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**Knowledge and Practice of Nurses and Midwives toward
Antenatal Care Provided at Governmental Primary
Health Care Centers in Gaza Strip**

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**Knowledge and Practice of Nurses and Midwives toward
Antenatal Care Provided at Governmental Primary
Health Care Centers in Gaza Strip**

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**A Thesis Submitted in Partial Fulfillment of Requirements
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Al-Quds University
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Thesis Approval




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Jerusalem- Palestine

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Dedication

For my mother

For my father

My husband: Sohaib

My son: Omar

For my sisters and brothers.

For my husbands' family

For my friends and colleges at Shohada' Alaqsa hospital

I dedicate my thesis for all of them

Declaration

I certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged, and this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed:**Mona Ashour Mohammed Abu Itiwy**

6/12/2022

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Mona Ashour Mohammed Abu Itiwy

Abstract

Background: Antenatal care (ANC) service is an important goal in terms of pregnant women's health during their reproductive time, and its health benefits account for around a quarter of all pregnancies globally. **Aim:** This study aimed to assess nurses' and midwives' knowledge and practice of ANC at all twenty-seven governmental primary health care (PHC) centers in the Gaza Strip that provide ANC services. **Materials and method:** A descriptive cross-sectional design was used, and a census sample was used to cover all 72 nurses and midwives that provide ANC services in the Gaza Strip's PHC centers. To collect data from respondents, a standardized, self-administered questionnaire was constructed by the researcher with the assistance of the supervisor. All administrative and ethical issues were considered. Pilot study was conducted with seven respondents and included in the final analysis and the tool was checked for reliability using Cronbach's alpha coefficient test which were 0.785, and 0.820 for knowledge, and practice respectively. The data collection period was continued for two months; March 2022- May 2022. The data were analyzed using the Statistical Package for Social Sciences (SPSS) application version 25. **Results:** In total, 72 midwives (48.6%) and nurses (48.6%) took part in the study, with two (2.8%) having both specialties. The majority (62.5%) are over 40, have more than ten years of health care experience (87.5%) and providing ANC (58.3%), and the majority have received training (93.1%). Half of those who took part had bachelor's degrees, 45.8% live in Gaza, and 59.7% work at a fourth-level clinic. Their mean knowledge score about the ANC service was 18.9 (12-23), and their mean practice score was 89.2. (60.9- 100). After categorizing knowledge and practice, less than half of the respondents (43.1%) had high knowledge, whereas the majority (95.8%) have high practice. The study discovered a statistically significant difference in knowledge score based on place of residence ($F= 3.3$, $p\text{-value}= 0.017$), but no difference in other variables (age, specialty, training, education level, experience, and clinic level). The study, on the other hand, found a statistically significant difference between practice and prior training ($t= 2.23$, $p= 0.029$). In addition, there is a statistically significant difference in practice score based on the number of training hours ($t= 2.6$, $p\text{-value}= 0.009$), with respondents with 50 or more training hours having a mean practice score of 92.1, higher than the score of 87.6 for those with less than 50 training hours. However, the study found no difference in practice when other characteristics were investigated (age, specialization, training, education level, experience, and clinic level). **Conclusion and Recommendations:** Nurses and midwives have good practice with the ANC services given in governmental PHCs, but their knowledge is insufficient. The study suggests expanding education and training programs for ANC members to keep them update on World Health Organization standards.

List of abbreviations

ANC	Antenatal Care
ASB	Asymptomatic Bacteriuria
CTG	Cardiotocography
GDM	Gestational Diabetes Mellitus
HIV	Human Immunodeficiency Virus
IPV	Intimate Partner Violence
MCH	Mother and Child Health
MLCC	Midwife-Led Continuity of Care
MMR	Maternal Mortality Rate
MoH	Ministry of Health
NGOs	Non-Governmental Organizations
NICE	National Institute for Health And Care Excellence
PCBS	Palestinian Central Bureau of Statistics
PCC	Preconception Care
PHC	Primary Health Care
PNC	Postnatal Care
PRPM	Pregnancy-Related Preventable Mortality
Rh	Rhesus
SDG	Sustainable Development Goals
SFH	Symphysis-Fundal Height
UNRWA	The United Nations Relief And Works Agency for Palestine Refugees in the Near East
USA	United States of America
WHO	World Health Organization

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Chapter One

Introduction

1.1 Background

The World Health Organization (WHO) defines Antenatal Care (ANC) as the care provided by experienced health care professionals to pregnant women and teenage girls to ensure the best health conditions for the mother and the baby during pregnancy (WHO, 2016a). ANC services is a significant objective in terms of the health status of pregnant women during their reproductive period, and its health benefits account for approximately a quarter of all pregnancies globally (Lincetto, 2014). Therefore, ANC provides an entry for interventions, which give health workers the ability to recognize dangerous situations that need additional interventions and consequently recommend them for early management, which would lead to better maternal and newborn outcomes (Afulani, 2015).

The unacceptable high rate of maternal death is one of the key health challenges that prompted the need for sustainable development goals (SDG). Maternal mortality is defined as the death of a woman during pregnancy or within one year after delivery due to a pregnancy complication, a sequence of events triggered by pregnancy, or the exacerbation of an unrelated ailment by the physiologic effects of pregnancy (Collier and Molina, 2019). The statistics of the year 2017 indicated that 259,000 women died during or after pregnancy. The majority of these deaths occurred in settings with limited resources, and nearly 94% of them might have been avoided (WHO, 2019).

Maternal ANC nursing might be mainly concerned with the essential components of a prenatal history, describe the normal physiologic changes one would expect to find when performing a physical assessment on a pregnant woman, describing areas that should be evaluated as part of the initial assessment of psychosocial factors related to a woman's

pregnancy, and timely identify the danger signs of pregnancy to their possible causes (Davidson et al., 2012). While important, these are all clinical tasks. The pregnant women need a lot more than the clinical services. The whole process of ANC is divided by WHO into five main branches (WHO, 2016a).

A skilled midwife can influence women's continuing use of ANC services, as well as the outcome of their pregnancy. If midwives lack knowledge and skills, this could encourage pregnant women to skip ANC services, resulting in an increased number of maternal deaths (Libingi et al., 2019).

ANC is administered free of charge to women residing in the Gaza Strip at Primary Health Care (PHC) institutions affiliated with the Palestinian Ministry of Health (MoH) or the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). However, not all patients take use of this free service, as some women choose private therapy and others do not obtain ANC for a variety of reasons, including location or economic status (Naim et al., 2016). Previous research in the Gaza Strip has evaluated the quality of ANC services (Nassar, 2018) and women's satisfaction (Shaqaleh, 2020) with the ANC service. However, no previous research has evaluated the knowledge and practice of midwives and nurses regarding the care delivered. This study was conducted to assess the knowledge and practice of midwives and nurses giving ANC at governmental PHC facilities in the Gaza Strip.

1.2 Research Problem

Most of the care provided for women is focused on ANC throughout pregnancy and postnatal care. According to the MoH, 48,029 new pregnant women received care during pregnancy in Gaza Strip (MoH, 2021). There are 52 health centers in Gaza, divided by

governorates (MoH, 2021). The number of nursing services in PHC centers is 766.956 services, of which 7% is ANC services (MoH, 2021).

All requirements of ANC should be completed at each visit, regardless of the number of pregnant women attend the clinic. This results in a significant task for nurses and midwives. A skilled nurse and midwife can influence a woman's continuous use of ANC treatments and affect the outcome of her pregnancy. If nurses or midwives lack knowledge and skills, the discovery of high-risk pregnancies will be delayed, resulting in hazardous pregnancies.

In light of the conclusions we arrived at after reviewing the literature, we can summarize the reasons that enumerate on the knowledge gap in the current scientific literature and justify the scientific urge to conduct this research in the following reasons: First: to assess the extent of compliance between the theoretical knowledge ANC providers have and the latest guideline. Second: to assess the implementation of the available knowledge, as in various setting there seems to be problems in implementation despite having a solid up-to-date theoretical background. Third: recent reviews point out the need for a consistent way of measuring ANC quality. The practice and knowledge variables are main constituents of the ANC services and contribute directly to its overall quality. This study uses a universally recommended way of monitoring ANC services. Fourth: to know if the ANC providers at Gaza are aware of the local risk factors that might cause health problems to the mothers and/or children in Gaza

Up to the researcher's knowledge, little number of studies conducted to assess the nurses' and midwives' knowledge and practice of ANC at the Primary Health Center in Gaza Strip. The research attempt to fill the gap of knowledge as it focused to assess the knowledge and practice of midwives and nurses toward provision of ANC and will find the defect in their knowledge and challenges encountered during the provision of a good ANC services.

1.3 Justification of the Study

By examining the knowledge and practices of nurse-midwives on ANC in centers for PHC in the Gaza Strip, the level of knowledge and practice gaps was determined. To identify and treat gaps and deficiencies in ANC services, and to advocate a plan to improve and strengthen the quality of ANC services. In addition, this study may provide principles for other researchers to follow when doing future studies in this sector, as well as provide recommendations or highlights for enhancing the quality of ANC services.

The study collects data for enhancements to nurse-midwifery preservation efforts, in-service teaching, and motivating future research. In addition to aiding in the collection of evidence-based data for interventions aimed at enhancing the quality of ANC services provided by nurse-midwives. This study aimed to assess nurses' and midwives' knowledge PHC centers in the Gaza Strip, which could result in knowledge about service gaps and suggestions for improvement of the ANC services in Gaza Strip.

1.4 Study objectives

1.4.1 General objective

The aim of this study is to assess the knowledge and practice of nurses and midwives toward antenatal care provided at governmental primary health care centers in Gaza Strip

1.4.2 Specific objectives

- To assess the level of knowledge among nurses and midwives regarding ANC.
- To investigate the level of practice of nurses and midwives regarding ANC.
- To examine the difference in knowledge and practice related to some demographic characteristics

1.5 Research questions

- What is the level of nurses and midwives knowledge toward ANC?
- To which extent nurses and midwives have practice regarding ANC?
- What the relationship between nurses and midwives knowledge and practice with their demographic characteristics; qualification, age, experience, place of residences, training....etc?

1.6 Context of the study

1.6.1 Gaza strip

The Palestinian territories is subdivided geographically into three areas: the West Bank (WB), the Gaza Strip, and East Jerusalem Annex (1). Gaza Strip is a tiny strip of territory bordered by Egypt to the south, the Mediterranean Sea to the west, and 1948-occupied regions to the east and north Annex (2). A recent report from the Palestinian Central Bureau of Statistics (PCBS) indicated that the population of the Gaza Strip is 2,106,740 people. The population density is 5,154 people per square kilometer. With a population growth rate of 2.8% and a fertility rate of 3.9%. Further, the population in the Gaza strip is considered young as 41.0% of the population of Gaza Strip is under 15 years old (PCBS, 2021).

1.6.2 Palestinian Health Care System

In Palestine, there are four major providers of health care, including the MoH, which is the primary provider of health services in the Gaza Strip, UNRWA, non-governmental organizations (NGOs), and private for-profit providers. The ministry provides comprehensive services for populations, including primary, secondary, and tertiary health services, and purchases unavailable tertiary health services from domestic and international health care providers for patients in need. UNRWA, which is considered the second provider of health care after the MoH, provides PHC services to refugee patients only and

purchases secondary care services for difficult cases from other providers, such as the MoH and private hospitals. Depending on the initiatives and money, NGOs provide primary, secondary, and some tertiary services. For profit, the private sector delivers services at all three levels of care through private specialist hospitals and centers.

1.6.3 Primary Health Care

PHC is an integral part of the Palestinian health care system. MoH, UNRWA, non-governmental, and private centers provide preventive, promotive, curative, and rehabilitative health care to all Palestinians, particularly children and other vulnerable groups. PHC clinics strive to provide inexpensive and accessible health services available to all Palestinians, regardless of geography. MoH policy classifies PHC facilities from level I to level IV based on the health services they offer. The number of PHC centers in the Gaza strip is 159, of which 52 centers (32.7%) are managed by MoH, 22 centers (13.8%) are managed by UNRWA, 80 are managed by NGOs, and 5 centers are managed by military health centers (MoH, 2021). Number of ANC visits is 287,851 with an average of 6 visits for each pregnant woman (MoH, 2021).

1.7 Definition of terms

1.7.1 Knowledge of ANC

The researcher-defined knowledge as have good information about ANC serviced provided in the PHC centers. Knowledge score was categorized into high and low considering answering 75% of the knowledge questions as a cut point as previously considered in a previous research (Libingi et al., 2019).

1.7.2 Practices of ANC

Practices of ANC refer to the assessment and care of a pregnant woman (Novak and Broom, 2014). The researcher-defined practice as have good practice ANC services

provided in the PHC centers. practice score was categorized into high and low considering answering practicing 75% of the practice statements as a cut point as previously considered in a previous research (Libingi et al., 2019).

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Chapter Two

Conceptual Framework and Literature Review

2.1 Conceptual framework

The researcher drew the conceptual framework based on the literature review and personal experience. This framework shows what the researcher is going to study. The current study examines the Knowledge and practice of nurses and midwives toward antenatal care provided at governmental PHC centers in Gaza Strip. There are 3 main variables in the study: First: the knowledge, which represents the scientific background the ANC providers possess and the local guidelines they are to follow. Second: the practice, which stands for the actual implementation of the scientific background. Third: demographic variables, which were collected and inspected for a possible true effect on the knowledge and/or the practice of the ANC providers. The knowledge and practice variables are the main outcome variables of the current study. Each of them were estimated using a numeric score that incorporates the nurses and midwives' performance regarding both the knowledge and the practice of ANC provided at the governmental primary healthcare units. The visual representation of the relationships between these variables is available at (Figure 2.1).

2.1.1 Knowledge

The base of high-quality ANC services is having trained professionals that are aware of the scientific evidence and guidelines regarding ANC practice. The knowledge variable is of vast scope, as it covers all the aspects of care and supports the pregnant woman needs. We assess the knowledge in each of five major aspects of ANC as defined by the latest WHO guidelines. Each question has only two possible answers, yes VS no.

first, are the ANC providers aware that the recommended number of ANC visits is now eight not four as stated in the 2002 WHO guidelines? Do ANC providers know the reasons behind changing the terminology of “ANC visit” to “ANC contact” or not?

