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Assessment of antenatal care services provided to pregnant women with gestational diabetes mellitus at UNRWA health centers in Gaza governorates

By

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Assessment of antenatal care services provided to pregnant women with gestational diabetes mellitus at UNRWA health centers in Gaza governorates

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Dedication

To the immortal spirit of my father and martyr brother, who their greatness built up the bride all over my heart .

To my husband, who have gone through a very tough time and carried most of the burden so that I did not have to. How do I say it, except: ***"Thank you***"

To my children, who not only stood by me but also they brought the happiness to my life.

To my mother, supporter, and so much more - she carried on for long years after my father has passed away and showed us all how to live life to the fullest.

This thesis would be incomplete without a mention of the support given me by my family: my sisters, my nephew and my brother, to whom this thesis is dedicated.

Dr.Mariam Abd-el-Kader

Declaration

I certify that this entire thesis submitted for the degree of Master is the result of my own

Research, except where otherwise acknowledged, and that this thesis (or any part of the same) has not submitted for a higher degree to any other university or institution..

Signature:…….

Dr. Mariam Abdelkader

Date: 9-6-2008

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Abstract

Antenatal care is a golden mean to ensure safe pregnancy and good outcome for pregnant women especially those at high-risk, e.g. patients with gestational diabetes mellitus (GDM).

This study is dedicated to assess antenatal care services provided to pregnant women with gestational diabetes in UNRWA health centers in Gaza governorates and serves the overall aim to help improving antenatal care services and decrease maternal and fetal complications caused by GDM.

This is a cross sectional study conducted in UNRWA health centers all over Gaza governorates. The study sample includes: all healthcare providers who work in antenatal care (ANC) in high risk pregnancy "103" staff members and all registered pregnant women with GDM "151" clients at the time of the study. The response rate was 98.1% for the providers and 96.1% for the clients. Two face-to-face questionnaires were used to collect data, one for the clients and one for healthcare providers.

UNRWA antenatal care services were found to be geographically accessible and for the availability of appointment system most of the clients 70.4 % agreed on the presence of an appointments system by date and time. Lack of knowledge in the clients with GDM was found to be a huge problem that makes such women underestimate their health problems with most of clients having poor to moderate knowledge about GDM. The results revealed that there is statistical significant relation ship between client knowledge and education level, There is no statistical significant relationship between client knowledge and income, age and district distribution.

The vast majority of healthcare providers were females (97%). The mean age of the providers was 40.95 years with a mean experience of 14.7 years. 23.8% of healthcare providers are doctors (obstetrician and GP) while 76.2% were Nurses. 70.3% of the ANC healthcare providers stated that they had received in- service training during the last five years of working for UNRWA only half of them received training in management of high risk pregnancy this lack in training resulted in lack of knowledge Most of the essential equipments, laboratory investigations and medications required for the management of GDM were found to be present and in working order in UNRWA health centers.

The knowledge of healthcare providers was lower than expected with 18.8% having poor knowledge about GDM. There were no statistically significant relationship between healthcare provider knowledge and Years of experience, district, Age group and Training in general. There was statistically significant relationship between healthcare providers' knowledge and qualification and there was statistical significant relationship between healthcare provider knowledge and the availability of written guidelines and reading them by the providers. The researcher recommends paying more attention to continuous effective training program for the healthcare providers and periodic assessment of their competency to improve health provider's knowledge and practice regarding management of GDM. Increasing the numbers of staff members found to be a crucial step to solve excessive workload problems, to decrease waiting time and to increase consultation time, thus the researcher recommends working on that issue. Improvement of health education services and improving the availability of teaching aids and health education materials recommended increasing the client's knowledge about GDM.

ملخص البحث

الرعاية الصحية للسيدات الحوامل تعتبر من الوسائل الأساسية لضمان حمل آمن و مواليد أصحاء، بـــالأخص في حالات الحمل الخطر و منها سكري الحمل.

هذه الدراسة تهتم بتقييم الرعاية الصحية ما قبل الولادة المقدمة للسيدات الحوامل اللاتي بعانين مـــن ســـكري الحمل في مراكز وكالة الغوث في محافظات غزة، و تهدف إلى رفع مـــستوى الخدمـــة الـــصحية و تقليـــل مضاعفات سكري الحمل على الأم و جنينها.

لقد اشتملت عينة الدراسة على فئتين هما مقدمي خدمة رعاية السيدات الحوامل(الحمل ألخطر) العاملين فـــي مراكز وكالة الغوث الصحية و عددهم 103 مقدم للخدمة، و السيدات الحوامل المصابات بسكري الحمل خلال فترة إجراء الدراسة وعددهم 151 سيدة، و قد كانت نسبة الاستجابة 96.1% بالنسبة للـــسيدات الحوامـــل و 98.1% بالنسبة لمقدمي الخدمة. تم جمع البيانات من خلال استبيانين، الأولى خاصة بمقدمي الخدمة و الثانية خاصة بالسيدات الحوامل تعبأ من قبل الباحث أو المساعدين.

لوحظ من خلال الدراسة إن السيدات الحوامل المصابات بسكري الحمل و اللاتي يتلقين الخدمة فـــي مراكـــز وكالة الغوث كن في المعظم ربات منزل، ذوات مستوى تعليمي متدني، و دخل شهري اقل من المتوســـط. وجدت الدراسة إن خدمات الرعاية الصحية للحوامل المقدمة للسيدات المصابات بسكري الحمل في مراكـــز الغوث متاحة لجميع السيدات من المنظور الجغرافي و من خلال وجود نظام مواعيد واضح حيث ذكـــر مـــا نسبته 70.4% من السيدات وجود نظاما مواعيد باليوم و الوقت المحددين.

بالنسبة للسيدات اللاتي بعانين من سكري الحمل محدودية المعرفة بسكري الحمل من حيث المضاعفات و طرق العلاج تعتبر مشكلة ضخمة تؤدي إلى عدم تقدير حجم المشكلة التي يواجهنها حيث وجدت الدراسة إن معظم السيدات لديهم مستوى من ضعيف إلى متوسط من المعرفة حول سكري الحمل. وجدت الدراسة انه يوجد علاقة ذات دلالة إحصائية بين مستوى المعرفة حول سكري الحمل و المستوى التعليمي للسيدة الحامل و لكن لا يوجد علاقة بين هذه المعرفة و مستوى الدخل، و العمر أو مكان السكن.

بالنسبة لمقدمي الخدمة وجدت الدراسة أن معظمهم من الإناث بنسبة 97%، و متوسط عمر مقدمي الخدمة كان 40.95 سنة بمتوسط خبرة يعادل 14.7 سنوات. 23.8% من مقدمي الخدمة كانوا أطباء و الباقون من الممرضات. أكد 70.3% من مقدمي الخدمة أنهم تلقوا تدريبا خلال السنوات الخمس الماضية، منهم حوالي النصف تلقوا تدريبا عن رعاية الحمل الخطر.

جميع الأجهزة و الأدوات و التحاليل المخبرية و الأدوية اللازمة لرعاية مرضى سكري الحمل وجد أنها متوفرة و تعمل بشكل سليم في جميع مراكز وكاله الغوث الصحية.

بالنسبة لمقدمي الخدمة، كان مستوى المعرفة بسكري الحمل، مضاعفاته و علاجه اقل بكثير من المتوقع حيث وجد أن 18.8% من هذه المجموعة لديهم مستوى متدني من المعرفة بسكري الحمل. لم يكن هناك علاقة ذات دلالة إحصائية بين مستوى المعرفة و العمر، التدريب، المحافظة أو سنوات الخبرة. بينما وجد أن هناك علاقة واضحة بين مستوى المعرفة بسكري الحمل و المؤهلات العلمية وكذلك الاطلاع على تعليمات و كاله الغوث المكتوبة للتعامل مع سكري الحمل.

