS for further assessment? 1-☐:Yes (if yes answer questions 35-to the end) 2-☐:No (no need to answer the following questions)					
35.	How old was the child when he was referred for first time as stunted growth to hospital/specialist_____	36. How many times was the child referred to specialist_____				
	The sender (MO) referred the stunted child after	Strongly disagree	disagree	neutral	agree	Strongly agree
37.	Fulfillment of first steps evaluation like general examination, basic lab investigation,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.	Providing the proper information about the importance of identifying the causes of the SS.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39.	Providing the proper information about the possible further management process and investigations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40.	Providing the proper information about the importance of follow up and feedback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Family action						
41.	The parents have knowledge and awareness about the SS magnitude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42.	The parents have taken the referral seriously and get to the referral point (hospital)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43.	The parents have found the referral is useful and they got answer about the possible cause of SS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44.	The family could make the required investigations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45.	The family attended the private doctor to clarify the possible causes of the SS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Receiver (hospital or advanced center specialist)						
46.	The receiver examined the child	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47.	The receiver asked for basic lab investigations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48.	The receiver requested X-ray to determine the bone age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49.	The receiver made a plan how management process can flow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50.	The receiver asked for external investigations like hormones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

51.	The receiver gave you instructions and proper information about the SS and or management process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52.	The receiver give you time line follow up schedule or appointment for further assessment and evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53.	The receiver gave you a feedback about the stunted child for sender to fulfil management process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54.	<p>Did the receiver identify if the cause of the SS is as normal variant or pathologic (final diagnosis)</p> <ul style="list-style-type: none"> • 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes Time span from first referral to final diagnosis</i> _____ 					
55.	<p>Do you have something else you think that it could be related to our Manifest?</p> <ul style="list-style-type: none"> • 1-<input type="checkbox"/>:Yes 2-<input type="checkbox"/>:No • <i>if yes please clarify</i> _____ 					

Annex 5. Quantitative part data collection tools: self-administered questionnaire for child's mother

1. first part: self-administered questionnaire for child's mother

العامل المجتمعي				
مؤيد وبشدة	مؤيد	متوسط	غير مؤيد	غير مؤيد وبشدة
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
العامل الاقتصادي				
هل تتلقون كاسرة دعم مجتمعي من أي نوع ؟				
1- نعم <input type="checkbox"/> 2- لا <input type="checkbox"/>				
إذا نعم أجب/أجيبى الأسئلة التالية و إذا لا اقفز/ي مباشرة الى سؤال رقم 5 .				
كاسرة: تتلقون	صحيح	غير صحيح	صحيح	صحيح بالتأكيد
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
العوامل المتعلقة بالأم و رعاية الامومة				
<ul style="list-style-type: none"> هل تم تسجيل الأم في رعاية ما قبل الحمل بخصوص هذا الطفل؟ 1- نعم <input type="checkbox"/> 2- لا <input type="checkbox"/> إذا نعم كم كان عدد الزيارات الدورية التي قمتي بها ----- هل تم تسجيل الأم في رعاية الحمل بخصوص هذا الطفل في أي مركز طبي ؟ 1- نعم <input type="checkbox"/> 2- لا <input type="checkbox"/> إذا نعم كم كان عدد الزيارات الدورية التي قمتي بها ----- بخصوص تنظيم الأسرة و مدى اتاحة المبادعة الزمنية بين الاطفال: كم هو الفارق الزمني بين هذا الطفل والأخ أو الأخت الأصغر بالاشهر ----- بخصوص تنظيم الأسرة و مدى اتاحة المبادعة الزمنية بين الاطفال: كم هو الفارق الزمني بين هذا الطفل والأخ أو الأخت الأكبر ----- هل تعانين من أي أمراض مزمنة بما في ذلك الاضطرابات الجسدية والنفسية والعقلية . 1- نعم <input type="checkbox"/> 2- لا <input type="checkbox"/> إذا نعم فما هي ----- 				
العوامل المتعلقة بالوضع الغذائي للام				