Regarding the nutritional interventions: What recommendation do ANC providers make about the healthy diet and the physical activity? Do they recommend increasing the daily intake of energy and proteins? Do they mention the importance of a balanced diet or they just advise the mothers to eat a lot of healthy food? If the mother is undernourished, do ANC professionals recommend having a high-protein supplementation? Do they tell the pregnant women that the daily oral intake of iron and folic acid supplements reduces the risk of having anemia, sepsis, low birth weight, preterm birth and neural tube defects? Are they aware of the context-specific recommendations for the intake of calcium, vitamin A and zinc? Are they aware that multiple micronutrients, vitamin B6, vitamin E, vitamin C, and vitamin D supplementations aren't recommended and didn't show evidence of having better perinatal outcomes? Do ANC professionals advise the pregnant women to reduce their daily intake of caffeine or not?

Regarding the maternal and fetal assessment: Do ANC professionals recommend testing for anemia and asymptomatic bacteriuria? And what methods of testing do they recommend? Can they accurately diagnose gestational diabetes mellitus (GDM) according to the recent WHO diagnostic guidelines? Do they inquire about the exposure to tobacco at every ANC visit? Are they aware that symphysis-fundal measurement height (SFH) is superior to the abdominal palpation technique when it comes to the assessment of fetal growth? Do they recommend having routine cardiotocograph scans? Do they recommend having an early ultrasound scan and discussing its benefit with the attendants?

Regarding the preventive measures: Do ANC professionals recommend the typical prophylactic seven-day antibiotic regimen to prevent the development of persistent bacteriuria? Do they make sure that all the pregnant women that attend ANC sessions are immune against tetanus until their delivery?

Regarding the interventions for the common physiological symptoms: When a pregnant woman is experiencing nausea in early pregnancy, do ANC professionals tell her that non-pharmacological interventions such as ginger, chamomile, vitamin B6 supplementation, and/or acupuncture are recommended for the relief of nausea? Do ANC providers mention that a healthy diet and lifestyle are associated with fewer heartburn symptoms? Do they recommend having calcium and/or magnesium supplements to relieve the pregnancy-related leg cramps? Do they mention that regular exercise is associated with having significantly less low back and pelvic pain? Do they recommend having wheat bran and other fiber supplements as safe interventions for constipation? And regarding the pregnancy-related varicose veins, do they recommend its management using non-pharmacological methods like compression stocking, water immersion, and leg elevation?

A questionnaire including the responses of the ANC providers at the governmental healthcare units to these questions should reflect the degree of compliance between the theoretical knowledge they have and the current guidelines and recommendations.

2.1.2 Practice

Within the practice, three major aspects are assessed:

1. Physical examination and medical history: This aspect concerns whether the ANC professionals take the history of the previous pregnancies, measure the blood pressure in each ANC contact, test for anemia and asymptomatic bacteriuria, vaccinate the pregnant woman if it is her first pregnancy, refer to a specialist

physician if any complications occur, and make sure all women get an ultrasound examination in the first 24 weeks of gestation.

2. Information about diet and supplements: This aspect is about whether the ANC providers advise the women regarding the healthy diet and physical activity, monitor their iron and folic acid intake, advise them regarding their individualized need for complements, and always caution the women against the unsupervised use of drugs during pregnancy.
3. Health promotion interventions for maternal and newborn health: In this aspect the ANC providers are asked whether they advise the women regarding personal hygiene, educate them on the first signs of pregnancy and the recommended time to go to the hospital, talk to the pregnant women about the expected pregnancy complications and solutions, talk to the pregnant women about the expected complications that may happen after the delivery, educate the women about family planning, and give the women information about breastfeeding and breast care during pregnancy.

A questionnaire including the responses of the ANC providers at the governmental healthcare units to these questions should reflect the status of the actual implementation of the recommendations in the guidelines and the knowledge of the ANC providers.

2.1.3 Demographic data

No prior hypothesis is made regarding the possible effect of the different demographic on either the knowledge variable or the practice variable. The demographic data are collected as 1. Potential confounders, as some demographic data might have a real effect on the other variables included in the study, and 2. The demographic data draw a descriptive picture of the ANC providers workforce, which in summation with the other previous and

following studies might reveal some interesting trends or shifts in the demographic background of ANC providers at governmental healthcare units in Gaza. Meaning that despite not having a justified expectation on the effects of the demographic data on the other variables, collecting these data serves purposes for this paper as well for future research.

The following demographic data are collected:

- Age, in years.
- Specialty: either a nurse or a midwife.
- Place of work: options are North Gaza, Gaza, Middle area, Khanyounis, and Rafah.
- Name of the clinic: open-ended question.
- Years of experience.
- Level of education: options are Diploma, Bachelor, Master, and Ph.D.
- A binary question regarding whether the participant has received formal ANC training.

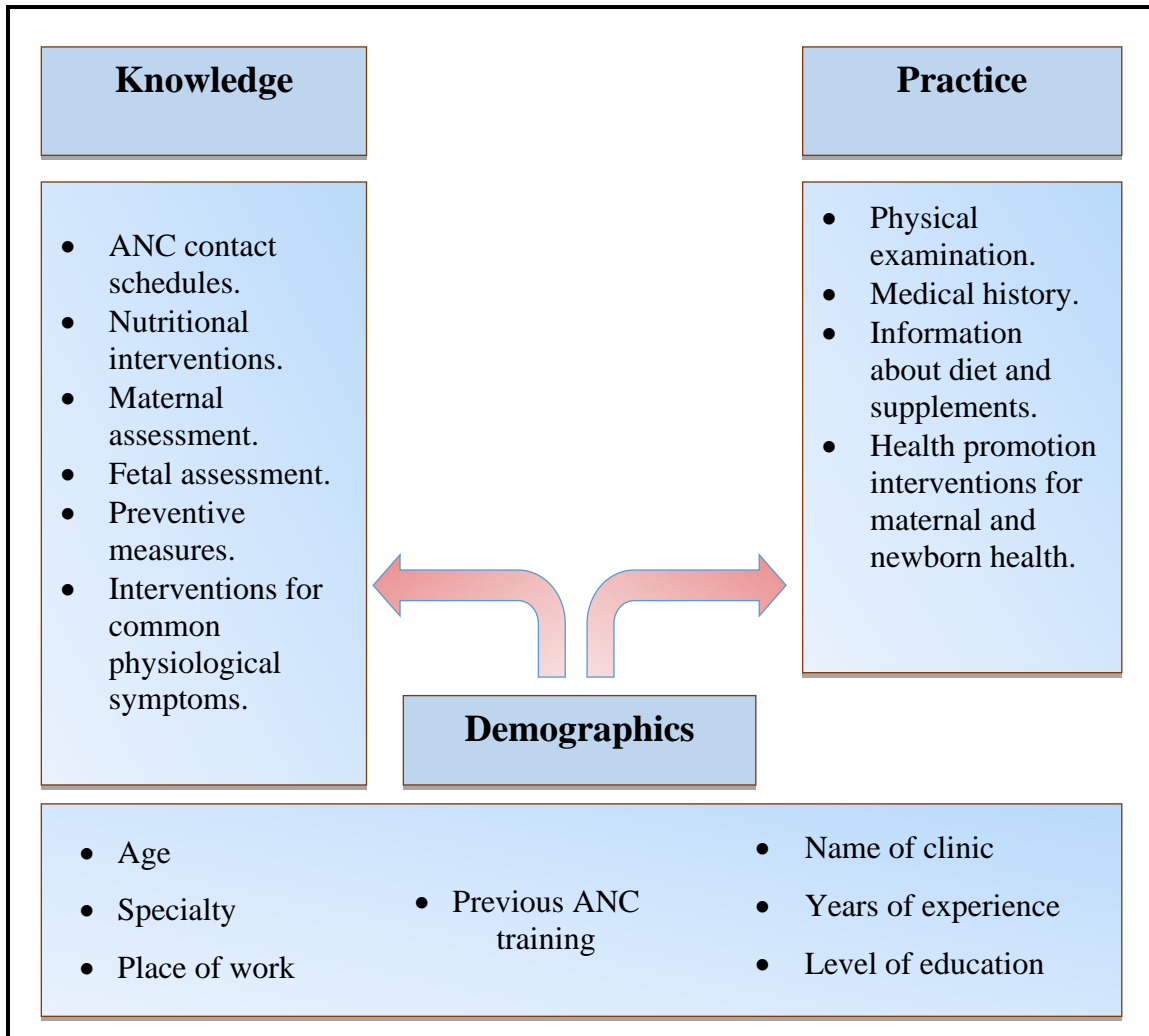


Figure (2.1) Conceptual framework of the study

2.2 Literature review

Via the literature review, the researcher aims to give a comprehensive, yet detailed account of what he is going to study. Human culture is nothing but the accumulation of knowledge and experience. In academia, literature review aims to make sure that the current study build up our knowledge in the right direction (Winchester and Salji, 2016). Namely, to avoid duplicating the previous scholarly findings, to know what is to be discovered next, and to pave the way to create the conceptual framework of the study, which concerns with how we can study it in a scientific, planned framework that hopefully yield us refined scientific evidence.

The researcher performs a wide-scope literature review that includes books, journal articles, and guidelines published in the last 10 years from different parts of the world; from far east to the far west, with a special focus on the studies that took place in countries that resemble the geographical, cultural or socioeconomic aspects of Gaza strip. The 2016 WHO ANC model guidelines constitute the main reference of ours, this is due to its comprehensiveness and global scope.

2.2.1 Definition of ANC

According to the 2016 WHO ANC guidelines, antenatal care may be defined as (WHO, 2016a):

The care provided by skilled health care professionals to pregnant women and adolescent girls to ensure the best health conditions for the mother and the baby during pregnancy.

As you might notice, it's defined as the care provided. The definition didn't specify the kind of care that's provided to make the definition as inclusive as possible so that all the medical, psychological, behavioral, and sociocultural needs of a pregnant woman can be considered in the ANC process. That way, all the hindrances that may obstacle the way towards a positive pregnancy experience shall be overcome as part of the ANC itself.

2.2.2 Components of ANC

Intuitive enough, the ultimate goal of the ANC health services is to promote health conditions for pregnant women so that they experience a positive pregnancy. Specifically, to reduce maternal mortality and morbidity. A positive pregnancy experience may be defined as (WHO, 2016a):

Sustaining physical and sociocultural normality, maintaining a healthy pregnancy for mother and child (including preventing or treating dangers, disease, and death), having a

successful transition to a positive labor and birth, and achieving positive motherhood (including maternal self-esteem, competence, and autonomy).

From the ANC definition, the ANC process seems to be formalized from multiple components whose interconnection defines the ANC process itself. For example: at the basest form, the pregnant women and healthcare professionals, interact, and the ANC process is the pure derivative and direct consequence of that interaction. The full list of formally-identified components is as follows (WHO, 2016a):

- Risk identification: professional healthcare providers shall be well-trained to an extent that enables them to assess the presence of virtually all the possible pregnancy-related risks. If a risk factor is present for long enough, complications may occur.
- Prevention and management of pregnancy-related or concurrent diseases: No matter how trained the healthcare providers are, they can't prevent all pregnancy-related diseases. So, the basics of how to manage these diseases is a must in the training of ANC providers.
- Health education and health promotion: The responsibility of spreading health awareness and disseminating scientifically-correct information to the public isn't the responsibility of health care providers alone. However, health care providers are trusted among the whole society and their role in health education is indispensable. Health care providers play the primary role in health promotion for vulnerable individuals, namely all those who seek medical care regarding a specific problem shall get proper health education from their health care providers.

N.B: In practice, these components may take place simultaneously. However, they are essential in the training of health care providers and in the assessment of the quality of the ANC service itself.

2.2.3 Pregnancy-related Preventable Mortality

One of the major health issues that necessitated having SDG is the unacceptable high MMR. The MMR in Gaza Strip is still high 24.2/100,000 despite its decrease in the recent years (MoH, 2021). According to Collier and Molina, 2019, pregnancy-related death is defined as:

The death of a woman during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.

The statistics confirm that 259,000 women died during or following pregnancy in 2017. Most of these deaths took place in low-resource settings, and almost 94% of these could have been prevented (WHO, 2019).

To see how pregnancy-related preventable mortality (PRPM) depends on the presence/absence of resources, it's enough to say that only 60% of the maternal mortality cases in the United States of America (USA) were considered incidences of PRPM as Petersen et al. (2019), compared 94% in resource-poor areas. That urged the healthcare systems worldwide to:

1. Deeply investigate the problem,
2. Launch evidence-based healthcare services that incorporate the up-to-date research output related to the possible causes of PRPM, and

3. Initiate ANC models that help implement these services in the real world, with special consideration given to resource-poor areas.

The rate of PRPM is not just related to the lack of resources, other medical and cultural factors are involved. For example women in low-income countries, on average, have many more pregnancies than women in the more developed countries, and that contributed to the fact that their lifetime risk of death due to pregnancy is higher. A woman's lifetime risk of maternal death may be defined as (WHO, 2019):

The probability that a 15-year-old woman will eventually die from a maternal cause. In high-income countries, this is 1 in 5400, compared to 1 in 45 in low-income countries.

The risk of maternal mortality is highest for adolescent girls under 15 years old and complications in pregnancy and childbirth are higher among adolescent girls age 10-19 (compared to women aged 20-24) (Souza, 2014; Althabe et al., 2015)

The differences in the lifetime risk of maternal mortality is the direct result of the interplay of many underlying factors. No progress on that regard is achievable without identifying these factors and their magnitude of effect, and then design an evidence-based, deliverable, facility-based model of healthcare for pregnant women. That is where the need for comprehensive ANC models originated, and that's why assessing the quality of the ANC provided for women in Gaza strip and its compliance with the up-to-date evidence and guidelines is a need, not a luxury.

2.2.4 The Critical importance of ANC

The literature confirms that many factors associated with PRPM are successfully identified, a list of the most important medical ones is found below (Megli and Coyne, 2021; McIntyre et al., 2019; Sousa Gomes et al., 2019; Saxena et al., 2016; WHO, 2016a):

- Infections: Maternal infections may be vertically transmitted to the fetus. Some infections may be fatal for the baby, others may cause irreversible deformities and thus, screening for maternal infections shall be a priority in evidence-based ANC models.
- Anemia: Maternal anemia is associated with the fetus being smaller than expected for his gestational age.
- Excessive weight gain: Maternal obesity may be reflected upon the fetus. The baby may exhibit macrosomia; being large for gestational age.
- Pre-eclampsia/eclampsia: May cause low birth weight for the fetus, and may also cause life-threatening conditions for the mother post-partum.
- GDM: Associated with preterm birth. Life-style changes are to be recommended, and if normoglycemic state isn't achieved, pharmacotherapy shall be initiated.
- Venous thromboembolism: Pregnancy is a hyper-coagulable state, in which normal physiologic changes occur due to the hormonal changes related to pregnancy itself. This is mainly a concern in women with pre-existing hemostasis-related disorders. Complications of thromboembolism in pregnancy vary widely and must be controlled before irreversible, maybe fatal, consequences occur.