خلصت الدراسة إلى عدة توصيات أهمها التركيز على برامج التدريب و التقييم المستمر لمقدمي الخدمة لما لها من بالغ الأثر على تطوير مستوى المعرفة لديهم و ذلك تحسيننا لمستوى الخدمة التي يقدمونها. يجب على

المسئولين العمل على زيادة الطاقم الصحي العامل في رعاية الحوامل و ذلك لحل مشكلة الانتظار الطويل و زيادة وقت الاستشارة الطبية. تحسين خدمات التوعية الصحية للسيدات الحوامل حول سكري الحمل هو مـــن أهم الحلول لمشكلة فقر المعرفة لديهم لذلك يجب العمل على تكثيف الإرشاد الصحي للنساء الحوامل واللاتي بعانين من سكري الحمل مع زيادة نشرات التوعية الخاصة بسكري الحمل .

Contents

List of Abbreviations

ADA	American Diabetes Association
ANC	Antenatal Care
ANOVA	Analysis Of Variance
BMI	Body Mass Index
BP	Blood Pressure
CBC	Complete Blood Count
CDC	Centre Of Disease Control
CFHP	Chief Field Health Program
CI	Confidence Interval
CS	Caesarean Section
DCC	Diabetes Control And Complications Trial Research Group
DfT	Department for Transport
DHS	Demographic And Health Surveys
DKA	Diabetic Ketoacidosis
DM	Diabetes Mellitus
FBS	Fasting Blood Sugar
GCT	Glucose Challenge Test
GDG	Guideline Development Group
GDI	Gender Development Index
GDM	Gestational Diabetes Mellitus
GDP	Gross Domestic Product
GP	General Practitioner
GS	Gaza Strip

Gyn/ Obs	Gynecologist And Obstetrician
H.Cs	Health Centers
HDI	Human Development Index
IUGR	Intra Uterine Growth Restriction
LGA	Large For Gestational Age
MCH	Maternal And Child Health
MD	Median
MHC	Maternal Health Care
MICS	Multiple Indicator Cluster Surveys
MNH	Maternal And Neonatal Health Program
MOH	Ministry Of Health
NDDG	National Diabetes Data Group
NGO's	Nongovernmental Organizations
NHS	National Health Service
NIS	New Israeli Shekels
OGCT	Oral Glucose Challenge Test
OGTT	Oral Glucose Tolerance Test
OHA	Oral Hypoglycemic Agents
OR	Odds Ratio
PAPCHILD	Pan Arab Project For Child Development
PCBS	Palestinian Central Bureau Of Statistics
PHC	Primary Health Care System
PHIS	Palestinian Health Information System
PIH	Pregnancy Induced Hypertension
PNA	Palestinian National Authority

PNIC	Palestinian National Information Centre
RCOG	Royal College Of Obstetricians And Gynecologist
RCT	Randomized Controlled Trial
SD	Standard Deviation
SGA	Small For Gestational Age
SPSS	Statistical package Of Social Science
SSN	Senior Staff Nurse
TT	Tetanus Toxoid
U/S	Ultrasound
UK	United Kingdom
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNRWA	United Nation Relief And Work Agency
US	United States
WHO	World Health Organization

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Definitions

Antenatal care:

Is the care provided to pregnant woman from the day of confirmation of pregnancy till the beginning of labor ( )

A high-risk pregnancy:

Is one in which some condition puts the mother, the developing fetus, or both at higher-than-normal risk of complications during or after pregnancy and birth.

Risk factors:

Factors that make a pregnancy high risk, Doctors identify these factors and use a scoring system to determine the degree of risk for a particular woman. Identifying high-risk pregnancies ensures that women who most need medical care receive it.

Accessibility of antenatal care service:

Refers to kind of antenatal care services, which are unrestricted, achieved easily and reachable for every woman who might need it.

Health care provider:

Professional members who provides care to the pregnant woman during the prenatal care period, which includes physicians, nurses or midwifes

Gestational diabetes mellitus:

Is defined as glucose intolerance of variable degrees with first recognition during the present pregnancy.

Hypoglycemia: Low level of glucose in the blood**.**

Polyhydramnios:

Condition where there is excessive fluid in the sac surrounding the baby**.**

Respiratory distress syndrome:

When newborn babies have difficulty breathing because of underdeveloped lungs.

Chapter 1

Introduction

Chapter 1: Introduction

Pregnancy and delivery is exciting event in the life of a woman, and family. Full of hope and fear, antenatal care services is the care that given to an expectant mother from the time of confirmation of pregnancy until the beginning of labor. It is an important aspect in modern health care, healthy mother and healthy outcome is the goal of antenatal care to prevent health problems in both infant and mother for each newborn child to have a good start in her life.

Antenatal care of pregnant woman needs to be individualized based on the needs and wishes of pregnant woman. The aims of this care is to detect early risk for both mother and fetus, intervene to improve outcomes, educate all who provide or receive care, and , help make pregnancy and birth a positive life experience .

Assessment of anti natal care services is evaluation of the effectiveness of antenatal care for women to have safe pregnancy and outcomes without much intervention (center of disease control, (CDC, 2003).

Health services quality requirement increased the necessity for researches directed towards quality and dimensions of antenatal care services. This assessed adherence to standards, equipment, technical procedures, training and education. The service quality must be located in the wider contexts of health service structure, and the socio-economic circumstances.

The World Health Organization (WHO), 1999 defines gestational diabetes. As ‘carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy (WHO, 1999),

Gestational diabetes is one of the most common complications of pregnancy. It is about 2-3% globally (CDC, 2003). In the United States, as highlighted by American diabetes association, 2007 that about 135,000 cases of pregnancy complicated by

gestational diabetes each year, Gestational diabetes affects about 4% of all pregnant women, by American diabetes association (ADA, 2007).

There are many factors which expose pregnant women to gestational diabetes mellitus such as obesity, hereditary factors, history of macrosomic babies, history of intrauterine fetal death , history of pregnancy induced hypertension or pregnancy accompanied with PIH .

Advanced antenatal care services for pregnant with gestational diabetes is important in screening, detecting, and measurement of pregnancy with gestational D.M. to prevent morbidity and mortality for pregnant mother and her fetus.

UNRWA plays a significant role in the antenatal care services for refugees in Gaza governorates, It provides services for (952.295) refugees in Gaza governorates in 2004 (33 157) pregnant women were newly registered in P.H.C. centers (UNRWA, 2004)

As stated in the annual report of UNRWA, 2004, each day about 1400 women die in pregnancy and childbirth, most deaths are due to hemorrhage, sepsis, abortion, obstructed labor, hypertensive disease of pregnancy. In Gaza governorates, eight deaths reported during 2004 (UNRWA, 2004).

Gestational diabetes have adverse complications " if not treated in correct way "on both mother and fetus , This is the first study of gestational diabetes conducted in UNRWA considering the effectiveness of A.N.C. services which will hopefully lead to decreasing in maternal and fetal morbidity and mortality. Assessment of antenatal care services provided to pregnant women is the key point for the identification of quality of services provided and the level of knowledge upon which the services built, it also clarifying the strong and weak points within the UNRWA antenatal care health

services for women with gestational diabetes. Decision makers for improving the detection, registration and management could take these points.

1.1 Justification of the study

Gestational diabetes is one of the common complications of pregnancy, its prevalence according to CDC, 2003 is 2-3% globally (CDC, 2003)**. T**he reported prevalence among pregnant women registered at UNRWA health centers in Gaza governorates is 0.46%. It is important therefore to verify the prevalence of GD among attendant pregnant women to UNRWA clinics. The prevalence of diabetes mellitus during pregnancy at UNRWA agency in Gaza, 2005 is estimated at 1.3% for both gestational and pre-gestational diabetes. Further analysis of data revealed that 35.0% of them were gestational diabetes (UNRWA, 2005). In 1999, a study revealed that prevalence of diabetes mellitus during pregnancy in UNRWA agency was established at 0.84 % (1999), from which 52% were gestational diabetes, (Sha'at, 2000).

UNRWA health reports indicate that there are many risk factors for GD such as : BMI (obesity), hereditary factors, history of macrosomic babies, history of IUFD, history of PIH or pregnancy accompanied (UNRWA 2004). This necessitates evaluating the process of identification and management of GDM including detecting affected cases. It is worth pointing that GDM exposes pregnant mothers for many risks such as increasing maternal and fetal mortality and morbidity. This has affected the selection of this topic meanwhile considering all its related aspects. Appropriate management of GDM is essential for improving the fetal and maternal outcomes. For example, good quality of A.N.C. appropriate screening, early detecting of pregnancy are important for decreasing hazards associated with GDM.