جيد جدا	جيد	متوسط	سيئ	سيئ جدا	كيف يمكنك وصف النظام الغذائي (غذاء صحي ، مغذيات دقيقة ، فيتامينات ، وجود منتجات حيوانية بانتظام) حسب اعتقادك في المراحل التالية
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	أثناء رعاية ما قبل الحمل بهذا الطفل
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	أثناء الحمل بهذا الطفل
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	أثناء فترة الرضاعة بهذا الطفل
العوامل المتعلقة بالوضع الغذائي للطفل					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	بخصوص مستوى الوعي التغذوي حول ممارسات التغذية الصحية اللازمة للطفل: شاملا المغذيات الدقيقة ، الفيتامينات ووجود المنتجات الحيوانية ، و دراية كافية بالكلم و الكيف و الحين, ماهو مستوى المامك بها:
الى أي عمر كان الطفل قد استطاع ان تكون تغذيته تقتصر على الرضاعة الطبيعية (بالاشهر): _____					
تغذية تكملية (بجانب الرضاعة الطبيعية): على أي سن بدأت (بالاشهر):					
ما نوع التغذية التكميلية التي قد ادخلتها على نظام الطفل الغذائي اثناء سن الرضاعة: (يمكن اختيار اكثر من اجابة)					
1- <input type="checkbox"/> حليب أطفال صناعي 2- <input type="checkbox"/> حليب ابقار 3- <input type="checkbox"/> مهروس خضار 4- <input type="checkbox"/> السمك واللحوم والكبد 5- <input type="checkbox"/> البيض 6- <input type="checkbox"/> محلول سكري او نشا 7- <input type="checkbox"/> مهروس فواكه					
عمر الطفل عند الفطام من الرضاعة الطبيعية (بالاشهر):					
كم عدد الوجبات التي يحصل عليها الطفل في العادة خلال اليوم و بشكل ثابت:					
يومية و بانتظام	ثلاثة او اكثر	مرتين في الاسبوع	مرة في الاسبوع	في المناسبات	ما مدى اتاحة و استهلاك السلع التالية على صعيد الاسرة في الاسبوع
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	الفواكه
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	اللحوم و المنتجات الحيوانية
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	الحليب ومشتقاته
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	البيض
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	التسالي المملحة (شيبس ، اندومي او غيرها) أسبوعيا
العوامل المتعلقة بالاسرة و المحيط العائلي					
مكان الإقامة		1- <input type="checkbox"/> مخيم	2- <input type="checkbox"/> قرية/ريف	3- <input type="checkbox"/> مدينة	
هل موصول في نظام صرف صحي			1- <input type="checkbox"/> نعم 2- <input type="checkbox"/> لا		
مصدر مياه الشرب:					
1- <input type="checkbox"/> مياه نقية من محطة تحلية و بانتظام 2- <input type="checkbox"/> نقطة المياه في الحي او ما شابهه 3- <input type="checkbox"/> ماء الصنبور					
نوع المنزل / السكن :					
1- <input type="checkbox"/> الأسرة الممتدة وتقاسم نفس المبنى مع الأقارب 2- <input type="checkbox"/> أسرة نووية ويعيشون في كيانهم الخاص					
مساحة المنزل:					
هل توجد صلة قرابة بين الابوين					
1- <input type="checkbox"/> نعم من الدرجة الأولى 2- <input type="checkbox"/> نعم من الدرجة اثنائية 3- <input type="checkbox"/> لا توجد صلة قرابة					