Namely, the major complications that account for nearly 75% of all maternal deaths worldwide are (Ricci, 2020; Say et al., 2014):

- Severe bleeding (usually bleeding after childbirth): In general, any bleeding during pregnancy is potentially lethal. The leading cause of death is obstetric hemorrhage. Management of obstetric hemorrhage is difficult regardless of the level of development of the healthcare system. Access to emergency obstetric treatment and

the presence of a birth attendant are crucial to lowering maternal morbidity and mortality.

- Infections (often following childbirth):
- Unsafe abortion
- High blood pressure during pregnancy (pre-eclampsia and eclampsia);

A comprehensive ANC model of healthcare shall also investigate non-medical causes of a negative pregnancy experience in general, and PRPM in specific such as domestic violence and homelessness.

2.2.5 Expected outcomes

Once we have the evidence that some factors are linked to PRPM, the next step is to develop a plan of how to –hopefully– eliminate them. But some intuitive questions arises, how do we know that the proposed plan will yield the expected outcomes? Once we deploy it into real world, will it be beneficial of some unexpected harmful downsides are present? Will be as effective as estimated? These questions are totally legitimate and require some evidence-based background to be answered.

We previously said that most maternal deaths are preventable (Petersen, Davis, et al., 2019; WHO, 2019), this is because the health-care solutions to prevent or manage the most prevalent pregnancy-related complications are well known. If so, then why the

MMR is still unacceptably high? This is because delivery of quality ANC isn't going very well on the ground.

To improve maternal health, barriers that limit access to quality maternal health services are to be identified and addressed at both healthcare system and societal levels. The main factors that prevent women from receiving professional healthcare during pregnancy and

childbirth are Poverty, distance to health facility, lack of information, inadequate and substandard services, and cultural behaviors and beliefs (Antsaklis et al., 2020).

Just as the plan did not work as expected in many countries, we have to identify the barriers that may hinder quality ANC delivery in the Palestinian context. That is the second major research objective of the current study, besides assessing the quality of the available ANC services. That is why our study shall be promising; it assesses both knowledge (the extent to which our healthcare professionals follow the up-to-date evidence) ANC practice (the implementation of the quality ANC in the Palestinian context).

2.2.6 ANC process

Since the WHO guidelines have a broader scope, as it isn't restricted to a certain geographical area, we use ANC aspect as laid out in the 2016 WHO ANC model, and, whenever appropriate, insert recommendations from other references.

Maternal ANC nursing may be primarily concerned with the essential components of a prenatal history. Describing the normal physiologic changes, one would expect to observe when performing a physical assessment on a pregnant woman, describing areas that should be evaluated as part of the initial assessment of psychosocial factors related to a woman's pregnancy, and identifying the danger signs of pregnancy and their potential causes in a timely manner (Davidson et al., 2012). Despite their importance, these are all clinical duties. Pregnant women require significantly more than clinical services.

To list the vast types of care a professional healthcare provider is expected to offer, we can split the whole process of ANC into five main branches (WHO, 2016a):

- Nutritional interventions: Recommendations regarding the diet of the mother.

- Maternal and fetal assessment: Medical examination to make sure no health problems are present.
- Preventive measures: Once the well-trained healthcare provider suspects the mother is at risk of developing some unwanted complications, preventative measures shall be taken.
- Intervention for common physiological symptoms: Healthcare providers should make sure all of the common physiological changes during pregnancy is handled based on scientific evidence. Otherwise, these apparently simple symptoms may progress into a real health issue.
- Health systems interventions to improve the utilization and quality of antenatal care: To implement and deliver the quality ANC model to the pregnant women, healthcare systems shall manage the logistics in an acceptable manner.

The 2016 WHO ANC guidelines mention the importance of continuity of care as a principle that must be integrated in the ANC process.

According to the Australian pregnancy care guidelines, factors that may improve continuity of care include (Department of Health, 2016):

- Sharing of information: this reduces the need for a woman to repeatedly “tell her story”
- Collaborative formulation of management plans: this assures their compatibility with locally accessible resources.
- Developing ties and networks
- Adapting locally proven approaches to care.

In the remainder of this part, we list the specifics of each of these 5 Aspect by combining information from a large number of sources.

A. Nutritional interventions

Based on up-to-date evidence, the following are the namely sources of poor pregnancy outcomes related to nutritional abnormalities:

1. Maternal under-nutrition in general is associated with poor perinatal outcomes, namely low birth-weight and stillbirths, and that's intuitive (Tang et al., 2016; Ota et al., 2015). On the other hand, being overweight is also associated with poor outcomes (Popkin and Slining, 2013). In various parts of the world, especially in middle- and low-income countries, the general belief is the exact opposite; they think that an obese –very well-nourished– mother shall have a very healthy child. This is an example of how cultural beliefs may affect maternal morbidity and mortality, and how ANC practice shall change to adapt to the cultural context of the pregnant women.
2. Anemia is defined as blood hemoglobin level below 110 g/L, and it is associated with some nutritional deficiencies, namely iron, folate (Vitamin B9) and vitamin A deficiencies. It may also be caused by an acquired infection, such as hookworms and malaria. The WHO estimates a prevalence of 38.9% for anemic individuals in Mediterranean region (WHO, 2015a). This is a disturbing fact because maternal anemia, in it's mild form, is associated with a higher risk of complications that may happen during pregnancy, delivery or post-partum for the mother, and a higher risk of preterm birth for the neonate (Beckert, Baer, et al., 2019). A severe form of malaria (defined as blood hemoglobin concentration < 70 g/L) seems to introduce a greater risk of maternal and infant mortality.
3. Neural tube defects in infants are associated with maternal folate deficiency (WHO, 2016b).

4. Calcium deficiency is associated with an increased risk of developing pre-eclampsia (WHO, 2013a).
5. Zinc deficiency is associated with impaired immune system (WHO, 2013a).

Various nutritional interventions that aim to reduce the harmful effects associated with these nutritional risk factors. Based on up-to-date evidence, the following nutritional interventions are recommended as part of ANC:

- A healthy nutritious diet that provides the woman (and the infant) with their energy, protein, vitamins and minerals they need to stay healthy (WHO, 2015b).
- Eating healthy food is particularly fruitful when combined with reasonable physical activity. A healthy lifestyle in which the pregnant woman exercises to maintain a reasonable level of physical fitness while consuming enough amounts of healthy food is optimal. Physical activities that involve a high risk of loss of balance and fetal trauma are to be discouraged (Lewis, 2014).
- Spreading evidence-based information regarding healthy nutrition is recommended whenever necessary. The urge to discuss the details of a healthy diet is to be more emphasized in areas where undernutrition and bad nutrition habits are more prevalent, even if the resources available may complicate the implementations of these instructions disturbingly unfeasible (Ota et al., 2015).
- Vitamins and minerals are generally recommended. Details regarding dosages are found in WHO. (2016a). However, multiple micronutrient supplements, –which are the dietary supplements that contain numerous vitamins and/or minerals combined together,– are NOT recommended, as the harms seem to overweight the benefits (Haider and Bhutta, 2017). Theoretically speaking, a multiple micronutrient that is specifically made for pregnant women, composing the vitamins and minerals that are typically needed by women under recommended dosages, may be

recommended. Up-to-date, there is no evidence that such a supplement exist, so the general rule of thumb is to discourage the usage of multiple micronutrient supplements during pregnancy.

- For women with high daily caffeine intake (defined as more than 300mg daily), it is recommended to lower the intake of caffeine to reduce the risk of pregnancy loss and low-birth-weight neonates (Jahanfar and Jaafar, 2015).
- High-protein diet is not recommended (Ota et al., 2015).
- Vitamin B6 supplements are not recommended (Salam et al., 2015).
- Vitamin C supplements are not recommended as it didn't have a significant effect on fetal loss, perinatal death, intrauterine growth restriction, preterm birth, or pre-eclampsia. Further research is required to clarify the possible role of vitamin C in the prevention of placental abruption and pre-labour rupture of membranes (Rumbold, Ota, et al., 2015).
- Vitamin E supplements are not recommended as no certain evidence show that it is beneficial for the pregnancy (Rumbold A, 2015).
- Vitamin D supplements are not recommended. However, exposure to sunlight is highly recommended (De-Regil, Palacios, et al., 2016).

B. Maternal and fetal assessment

The prototype perception of ANC among pregnant women in Gaza may be the part related to medical care. This corresponds to the 'maternal and fetal assessment' aspect of the current ANC practice.

- Maternal assessment

In this section, we shall enumerate on the most important risks a pregnant woman might suffer from. These are the most worthy to be included as part of routine evidence-based quality ANC services. Such risk factors include (WHO, 2016a):

1. Hypertensive disorders: These include a wide range of –mostly – chronic diseases that are directly associated with maternal and fetal morbidity and mortality. Recent estimations on that regard indicate that approximately 25% of the maternal mortality cases and near-misses are solely attributed to pre-eclampsia and eclampsia (Vogel et al., 2014). These two diseases are well-known hypertensive disorders that constitute the nightmares of millions of pregnant women around the world, especially those predisposed to them. Risk factors for pre-eclampsia and eclampsia are mainly genetic and related to the family history (Goldman and Cecil, 2020; Serrano et al., 2020).
2. Anemia: Anemia isn't only a nutritional disorder, it is also considered a hematological condition. Anemia is ranked as the second risk factor leading to disabilities worldwide. The prevalence of anemia among pregnant women is 38% worldwide, and 38.9% in the Mediterranean region (WHO, 2015a). Being so close to the global prevalence is a good indicator of the overall health status in Gaza.
3. Asymptomatic bacteriuria (ASB): ASB is a common condition in which bacteria are shed in the urine of the infected individual without prompting clinical manifestations, hence the name 'asymptomatic'. The condition, however, introduces an increased risk of developing urinary tract infections. In pregnant women, this namely includes having cystitis and pyelonephritis, caused by *Escherichia coli*, *Klebsiella*, *Proteus mirabilis* and group B streptococci. ASB

carries an increased risk of preterm birth, and thus it is a real concern for ANC providers (Smaill and Vazquez, 2019).

4. Intimate partner violence (IPV): is in short the actions or behaviours taking place within an intimate relationship that leads to psychological, physical or sexual harm. Currently, IPV is a public health issue of a worldwide scope. Latest estimations on that regard indicate that approximately 33% of the women who have been in a relationship have experienced physical and/or sexual abuse by their intimate partner. Evidence indicates that emotional abuse, typically considered unrelated to child bearing, actually has direct negative effects on the health of individuals. In women, some negative effects associated with IPV include depression, mental health problems, and poor reproductive health. For pregnant women, these negative effects may also include maternal and fetal death (WHO, 2013b). This is why IPV is considered an important risk factor that may be restricted in order to reduce the rates of PRPM.
5. Gestational diabetes mellitus (GDM): is defined as glucose intolerance (fasting blood sugar level greater than 125 mg/dL or a 2-hour random blood sugar level of 200 mg/dL or higher) that develops or is recognized for the first time during pregnancy. Estimations of the burden of diseases yield alarming results. In the United States, GDM affects between 4 and 14% of pregnancies. The incidence is of course relevant to the individual characteristics of the patient. The really concerning problem with GDM is that it predisposes the mother and the infant to other, potentially fatal, complications. Such disorders include including hypertension, pre-eclampsia, worsening nephropathy, and retinopathy. A woman with poorly controlled serum glucose may suffer from adverse pregnancy

outcomes, including abortion, fetal loss, congenital anomalies and pre-eclampsia (Goldman and Cecil, 2020).

The following recommendations are integrated to routine ANC services in order to reduce or hopefully eliminate the mortality and morbidity associated with the previously listed maternal risk factors (WHO, 2016a):

- Antenatal screening for pre-eclampsia is an essential part of the quality ANC process. Pre-eclampsia is defined as blood pressure of 140/90 or greater, along with proteinuria greater than 300 mg/24 hours after the 20th week of gestation in a previously normotensive patient (Goldman and Cecil, 2020). Once detected, or even suspected, specific measurements that mainly aim to control the blood pressure and to deliver the baby as soon as possible are put into action, along with referral to a specialist.
- Performing a full blood count is recommended in the routine ANC. In low-income countries, a full blood count is often unfeasible. In that situation, clinical assessment of the mother is often conducted (Downe, et al., 2017). The presence of pallor, especially seen in the conjunctiva, is a commonly used indicator for the presence of anemia. However, this method turns out to be more inaccurate than pregnant women can afford. WHO alternatively developed a low-cost, yet a reliable method for detecting anemia. This is a reliable hemoglobinometer alternative for the full blood count that is recommended as part of ANC in cases when the large-scale access to laboratory facilities isn't feasible (Marn and Critchley, 2016, Rogozinska, et al., 2016).
- To prevent the preterm births related to ASB, diagnostic methods shall be performed as part of quality ANC. The gold standard is using midstream urine

culture. Reliable alternatives are Gram stain test and urine dipstick test. Fortunately, these tests are globally feasible.

- Screening for IPV is important as part of routine ANC. Some countries only investigate the surroundings of women that have symptoms only, other countries screen all women for IPV. The latter is recommended whenever feasible (Downe, Finlayson et al., 2016 a; WHO, 2013c; O'Doherty, Hegarty, et al., 2015). Guidelines for healthcare workers on how to respond to IPV include the WHO handbook on Health care for women subjected to IPV or sexual violence (2014).
- Considerations to keep in mind while dealing with a GDM case include: following a tight glucose control is necessary or neonatal hypoglycemia may occur, the definitive goal of ANC is to maintain serum glucose levels of 72 to 144 mg/dL. A step-by-step approach for lifestyle changes (including counselling on healthy diet and reasonable exercise) should be recommended (WHO, 2013d).
- For the pregnant women dependent on alcohol and/or drugs, screening for substance use shall be done for all pregnant women and cessation of substance use shall be instantly recommended once confirmed. ANC providers might also refer them to detoxification services whenever necessary and feasible (Whittaker, 2015).
- Depending on the overall prevalence of Human Immunodeficiency Virus (HIV) and syphilis in a given country, recommendations regarding screening are formed.
- Depending on the overall prevalence of tuberculosis in a given country, recommendations regarding screening are formed.