Interestingly, the screening and management of GDM at UNRWA clinics has been never investigated before. It is expected that this study will help to identify gaps in the management of GDM and to provide suggestions for corrective measures.

1.2 Aim of the study

The purpose of the study is to assess some aspects of antenatal care services provided to pregnant women with gestational diabetes mellitus at UNRWA H.C.s in Gaza governorates to have safe pregnancy and outcomes without much intervention.

1.3 Objectives.

1. To assess antenatal care services in terms of accessibility and Availability of equipment and supplement in UNRWA H C in Gaza governorates.
2. To assess the availability and the implementation of guideline that is related to gestational D.M and its management in UNRWA health centers in Gaza governorate.
3. To assess healthcare providers knowledge about GDM in UNRWA health centers in Gaza governorates.
4. To assess the knowledge of pregnant women of gestational D.M health services in UNRWA H.C.s in Gaza governorates.
5. To examine the level of client satisfaction with antenatal care health services provided to pregnant women with gestational D.M. in UNRWA health centers in Gaza governorate
6. To suggest recommendations that help to improve detection of cases of pregnant women with gestational diabetes at UNRWA H.Cs. in Gaza governorate.

1.4 Research questions.

1. How accessible are the antenatal care services for pregnant women with gestational diabetes at the UNRWA H.Cs in Gaza governorate?
2. Are there the necessary equipments and supplements for antenatal care services, which provided by UNRWA H.C. in Gaza governorate?
3. Are there guideline related to gestational D.M. and its management at UNRWA H.C. in Gaza governorate?
4. To which extend there is implementations of guideline that are related to gestational D.M. and its management in UNRWA H.C. in Gaza strip?
5. What is the level of knowledge of healthcare providers concerning gestational D.M. in UNRWA H.C. in Gaza strip?
6. What is the knowledge of the pregnant women of gestational diabetes?
7. What is the opinion of clients about services provided to pregnant women with gestational D.M. at UNRWA H.C. in Gaza governorate?

1.5 Feasibility and cost.

The study conducted at UNRWA primary health care centers, as a part of the researcher study for the master at the school of public health, Al-Quds University. After the approval of Al-Quds university, school of public health, there was a discussion with the responsible people in the UNRWA health especially the field health office, they were cooperative which made the implementation of the study more feasible. Regarding the study cost. This study is self-funded the researcher was responsible for all the needed cost. The managers of the PHC clinics At the UNRWA offered and provided support such as access to study population and ethical approval to conduct the study, which made the implementation more feasible

1.6 Context of the study.

The study is for assessment of antenatal care services provided to pregnant women with gestational diabetes, at UNRWA health centers in Gaza governorates.

Qualified healthcare providers of different qualification provide those health services, health services received by clients, both providers and clients influenced by the background of the situation, even their training and knowledge.

Health services which are delivered among the difficult situation in Gaza governorate for Palestinian refugee built upon all information related to their situation , Geographical and demographic situation ,educational, socioeconomic , and political ,so the following describe .relevant information presented the Palestinian population and their status .

1.6.1 Geographical and demographic characteristics.

Palestine Borders From the west the Mediterranean Sea along a coast of 224 kilometers, from the east is Syria and Jordan (360 Kilometer), Lebanon from the north (79 Kilometers). Palestine western border extends from Rafah until Taba and the Gulf of al-Aqaba (10 5 Kilometers).

The northern and the northeastern borders marked by a French-English agreement on 23 December 1920. The two countries to include areas of water resources modified this agreement two years later on 22nd 1923.

The entire area of Palestine is about 27,000 sq Km, including Tabariya, El-Hoola lakes and half of the area of the Dead Sea.

Gaza strip is a rectangular area that borders the Mediterranean Sea between Egypt and occupied Palestine .It lies on an area of 360 km^2 with a width of 6 km in north,

13 km in the south, it has total boundaries of 62 km, 11 of them with Egypt and 51 with occupied Palestine & a coastline of 40 km.

Gaza is a very overcrowded region with a density of 3860 I/km^2 & a total population of 1,389,789 divided into 5 governorates north of Gaza, Gaza, Midzone, Khanyonis and Rafah. 65.5% of the populations are refugees who are concentrated in (8) refugee

Camps namely: Jabalia, Beach, Deir El-Balah, Al-Maghazi, Al-Nussairat, Al-Boraige, Khan-Younos & Rafah (PNIC, 1999). UNRWA plays an essential role in the antenatal Care service for refugee in Gaza governorate, It covers (986.034) refugee population in Gaza strip, (34 .330) pregnant women were newly registered in P.H.C centers

Among refugees in 2005 (UNRWA, 2005) .this situation influence not only the health services and even the competency of the healthcare providers.

1.6.2 Economic status.

The Palestinian economy affected by two main factors during the last years. Firstly, continues deterioration of the social and economic situation due to the Israeli measures in the Palestinian Territory erupted at the outbreak of the second Intifada late September 2000 until 2008. The second factor is the changes in the policy of the donor community according to political reasons. The decline in the GDP during the 2006 compared with the 2005 is estimated to 3.6%, with GDP of 3,192 US $ million in 2006 and 1,152 GDP per capita Unemployment rate increased during the 3rd quarter of 2006 to reach 24.2% of total Increment (PCBS, 2006).

The total number of poor people in the Palestinian territory at the end of the second quarter 2006 reached 2.1 million persons compared with 1.3 million at the end of 2005.

1. During 2006, the Human Development Index (HDI) was estimated to decline by1%.

2. Gender Development Index (GDI) declined during 2006 by 5%.

3. GDP per capita declined by 10% (PCBS, 2006).

1.7 Demographic trends

1.7.1 Population size

1.7.1.1 Projection of Palestinians worldwide:

Population projections estimate the total number of Palestinians at the end of 2006 at 10.1 millions. 3.95 millions reside in the Palestinian Territory, Gaza Strip and West Bank including Jerusalem, (39.2%), 1.1 million (11.2%) live in occupied Palestine before 1948, 2.8 million (27.7%) in Jordan, 1.6 million (16.2%) in other Arab states, and 573 (5.7%) thousands live in other countries.

1.7.1.2. Palestinian Population in the Palestinian Territory:

About 4 millions of Palestinians live in the Palestinian Territory at the end of 2006, 2.5 millions (63%) of them in the West Bank and 1.5 million (37%) in Gaza Strip. According to the distribution of the population by Governorates, Hebron Governorate has the largest population size where 13.9% of the total population lives in Hebron. Gaza Governorate hosts 13%; Jerusalem Governorate comes third at 10.6%. On the other hand, Jericho and Al-aghwar Governorate has the lowest rate of population at the end of 2006 at 1.1 % (PHIC, 2006).

1.7.1.3 Distribution of the refugees:

According to the UNRWA report, the total number of refugees in Palestine is 1,685,851. The number of refugees in Gaza strip is 986, 034 and in the west bank 699.817 refugees (UNRWA, 2005)

1.7.1.4 Age distribution:

According to the most recent estimates, 46.3% of the population in the Palestinian Territory is under 15 years; 44.2% in the West Bank and 49.1% in Gaza Strip. The percentage of Palestinians who are 65 years and more in the Palestinian Territory is 2.8%; this figure reached 3.1% in the West Bank and 2.5% in Gaza Strip, (PHIC, 2005).

1.7.1.5 Distribution by sex:

The estimated number of males in Palestine is 1,905,642 of whom 703,532 in Gaza and 1,202.110 in the west bank. The sex ratio of males for females in Palestine at the end of 2006 was 102.7:100.

The number of females in Palestinian territory is 1,856,363 of whom 686,257 in Gaza and 1,170,106 in the west bank, (PHIC, 2005).

1.7.1.6 Dependency ratio in the Palestinian Territory:

Population statistics indicate that dependency ratio in the Palestinian Territories dropped from 101.3 in 1997 to 94.2 in 2006 where it declined from 94.7 in 1997 to 88.5 in 2006 in the West Bank and from 114.5 in 1997 to 104.7 in Gaza Strip in 2006, (PCBS, 2006).

1.7.1.7 Crude birth rate:

The crude birth rate in the Palestinian Territory dropped from 42.7 births per 1000 population in 1997 to 36.7 in 2006, (PCBS, 2006).