مسؤولية صنع و اتخاذ القرار بشأن الأمور التالية	عادة الزوجة	عادة الزوج	كلاهما	غير ذلك
إدارة المصاريف المنزلية في الحياة اليومية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ما هي وجبات الغذاء اليومية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
طلب الرعاية الطبية و الصحية للطفل إذا مرض او لمتابعة طبية دورية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
من مظاهر و ممارسات رعاية الطفل :				
ما مدى إتاحة عمل المظاهر التالية للطفل في الأسبوع	في المناسبات	مرة في الأسبوع	مرتين في الأسبوع	ثلاثة او أكثر
يوميًا و بانتظام	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
مدى تواجد الطفل خارج عتبة المنزل (لا يشمل الوقت الذي يمضيه الطفل في المدرسة او الروضة) سواء في الشارع او عند الجد و الجدة , الخ	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
مدى استخدامه للوسائل المرئية كالتلفاز , الأجهزة اللوحية, الكمبيوتر, الجوالآت الذكية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
هل يوجد مظاهر أخرى لسوء التغذية بين افراد الاسرة, كالوزن الزائد, النحالة , قصر القامة				
1- <input type="checkbox"/> نعم 2- <input type="checkbox"/> لا				
إذا نعم : حدد من الشخص _____ و العلة _____				
: حدد من الشخص _____ و العلة _____				
: حدد من الشخص _____ و العلة _____				

2. second part: SDQ questionnaire in Arabic

Strengths and Difficulties Questionnaire for completion by Parents (Age 4-17)

إستبيان مواطن القوة والصعوبة SDQ – للوالدين (4-17 سنة)

يرجى الاجابة على كل بند ب: غير صحيح ,صحيح نوعاً ما ,أو صحيح بالتأكيد بوضع علامة تحت الإجابة المناسبة حاول أن تكون دقيقاً في إجابتك ,سوف يساعدنا كثيراً إذا أجبت على كل بند حتى وإن كنت غير متأكد أو تري انه غير مناسب ,يرجى ان تكون اجابتك حول سلوك الطفل خلال الستة الأشهر الأخيرة أو السنة الدراسية .

تاريخ الميلاد _____ ولد بنت

البند	غير صحيح	صحيح نوعاً ما	صحيح بالتأكيد
1. يهتم بمشاعر الآخرين	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. لا يستطيع البقاء أو الاستقرار في مكان واحد, كثير الحركة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. كثيراً ما يشكو من صداع , أو آلام في البطن , أو الشعور بالغثيان .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. يشرك الآخرين بسهولة فيما يخصه (أقلام , لعب , ألعاب , حلويات , إلخ)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. كثيراً ما تنتابه نوبات من الغضب الشديد أو سريع الغضب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. يحب العزلة ,يميل إلى اللعب لوحده	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. مطيع علي وجه العموم ,عادة يفعل ما يطلبه منه الكبار	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. قلق من أشياء كثيرة, كثيراً ما يبدو عليه القلق	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يساعد الآخرين اذا ما حدث لأحدهم مكروه	9.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتلملم أو يتلوى باستمرار (جسمه في حركة مستمرة أثناء جلوسه)	10.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	لديه على الأقل صديق واحد جيد	11.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	عادة يتعارك مع الآخرين من نفس سنه أو يستأسد عليهم	12.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	كثيراً ما يكون غير سعيد , حزين أو يبكي بسهولة	13.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	في الغالب محبوب من هم في سنه	14.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتشنت انتباهه بسرعة وقليل التركيز	15.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	عصبي أو متشبه (متعلق) بالآخرين في المواقف الجديدة و من السهل أن يفقد ثقته في نفسه	16.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	لطيف مع من هم أصغر منه	17.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	كثيراً ما يكذب , يخدع أو يعش	18.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يستهزأ منه أو يستأسد عليه من هم في سنه	19.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	كثيراً ما يتطوع لمساعدة الآخرين (الوالدين, المدرسين, الأطفال الآخرين)	20.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يفكر قبل أن يتصرف	21.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يسرق من البيت, المدرسة أو من أماكن أخرى	22.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ينسجم بشكل أفضل مع الكبار عنه مع في نفس سنه	23.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يخاف من أشياء كثيرة ,من السهل تخويفه	24.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتابع أداء الواجبات حتى النهاية , لديه انتباه جيد	25.								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	من باب التهذيب وطرق التربية والتوجيه للطفل في الحياة اليومية : هذه مسطرة من 1 الى 10 بحيث تبدأ من 1 حيث تعتمدون في المنزل على توجيه و تهذيب الطفل بالحوار و الاقتناع. و بعد الدرجة الخامسة يبدأ استخدام التعنيف اللفظي و أخيراً الدرجة 10 تعني ان الطفل يتعرض الى تعنيف و عقاب جسدي.	26.