- Fetal assessment

Many of the complications the infant may be going through are totally discoverable with the appropriate assessments. Clinical assessment, laboratory tests, and mother-reported information are all important sources of knowledge that together help us perceive the status

of the infant and hopefully intervene early enough to prevent any irreversible complications from taking place. The following are the most important recommendations alongside the possible complications that might advance insidiously if no appropriate fetal assessment is performed as part of ANC (WHO, 2016a):

- Reduced frequency of fetal movements is found to be associated with adverse pregnancy outcomes that may be as extreme as fetal death. Think of the reduced movements as the language in which the infant tells us that something is wrong. Early detection of decreased fetal movements may indicate the fetus is compromised. So, screening for fetal movement is recommended as part of the routine ANC. A reported case of decreased movements shall be thoroughly investigated for possible causes. In some cases, the time window between the detection of decreased movements and fetal death is too narrow to take action, but early detection of possible risks threatening the fetus is a priority for ANC health professionals (Hofmeyr et al., 2015)
- Symphysis-fundal height (SFH) measurement: SFH is a non-invasive safe method that is commonly used to estimate the fetal growth, typically to investigate if there is any suspicions about the fetus having intrauterine growth restriction. It is also useful in detecting multiple pregnancies and other fetal abnormalities, such as macrosomia, polyhydramnios and oligohydramnios. An alternative to SFH is the more traditionally used abdominal palpation, which is also a non-invasive method. SFH has proved to be more accurate compared to abdominal palpation. SFH is accurate and low-cost method that is indispensable during ANC, because the accurate techniques are often too expensive to be a part of the routine clinic visits, especially in low- and middle-income countries (Peter, Ho, et al., 2015).

- Routine antenatal cardiotocography (CTG): It is a useful radiological technique used to reflect the fetal well-being. It is mainly a continuous recording of the fetal heart rate along with the uterine contractions obtained via an ultrasound transducer placed on the mother's abdomen. CTG was thought to be useful as part of the routine ANC visits, with more care given to its results in pregnancies with increased risk of complications and during labour. Up-to-date, however, there is no evidence of beneficial effect for CTG at high-risk pregnancies (Grivell et al., 2015).
- Fetal ultrasound scan is recommended for all pregnancies, not just when there are concerns about fetal growth or clinical complications. Routine ultrasound examinations may enable the early detection of possible insidious problems; problems that are present but don't produce clear signs or manifestations. It also allows more accurate gestational age estimation (Whitworth et al., 2015).
- Fetal Doppler ultrasound examination is recommended in high-risk pregnancies. It is mainly used to detect intrauterine growth restriction and pre-eclampsia in apparently healthy pregnancies. Ultrasound can be used to measure the velocity of blood flow during Doppler flow tests. Doppler flow tests can detect fetal impairment in pregnancies with a high risk of complications. The test is noninvasive and contraindicated for no conditions. The created color images aid in identifying anomalies in the diastolic flow of the umbilical arteries. Measuring the change in frequency of the sound wave reflected off the red blood cells of a fetus allows for the determination of their velocity. Thus, Doppler flow studies can detect red blood cell movement in arteries. The method measures the rate of blood flow through the umbilical artery, and when a high resistance to blood flow is observed, further evaluations are conducted for intrauterine growth restriction and pre-eclampsia (Ricci, 2020; Maulik and Levine, 2019; Alfievic et al., 2017).

C. Preventive measures

Not all health-related complications that occur in pregnancy are predictable. And of course, not all of them are preventable. There are, however, some medical conditions that are preventable. Preventive measures are taken to help keep the pregnant women safe from such predictable risks. Next we list the most important of these, alongside the preventive measures taken to to reduce their incidence (WHO, 2016a):

- **Asymptomatic bacteriuria (ASB):** This previously mentioned condition is more prevalent than a regular not-informed ANC provider might think. In some low- and middle-income countries, more than 70% of all pregnant women have ASB, mostly caused by *Escherichia coli*. Being pregnant increases the risk of developing complications from this typically-benign condition. If ASB is left untreated in a pregnant woman, there is a 45% risk of developing pyelonephritis and preterm birth (Ahmed et al., 2019; Leeper and Lutzkanin, 2018). A seven-day antibiotic regimen is recommended for all women with ASB in effort to avoid these complications.
- **Rhesus D alloimmunization:** A well-known medical condition known as hemolytic disease of the newborn occurs when a rhesus (Rh)-positive infant is born to a Rh-negative mother. The hemolysis is fatal and occurs due to the production of anti-Rh antibodies in the maternal blood circulation in the first pregnancy, which passes through the placenta to destroy the red blood cells of the infants in subsequent pregnancies, leading to the hemolytic condition known as hemolytic disease of the newborn. This unfortunate conditions is fortunately avoidable. Administering anti-D immunoglobulin to Rh-negative women within 72 hours of giving birth to an Rh-positive baby prevent most of these cases (Goldman and Cecil, 2020).
- **Soil-transmitted helminthiasis:** This is mainly context-dependent recommendation that shall be taken into consideration in areas/individuals where contact with the

soil or raw agricultural products is present. The parasitic infections transmitted from the soil are mainly cause unpleasant gastrointestinal tract manifestations like vomiting, diarrhea and anorexia. These symptoms are usually accompanied by anemia, and they are contributing factors to the high prevalence of anemia in low- and middle-income countries. The major infective agents include *Ascaris lumbricoides*, hookworms, and *Trichuris trichuria*. These infections shall be suspected in any woman suffering from anemia and gastrointestinal tract symptoms in known endemic areas. Preventive antihelmenthic regimen is recommended for pregant women in endemic areas (Salam et al., 2015).

- Neonatal tetanus: This is an intoxication caused by the bacterial agent *Clostridium tetani*. Symptoms are severe, including generalized rigidity and painful muscle spasms, mainly presenting as an infant with impaired sucking. The disease is typically fatal if left untreated. The bacteria is typically introduced to the infant during an labour, namely due to exposure to a umbilical cord stump contaminated with tetanus spores. Vaccination against these helminths are available and effective. Vaccination programs are carried out across the globe to reduce the burden of the disease (Demicheli et al., 2015). If accompanied with sterile medical equipment during labour, neonatal tetanus is virtually preventable.
- Intermittent preventive treatment for malaria: In parts of the world where malaria is endemic, prophylaxis is recommended for all pregnant women. Sulfadoxine-pyrimethamine is the drug of choice for prophylaxis during pregnancy (WHO, 2015c).
- HIV prophylaxis is recommended in high prevalence areas or diagnosed maternal HIV infections (WHO, 2015d).

D. Intervention for common physiological symptoms

Pregnancy, by definition, induces maternal physiological changes that are part of a typical pregnancy, not a sign for any health abnormalities. The ANC professionals are trusted by the pregnant women and the healthcare system to manage these symptoms efficiently and refer to a specialist whenever necessary. Namely, nausea and vomiting, low back pain, pelvic pain, heartburn, varicose veins, leg cramps and constipation (WHO, 2016a).

A dozen of non-pharmacological intervention is recommended because, despite the absence of strong evidence of effectiveness, they are mostly harmless. The available evidence suggest that ginger helps reduce nausea and vomiting and that vitamin B6 helps with nausea (Matthews et al., 2015). For the heartburn, diet and general lifestyle changes are recommended. If the heartburn persists after considerable lifestyle changes, antacids may help alleviate the symptoms (Macedo, 2016). Calcium and/or magnesium supplementation may help reduce leg muscle cramps. Non-pharmacological interventions such as muscle stretching, massage, and heat therapy showed no evidence of efficacy (Zhou et al., 2015). When it comes to the lower back pain and pelvic pain, this is another reason for the recommendation of regular moderate-intensity physical exercise during pregnancy. The physiotherapy may focus more on alleviating back pain or pelvic pain, as the interventions to reduce either seem to differ from the other (Liddle and Pennick, 2015). Interventions for constipation during pregnancy is almost identical to any typical constipation. Dietary modifications shall relieve the constipation, If it persists, fibers and fiber supplements, mainly wheat bran and oat bran fiber supplementation, are recommended (Rungsiprakarn et al., 2015). To help manage varicose veins and edema, non-pharmacological interventions are recommended including leg elevation and water immersion (Smyth et al., 2015).

In general, when managing such common symptoms, pharmacological interventions are better avoided due to the side effects and to spare the possible harm to the fetus.

E. Health systems interventions to improve the utilization and quality of antenatal care

In the previous sections, the skeleton of the up-to-date quality ANC were discussed. Now it's time to discuss the healthcare system changes required to adapt and implement these changes and also to integrate the desired recommendations into a model of care. The recommended changes are case-specific as they depend on the context in which the ANC is provided. The following are the major recommendations to consider (WHO, 2016a):

- It is advisable to disseminate women-held case notes or records, which are the medical records of the women carried along inside her bag. This practice increases the availability of medical record for both the mother and the neonate (Mori, et al., 2015). Post-partum, it is used as a monitoring tool for both the mother and the baby (Kiserud et al., 2018).
- Midwife-led continuity of care (MLCC) models: This model of care outlines the goals of a midwife-led healthcare service and interconnects them using a set of principles that draw the outer frame of the per-listed goals. It's mainly a multidisciplinary model that organizes the traditionally-chaotic midwifery practice. The MLCC model principles include continuity of care, offering individualized health education, and being supportive during childbearing, post-partum period, and during the labour itself (Sandall et al., 2016).
- Group ANC: While the traditional ANC services are mostly one-on-one consultations, group ANC model adds on other activities such as group education, behavioral change motivation and peer support.
- Community-based interventions: These are mainly regarding the basic human rights of a pregnant woman. Being able to make decisions regarding their reproductive health and being provided with sanitary healthcare services. The

whole process of ANC may be summarized as the communication (between the pregnant woman and the healthcare provider) and the support (the woman gets from the ANC professional and other people around her). Any hindrance on the community-level that makes this process inapplicable shall be addressed under the title of community-based interventions.

2.2.7 Women's Satisfaction about ANC

Now let's see what the literature says about the ANC services that actually satisfies the pregnant women.

In general, women view ANC as a source of knowledge, information and clinical expertise, and they generally appreciate the tests and advice they are offered (Downe et al., 2016 a). A previous publication suggested that providing the ANC services in central locations, if no proper affordable transportation methods are available, a large proportion of the targeted population doesn't attend any of the recommended ANC visits at the first place. In some Low- and middle-income countries, lack of diagnostic equipment discourage women from attending (Downe et al., 2017).

However, recent investigations suggest that women don't always attend the recommended ANC sessions even when services are accessible and affordable (Downe et al., 2017). For those who enjoy professional ANC services, their engagement with their ANC providers may be limited if the tests and procedures aren't explained properly or the woman their beliefs and traditions are being overlooked by healthcare professionals (Downe et al., 2016 b). This means that the satisfaction of the women is the result of many interacting factors, not an inevitable result of up-to-date clinical practice.

A recent study suggested that, even when ANC services are provided in a more accessible and affordable way, women do not always use them. In particular, women who are

members of marginalized demographic groups, and that fact holds for both high- and low-income countries. These findings suggest that the medical assumptions on which formal ANC is based might not fulfill the needs of all whole population of pregnant women, especially in cultures where a more psychosocial approach is culturally the common. In addition, the reports regarding the potential abuse and disrespect women are treated with from their healthcare providers to which women are subject to disrespect in formal maternity care systems also provides an insight into why women may choose not attend ANC programs (Downe et al., 2016 b).

Evidence from the literature suggests that women during ANC are in need of social support, the health education they particularly inquire about, along with monitoring their well-being and providing the interventions timely whenever required. That review shaped the current framework to assess ANC services quality. It clearly defined three equally important aspects that are provided by ANC professionals assumingly operating under a high-quality healthcare system: 1. Clinical practices (interventions and tests), 2. Relevant and timely information, and 3. Psychosocial and emotional support (Downe et al., 2016 b). The impactful WHO 2016 ANC guidelines shed light on the importance of the psychosocial and emotional support domain by changing the terminology used from ANC “visit” to ANC “contact” in effort to reflect expected significance of the relationship between the pregnant mother and her ANC provider (WHO, 2016a).

A 2019 systematic review suggests that the women decision to continue or stop utilizing the provided ANC services depends on her convictions that attending will help her have a positive pregnancy experience. The factors that are confirmed to significantly increase the rate of full utilization of ANC services include providing continuity of care that is personalized, supportive, kind, caring, culturally accepted, flexible, and respectful of women’s need for privacy, and that allow staff to take the time needed to provide relevant

support, information and clinical safety for the woman and the baby, when they need it and in the way they prefer. The local socio-cultural beliefs regarding the possible advantages or disadvantages of ANC. The conviction the woman build during her first visit has a big impact on here decision on whether or not to continue the recommended course of ANC (Downe et al., 2017). This is why women satisfaction is very important; even when ANC services are easily accessible and socially accepted, its the mother's perception that mainly controls the total utilization of the ANC services.

A recent study assessing the quality of ANC services Gaza was published in 2018. The study aimed to assess the quality of ANC services available in governmental PHC centers. The population of the study was the workforce of ANC providers; nurses and midwives. The study design was cross sectional, where 55 ANC providers were included as respondents. The results showed that the majority of the ANC professionals (72.7%) have 10 years of work experience or more. Regarding their formal education, 40% of respondents hold a diploma in midwifery. Respondents thought that emotional support was the most essential feature of quality of antenatal care and that they are following the national standards for ANC services practice (Abu-El-Noor et al., 2018). These results are promising as the most important value in the eyes of the ANC professionals is the same important value according to the 2016 WHO ANC guidelines.

As the psychosocial aspect of ANC is not recognized as one of the most significant factors that may influence the woman's perceptions of the ANC process, it is recommended that, as part of the initial psychosocial-cultural assessment, the ANC professional discuss with the woman any religious, cultural, or socioeconomic factors that may affect the woman's expectations of the childbearing experience. The nurse's familiarity with the customs of the many religious and ethnic groups residing in the neighborhood is very advantageous. Collecting data in a courteous and caring manner can contribute to a positive experience

for the pregnant lady and create the potential for a partnership in care to grow (Davidson et al., 2012).