1.7.1.8. Crude death rate:

The crude death rate in the Palestinian Territory declined from 4.9 deaths per 1000 population in 1997 to 3.9 in 2006. (PCBS, 2006)

1.7.1.9 Population natural increase rate:

Population natural increase rate is 3.3% in the Palestinian Territory in 2006. This rate reaches 3.0% in the West Bank and 3.8% in Gaza Strip. The declining mortality rate and increasing fertility rate would lead to a high rate of natural increase in the population, (PHIC, 2006).

1.7.1.10 Fertility rate:

The total fertility rate in 2004 was 4.6 births; 4.1 births in the West Bank and 5.8 births in Gaza Strip, according to Demographic and Health Survey (DHS, 2004). The average number of children born to every married woman in the Palestinian Territories in 2004 was 4.5; 4.3 in the West Bank and 4.9 in Gaza Strip (PCBS, 2005).

1.7.1.11 Life expectancy:

Life expectancy in 2006 is 71.7 years for males and 73.0 years for females

The decline in mortality rate in the Palestinian Territories led to longer life expectancy to reach 71.7 years for males and 73.2 years for females in 2006. There

are regional discrepancies; life expectancy in the West Bank is 71.9 years for males and 73.6 years for females compared with 71.4 years for males and 72.5 years for females in Gaza Strip (PCBS, 2006).

1.8. Healthcare services.

Healthcare services provided by two major components of health care systems, ministry of Health MOH of the Palestinian National Authority (PNA), and the United Nations Relief and Work agency for Palestinian refugee (UNRWA)

The Non-governmental organization and the private sectors contribute to Health care providers.

1.8.1. Primary health care services.

Primary health care system (PHC) is a major component of the Palestinian health care system; this system has provided health care to all Palestinians especially for children and other vulnerable groups.

The MOH is working with other health sectors in providing primary health services mainly with UNRWA, and NGOs sector.

At the end of 2005, there were 654 PHC centers in Palestine; these centers provided services to about 3.7 million people (129 centers in Gaza and 525 centers in West Bank). They provided comprehensive MCH, school health, and dental health services in addition to non-communicable disease detection and management (PHIC, 2006).

1.8.1.1. Primary health care centers in Gaza strip:

56 centers in the Gaza Strip belong to the MOH

The highest ratio of population per center recorded in Rafah with 41,310 persons per center and the lowest ratio in Mid-Zone with 12,570 persons / center.

The total number of nongovernmental primary health care centers in the Gaza strip is 81 centers, distributed as follows: 55 centers run by NGOs (67.9%), 8 centers run by Medical Services for Police and General Security (9.9%) and 18 centers run by UNRWA (22.2%) (MOH, 2005).

1.8.2. Secondary health care services.

1.8.2.1. Hospital health Services:

Secondary health care delivery system is a mix of governmental, non-governmental, UNRWA and private sectors. With the development of governmental health insurance, the MOH is responsible for a significant portion of the secondary healthcare delivery system and some tertiary care activities, (MOH, 2006).

1.8.2.2. Hospitals in Palestine:

In Palestine, there are 77 hospitals furnished with 4,824 beds. Beds per 1000 are 1.37 by the end of 2006 according to the Palestinian central bureau of statistics (PCBS, 2008)

1.8.2.3. Hospital Categories:

In 2004, there were 43 general hospitals with 3,539 beds. 10 specialized hospitals with total bed capacity of 813 beds, 20 maternity hospitals at a total bed capacity of 315 beds and 4 rehabilitation centers with a total bed capacity of 157 beds (MOH, 2006).

1.8.3 Maternal health services.

Antenatal care services are a comprehensive care provided to pregnant women from the start of pregnancy throughout the puerperium i.e. 42 days after delivery, mainly in MOH and UNRWA.

1.8.3.1 Maternal health services in UNRWA:

Qualified team of health care providers, obstetricians, general practitioners, senior staff nurses, and midwives provides maternal health services in UNRWA. according to UNRWA guidelines for antenatal care which encourage early booking for pregnant woman ,and during 1st antenatal visit the health care provider takes a full history medical , personal ,social ,previous and current history of pregnancy .

For normal pregnancy, the schedule of visits is every month until 28 week then every two weeks until 36 weeks, and then one visit weekly until delivery. Antenatal care for pregnant woman in UNRWA divided into normal pregnancy, alert pregnancy and high-risk pregnancy. Midwives carry out follow up of normal pregnancy; any deviation from normality classified as alert pregnancy with one risk factor in past or present history of the current pregnancy and followed up by general practitioner. If there are two risk factors according to the risk score of UNRWA health standards the pregnancy is classified as high-risk pregnancy and follow up is carried out by an obstetrician. Frequent antenatal visits including pregnant women with gestational diabetes mellitus, which is according to the guidelines every two weeks.

UNRWA guidelines for GDM

Definition of gestational DM:

Gestational DM is any degree of carbohydrate intolerance of variable severity with onset or first recognition during pregnancy. It complicates 2-5% of all pregnancies

Surveillance

- Fasting plasma glucose is recommended screening test for gestational DM and should be performed as follows:
    - At first antenatal visit for all pregnant women age 25 years and more and all women with past history of large babies ,women with glucosuria or previous history of gestational diabetes, family history of diabetes mellitus , regardless of age .
    - Between 24-28 weeks of gestation for all pregnant women regardless of age.
- The oral glucose tolerance test (OGTT) should perform for pregnant women with a fasting plasma glucose between 100 and 125 mg/dl to rule out or to confirm the diagnosis of GDM.
- Confirmation of the diagnosis of gestational diabetes and initiation of management are based on :
    - Fasting plasma glucose ≥ 126 mg/dl.
    - 2-hour plasma glucose ≥ 140 mg/dl after 75 g oral glucose
- Pregnant women with major risk factors should be closely monitored for possible development of gestational diabetes at any time of pregnancy

Monitoring

- Monitoring of glycemic control made by measuring plasma glucose 1-2 hours after meals, 1-2 weeks interval. Acceptable levels are between 140-160 mg/dl. If plasma glucose is higher, further assessment needed.
- Blood pressure measurement and urine analysis is required
- Assessment of fetal growth by U/S particularly early in third trimester helps identify fetuses with macrosomia that can benefit from maternal insulin therapy.

Management

- Nutritional counseling
- exercise should be encourage
- Oral hypoglycemic agents are contraindicated during pregnancy
- Combination of insulin therapy and lifestyle modifications have been shown to reduce fetal morbidity
- Insulin therapy initiated when life style modifications have failed to maintain 1-2 hour post-prandial plasma glucose levels in range of 140-160 mg/dl.
- The dose of insulin
    - The insulin used is a mixture of short acting (1/3) and intermediate acting (2/3).
    - The initial total daily dose is 0.2-0.3 units/kg body weight divided into two doses morning and evening. Two thirds of the total dose is given in the morning and one third is in the evening
    - A bedtime snack is mandatory

If the patent is not responding to the above maximum dose, the patient referred to hospital without taking risk by increasing the dose of insulin (**UNRWA guidelines for GDM)**

1.9 Limitation of the study

- Limited financial resources
- Electricity interruptions for long time make Limitation for preparing the study
- Limitation of time of researcher, time of participants
- The political and socio-economic situation made difficulty in different location.
- Pregnant women who have heavy responsibility or medical problem create limitation to the study, which need more time in preparing for meeting.

Chapter 2

Literature review

Chapter 2: Literature review

2.1. Antenatal care.

Looking after pregnant women presents one of the paradoxes of modern medicine. Normal women proceeding through an uneventful pregnancy require little formal medicine. Conversely, those at high risk of damage to their own health or that of their fetus requires the use of appropriate scientific technology. Accordingly, there are two classes of women, the larger group requiring support but not much intervention and the other needing the full range of diagnostic and therapeutic measures as in any other branch of medicine. To distinguish between the two is the aim of a well runs antenatal service. Antenatal clinics provide a multiphase screening service; the earlier women are screened to identify those at high risk of specified problems the sooner appropriate diagnostic tests can be used to assess such women and their fetuses and treatment can be started. As always in medicine, diagnosis must precede treatment, for unless the women who require treatment identified specifically, management cannot applied.