3. Third part: SDQ questionnaire in English

Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of the child's behavior over the last six months or this school year.

Child's Name..... Male/Female
Age.....

	Not true	Somewhat True	Certainly True
Considerate of other people's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restless, overactive, cannot stay still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often complains of headaches, stomach-aches or sickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shares readily with other children (treats, toys, pencils etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Often has temper tantrums or hot tempers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Rather solitary, tends to play alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Generally obedient, usually does what adults request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Many worries, often seems worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Helpful if someone is hurt, upset or feeling ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Has at least one good friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Often fights with other children or bullies them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Often unhappy, down-hearted or tearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Generally liked by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Easily distracted, concentration wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Nervous or clingy in new situations, easily loses confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Often lies or cheats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Picked on or bullied by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Often volunteers to help others (parents, teachers, other children)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Thinks things out before acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Steals from home, school or elsewhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Gets on better with adults than with other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Many fears, easily scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Sees tasks through to the end, good attention span	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
child's discipline, politeness methods, This is a scale from 1 to 10, starting from 1 where you depend at home on dialogue and persuasion where the child does not experience any violent discipline, and by increasing the scale reaching fifth degree, the child may experience verbal abuse, and finally, grade 10 means that the child is exposed to violence and physical punishment. This question was added to the SDQ by researcher.	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date.....

Signature.....

Parent/Teacher/Other (please specify :) _____

Thank you very much for your help

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شكرا لتعاونكم

Annex 6 Qualitative part questions for key informants child's mothers

نقدر مشاركتكم في هذه المقابلة!

كما ناقشنا مسبقاً، سيتم تسجيل هذه المقابلة صوتياً حتى تتمكن من مراجعة ردودك بعد هذه المقابلة على أن تبقى جميع ردودك سرية، ولن تتم مشاركة أي شيء من الردود مع أي جهة أو توثيقه في أي سجل، هل أنت موافق على تسجيل هذه المقابلة بالصوت؟

الغرض من هذه المقابلة هو فهم أعمق لجوانب قد يكون لها اثر على موضوع النمو او تأخره لدى أبنائكم و بناتكم , و لفهم تجربتكم بهذا الخصوص، والطرق التي يمكننا بها تحسين فهمنا كمقدي خدمة صحية و بالتالي تحسين الخدمة المقدمة لتكون بشكل افضل و فعال.

ستستغرق هذه المقابلة حوالي 30 دقيقة. إذا كان لديك سؤال في أي وقت، أو ترغب في أخذ قسط من الراحة، فيرجى إبلاغي بذلك. هل لديك أي أسئلة قبل البدء؟

Tell me about stunting or growth delay:		1		بناءاً على معرفتكم. احكي لي عن موضوع التقزم او تأخر النمو
<ul style="list-style-type: none"> • Possible determinants and causes • Consequences, physical, mental, short and long run , • Magnitude • Is it correctable • Does the medical health status of the child implicated 		<ul style="list-style-type: none"> • المحددات والأسباب المحتملة • العواقب و التبعات: الجسدية والعقلية والقصيرة والطويلة المدى ، • الانتشار و التفشي • هل هو قابل للتصحيح • هل الوضع الصحي و التاريخ الطبي للطفل متورط او له دور 		
In your opinion, to what extent can the pregnancy life affect the growth of the child		2		في رأيك ، إلى أي مدى يمكن أن تؤثر حياة الحمل على نمو الطفل
Nutrition of the baby: what are your perceptions on the following		3		تغذية الطفل: ما هي تصوراتك عن التالي
Nutrition status		<i>perceptions on</i>	<i>source of information</i>	<i>challenges</i>
الرضاعة الطبيعية	<i>Breastfeeding</i>			
القطام	<i>Weaning</i>			
التغذية التكميلية	<i>Complementary feeding,</i>			
وجبات يومية	<i>Daily meals</i>			
Can you please tell me about the Intra-household food distribution,		4		هل يمكنك أن تخبرني من فضلك عن توزيع الغذاء داخل الأسرة ،
<i>Discrimination between age groups or by gender</i>				التمييز بين الفئات العمرية او حسب الجنس
Tell me about the growth and development monitoring that is provided in the PHC system.		5		بناءاً على معرفتكم أو تجربتكم. أخبرني عن خدمة متابعة النمو والتطوير التي يتم توفيرها في نظام الرعاية الصحية الأولية.
<i>Describe the service</i>				صف الخدمة
<i>Duration,</i>				المدة الزمنية،
<i>Why the child's parameters are measured?</i>				لماذا يتم اخذ قياسات الطفل؟