According to the Department of Health (2016), during the first ANC visit, ANC professionals should discuss ANC health education with the pregnant woman, paying special attention to how it can help women prepare for the birth and how it is an excellent opportunity to establish a peer network and develop skills for adapting to parenthood. Also encouraged is involving the partner; the ANC professional should highlight the benefits of partners attending prenatal classes with the woman. The ANC professional should assist prenatal education by asking women if they have any questions they would like answered (Department of Health, 2016).

2.2.8 Previous related studies

2.2.8.1 Previous studies worldwide

A study was carried out to test Zambian midwives' knowledge and abilities regarding ANC. Between October 2016 and February 2017, 89 midwives participated in a quantitative cross-sectional study. Data was gathered using a standardized questionnaire. Knowledge levels were high, however 61.8% of responders did not have the needed clinical skills when observed. In total, 70% of respondents had received supervision in the six months before data collection (Libingi et al., 2019).

A recent systematic review pooled results from 135 research articles in a try to find a consistent way of measuring the quality of ANC. The included articles investigated the quality of ANC services provided to non high-risk pregnant. The indicators used to assess ANC quality was extracted from the selected publications. The most commonly used quality indicators included Measure of diagnostic approach indicators, the indicators related to medical history and physical exam, followed by prophylactic interventions with medication prescription, and general health education and preventive measures counseling.

The researchers concluded that numerous ANC quality indicators may be used to assess ANC quality, but a standard way of measuring the overall quality is lacking. Researchers recommend using standardized indicators across different countries and settings to develop a universally accepted way of quality evaluation (Morón-Duarte et al., 2019).

Another study tried to build a framework of quality assessment based on the 2016 WHO ANC guidelines. To enable consistent monitoring of ANC content and care processes and to provide guidance to countries and health facilities, WHO developed an ANC monitoring framework. This framework is based on the theoretical framework for quality ANC that incorporated the existing indicators related to 2016 ANC model recommendations. Researchers argue that after consultative edits, the resulting framework consists of core indicators recommended for monitoring the implementation of quality ANC regardless of the surrounding settings. Nine core indicators can already be monitored on a global (or national) scale. Six context-specific indicators are ready for monitoring under national settings. Thirty-five additional indicators may be desirable for monitoring (Lattof et al., 2020).

Low socioeconomic status has been significantly associated with negative perinatal outcomes, including fetal mortality, preterm birth and intrauterine growth restriction, and to lesser extent, higher rates of congenital anomalies and perinatal asphyxia. For the mothers, they experience higher odds for maternal mortality, GDM, mental disorders, and pre-eclampsia. The study by Origlia et al. (2017) investigated the perception of ANC among women from low socioeconomic status. Unfavorable attitudes of discrimination was a main reason that discouraged women from low-socioeconomic background from accessing ANC services. Another widely reported reason was that they didn't feel valued from the ANC professionals. At the end of the review article, the researchers conclude that the principles believed to increase the attendance of ANC sessions by women from low-socioeconomic background include relationship-building and continuity-of-care components common to midwifery-led models (Origlia et al., 2017). This is why providing

a midwifery-based model of care is recommended irrespective to the economic status of country.

2.2.8.2 Previous studies in Gaza

The single most important related study is the one entitled “Factors Influencing the Quality of Antenatal Care at Governmental Clinics in Gaza Strip” (Nassar, 2018). The study was conducted in 2018 and provided us with high-quality results that reflected the ANC services situation on the ground in a detailed and comprehensive manner. The study found a statistically significant difference between geographic region and the beginning of ANC during pregnancy. Fisher's exact test found that 37.5 % of women who began ANC after 12 weeks of pregnancy reside in Gaza City. Additionally, 50% of women who began their ANC after 12 weeks reside in Khanyounis. In addition, 12.5% of them dwell in the city of Rafah. And when it comes to the results from the ANC professionals, the study revealed that health care providers still face challenges that may affect the provision of care. These challenges were related to limited incentives to staff, heavy workload, no feedback of patients after referral of obstetric complications, limited space for privacy, small ANC waiting area, and shortages of essential ANC supplies and others. Further improvements are needed in order to tackle these barriers, and thus making the provision of ANC services of more quality and equity (Nassar, 2018).

Another, more recent master thesis study was conducted in 2020 in Gaza in an aim to examine pregnant women's satisfaction with quality of ANC at the Governmental PHC clinics in Gaza Strip. The study used self-administered questionnaires to assess the satisfaction of women receiving ANC services at governmental healthcare clinics. 60.8% of the respondents were satisfied with ANC services, while 39.2% were not. The highest satisfaction was with delivered care (95.6%), followed by number of visits (91.3%), place of care (83.2%), provided information (67%), and waiting time (66.15%). ANC service was rated excellent by 32% of respondents and very good by 48.7%. Compared to other prenatal clinics, Der Al Balah respondents were significantly more satisfied ($P= 0.002$).

Overall satisfaction and antenatal visit time were statistically significant ($P= 0.000$). The report found high satisfaction with ANC services. However, they found the consultation information and waiting time low. The study advocated decreasing waiting time before ANC checkups because it negatively impacts pregnant women's satisfaction with quality of care, initiating appointment systems, and improving quality face time with health care providers (Shaqaleh, 2020).

Another study was conducted to assess the quality of ANC services given by government PHC centers in the Gaza Strip, as perceived by nurses and midwives providing ANC to this group of health service consumers. All of the study's 55 participants were nurses and midwives who administer ANC at government-run primary health care institutions in the Gaza Strip. About half of the participants (50.9%) were between the ages of 36 and 45, and the majority (72.7%) have more than 10 years of job experience. 40% of participants hold a degree in midwifery, and around 34% of them are from the Gaza Governorate. Participants believed that emotional support was the most important aspect of prenatal care quality and that they adhere to the national standards criteria for delivering ANC (Abu-El-Noor et al., 2018).

Another study tried to identify some risk factors associated with low birth-weight children in Gaza. Low birth-weight was defined as birth-weight < 2.5 kg. The study followed a matched case-control study design. A total of 446 women were sampled in the study. A multivariate analysis showed that six prenatal factors were significantly associated with an increased likelihood of low birth weight after adjustment for the identified principal confounding variables, namely lower perception of the quality of given antenatal care, first cousin marriage, maternal anaemia, pregnancy-induced hypertension, incidences of vaginal bleeding, and periodontal diseases. The bad news is that there are several factors that are significantly associated with low birth-weight in Gaza. The good news is that most of these factors are preventable. ANC professionals at Gaza should give more care to these factors,

as low birth weight is significantly associated with fetal long-term morbidities (Abu Salah, 2018).

Another study tried to dig deep and gain insights about the causes of maternal mortality in Gaza strip. It was a retrospective study in which qualitative and quantitative data were collected. The researchers conclude that maternal medical care in Gaza showed major defects. Some healthcare providers didn't even follow the guidelines that are well-announced without any evidence-based reasons to do so. Poor communication skills and team-work abilities were also reported. The researchers recommend that specialized training should be offered for clinicians in order to improve these aspects. However, the most notable defect was the extremely poorly documented medical records, which reflected a lack of awareness among clinicians regarding the importance of documentation. In response to these results, local policymakers are encouraged to come up with on systematic application of quality improvement strategies in these aspects in order to achieve greater patient safety and further reductions in the MMR (Böttcher, 2018).

Chapter Three

Materials and Methods

In this chapter, the researcher indicates the main methodological parts. It includes; study design, study sample (study population, sample size, sampling process), study place, ethical consideration, study instruments, data collection procedures and data analysis procedure.

3.1 Study design

This study designed as a descriptive cross-sectional design. This design was chosen because it is less expensive, suitable in terms of time and costs, and meets the study objectives in short time.

3.2 Study population

In this research study, the population included nurses and midwives working in the ANC unit practicing ANC in primary health centers in Gaza strip at the time of the study.

3.3 Sample size and sampling process

We adopted a census sample of all the 72 nurses and midwives who provides the ANC services at the governmental PHC centers in the Gaza Strip.

3.4 Study setting

The study was conducted at the all twenty-seven governmental PHC centers providing ANC in Gaza Strip. These are namely; Jabalia, Shaima, Abu Shabak, Sheikh Radwan, Al-Remal, Aldaraj, Alhorea, Sorani, Alsalam, Atta Habib, Alfalah, Algoba, Sabha Alharazeen, Alzaitune, Dair Al Balah, Algararah, Bani Suhaila, KhanYounis, Jouret allot, Abbasan Alkabira, Tal Sultan, Rafah martyrs, Abbasan Saghira, Zawaida, Wadi Salka , Johr Aldeek, Khuza'a PHC centers.

3.5 Period of the study

The study started on Jan, 2021 and completed by the December 2022. Data collection period was started on March 2022 – May 2022

3.6 Eligibility Criteria

3.6.1 Inclusion criteria

Nurses and midwives regularly working in the ANC clinics during the study period were involved in this study.

Nurses and midwives who at least worked for 6 months in the ANC were involved in this study.

3.6.2 Exclusion criteria

Volunteers and internship students were excluded.

3.7 Study tool and measurements

A structured, self-administered questionnaire was used to collect data from respondents Annex (3). The study focused on knowledge and practices that are related to ANC. The questionnaire consisted of four sections, namely:

Section A: Demographic characteristics of the respondents, including age, specialty, place of work, name of the clinic, years of experience, level of education, and previous training.

Section B: Yes, and no questions about knowledge of the ANC services

Section C: Five points Likert scale about ANC practices.

Section D: Open ended questions about the respondents' knowledge and practice.

3.8 Ethical and administrative considerations

Ministry of Health and the Helsinki Committee gave their approval after Al-Quds University complied with all ethical requirements for conducting research Annex (4), Annex (5), Annex (6). In addition, a formal letter was sent to the MoH in the Gaza Strip requesting permission to begin data collection. In addition, all nurses and midwives provided informed consent to participate in the study Annex (7). Participation in the current study poses no risk to the nurses and midwives, and the problem of anonymity has been assured.

3.9 Pilot study

Pilot study was done prior to the beginning of the data collection to check the appropriateness of the questionnaire. The pilot study consisted of 7 respondents. Slight modifications were done and the pilot study respondents were included in the analysis.

3.10 Validity and reliability of the instrument

Content and face validity were examined by number of expertise working in both medical and nursing fields Annex (8). Reliability also was checked using Cronbach's alpha coefficient test which was 0.785, and 0.820 for the knowledge, and practice respectively demonstrating a good reliability for the tool.

Table (3.1): Cronbach's alpha coefficient, test of reliability

Domain	Cronbach's alpha coefficient	No. of statements
Knowledge	0.785	28
Practice	0.820	16
Total	0.734	44

3.11 Data collection procedure

The data collection process involved the researcher physically distributing questionnaires nurse-midwives at the PHC clinic. Respondents who meet the criteria were invited to sign the information and consent form, fill out the questionnaire and return to the researcher.

3.12 Statistical Analysis

The researcher used Statistical Package for Social Sciences (SPSS) program version 25 for data entry and analysis. Prior to statistical analysis, data were cleaned and checked for accuracy. Knowledge score was calculated by give one point for the correct answer and 0 for the incorrect answers, then the correct answers were summed and the possible scores for the respondents was 0-28. Practice statements was answered by the four points Likert scale 1-4. Practice scores was calculated by summation the points of the practice statements, then multiplied by 100 over (16*4). Thus, the possible scores for the respondents' practice was 16-64. Respondents' knowledge and practice scores were then categorized into high and low considering $\geq 75\%$ as a cut point which was previously used by another related study (Libingi et al., 2019). Different statistical measures were used to analyze data including frequencies, and means. Statistical analysis tests including t-test and ANOVA test to examine the differences among the means of some variables of the study.

Chapter Four

Results and discussion

In this chapter, the study findings are presented. These findings answer the research questions that formulated in the introductory chapter regarding the level of nurses and midwives toward antenatal care provided at governmental PHC centers in Gaza Strip. Then, we interpreted the main results and compared them with the international findings.

4.1 Characteristics of the study respondents

4.1.1 Baseline characteristic

Table (4.1): Demographic characteristics of the study respondents (n=72)

Variables	N	(%)
Specialty		
Nurse	35	(48.6)
Midwife	35	(48.6)
Nurse-Midwife	2	(2.8)
Age		
< 30 years	5	(6.9)
30-40 ears	22	(30.6)
> 40 years	45	(62.5)
Years of experience in providing health care	5	(6.9)
<5 years	4	(5.6)
5-10 years	63	(87.5)
>10 years		
Years of experience in providing ANC		
<5 years	18	(25)
5-10 years	12	(16.7)
>10 years	42	(58.3)
Level of education		
Diploma	30	(41.7)
Bachelor	36	(50)
Master	6	(8.3)
Receive training courses		
Yes	67	(93.1)
No	5	(6.9)

Table (4.1): Continued

Place of work		
North Gaza	10	(13.9)
Gaza	33	(45.8)
middle zone	6	(8.3)
Khanyounis	17	(23.6)
Rafah	6	(8.3)
Clinic level		
Regular	5	(6.9)
Third	18	(25)
Fourth	43	(59.7)
NA (missing data)	6	(8.3)

Table (4.1), shows the descriptive analysis of respondents' demographic characteristics. Seventy-two female nurses (48.6%) and midwives (48.6%) took part in the study. The majority (62.5%) are more than 40 years old, and having more than 10 years in providing health care (87.5%), and antenatal care (58.3%) and received previous training (93.1%). Half of the respondents holding bachelor degree, 45.8% resident in Gaza city, and the majority (59.7%) are working at a fourth level clinic.