2.1.1. Definition of antenatal care:

World health organization (WHO), 1996 defined Antenatal care as "the care refers to pregnancy related care provided by a health worker either in a medical facility or at home, in theory antenatal care should address both the psychosocial and medical needs of the woman in the context of the health care delivery system and the surrounding culture (WHO, 1996). The maternal and neonatal health program (MNH), 2001, defines the antenatal care as" the care a woman receives throughout her pregnancy (MNH, 2001).

2.1.2. History of antenatal care:

Before 1920s antenatal care clinics for pregnant women were rare as mentioned by WHO, 1996.It started in Edinburgh, as midwifery departments of hospitals and interested general practitioners saw women at intervals to check their urine for protein, or palpated the abdomen, Most pregnant women had one consultation before labor, when they booked. Doctors were concerned with antenatal care only "if any of the complications of pregnancy should be noticed"; all attention centered on delivery and its mechanical enhancement. Little attention paid to the antenatal months (WHO, 1996). After the 1920s Rooney, 1992 said that a wider recognition emerged of the maternal problems of pregnancy as well as those of labor; and mentioned that (Janet Campbell), one of the clear thinking women in medicine, started a national system of antenatal clinics with a uniform pattern of visits. Her pattern of management can recognize today in all the clinics of the Western world. , Campbell's ideas became the clinical obstetric screening service of the 1930s (Rooney, 1992)

2.1.3. Key elements of antenatal care:

Carroli, Rooney and Villar, 2001, told that most of antenatal care program in developing countries were following that in developed countries, with little adjustment for local conditions. In recent years, antenatal care standard and components have been subjected scientific evaluation to determine their effectiveness (Carroli, Rooney and Villar, 2001).

In 2001, WHO published the conclusions of a randomized controlled trial of a new model of antenatal care, and carried out a systematic review of other randomized trials, that looked at the effectiveness of different models of antenatal care (Villar, et

al, 2001). This work has led to a growing consensus around key elements of antenatal care that are likely to improve maternal and/or perinatal health outcomes, though it is important to note that these outcomes tend to be either maternal and perinatal health or perinatal survival, not maternal survival (WHO, 2001).

The new WHO model of antenatal care separates pregnant women into two groups those likely to need only routine antenatal care (75% of the total population of pregnant women), those with specific health conditions or risk factors that necessitate special care (25% of pregnant women). For the first group, a standard program of four antenatal visits is recommended (with additional visits should conditions emerge which require special care). The WHO, 2001 guidelines are also specific as regards the timing and content of antenatal care visits according to gestational age. The guidelines stipulate that "only examinations and tests that serve an immediate purpose and that have been proven to be beneficial should be performed" These examinations include measurement of blood pressure, testing of urine for bacteriuria and proteinuria, and blood tests to detect syphilis and severe anemia. Routine weight and height measurement at each visit considered optional. However, evidence-based programming on the optimal number, timing and content of antenatal visits is not yet routine in most settings (WHO, 2001).

2.1.4. Antenatal care services in Palestine:

Antenatal care is an essential part of health care in Palestine; serious attention is paid to the health of the pregnant woman and her fetus. In Palestine there are four health sectors providing maternal care as described by (MOH, 2005), they are, the MOH, UNRWA, the NGOs and the private doctors. There are 353 MCH clinics in MOH and 53 clinics in UNRWA providing antenatal care. The number of visits paid per

pregnant woman was 5.5 in Palestine (6.5 in GS and 4.8 in WB). In UNRWA, it was reported at 7.6 visits per pregnant women in Gaza Strip, the percent of women who paid 7-9 visits was 47.5%. According to DHS in 2005, Data showed that 96.5% of women aged 15-49 years received antenatal care in Palestine (MOH, 2005).

2.1.5. Accessibility of Antenatal care Services:

2.1.5.1. Main components of Accessibility to primary health care:

Edmonton, 2000 describe accessibility of Services, as one of the main components of primary health care and according to the World Health Organization is that health Services must be accessible. An accessible health system makes health services available to all who need them without barriers or long delays. Language, culture, distance, lack of common standards, regional boundaries, and other obstacles to effective health services are identified and eliminated as much as possible (Edmonton, 2000), a method for estimating the geographical accessibility used to determine the minimum travel time and distance to the closes geographical accessibility is but one of many dimensions in the accessibility of health care. Other dimensions of accessibility, identified by the World Health Organization, 2000 are financial, cultural and functional dimensions, in perhaps the seminal text on the topic of geographic patterns of health service delivery, present "locational" and "effective" accessibility as the defining components of any accessibility description. "Locational" accessibility refers to the physical proximity of the service. This measure is inherently geographical. However, "effective" accessibility is somewhat more complex as it includes opening hours of a service, social and financial availability of the service, and personal space-time budgets. These measures are more difficult to model what is

important to the latter group is that a method for calculating physical accessibility has been described and demonstrated to be useful (Edmonton, 2000).

According to Hurley, Birch, Stoddart and Torrance**,** in 1997 accessibility focus into three dimensions, needs, utilization, outcomes, access to appropriate population will result in improvement of health status (Hurley, Birch, Stoddart and Torrance, 1997**)**

2.1.5.2. Accessibility indicators:

Edmonton, explain the core standard transport indicators relevant to the health sector are, Access to hospitals, within 30 and 60 minutes from a hospital by public transport, Access to GPs: within 15 and 30 minutes from a GP by public transport (Edmonton, 2000).

2.1.6. Antenatal care assessment:

WHO on 2003 stated that: Efforts to monitor progress in coverage of antenatal care have generally focused on quantifiable issues such as the number and timing of visits. The World Summit for "access" to antenatal care with at least five different components of access: physical availability of services, distance and/or time to a facility, economic and other costs associated with use of services, cultural and social factors that may prevent access, and quality of services offered. Despite the broad consensus on what the content and quality should be. The antenatal care services in many parts of the world, fail to meet the standards recommended by WHO (WHO, 2003) .Some information on the content of care is now available from recent Demographic and Health Surveys (DHS) which included questions about antenatal interventions such as height and weight checking, blood pressure testing, and blood and urine testing. For the most part, however, the available data do not report on specific interventions or the quality of care. The analysis that follows should treated

with a certain degree of caution. In most developing countries, information on the use of antenatal care services obtained from household surveys. Such surveys have been conducted over the past decade by many organizations, including the Demographic and Health Surveys (PCBS,2004), supported by the United States Agency for International Development, the Multiple Indicator Cluster Surveys (MICS) supported by UNICEF, and the PAPCHILD surveys.

These pose a similar series of questions to women who have had a live birth in a specified period (ranging from one to five years), asking whether and from whom the woman received antenatal care, the number of visits and, more recently, the content of the visits (WHO, 2003). In the DHS surveys conducted in the first half of the 1990s, women respondents of reproductive age (15-49 years)a were asked to provide information about pregnancies resulting in live births that occurred during the five years prior to the interview date (PCBS,2004).

In most of the subsequent surveys, the reference period reduced to the three years prior to the interview. In the most recent surveys (PCBS, 2004), information is collected only about the last birth in the last five years.

The MICS surveys use methodology and questions similar to those of the DHS surveys, but the information collected only for live births occurring within the previous year. Regardless of the reference period, women asked whether they saw anyone for antenatal care during the pregnancy. Those who respond ‘yes’ are asked to list all of the people they saw (UNICEF, 2004) In the analysis below, for women listing more than one person seen, only the most qualified person is counted. The woman then asked how many months pregnant she was at the time of the first visit and how many visits she had in total during the pregnancy (WHO, 2003). While every effort is made to ensure that the data reported are accurate, it is clear that much

depends on the ability of the respondent to identify correctly the type of health care provider she saw, whether a qualified doctor, midwife, nurse or other country-specific category of provider.

Broadly speaking, the term 'skilled attendant' embraces qualified doctors, midwives, nurses and providers with equivalent levels of skills. Traditional birth attendants and other practitioners who are not part of the formal health care system not defined as skilled providers (WHO, 2003).

2.1.7. Current use of antenatal care:

WHO, which studied antenatal care in developing countries performed in 2003 stated that over 70% of women worldwide have at least one antenatal visit with a skilled provider during pregnancy (Figure 2.1).