<i>Adherence</i>	التقيد	
<i>Challenges or obstacles</i>	التحديات أو العقبات	
Once the child was detected as SS: please tell me about: What is the process of management?	بمجرد اكتشاف الطفل على أنه لديه قصر قامة: من فضلك أخبرني عن: ما هي الية التعامل مع الطفل	6
Starting from counselling's, diagnosis,	بدءا من الاستشارات ، تشخيص،	
The referral process, whether the internal or external referral	عملية الإحالة سواء الإحالة الداخلية أو الخارجية	
Do you think; is there something that you can tell me how we can optimally deal with this manifest.	هل تعتقد؛ هل هناك شيء يمكنك أن تخبرني به كيف يمكننا التعامل على النحو الأمثل مع هذا الظاهرة الصحية	7
<i>And who are the stakeholders in this regards.</i>	ومن هم أصحاب الشأن في هذا الصدد.	

• هل هناك أي شيء آخر تود مناقشته أو إخبارنا به قبل إنهاء المقابلة؟

يقودنا هذا إلى نهاية المقابلة. نحن نقدر بشدة وقتك وتعليقاتك المفيدة في الإجابة على هذه الأسئلة. شكرا لك!

Annex 7 Qualitative part questions for key informants Healthcare personnel

نقدر مشاركتكم في هذه المقابلة!

كما ناقشنا مسبقاً، سيتم تسجيل هذه المقابلة صوتياً حتى تتمكن من مراجعة ردودك بعد هذه المقابلة على أن تبقى جميع ردودك سرية، ولن تتم مشاركة أي شيء من الردود مع أي جهة أو توثيقه في أي سجل، هل أنت موافق على تسجيل هذه المقابلة بالصوت؟

الغرض من هذه المقابلة هو فهم أعمق لجوانب قد يكون لها اثر على موضوع النمو أو تأخره لدى الأطفال وخاصة في المرحلة العمرية القبل المدرسية ، و لفهم تجربتكم بهذا الخصوص، والطرق التي يمكننا بها تحسين فهمنا كمقدمين خدمة صحية و بالتالي تحسين الخدمة المقدمة لتكون بشكل افضل و فعال.

ستستغرق هذه المقابلة حوالي 30 دقيقة. إذا كان لديك سؤال في أي وقت، أو ترغب في أخذ قسط من الراحة، فيرجى إبلاغي بذلك. هل لديك أي أسئلة قبل البدء؟

One of the UNRWA health services, growth and development monitoring, from birth until 5 years old, that is provided by the primary health care nets of UNRWA, where detection of abnormalities of the growth is logically expected, thus I hope to find as a researcher some answers for coming questions, aiming to understand the stunting as a manifest, and its possible determinants at this child's age category.

At the beginning, I thank you for your participation and support to conduct this interview, which represents the qualitative part of my thesis, where this tool where designed upon the quantitative part results.