Table (4.2): Highest statements order of respondents' responses about the knowledge statements

Statements	Responses (%)	Responses (%)	Correct N (%)	
	Yes=1	No=0		order
Pregnant women should be counseled on healthy eating and physical activity to stay healthy and avoid excessive weight gain.	71 (98.6)	1 (1.4)	71 (98.6)	1
Full blood count testing is the recommended method for diagnosing anaemia during pregnancy.	71 (98.6)	1 (1.4)	71 (98.6)	1
Midstream urine culture is the recommended method for diagnosing asymptomatic bacteriuria (ASB) in pregnancy	71 (98.6)	1 (1.4)	71 (98.6)	1
In undernourished population, pregnant women are advised to increase daily energy and protein intake to reduce the risk of low birth weight babies.	69 (95.8)	3 (4.2)	69 (95.8)	4

Table (4.2): Continued

Statements	Responses (%)	Responses (%)	Correct N (%)	
	Yes=1	No=0		order
Advice on diet and lifestyle is recommended to prevent and relieve heartburn in pregnancy	69 (95.8)	3 (4.2)	69 (95.8)	4
Non-pharmacological options, such as compression stockings, leg elevation and water immersion, can be used for the management of varicose veins and oedema in pregnancy	68 (94.4)	4 (5.6)	68 (94.4)	6
Wheat bran or other fiber supplements can be used to relieve constipation in pregnancy if the condition fails to respond to dietary modification, based on a woman's preferences and available options	67 (93.1)	5 (6.9)	67 (93.1)	7
WHO recommends antenatal care models with a minimum of eight contacts to reduce perinatal mortality and to improve women's experience of care	66 (91.7)	6 (8.3)	66 (91.7)	8
Early ultrasound (before 24 weeks of gestation) is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy	66 (91.7)	6 (8.3)	66 (91.7)	8

All the statements scores are demonstrated in Annex (9). Table (4.2) displays the highest responses of the respondents to the knowledge-related statements. The statements "Pregnant women should be counseled on healthy eating and physical activity to stay healthy and avoid excessive weight gain.", "Full blood count testing is the recommended method for diagnosing anaemia during pregnancy, and "Midstream urine culture is the recommended method for diagnosing ASB in pregnancy ", ranked first as all the respondents except one had correct answers. Furthermore, the phrases " In undernourished

population, pregnant women are advised to increase daily energy and protein intake to reduce the risk of low birth weight babies, and "In undernourished population, pregnant women are advised to increase daily energy and protein intake to reduce the risk of low birth weight babies" ranked fourth as 95.8% of the respondents had correct answers.

Non-pharmacological options, such as compression stockings, leg elevation and water immersion, can be used for the management of varicose veins and oedema in pregnancy tied for 6th position, with 94.4% of respondents correctly answered it. The statement "Wheat bran or other fiber supplements can be used to relieve constipation in pregnancy if the condition fails to respond to dietary modification, based on a woman's preferences and available options" was correctly answered by 93.1% and ranked seventh. Finally, the statements, "WHO recommends antenatal care models with a minimum of eight contacts to reduce perinatal mortality and to improve women's experience of care" and "Early ultrasound (before 24 weeks of gestation) is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy" ranked 8 with 91.7% had correct responses.

The most frequently asked concerns include health nutrition and physical activity counseling, full blood count tests to diagnosis anemia, urine culture to diagnose asymptomatic bacteriuria, and being advised to boost daily energy and protein consumption to lower the risk of low birth weight babies. Diet and lifestyle advice, compression stockings, leg elevation, and water immersion to treat varicose veins Constipation, minimum contact, and early ultrasonography can all be relieved with wheat bran or other fiber supplements. This could be attributable to the quality of training they received as well as their regular practice. A prior related master thesis found that most

women received health instruction on food, breast feeding, iron supplements, drug use, personal hygiene, exercise, and rest during their ANC visits (Nassar, 2018).

Table (4.3): Lowest statements order of respondents' responses about the knowledge statements

Statements	Responses (%)	Responses (%)	Correct N (%)	
	Yes=0	No=1		order
In undernourished populations, high-protein supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	69 (95.8)	3 (4.2)	3 (4.2)	28
Replacing abdominal palpation with symphysis-fundal height (SFH) measurement for the assessment of fetal growth is recommended to improve perinatal outcomes.	68 (94.4)	4 (5.6)	4 (5.6)	27
Multiple micronutrient supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	62 (86.1)	10 (13.9)	10 (13.9)	25
Vitamin E and C supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	62 (86.1)	10 (13.9)	10 (13.9)	25
Vitamin D supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	59 (81.9)	13 (18.1)	13 (18.1)	24
Vitamin B6 (pyridoxine) supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	55 (76.4)	16 (22.2)	16 (22.2)	23

Table (4.3): Continued

Statements	Responses (%)	Responses (%)	Correct N (%)	
Routine antenatal cardiotocograph (CTG) is recommended for pregnant women to improve maternal and perinatal outcomes	54 (75)	18 (25)	18 (25)	22
Tetanus toxoid vaccination is recommended for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus	25 (34.7)	47 (65.3)	25 (34.7)	21
Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem, to prevent night blindness.	39 (54.2)	33 (45.8)	39 (54.2)	20
Hyperglycaemia first detected at any time during pregnancy should be classified as either gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to WHO criteria	47 (65.3)	25 (34.7)	47 (65.3)	19

Table (4.3) displays the lowest responses of the respondents to the knowledge-related statements.

The statements “High-protein supplementation is recommended for pregnant women in undernourished populations to improve maternal and perinatal outcomes”, and “replacing abdominal palpation with SFH measurement for the assessment of fetal growth is recommended to improve perinatal outcomes”, ranked 28th and 27th, respectively, with only 3 (4.2 %) and 4 (5.6 %) correct responses. Furthermore, the phrases "Vitamin E and C supplementation is suggested for pregnant women to improve maternal and perinatal

outcomes" tied for 25th position, with 10 (13.9 %) of respondents correctly answering each. The statement "Vitamin B6 (pyridoxine) supplementation is recommended for pregnant women to improve maternal and perinatal outcomes" was correctly answered by 16 (22.2 %). And the statement "Pregnant women are advised to have routine prenatal CTG to improve maternal and perinatal outcomes" ranked 22 with 18 (25%) correct responses.

The respondents' answers to the questions about high-protein supplementation, replacing abdominal palpation with SFH, and Vitamin E and C supplementation, Vitamin D supplementation, Vitamin B6 (pyridoxine) supplementation, routine prenatal cardiotocograph, Tetanus toxoid vaccine is advised for all pregnant women, depending on prior tetanus vaccination exposure, Vitamin A supplementation, and pregnancy hyperglycemia. The wrong responses could be ascribed to a lack in practice, as these points are not practiced on a daily basis.

Table (4.4): Descriptive analysis of respondents' responses about the practice statements

Statements	Never	Sometimes	Often	Most Often	Mean	Rank
I measure the blood pressure for pregnant women in each contact	0 (0)	1 (1.4)	5 (6.9)	66 (91.7)	3.9	1
I take history about previous pregnancies and deliveries	0 (0)	1 (1.4)	6 (8.3)	65 (90.3)	3.9	2
I tell the women and remind them about iron/folic acid	0 (0)	1 (1.4)	7 (9.7)	64 (88.9)	3.9	3
I advise the women about healthy diet	0 (0)	1 (1.4)	8 (11.1)	63 (87.5)	3.9	4
I talk to the pregnant women about the first signs of birth and when to go to the hospital.	0 (0)	3 (4.2)	9 (12.5)	60 (83.3)	3.8	5
I give the women information about breastfeeding and the breast care during pregnancy	0 (0)	3 (4.2)	9 (12.5)	60 (83.3)	3.8	5
I advise the women about practices of personal hygiene	0 (0)	1 (1.4)	14 (19.4)	57 (79.2)	3.8	7

Table (4.4): Continued

Statements	Never	Sometimes	Often	Most Often	Mean	Rank
I advise the women about suitable exercise and rest	0 (0)	2 (2.8)	16 (22.2)	54 (75)	3.7	8
I talk to the pregnant women about the expected pregnancy complications and solutions	0 (0)	3 (4.2)	14 (19.4)	55 (76.4)	3.7	8
I give the women information about expected complications after delivery	1 (1.4)	6 (8.3)	14 (19.4)	51 (70.8)	3.6	10
I do the urine sample test for each woman	0 (0)	8 (11.1)	14 (19.4)	50 (69.4)	3.6	11
I give the women advice about some complements if it is needed	1 (1.4)	3 (4.2)	22 (30.6)	46 (63.9)	3.6	12
I give the women information about family planning methods	3 (4.2)	7 (9.7)	13 (18.1)	49 (68.1)	3.5	13
I do the blood sample test (CBC, Blood sugar) for each woman	1 (1.4)	11 (15.3)	14 (19.4)	46 (63.9)	3.5	14
I promote the involvement of men during pregnancy, childbirth and after birth	2 (2.8)	21 (29.2)	19 (26.4)	30 (41.7)	3.1	15
Tetanus vaccine is given for each pregnant woman in the first pregnancy	26 (36.1)	29 (40.3)	8 (11.1)	9 (12.5)	2	16

Table (4.4) demonstrates the responses of the respondents to the practice-related statements.

The statement “Tetanus vaccine is given for each pregnant woman in the first pregnancy” has the lowest mean”2” and ranked the last 16th as 26 (36.1%) of the respondents’ responses with never. All other statements related to the practice have means above 3 as shown in Table (4.4).

4.1.2 Level of knowledge and practice

Table (4.5): Knowledge and practice scores

Variable	Mean \pm SD	Min	Max
Knowledge	18.9 \pm 2.4	12	23
Practice	89.2 \pm 8.2	60.9	100

Table (4.5) shows the descriptive analysis of knowledge and practice scores among the respondents. Mean of knowledge score is 18.9 (12- 23), and the mean of the practice score is 89.2 (60.9- 100).

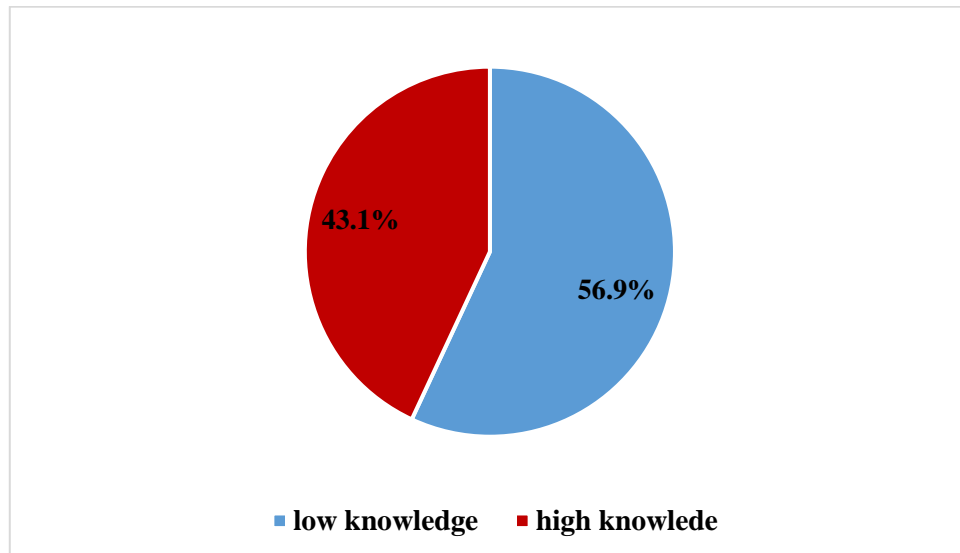


Figure (4.1): Level of knowledge



Figure (4.2): Level of practice

Figures (4.1), and (4.2) demonstrate the level of knowledge and practice among the respondents. Less than half of the respondents (43.1%) have high knowledge. In comparison with a similar study, overall, 65 (73%) respondents had high knowledge level and answered more than 75% of the knowledge statements correctly (Libingi et al., 2019). The finding indicates that nurses and midwives' knowledge of the ANC services they provide is still insufficient and needs to be improved.

The majority (95.8%) of the respondents have high practice. Inconsistent with this finding, in a previous study, Libingi et al (2019) showed that 61.8% of the midwives did not complete an adequate number of procedures during their practice. Also, in another study (Schoon and Motlolometsi, 2012) revealed that midwives lacked the required skills to provide the ANC services. The inconsistency between studies could be related to the methodology of data collection as our study used the self- administered questionnaire whereas the previous used the observation checklist.

4.2 Inferential analysis

4.2.1 Differences in knowledge scores with regard to demographic characteristics

Table (4.6): Differences in knowledge scores

Variable	N	Mean \pm SD	F/t	P-value
Age				
< 30 years	5	17 \pm 2.7	1.703	0.190
30-40 years	22	19.2 \pm 1.4		
> 40 years	45	18.7 \pm 2.7		
Specialty				
Nurse	35	18.6 \pm 1.9	-0.566	0.573
midwife	37	18.9 \pm 2.8		
Place				
North Gaza ^a	10	16.5 \pm 3.5	`3.3	0.017* between ^a and ^b = 0.008 ^a and ^c = 0.026 ^a and ^d = 0.001 ^a and ^e = 0.019
Gaza ^b	33	18.8 \pm 2.3		
middle zone ^c	6	19.2 \pm 1.8		
Khanyounis ^d	17	19.6 \pm 1.4		
Rafah ^e	6	19.3 \pm 2.3		
Clinic level				
Third	18	19 \pm 2.1	0.343	0.733
Fourth	43	18.8 \pm 2.5		
Years of experience in providing health care				
< 5 years	5	17.8 \pm 3	0.723	0.489
5-10 years	4	19.8 \pm 1		
> 10 years	63	18.7 \pm 2.4		
Years of experience in providing ANC				
< 5 years	18	18.7 \pm 2.2	1.093	0.341
5-10 years	12	17.8 \pm 2.4		
> 10 years	42	19 \pm 2.5		
Level of education				
Diploma	30	18.9 \pm 2.9	0.276	0.760
Bachelor	36	18.7 \pm 2		
Master	6	18.2 \pm 2.6		
Training				
Yes	67	18.9 \pm 2.4	1.5	0.141
No	5	17.2 \pm 2.7		
Training hours				
< 50 hours	46	18.6 \pm 2.1	0.695	0.490
>= 50 hours	26	19 \pm 3		

***Statistically significant**

Table (4.6) depicts the differences in mean knowledge scores among individuals. The study found a statistically significant variation in knowledge score based on location (F= 3.3, p-value= 0.017). A post hoc test finds statistically significant variations in knowledge scores between individuals working in north Gaza and all other governorates

Annex (10). The finding could be attributed to the lack of participation of the employees in the professional development courses. The other examined demographic variables (age, specialty, training, education level, experience, clinic level) did not show any differences in the knowledge score.