In the industrialized countries, coverage is extremely high, with 98% of women having at least one visit. In the developing world, antenatal care use is around 68%, but this indicates considerable success for program aimed at making antenatal care available. In the Middle East and North Africa, use of antenatal care is 65% of pregnant women report at least one antenatal visit (WHO, 2003).

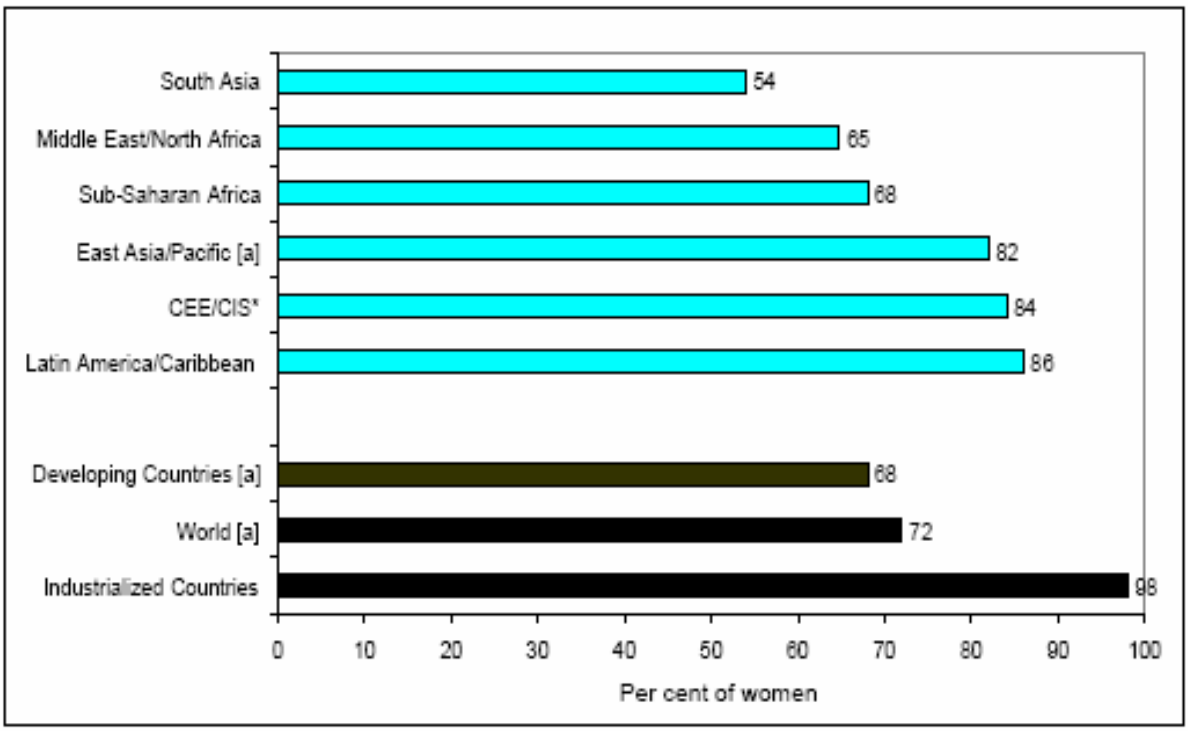

Figure 2.1: Antenatal care by region in developing countries, (WHO, 2003)

WHO, 2003 reported that the extent of antenatal care have been largely successful. Only in a few countries, antenatal care use fall below 50% of pregnant women. Nothing mentioned about the quality of care. It is clear that women are able and willing to present for antenatal care services, which can help improve their health and that of their infants (WHO, 2003).

According to the UNECIF and WHO data the antenatal coverage in Palestine is 96% which puts it among the best coverage numbers in the Middle East just behind the Emirates and Bahrain (UNECIF,2004)

2.1.8. Healthcare provider's qualification:

Villar and Khan-Neelofur, 2003 describes one systematic review assessed the clinical effectiveness and perception of antenatal care by type of antenatal care provider, i.e. midwife and general practitioner-led managed care was compared with obstetrician and gynecologist-led shared care (Villar and Khan-Neelofur, 2003). Three trials were

included in the study, randomizing 3041 women who were low risk (i.e. no medical or obstetrical complications). The two largest trials were set in Scotland (n = 2952). Of these, one assessed midwifery-led care and the other assessed care led by midwives and GPs No differences were observed between the midwife and GP-managed care and the obstetrician and gynecologist-led shared care for preterm birth, caesarean section, anemia, urinary tract infections, Antepartum hemorrhage and perinatal mortality. However, the midwife and GP managed care group had a statistically significant lower rate of pregnancy-induced hypertension and pre-eclampsia than the standard care group. This could result from either a decreased incidence or decreased detection (Villar and Khan-Neelofur, 2003).

There was no significant difference in the levels of satisfaction with the types of care provided between the two groups. Based on this meta-analysis of 3041 women from three trials, midwife-managed or midwife and GP-managed antenatal care programs for women at 'low risk' did not increase the risk of adverse maternal or perinatal outcomes. Midwife and GP-led models of care should offer for women with an uncomplicated pregnancy. Routine involvement of obstetricians in the care of women with an uncomplicated pregnancy at scheduled times does not appear to improve perinatal outcomes compared with involving obstetricians when complications arise. (Villar and Khan-Neelofur, 2003)

2.2. Gestational diabetes.

2.2.1. Definition of gestational diabetes:

The World Health Organization (WHO), 1999 as 'carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy', defines gestational diabetes (WHO, 1999). Alberti and Zimmet, 1998

defined Gestational diabetes as diabetes detected in pregnant women who have never had diabetes before but who have high blood sugar (glucose) levels during pregnancy (Alberti and Zimmet, 1998).

2.2.2. Prevalence of gestational diabetes:

American diabetes association, 2007 highlighted that Gestational diabetes affects about 4% of all pregnant women - about 135,000 cases of gestational diabetes in the United States each year (ADA, 2007). Study shows that the prevalence of Gestational Diabetes Mellitus is increasing Over Time; the increasing GDM prevalence suggests that the vicious cycle of diabetes in pregnancy initially described among Indians may also be occurring among other U.S. ethnic groups (Dana, et al, 2005), Gestational diabetes affects 3-10% of pregnancies, depending on the population studied (Thomas, et al, 2005)

2.2.3. Prevalence of gestational diabetes in Palestine:

No studies conducted for prevalence of gestational diabetes in Palestine (MOH),but in UNRWA agency the prevalence of diabetes mellitus during pregnancy in 2005 was established at 1.3% in Gaza and 2.1% in west bank. Further analysis of data revealed that 35% of them were gestational diabetes, 34.9% of them were with pre-existing diabetes, (UN annual health report, 2005), which is below the expected rate of 3%. Previous study conducted in Gaza governorate in which mentioned that ^{the} prevalence of diabetes mellitus during pregnancy in UNRWA agency was established at 0.84 %(1999). 52.0% of them were gestational diabetes, 48.0% of them were with pre-existing diabetes, further efforts needed in order to improve detection rate (sha'at, 2000)

2.2.4. Risk factors for GDM

Dornhorst and colleagues, 2002, showed that study conducted in UK results were 1.5% (170/11205) of women diagnosed with gestational diabetes. Women with gestational diabetes were significantly older (32.3 versus 28.3 years, $p<0.001$), had higher BMI (27.7 versus 23.8, $p<0.001$), and were more likely to be from an ethnic minority (55.4% versus 15.3%, $p<0.0001$). Rates of gestational diabetes by ethnicity were: White 0.4% (26/6135), Black 1.5% (29/1977), South-East Asian 3.5% (20/572), and Indian 4.4% (54/1218) Dornhorst and colleagues find that using risk factors alone as a screening test produced low sensitivities (50-69%) and specificities (58-68%; eight studies) (Dornhorst, et *al*., 2002).