1	According to your perception, what is the magnitude of stunting among children, especially pre-scholar children	بناء على معرفتك وخبرتك ورؤيتك ماذا ترى في موضوع التقزم من حيث الأهمية والانتشار بين اطفال الفئه العمرية قبل المدرسية
	<i>Prevalence</i>	الانتشار
	<i>Impact, medical, psychological, school achievement.</i>	وما اثارها او تبعاتها المستقبلية والنفسية تاج واثارها على التحصيل الدراسي
2	Please define the detection and diagnosis process of short stature especially in preschool children	هل يمكنك وصف اليه التقاط حالات التقزم في الطفولة وخاصة في هذه الفئه العمرية
	<i>How is addressed: on E-health, family recruitment.</i>	
3	How can counseling improve or affect the prevention and management of short stature	كيف يمكن للاستشارة الطبية تحسين او ان تؤثر على الوقاية او علاج حاله التقزم
4	In your opinion to what extent healthcare Providers adhere to proper growth and development monitoring	من وجهه نظركم الى اي مدى يوجد التزام مثالي في متابعه نمو وتطور الاطفال
	<i>process</i>	الاليه
	<i>technique</i>	التقنية الفنية طبيا
	<i>attitude of staff</i>	توجه الموظف وسلوكه على ارض الواقع
5	In case of detection of any abnormality of growth and development please describe the referral pathway	في حالة تشخيص او التقاط اي حاله او اكتشاف أي خلل في النمو والتطور ، كنقص وزن او قصر قامه, يرجى وصف مسار الإحالة أو ما هي اليه التحويل الطبية -
	<i>directions</i>	الجهة المراد التحويل اليها -
	<i>internal and external referral</i>	التحويل الداخلي او الخارجي -
	<i>feedback</i>	التغذية الراجعة -
	<i>how much is useful or the benefit of referral</i>	الى اي مدى نجاعة التحويل الطبي
6	What do you suggest to implement in order to enhance prevention detection and management of short stature	هل يمكن ان تقترح شيء من شأنه تحسين الوقاية, التقاط او علاج التقزم
	<i>process</i>	اليه
	<i>screening</i>	المسح
	<i>referral</i>	التحويل الطبي
	<i>counseling</i>	تقديم المشورة الطبية
	<i>supplementation</i>	المداخلة العلاجية - مكملات
	<i>Inter sectorial action</i>	التنسيق مع جهات اخرى
7	Anything to add	هل يوجد شيء اخر يمكن قوله بهذا الخصوص

Annex 8 Helsinki Committee Approval Letter



المجلس الفلسطيني للبحوث الصحي Palestinian Health Research Council

تعزيز النظم الصحي الفلسطيني من خلال مؤسسة استخدام المعلومات الصحية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee For Ethical Approval

Date: 04/04/2022

Number: PHRC/HC/1035/22

Name: Yazed Kollab

الاسم:

We would like to inform you that the committee had discussed the proposal of your study about:

لقد تم مناقشة مقترح دراستكم
حول:

The Prevalence and Determinants of Short Stature among First Graders in UNRWA Schools in the Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/1095/22 in its meeting on 04/04/2022

و قد قررت الموافقة على البحث المذكور اعلاه
بالرقم والتاريخ المذكوران اعلاه

Signature

Member

Member

Chairman

General Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-



E-Mail: pal.phrc@gmail.com

Gaza - Palestine

غزة - فلسطين

شارع النصر - مفترق العيون

عنوان الدراسة: محددات قصر القامة في طلبة المراحل الابتدائية - للصف الأول في مدارس وكالة الغوث الدولية بقطاع غزة.

إعداد: يزيد جميل عبد الرازق كلاب.

إشراف: أ.د. يحيى عابد

الملخص:

النمو الطبيعي للطفل هو عملية مستمرة ، بطيئة نسبياً في النمط ، ويعتمد على العديد من العوامل بما في ذلك المحددات الجهرية والخارجية على المستوى الفردي أو المجتمعي ، وبالتالي المراقبة والتدخل لإدارة انحرافات هذه العملية ، خاصة في الأيام الألف الأولى من الحياة ، ستكون ذات قيمة عالية ، بما في ذلك التقزم أو قصر القامة.

الأهداف: تهدف الدراسة إلى التأكد من حجم قصر القامة لدى طلاب الصف الأول في مدارس الأونروا في قطاع غزة وتحديد المحددات الممكنة.