4.2.2 Differences in practice score with regard to demographic characteristics

Table (4.7): Differences in practice scores

Variable	N	Mean \pm SD	F/t	P-value
Age				
< 30 years	5	86.6 \pm 7.7	1.108	0.336
30-40 years	22	91.3 \pm 6.7		
> 40 years	45	88.5 \pm 8.8		
Specialty				
Nurse	35	88.6 \pm 8.7	0.668	0.506
midwife	37	89.9 \pm 7.7		
Place				
North Gaza	10	87.8 \pm 5.9	1.56	0.196
Gaza	33	89.9 \pm 8.4		
middle zone	6	86.5 \pm 10.1		
Khanyounis	17	91.8 \pm 6.4		
Rafah	6	83.3 \pm 11.2		
Clinic level				
Third	18	90.4 \pm 6.0	0.798	0.428
Fourth	43	88.6 \pm 8.6		
Years of experience in providing health care				
< 5 years	5	89.1 \pm 8.4	0.143	0.867
5-10 years	4	87.1 \pm 6.9		
> 10 years	63	89.4 \pm 8.3		
Years of experience in providing ANC				
< 5 years	18	89 \pm 8.4	0.042	0.959
5-10 years	12	89.8 \pm 7.2		
> 10 years	42	89.2 \pm 8.5		
Level of education				
Diploma	30	88 \pm 7.8	0.649	0.0526
Bachelor	36	90.3 \pm 8.5		
Master	6	88.8 \pm 8.9		
Training				
Yes	67	89.8 \pm 7.4	2.23	0.029*
No	5	81.6 \pm 13.9		
Training hours				
< 50 hours	46	87.6 \pm 9.1	2.6	0.009*
>= 50 hours	26	92.1 \pm 5.2		

*Statistically significant

The variances in respondents' mean practice scores are displayed in Table (4.7). The research revealed a statistically significant difference between practice score and prior training ($t= 2.23$, $p= 0.029$). In addition, there is a statistically significant variation in practice score based on the number of training hours ($t= 2.6$, $p\text{-value}= 0.009$), with respondents with 50 or more training hours having a mean practice score of 92.1, which is greater than the score of 87.6 for those with less than 50 training hours. The availability of training and mentoring is one of the three main identified groups of factors that hinder complete providers' adherence to the ANC guideline. Refresher training should be provided at the beginning of the updated eight-contact ANC guideline, as well as ongoing education and supervision throughout the implementation process (Seyoum et al., 2021). Another study provides evidence that provider training could help improve counseling and support for early initiation of breastfeeding (Mallick et al., 2020).

However, the practice score was unaffected by the other studied demographic variables (age, specialization, training, education level, experience, clinic level).

Chapter Five

Conclusion and recommendations

5.1 Conclusion

The study was carried out to assess nurses' and midwives' knowledge and practice of providing ANC services in governmental PHC centers in the Gaza Strip.

The study found that the average level of knowledge is 18.9 (12-23) and that 43.1% properly answered 75% or more of the knowledge statements. The level of practice score is 89.2 (60.9-100), with 95.8% accurately responding to the practice score. More over 90% of the respondents correctly answered each of the nine statements, demonstrating a high level of knowledge. Respondents, on the other hand, demonstrated a low degree of understanding of ten statements, with fewer than 65% responding correctly for each one.

The study found a statistically significant variation in respondents' knowledge levels based on where they resided. Furthermore, the presence of previous training and the quantity of training hours have a positive effect on practice score.

5.2 Recommendations

5.2.1 Recommendations for policy makers

Based on the findings of this study the following recommendations were made:

- To increase education and training programs for the respondents working in the ANC to keep them update with the WHO recommendations.
- To execute an integrated health education program specially for midwives and nurses resident in the North Gaza.
- To further educate nurses, and midwives about diet such as protein, vitamins, and micronutrient supplementations.

- There is a need to educate nurses and midwives providing ANC services about the Tetanus Toxoid vaccine and its importance.
- Midwives and nurses should know more about hyperglycemia in pregnancy and its detection.

5.2.2 Recommendations for further research

- Conduct a study examining the practice of midwives and nurses using an observation checklist.
- Conduct a prospective study to investigate Knowledge and practice of Gaza women about ANC services in Gaza Strip.

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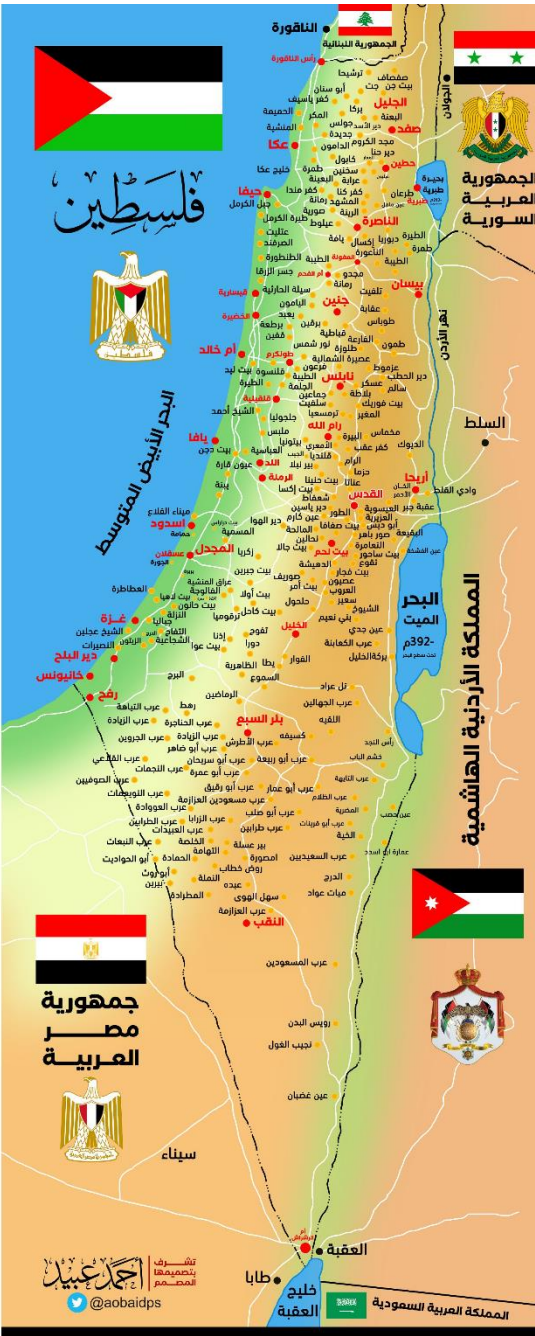
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Annexes

Annex (1): Palestine map



Annex (2): Gaza Strip map



Annex (3): Study tool

1. Demographic characteristics					
AgeYears					
Specialty	<input type="checkbox"/> Nurse			<input type="checkbox"/> Midwife	
Place of work	<input type="checkbox"/> North Gaza	<input type="checkbox"/> Gaza		<input type="checkbox"/> Middle area	
	<input type="checkbox"/> Khanyounis		<input type="checkbox"/> Rafah		
Name of clinic				
Years of experienceYears				
Level of education	<input type="checkbox"/> Diploma	<input type="checkbox"/> Bachelor	<input type="checkbox"/> Master	<input type="checkbox"/> PhD	
Did you receive previous training regarding providing ANC?				<input type="checkbox"/> Yes	<input type="checkbox"/> No

2. Knowledge

Statements	Yes	No
Antenatal care contact schedules		
WHO recommends antenatal care models with a minimum of eight contacts to reduce perinatal mortality and to improve women's experience of care		
Guideline Development Group prefers the word "contact" to "visit", as it implies an active connection between a pregnant woman and a health-care provider that is not implicit with the word "visit"		
Nutrition Intervention		
Pregnant women should be counseled on healthy eating and physical activity to stay healthy and avoid excessive weight gain.		
In undernourished population, pregnant women are advised to increase daily energy and protein intake to reduce the risk of low birth weight babies.		
In undernourished population, pregnant women should take balanced energy and protein supplements to reduce the risk of stillbirths.		
In undernourished populations, high-protein supplementation is recommended for pregnant women to improve maternal and perinatal outcomes		
Pregnant women should take oral iron and folic acid daily to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth.		

Statements	Yes	No
In populations with low dietary calcium intake, daily calcium supplementation is recommended for pregnant women to reduce the risk of pre-eclampsia.		
Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem, to prevent night blindness.		
Multiple micronutrient supplementation is recommended for pregnant women to improve maternal and perinatal outcomes		
Vitamin B6 (pyridoxine) supplementation is recommended for pregnant women to improve maternal and perinatal outcomes		
Vitamin E and C supplementation is recommended for pregnant women to improve maternal and perinatal outcomes		
Vitamin D supplementation is recommended for pregnant women to improve maternal and perinatal outcomes		
lowering daily caffeine intake during pregnancy is recommended to reduce the risk of pregnancy loss and low-birth-weight neonates		
Maternal and fetal assessment		
Full blood count testing is the recommended method for diagnosing anaemia during pregnancy.		
Midstream urine culture is the recommended method for diagnosing asymptomatic bacteriuria (ASB) in pregnancy		
Hyperglycaemia first detected at any time during pregnancy should be classified as either gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to WHO criteria		
Health-care providers should ask all pregnant women about their tobacco use (past and present) and exposure to second-hand smoke as early as possible in pregnancy and at every antenatal care visit		
Replacing abdominal palpation with symphysis-fundal height (SFH) measurement for the assessment of fetal growth is recommended to improve perinatal outcomes.		
Routine antenatal cardiotocograph (CTG) is recommended for pregnant women to improve maternal and perinatal outcomes		
Early ultrasound (before 24 weeks of gestation) is recommended for pregnant women to estimate gestational age, improve detection		

Statements	Yes	No
of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience		
Preventive measures		
seven-day antibiotic regimen is recommended for all pregnant women with asymptomatic bacteriuria (ASB) to prevent persistent bacteriuria, preterm birth and low birth weight.		
Tetanus toxoid vaccination is recommended for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus		
Interventions for common physiological symptoms		
Ginger, chamomile, vitamin B6 and/or acupuncture are recommended for the relief of nausea in early pregnancy, based on a woman's preferences and available options.		
Advice on diet and lifestyle is recommended to prevent and relieve heartburn in pregnancy.		
Magnesium, calcium or non-pharmacological treatment options can be used for the relief of leg cramps in pregnancy, based on a woman's preferences and available options.		
Regular exercise throughout pregnancy is recommended to prevent low back and pelvic pain		
Wheat bran or other fiber supplements can be used to relieve constipation in pregnancy if the condition fails to respond to dietary modification, based on a woman's preferences and available options		
Non-pharmacological options, such as compression stockings, leg elevation and water immersion, can be used for the management of varicose veins and oedema in pregnancy		

3. Practice

Statements	SA	A	N	D	SD
Physical examination and medical history					
I always take history about previous pregnancies and deliveries					
I measure the blood pressure for pregnant women in each contact					
I do the urine sample test for each woman					
I do the blood sample test for each woman					
Vaccination is given for each pregnant woman in the first pregnancy					
I always refer the women with any pregnancy complication to the physician					
All women conduct the U/S examination at the 24 weeks of gestation					
Information about diet, supplements					
I always told the women and remember them about iron/folic acid					
I always advice the women about healthy diet					
I always advice the women about suitable exercise and rest					
I give the women advice about some complements if it is needed					
I always cautioned women against the use of drugs during pregnancy					
Health promotion interventions for maternal and newborn health					
I always advice the women about practices of personal hygiene					
I'm constantly talking to pregnant women about the first signs of birth and when to go to the hospital.					
I'm constantly talking to pregnant women about the expected pregnancy complications and solutions					
I always give the women information about expected complications after delivery					
I promote the involvement of men during pregnancy, childbirth and after birth					
I always give the women information about family planning methods					
I always give the women information about breastfeeding and the breast care during pregnancy					

4. General questions about the ANC service

4.1 How many visits do you book for every woman during pregnancy period?

.....

4.2 When do you advise the pregnant woman to open the file and register for the pregnancy?

.....

Annex (4): Helsinki committee approval



المجلس الفلسطيني للبحث الصحي
Palestinian Health Research Council

لتعزيز نظام صحي فلسطيني من خلال مناسبة استخدام المعلومات البحثية في صنع القرار
Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 07/02/2022 **Number: PHRC/HC/1043/22**

Name: Mona Ashour Abu Itiwy **الاسم:**

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

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Knowledge and Practice of Nurses and Midwives toward Antenatal Care Provided at Governmental Primary Health Care Centers in Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/1043/22 in its meeting on 07/02/2022

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

Signature

Member **Member**

Chairman

Genral 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 - مقترق العيون

Annex (5): MoH Approval 1

Al Quds University
Faculty of Health Professions
Nursing Dept. - Gaza



جامعة القدس
كلية المهن الصحية
محافظة غزة - غزة

التاريخ: 2022/3/27

حضرة الأخ/ م. أسامة قاسم
وكيل مساعد وزارة الصحة
السلام عليكم ورحمة الله وبركاته

الموضوع: تسهيل مهمة الطالبة الباحثة منى عاشور أبو اعطيوي

تهديكم كلية المهن الصحية بجامعة القدس أطيب التحيات، ونرجو من حضرتكم مساعدة الطالبة المذكورة بتسهيل مهمتها في توزيع وتعبئة استبانة الدراسة الخاصة بموضوع دراستها البحثية بعنوان:

**Knowledge and Practice of Nurses and Midwives toward Antenatal care
Provided at Governmental Primary Health Care Centers in Gaza Strip**

حيث هذه الدراسة من متطلبات الحصول على درجة الماجستير في تمريض صحة الأم والطفل وستكون عينة الدراسة من الممرضات والقابلات بمراكز الرعاية الأولية بوزارة الصحة (جباليا الشيماء - أبو شباك - الشيخ رضوان - الرمال - الدرج - الحرية - الصوراني - السلام - عملا حبيب - الفلاح - القبة - صبحه - الزيتون - دير البلح - القرارة - بني سهيلا - شهداء خانيونس - جورة اللوت - عيسان الكبيرة - تل السلطان - شهداء رفح - عيسان الصغيرة - الزوايدة - وادي السلقا - جحر الديك - خزاعة).