One non-randomized, uncontrolled observational study that gave all women (n=1185) a 75g OGTT found 39.2% (31) of women with gestational diabetes had no risk factors and would have been missed if only selective testing was used. In this study, women with no risk factors had a gestational diabetes prevalence of 4.8% (Moses, Griffiths and Davis, 1995)

Ostlund and Hanson, 2003 stated that a prospective population-based study conducted in Sweden offered all pregnant women without diabetes a 75g OGTT at 28-32 weeks' gestation Seventy-four percent (3616/4918) of women agreed to the OGTT. Women who did not take the OGTT were more likely to be multiparous and of non-Nordic origin but were less likely to have a family history of diabetes, previous macrosomic baby or previous gestational diabetes. Of the women who had the OGTT, 1.7% (61) had gestational diabetes. The risk factors with the strongest association were previous gestational diabetes and previous macrosomic baby. Other risk factors were family history of diabetes, non-Nordic origin, BMI ≥30 kg/m and age ≥ 25 years (Outland and Hanson, 2003). In the context of previously mentioned study, the following

shown to be independent risk factors for gestational diabetes and should be recognized as such by healthcare professionals:

- Age $\geq$ 25 years.
- Unexpected stillbirth.
- Previous congenital anomalies
- BMI >30 kg/m^2
- previous macrosomic baby (> 4500 g) ,
- previous gestational diabetes ,
- family history of diabetes (first-degree relative with type 1 diabetes or type 2 diabetes) , ethnicity (high-risk ethnic groups include South Asian (Indian, Pakistani, Bangladeshi, Black, Caribbean, and, China)

2.2.5. Diagnosis of gestational diabetes:

The following Table summarizes the 2006 WHO recommendations for the diagnostic criteria for diabetes and intermediate hyperglycemia.

Diabetes

Fasting plasma glucose ≥ (126mg/dl)
Or
2–h plasma glucose* ≥ (200mg/dl)

Impaired Glucose Tolerance (IGT)

Fasting plasma glucose < (126mg/dl)
And
2–h plasma glucose* ≥ 140mg/dl and < 200mg/dl

Impaired Fasting Glucose (IFG)

Fasting plasma glucose 110mg/dl to 125mg/dl
and (if measured)
2–h plasma glucose* < (140mg/dl)

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* Venous plasma glucose 2–h after ingestion of 75g oral glucose load

* If 2–h plasma glucose is not measured, status is uncertain as diabetes

or IGT cannot be excluded

For diagnosis of gestational diabetes the most commonly used tests are the 2-hour 75g OGTT used by the WHO (Table 2.1) (WHO, 2001).

Table 2.1: World Health Organization criteria for the 75g OGTT

75 g glucose load test	World Health Organization
Fasting glucose	≥126 mg/dl
2 hour glucose	≥140 mg/dl

Levels of glucose intolerance and adverse pregnancy outcomes three cohort studies found adverse pregnancy outcomes increased with increasing gradients of glucose

intolerance. In all three studies, the glucose intolerance was previously undiagnosed and untreated and the confounding effects of obesity and maternal age were controlled. The evidence shows that when gestational diabetes is diagnosed using the 2-hour 75g OGTT and the WHO criteria there is an increased incidence of (treatable) maternal and neonatal complications. Therefore, the 2-hour 75g OGTT adopted using the WHO criteria as the diagnostic test for gestational diabetes administered at 24-28 weeks' gestation (WHO, 2001).

2.2.6. Recommendations for diagnosis of gestational diabetes:

WHO , 2001 recommended that The 2-hour 75g oral glucose tolerance test (OGTT) should be used to diagnose gestational diabetes at 24-28 weeks' gestation using the criteria defined by the World Health Organization (WHO , 2001).

Tallarigo, 1995 first study divided women with normal results on a 100g OGTT (O'Sullivan and Mahan criteria) into three groups. Group A (n=151) had 2-hour glucose levels <5.6 mmol/l, group B (n=58) had 2-hour levels of 5.6-6.6 mmol/l and group C (n=40) had 2-hour values of 6.6-9.1 mmol/l.

They found a positive correlation between the 2-hour glucose level and macrosomia and maternal complications (toxemia and/or caesarean section; test for linear trend, $p<0.01$). (Tallarigo, et al, 1995)

Sermer and colleagues, 1998 in second study found that of 3352 women with 75g OGTT FBG <5.8 mmol/l and 2-hour values <11.0 mmol/l. a progressive increase in the prevalence of macrosomia with incremental fasting, 1-hour and 2-hour values (Sermer, *et al* , 1998).

Sacks, 1995, mentioned that in the third study was of 3352 women who did not fulfill the National Diabetes Data Group (NDDG) criteria for gestational diabetes. It found progressively increasing plasma glucose associated with increased incidence of macrosomia and caesarean section (Sacks, *et al,* 1995).

All three studies found that women with levels of glucose tolerance above normal but below the threshold values for gestational diabetes significantly higher risk of adverse maternal and neonatal outcomes.

2.2.7. Screening of gestational diabetes:

Rayner, Petersen, Buckley and Press, 2001 explained that, currently an unselected pregnant population will have the risk of gestational diabetes. Assessed using risk factors such as, BMI > 30 kg/$m^{2,}$ previous macrosomic baby (≥ 4000g), previous gestational diabetes, family history of diabetes (first-degree relative with type 1 diabetes or type 2 diabetes), high-risk ethnic group, which would include (South Asian (Indian, Pakistani, Bangladeshi) Black Caribbean, Chinese (Rayner, Petersen, Buckley and Press, 2001).

According to a 1999 survey, Mires, Williams and Harper, 1999 mentioned that 67% of UK maternity service providers currently screen using a combination of these factors. The evidence for screening using risk factors is unclear. However, whilst screening using risk factors is less sensitive than performing a GCT or OGTT, it is more practical and less disruptive for women

Hypoglycemic therapy considered for women with gestational diabetes if diet and exercise fail to maintain blood glucose targets during a 1-2 week period or if ultrasound investigation suggests fetal macrosomia. Screening for gestational diabetes based on risk factors alone has low sensitivity and specificity compared to two-stage screening or universal administration of OGTTs. . (Mires, Williams and Harper, 1999)

2.2.8. Treatment of gestational diabetes during pregnancy

Crowther, et al,2005 stated that treating gestational diabetes as defined by the WHO improves outcomes for women and babies Treatments for gestational diabetes include lifestyle interventions such as diet and exercise, self-monitoring of blood glucose, and hypoglycemic therapy (using regular insulin, and/or short-acting insulin analogues [lispro and aspart]). The primary goal of interventions for gestational diabetes is to maintain near normal glycemic control in order to reduce morbidity and mortality in women and babies. (Crowther, *et al*, 2005*)*

2.2.81. Diet and Calorie restriction

Dornhorst and Frost, 2002 mentioned that the goals of dietary interventions in pregnancies complicated by diabetes are the optimization of glycemic control while avoiding ketoacidosis and minimizing the risk of hypoglycemia in women taking insulin (Dornhorst and Frost, 2002).

De Veciana, *et al, 1995* stated that in women with gestational diabetes adverse outcomes have been associated with postprandial hyperglycemia therefore the important aim of dietary therapy is reducing postprandial glucose levels. Between 82% and 93% of women with gestational diabetes will achieve blood glucose targets on diet alone. A diet that is high in unrefined carbohydrates improves overall glucose control and reduces postprandial glucose level (de Veciana, *et al, 1995).*

2.2.8.2. Exercise

a study done by Jovanovic, Durak and Peterson ,1989 which showed they compare diet to diet plus exercise in women with Gestational diabetes 20 women with gestational diabetes were randomized to diet or diet plus 20 minutes of supervised exercise three times a week. Exercise consisted of arm movements while seated in a

chair. By the sixth week women in the diet plus exercise group had The glucose challenge fasting value was 3.9±0.4 mmol/l compared to in the diet-only group 4.8 ± 0.3 mmol/l ($p<0.001$).. The 1-hour postprandial value was 5.9±1.0 mmol/l versus 10.4±0.16 mmol/l, $p<0.001$,.exercise in conjunction with diet, improves blood glucose control, over and above the improvement achieved by diet alone, and may reduce the need for insulin .(Jovanovic, Durak and Peterson ,1989) .