المنهجية: اعتمدت الدراسة المنهج الوصفي والمثلث المقطعي. كان مجتمع الدراسة أكبر من 33000 تلميذ ، وكانت العينة 488 المستجيبة موزعة بين الجزأين الكمي والنوعي (448 ، و 40 على التوالي). بالنسبة للجزء الكمي ؛ تم اختيار 448 تلميذاً بشكل عشوائي من طلاب الصف الأول في مدارس الأونروا ، تتراوح أعمارهم بين 6-7 سنوات ، والتلاميذ اللاجئين في مدارس الأونروا خلال العام الدراسي 2022-2023. بينما الجزء النوعي ، تم سحب عينة هادفة غير احتمالية وتم اختيار 10 مدراء ومخبرين رئيسيين للرعاية الصحية (مديرين حاليين أو سابقين في الأونروا) ، بالإضافة إلى 30 أمًا لأطفال الذين يعانون من التقزم.

النتائج:

وقد توصلت الدراسة لعدة نتائج هامة تجيب عن أسئلتها الرئيسية ومنها : كشفت هذه الدراسة أن 3.6% من الأطفال كانوا أقل من أو يساوي 2- انحراف معياري (أ.م) ، وكانوا يعانون من قصر القامة (بما في ذلك طفل واحد أقل من 3-أ.م) ، إضافة الي ان 20.5% من الأطفال كانوا ما بين أقل من أو يساوي 1- (أ.م) و أكثر من 2- انحراف معياري (أ.م) ، وبالتالي 24.1% من الأطفال أقل من أو يساوي 1- أ.م. علاوة على ذلك ، كان معدل انتشار فقر الدم (خضاب الدم أقل من 11.5 جم / ديسيلتر) بين العينة المختارة (طلاب الصف الأول) 49.6% ، اما في حين اذا اعتمد ان فقر الدم دون 11.0 جم / ديسيلتر كما هو معتمد من قبل بعض المؤسسات والتقارير ؛ سيصبح معدل الانتشار 24.3% خاصة إذا تم إجراء اختبار فحص خضاب الدم بواسطة مقياس الطيف الضوئي. وفي الوقت نفسه ، كان الوزن بالنسبة لتصنيف الدرجة (age Z-score categorization) Z بين الأطفال كما يلي: 6.3% يعانون من نقص متوسط في الوزن (أقل من أو يساوي 2- أ.م) ، بينما كان 18.5% أقل من أو يساوي 1- أ.م و أكثر من 2- انحراف معياري (أ.م) . ومع ذلك ، كانت هناك ارتباطات إحصائية بين التقزم وحالة تدني الوزن (أقل من 1- أ.م) (قيمة معيارية أقل من 0.000 ، نسبة الأرجحية 11.74 ، فاصل الثقة 7.088-19.452). وكانت هناك ارتباطات إحصائية بين قصر القامة وحالة تدني خضاب الدم أقل من 11.0 جم / ديسيلتر (قيمة معيارية أقل من 0.000 ، نسبة الأرجحية 0.401 ، فاصل الثقة 0.241-0.666) .