وتفضلوا بقبول وافر الاحترام والتقدير

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Annex (6): MoH Approval 2

State of Palestine Ministry of health		دولة فلسطين وزارة الصحة
<hr/>		
التاريخ: 29/03/2022 رقم المراسلة: 925272	المسيد : جهاد عبدالقادر عكاشه المحترم	
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مدير دائرة الإدارة العامة للوحدات الإدارية المساعدة لوزارة الصحة		
السلام عليكم :-		
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<u>الموضوع: تسهيل مهمة الباحثة منى عاشور ابو عطوي</u>		
<hr/>		
التفصيل :- السلام عليكم نهدىكم أطيب التحيات ونود منكم تسهيل مهمة الباحثة منى عاشور محمد ابو عطوي الملتحقة ببرنامح ماجستير صحة الأم والطفل - جامعة القدس أبو نيس في إجراء بحث بعنوان Knowledge and Practice of Nurses and Midwives toward Antenatal Care Provided at Governmental Primary Health Care Centres in Gaza Strip حيث الباحثة بحاجة لتعبئة استبانة من عدد من العاملين (الممرضات والقابلات) في مرافق وزارة الصحة (مركز الرعاية الأولية) بما لا يتعارض مع مصلحة العمل فضمن الخلاليات البحث العلمي، وبمن تحمل الوزارة أي أعباء أو مسؤولية وتفضلوا بقبول التمية والتقدير.		
<hr/>		
ملاحظات :- تسهيل المهمة الخاص بالمراسة أعلاه صالح لمدة 3 أشهر من تاريخه. يرجى التأكد من توافق الاستبانة المرفقة والتي يتم تعبئتها ميدانياً على أن لا يتم أي إضافة أو تعديل على الاستبانة المرفقة علي حسن الجليلي حكيم جلهي		
<hr/>		
المرفقات :- ■ استبانة منى عاشور ابو عطوي.pdf		
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Gaza	Tel. (+970) 8-2846949 Fax. (+970) 8-2826295	غزة تلفون: (+970) 8-2846949 فاكس: (+970) 8-2826295

Annex (7): Consent form

عزيتي المشاركة

يسعدني مشاركتك الفاعلة في بحث بعنوان

Knowledge and Practice among Nurses and Midwives toward Antenatal Care

Provided at the Governmental Primary Health Care Centers in Gaza Strip

"المعرفة والممارسات بين الممرضات والقابلات في مجال الرعاية الأولية للحوامل المقدمة في

المراكز الحكومية للرعاية الصحية الأولية في قطاع غزة"

أنا الباحثة منى أبو عطوي أقوم بجمع البيانات من أجل البحث الخاص بي والذي سيقدم للحصول على درجة الماجستير من كلية المهن الصحية/ تخصص صحة الأم والطفل - جامعة القدس (أبوديس).

حيث أنك من الفئة المستهدفة للبحث وهي "الممرضات والقابلات اللواتي يعملن في تقديم الرعاية الصحية للحوامل في مراكز الرعاية الأولية" فإن مشاركتك في البحث هامة بالنسبة لي إذا كنت موافقة على المشاركة في هذه الدراسة، يرجى التكرم بقراءة العبارات التالية بدقة والإجابة عنها بموضوعية لما في ذلك من أثر كبير على صحة النتائج والتوصيات التي ستتوصل إليها الباحثة. مع التأكيد بأن هذه البيانات سوف تستخدم لأغراض البحث العلمي فقط، وسيتم التعامل معها بسرية تامة.

ملاحظة / الوقت اللازم لتعبئة الاستبانة كاملة يستغرق 15 دقيقة فقط.

أشكرك على حسن تعاونك

الباحثة

منى أبو عطوي

Annex (8): List of arbitrators

No.	Name	Specialty	Affiliation
1.	Dr. Khalil M A Shuaib	RN,MSN, PhD in nursing	Palestine College of Nursing
2.	Atef J. Ismail	Ph.D. of nursing science	Islamic University
3.	Dr. Ayman Abu Mustafa	Statistician, PhD in Bio	Palestine College of Nursing
4.	Dr. Yousif M. Awad	Assist. Professor, RN., BSN., MSN., DnSc."Management	University of Palestine, College of Medicine and Health Sciences
5.	Dr. Samira Abo Al Sheikh	Ph.D. in Public Health	MoH

Annex (9): Respondents' responses about the knowledge statements

Statements	Responses (%)	Responses (%)	Correct N (%)	order
	Yes	No		
WHO recommends antenatal care models with a minimum of eight contacts to reduce perinatal mortality and to improve women's experience of care	66 (91.7)	6 (8.3)	66 (91.7)	8
Guideline Development Group prefers the word "contact" to "visit", as it implies an active connection between a pregnant woman and a health-care provider that is not implicit with the word "visit"	63 (87.5)	9 (12.5)	63 (87.5)	12
Pregnant women should be counseled on healthy eating and physical activity to stay healthy and avoid excessive weight gain.	71 (98.6)	1 (1.4)	71 (98.6)	1
In undernourished population, pregnant women are advised to increase daily energy and protein intake to reduce the risk of low birth weight babies.	69 (95.8)	3 (4.2)	69 (95.8)	4
In undernourished population, pregnant women are advised to increase daily energy and protein intake to reduce the risk of low birth weight babies.	61 (84.7)	11 (15.3)	61 (84.7)	14
In undernourished populations, high-protein supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	69 (95.8)	3 (4.2)	3 (4.2)	28
Pregnant women should take oral iron and folic acid daily to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth.	65 (90.3)	7 (9.7)	65 (90.3)	10
In populations with low dietary calcium intake, daily calcium supplementation is recommended for pregnant women to reduce the risk of pre-eclampsia.	60 (83.3)	12 (16.7)	60 (83.3)	15
Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem, to	39 (54.2)	33 (45.8)	39 (54.2)	20

Statements	Responses (%) Yes	Responses (%) No	Correct N (%)	order
prevent night blindness.				
Multiple micronutrient supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	62 (86.1)	10 (13.9)	10 (13.9)	25
Vitamin B6 (pyridoxine) supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	55 (76.4)	16 (22.2)	16 (22.2)	23
Vitamin E and C supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	62 (86.1)	10 (13.9)	10 (13.9)	25
Vitamin D supplementation is recommended for pregnant women to improve maternal and perinatal outcomes	59 (81.9)	13 (18.1)	13 (18.1)	24
lowering daily caffeine intake during pregnancy is recommended to reduce the risk of pregnancy loss and low-birth-weight neonates	62 (86.1)	10 (13.9)	62 (86.1)	13
Full blood count testing is the recommended method for diagnosing anaemia during pregnancy.	71 (98.6)	1 (1.4)	71 (98.6)	1
Midstream urine culture is the recommended method for diagnosing asymptomatic bacteriuria (ASB) in pregnancy	71 (98.6)	1 (1.4)	71 (98.6)	1
Hyperglycaemia first detected at any time during pregnancy should be classified as either gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to WHO criteria	47 (65.3)	25 (34.7)	47 (65.3)	19
Replacing abdominal palpation with symphysis-fundal height (SFH) measurement for the assessment of fetal growth is recommended to improve perinatal outcomes.	68 (94.4)	4 (5.6)	4 (5.6)	27
Routine antenatal cardiotocograph (CTG) is recommended for pregnant women to improve	54 (75)	18 (25)	18 (25)	22

Statements	Responses (%) Yes	Responses (%) No	Correct N (%)	order
maternal and perinatal outcomes				
Early ultrasound (before 24 weeks of gestation) is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnan	66 (91.7)	6 (8.3)	66 (91.7)	8
seven-day antibiotic regimen is recommended for all pregnant women with asymptomatic bacteriuria (ASB) to prevent persistent bacteriuria, preterm birth and low birth weight.	56 (77.8)	16 (22.2)	56 (77.8)	17
Tetanus toxoid vaccination is recommended for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus	25 (34.7)	47 (65.3)	25 (34.7)	21
Ginger, chamomile, vitamin B6 and/or acupuncture are recommended for the relief of nausea in early pregnancy, based on a woman's preferences and available options.	56 (77.8)	16 (22.2)	56 (77.8)	17
Advice on diet and lifestyle is recommended to prevent and relieve heartburn in pregnancy	69 (95.8)	3 (4.2)	69 (95.8)	4
Magnesium, calcium or non-pharmacological treatment options can be used for the relief of leg cramps in pregnancy, based on a woman's preferences and available options.	57 (79.2)	15 (20.8)	57 (79.2)	16
Regular exercise throughout pregnancy is recommended to prevent low back and pelvic pain	65 (90.3)	7 (9.7)	65 (90.3)	10
Wheat bran or other fiber supplements can be used to relieve constipation in pregnancy if the condition fails to respond to dietary modification, based on a woman's preferences and available options	67 (93.1)	5 (6.9)	67 (93.1)	7

Statements	Responses (%) Yes	Responses (%) No	Correct N (%)	order
Non-pharmacological options, such as compression stockings, leg elevation and water immersion, can be used for the management of varicose veins and oedema in pregnancy	68 (94.4)	4 (5.6)	68 (94.4)	6

Annex (10): Post Hoc multiple comparison/ Knowledge score

Multiple Comparisons

Dependent Variable: Knowledge_level

LSD

(I) place of residence	(J) place of residence	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
north Gaza	Gaza	-2.25758*	.82103	.008	-3.8964	-.6188
	middle zone	-2.66667*	1.17454	.026	-5.0111	-.3223
	Khanyounis	-3.14706*	.90644	.001	-4.9563	-1.3378
	Rafah	-2.83333*	1.17454	.019	-5.1777	-.4889
Gaza	north Gaza	2.25758*	.82103	.008	.6188	3.8964
	middle zone	-.40909	1.00944	.687	-2.4240	1.6058
	Khanyounis	-.88948	.67903	.195	-2.2448	.4659
	Rafah	-.57576	1.00944	.570	-2.5906	1.4391
middle zone	north Gaza	2.66667*	1.17454	.026	.3223	5.0111
	Gaza	.40909	1.00944	.687	-1.6058	2.4240
	Khanyounis	-.48039	1.08006	.658	-2.6362	1.6754
	Rafah	-.16667	1.31317	.899	-2.7878	2.4544
Khanyounis	north Gaza	3.14706*	.90644	.001	1.3378	4.9563
	Gaza	.88948	.67903	.195	-.4659	2.2448
	middle zone	.48039	1.08006	.658	-1.6754	2.6362
	Rafah	.31373	1.08006	.772	-1.8421	2.4695
Rafah	north Gaza	2.83333*	1.17454	.019	.4889	5.1777
	Gaza	.57576	1.00944	.570	-1.4391	2.5906
	middle zone	.16667	1.31317	.899	-2.4544	2.7878
	Khanyounis	-.31373	1.08006	.772	-2.4695	1.8421

*. The mean difference is significant at the 0.05 level.

Abstract in Arabic

عنوان الدراسة: "المعرفة والممارسات بين الممرضات والقابلات في مجال الرعاية الأولية للحوامل المقدمة في المراكز الحكومية للرعاية الصحية الأولية في قطاع غزة"

إعداد الباحثة: منى عاشور محمد أبو عطوي

إشراف: حاتم سليمان الدباكة

الملخص:

الخلفية: تعتبر خدمة رعاية الحوامل (ANC) هدفاً مهماً من حيث صحة المرأة الحامل أثناء وقت الإنجاب، وتمثل فوائدها الصحية حوالي ربع جميع حالات الحمل على مستوى العالم.

الهدف: هدفت هذه الدراسة إلى تحليل معرفة وممارسات الممرضات والقابلات حول الرعاية الصحية الأولية المقدمة في مراكز الرعاية الصحية الأولية الحكومية في قطاع غزة.

منهجية الدراسة: تم استخدام التصميم الوصفي المقطعي، واستخدمت العينة الكلية الشمولية لتشمل جميع الممرضات والقابلات الـ 72 الذين يقدمون خدمات الرعاية الصحية الأولية في مراكز الرعاية الصحية الأولية في قطاع غزة. تم استخدام الاستبيان الذاتي، مع مراعاة جميع الاعتبارات الإدارية والأخلاقية. تم تحليل البيانات باستخدام تطبيق الحزمة الإحصائية للعلوم الاجتماعية (SPSS) الإصدار 25.

النتائج: شاركت 72 قابلة وممرضة (48.6%) لكل منهم في الدراسة. الغالبية (62.5%) تزيد أعمارهم عن 40 عاماً، ولديهم أكثر من عشر سنوات من الخبرة في مجال الرعاية الصحية (87.5%) ويقدمون الرعاية الصحية أثناء الحمل (58.3%)، وتلقى الغالبية تدريباً (93.1%). نصف المشاركون حاصلون على درجة البكالوريوس، 45.8% يسكنون في مدينة غزة، و 59.7% يعملون في عيادة من المستوى الرابع. كان متوسط درجات معرفتهم حول خدمة رعاية أثناء الحمل 18.9 (12-23)، وكان متوسط درجات ممارستهم لها 89.2 (60.9 - 100). بعد تصنيف المعرفة والممارسة، كان أقل من نصف المشاركين (43.1%) لديهم معرفة عالية، بينما الغالبية (95.8%) لديهم أداء عالي.

وجدت الدراسة فروقاً ذات دلالة إحصائية في درجات المعرفة بناءً على مكان السكن (ف=3.3، مستوى المعنوية $p = 0.017$)، ولكن لا يوجد فروق في المتغيرات الأخرى (العمر، التخصص، التدريب، المستوى التعليمي، الخبرة، ومستوى العيادة). من ناحية أخرى، وجدت الدراسة فروقاً ذات دلالة إحصائية بين الممارسة والتدريب السابق (ت=2.23، مستوى معنوية 0.029). علاوة على ذلك، هناك فرق ذو دلالة إحصائية في درجة الممارسة بناءً على عدد ساعات التدريب (ت=2.6، قيمة $p = 0.009$). المشاركون الذين لديهم 50 ساعة تدريب أو أكثر لديهم متوسط درجة ممارسة 92.1، وهو أعلى من مجموع 87.6 لمن لديهم أقل من 50 ساعة تدريب. ومع ذلك، لم تجد الدراسة أي اختلاف في الممارسة عند اختبار الخصائص الأخرى (العمر، والتخصص، والتدريب، والمستوى التعليمي، والخبرة، ومستوى العيادة).

الخلاصة والتوصيات: الممرضات والقابلات لديهم ممارسة جيدة في خدمة رعاية الحوامل المقدمة في مراكز الرعاية الصحية الأولية الحكومية، لكن معرفتهم غير كافية. تقترح الدراسة توسيع برامج التعليم للممرضات والقابلات العاملات في مراكز رعاية الحمل لإبقائهم على اطلاع دائم بمعايير منظمة الصحة العالمية.