من خلال نتائج هذه الدراسة وجد أن معدل انتشار قصر القامة أعلى من الناحية الإحصائية بين الأطفال فوق 6 سنوات (بقيمة احتمالية 0.014 و نسبة الأرجحية 0.579 و فاصل الثقة 0.374-0.896) ، والتي يمكن أن تُعزى إلى أن قصر القامة يضطر الأسر لتأخير دخول أبنائهم إلى المدرسة. أما بالنسبة للتقييم النفسي والعقلي للأطفال ، فقد كانت درجة الصعوبات الإجمالية 23.2. ووجدت علاقة إحصائية بين قصر القامة وسلوكيات الاطفال غير الطبيعية بقيمة احتمالية 0.016 و نسبة الأرجحية 0.542 , فاصل الثقة 0.327-0.897 مقارنة مع الاطفال المصنفين طبيعيين. من حيث الوضع الاقتصادي ، كانت معدلات قصر القامة بين الأسر التي تتلقى مساعدات غذائية منتظمة أعلى (25%) من الأسر التي لا تتلقى هذا النوع من الدعم (7%) حيث كانت القيمة الاحتمالية 0.016 (اختبار فيشر). و نسبة الأرجحية 0.246, فاصل الثقة 0.07-0.84 , و لوجظ ان بعد الانتهاء من برنامج التطعيم ، كان التزام الأسر بالاستمرار في متابعة النمو والتطور منخفضًا نسبيًا ، حيث يمكن أن يُعزى ذلك إلى نقص معرفة الأسر بأهمية هذه الخدمة ، كما تم الكشف أيضًا في البحث النوعي ، 50% فقط يعرفون أنه يجب أن يستمروا حتى سن 5 سنوات ، حيث قالت إحدى الأمهات " المتابعة غير مرتبطة بلفاح أو فيتامين ، لماذا يجب أن أحضر". علاوة على ذلك ، فإن غياب هيئة أو جهة مسؤولة في نظام الرعاية الصحية الأولية كوجود اخصائي مثلا قد يكون له دور في عدم الامام ومتابعه حالات تاخر النمو وهذا السبب قد رجحه جميع المختارين الصحيين في الدراسة تقريبًا ، والعديد من الأمهات المرشدات الرئيسيات في البحث النوعي ، كما إتضح ايضا في البحث الكمي. و أظهرت الدراسة أن معدل انتشار قصر القامة بين الأطفال المصابين بأمراض مزمنة أعلى إحصائياً (52.1%) مقارنة بالأطفال الأصحاء (20.8%) بقيمة معيارية 0.001. من ناحية أخرى ، حيث كانت معدلات التقزم بين الأطفال الذين يعانون بشكل دوري من الحمى أو التهابات الجهاز التنفسي ، مقارنة بالأطفال الذين لا يعانون من أي من هذه المشاكل الصحية ، أعلى إحصائياً مع قيمة معيارية 0.048 و 0.097 (هامشيًا) على التوالي. . وبالتالي ، فإن الحالة الصحية الطبية متورطة في قصر القامة. علاوة على ذلك أوضحت الدراسة وجود ارتباطات إحصائية بين قصر القامة مع مستوى اطوال الام والأب , ، مع انتشار أعلى بين الوالدين قصار القامة ، بقيمة معيارية 0.004 و 0.001 على التوالي. وهذا يرجح العامل الوراثي في التقزم.

علاوة على ذلك ، أظهرت الدراسة ارتباطات إحصائية بين قصر القامة ووزن وطول الطفل عند الولادة ، حيث كان معدل انتشار التقزم بين الأطفال المولودين أقل وزنًا (أقل من 2.5 كجم) والأطفال المولودين بالتقزم (أقل من 46 سم) مع قيمة معيارية 0.003 و 0.001 على التوالي. بالرغم من عدم وجود ارتباط إحصائي بين التقزم وممارسات متابعه الامومه والتوليد لدى الامهات.

المحصلة والتوصيات

خلصت الدراسة الحالية إلى أن هناك ارتفاعاً إحصائياً في معدل انتشار قصر القامة بين الأطفال الذين تجاوزوا سن الست سنوات والذي يمكن أن يعزى إلى أن قصر القامة قد يجعل الأسر تضطر إلى تأجيل دخول أطفالها إلى المدرسة . هذا قد يعني أن معدل انتشار التقزم الذي تم الكشف عنه في هذه الدراسة لا يمثل فئة عمر الأطفال بل يمثل فئة الطلاب الذين التحقوا بالصف الأول.

وعلاوة على ذلك، فإن قصر القامة تأخر النمو يحتاجان إلى مزيد من الاهتمام والدعم من قبل النظام الصحي، حيث يمكن أن يكون توفير جهة مسؤولة متخصصة في تتبع هذه الحالات ذات فائدة كبيرة. خصوصاً في ظل نظام الرعاية الصحية المتفكك ، دون تجاهل أهمية العمل على تعزيز قدرة الأسر ومقدمي الرعاية الصحية على مراقبة النمو والتطور السليم من خلال زيادة الإرشاد والتسويق للخدمة نفسها، وعليه ينبغي تصميم التدخلات وفقاً للظروف الاقتصادية التي تجد فيها الأسر نفسها غير قادرة على مواصلة عملية الإدارة والمتابعة.