2.2.83. Blood glucose monitoring

Mires, Williams and Harper, 1999, recommended that: Blood glucose targets during pregnancy for women with gestational diabetes are a pre-prandial value of 3.5-5.9 mmol and a 1-hour postprandial value of <7.8 mmol/l. Moreover, recommended for self-monitoring of blood glucose during pregnancy are to test FBG levels and to test blood glucose 1 hour after eating (Mires, Williams and Harper, 1999)

2.2.8.4. When to initiate insulin

Thompson, *et al*, 1990 describe when to initiate insulin therapy, which is needed when near-normal blood glucose control cannot be achieved by diet alone. The duration of dietary treatment prior to initiation of insulin will depend on gestational age at diagnosis and the level of glycemic control. Another randomized controlled trial (RCT) randomized 108 women with gestational diabetes to receive either diet alone or diet plus insulin for glycemic control. Blood glucose levels evaluated weekly in a high-risk clinic where medical and nutritional support and counseling provided. Among 68 women successfully treated for a minimum of 6 weeks, the mean birth weight and macrosomia rate reduced significantly in the insulin-treated group. Insulin reduced birth weights significantly in women receiving insulin. Women with poor glycemic control were at greatest risk (30%) for fetal overgrowth whether initially receiving insulin or not. (Thompson, *et al*, 1990)

2.2.8.5. Insulin analogues

Jovanovic, *et al*' 1999 mentioned that by An RCT randomly allocated 42 women with insulin-requiring gestational diabetes to either insulin lispro or regular insulin. The women receiving insulin lispro had significantly lower glucose excursions after a test meal and experienced fewer episodes of hypoglycemia. There was no difference in obstetric or fetal outcomes. (Jovanovic, *et al*' 1999)

2.2.8.6. Summary of treatment

Gestational diabetes treated initially with diet and exercise. If near-normal blood glucose not achieved by diet and exercise alone, or if ultrasound scans, suggest fetal

macrosomia, hypoglycemic therapy initiated. Insulin therapy using regular human insulin or short-acting insulin

Hypoglycemic therapy for women with gestational diabetes tailored to the glycemic profile of the individual and acceptability to the woman.

2.3. Antenatal care for woman with gestational diabetes

2.3.1.Target ranges for blood glucose during pregnancy

There is evidence that high blood glucose levels during pregnancy are associated with fetal macrosomia and associated birth injury and caesarean sections and fetal morbidity. Postprandial blood glucose levels have a stronger association with incidence of macrosomia.

Hod, Jovanovic, Renzo, Leiva and Langer **,** 2003 stated that by two RCTs they found that monitoring of postprandial blood glucose produced better outcomes than pre-prandial monitoring. There is evidence that in women without diabetes blood glucose levels in the third trimester of pregnancy are lower than in non-pregnant women measurements in the second and third trimesters of pregnancy.

The evidence suggests that the important intervention for preventing fetal macrosomia is blunting postprandial blood glucose peaks and, therefore, the postprandial blood glucose target for women during pregnancy should be lower than when not pregnant. As in the pre-conception period, the targets for blood glucose control during pregnancy should agreed with the individual woman taking into account the risk of hypoglycemia.

Fetal macrosomia: The term macrosomia is often used to describe birth weight > 4000g or refer to birth weight ≥ 90th percentile for gestational age, There are two types of macrosomia: symmetric and asymmetric. Symmetric macrosomia accounts for about 70% of cases. In symmetric macrosomia, the baby is big but the only potential problem is trauma during delivery. The baby is at risk of shoulder dystocia,

clavicular fracture and brachial palsy, consequently, the woman is more likely to undergo caesarean section. (Hod, Jovanovic, Renzo, Leiva and Langer, 2003)

2.3.2. Monitoring blood glucose and ketones during pregnancy

Rosenn, *et al*' 1996 stated that high quality RCTs have found better pregnancy outcomes for women with diabetes when blood glucose is monitored 1-hour after meals than when monitored before meals. In addition, treatment package that included self-monitoring of blood glucose improved outcomes in women with gestational diabetes compared to routine obstetric care. Women with diabetes advised to test fasting blood glucose levels and 1 hour after eating during pregnancy. Women with insulin-treated diabetes advised to test blood glucose levels before going to bed during pregnancy. (Rosenn, *et al*' 1996)

2.3.3..Recommendations for management of diabetes during pregnancy

Healthcare professionals should be aware that short-acting insulin analogues have advantages over soluble human insulin during pregnancy and should consider their use. Women with insulin-treated diabetes advised of the risks of hypoglycemia and hypoglycemia unawareness in pregnancy, particularly in the first trimester.

2.3.4.Screening for congenital malformations

McLeod and Ray, 2002 said that Women with diabetes have an increased risk of having a baby with a congenital malformation. Major congenital malformations affecting babies of women with diabetes include cardiac, neural tube and genitourinary anomalies. As reported in published studies. The benefits of screening for congenital malformations include the opportunity for counseling, enabling

families' time to prepare, allowing antenatal treatment, and ensuring appropriate obstetric management (McLeod and Ray, 2002).

2.3.5. Monitoring fetal growth and wellbeing

Women with diabetes offered ultrasound monitoring of fetal growth and amniotic fluid volume every 4 weeks from 28 to 36 weeks' gestation.

Routine monitoring of fetal wellbeing before 38 weeks' gestation not recommended for women with diabetes, except for those women with diabetes who are at risk of intrauterine growth restriction (IUGR).

2.3.5.1. Fetal growth

Hod, Jovanovic, Renzo, Leiva and Langer, 2003 stated that Women with gestational diabetes are at increased risk of having a baby with macrosomia. Macrosomia is defined in terms of absolute birth weight (usually > 4000 g) or birth weight percentile for gestational age (usually ≥ 90th percentile), also referred to as LGA. Macrosomia is a risk factor for shoulder dystocia, brachial plexus injury, asphyxia or prolonged labor, operative delivery and postpartum hemorrhage. (Hod, Jovanovic, Renzo, Leiva and Langer, 2003)

Stratton, *et al*, 1995 highlighted that women with diabetes are also at risk of having a baby that is SGA. The risks associated with a baby that is SGA are not as well documented as for macrosomia, but at least one study was identified that suggested that babies who were SGA (<10th percentile for gestational age) have an increased risk of perinatal morbidity and mortality (Stratton, *et al*, 1995). There is no clear consensus for monitoring fetal size in pregnant women with diabetes (Coomarasamy, et al, 2005). Kehl, et al, 1996 said that Clinical assessment of fetal size is by measurement of the symphysis-fundal height, fetal size measured by sonography, the

two main ultrasonic methods for predicting birth weight are estimated fetal weight and abdominal circumference of the fetus. Abdominal circumference considered a more relevant measure of diabetes-related macrosomia and the risk of shoulder dystocia. Abdominal circumference also has the advantage of being a single measure that is accessible even when the head is engaged in the pelvis. In the absence of comparative data on the effectiveness of different methods of ultrasound monitoring of fetal growth, fetal growth and amniotic fluid volume (to detect polyhydramnios) monitored by ultrasound every 4 weeks from 28 weeks' gestation to 36 weeks' gestation. This would represent a change in clinical practice, which would effect a reduction in the frequency of monitoring for fetal growth and amniotic fluid volume in women with diabetes and would therefore bring a cost saving to the NHS. Fetal growth and amniotic fluid volume should be measured in all women with gestational diabetes (i.e. even in women with gestational diabetes controlled by diet alone) because of the increased risk of macrosomia. (Kehl, et al, 1996)

2.3.5.2. Fetal wellbeing

Williams, et al, 2003 explain that obstetricians to monitor fetal wellbeing use three main tests. These are umbilical artery Doppler ultrasound velocimetry, fetal cardiotocography (non-stress test) and the biophysical profile and fetal wellbeing. That appropriately timed intervention (induction of labor or caesarean section) may reduce the risk of perinatal morbidity, admission to neonatal intensive care, asphyxia and fetal death Evidence shows that monitoring for fetal wellbeing using umbilical artery Doppler ultrasound is a better predictor of pregnancy outcome than fetal cardiotocography and biophysical profile in women with diabetes (Williams, et al, 2003*)*.

2.3.6. Timetable of antenatal appointments for pregnant women with gestational diabetes.

Williams, et al, 2003 recommended that women with diabetes who are pregnant offered early referral to a joint diabetes and antenatal clinic. The diabetes care team for assessment of glycemic control every 1-2 weeks throughout pregnancy. Antenatal appointments for women with diabetes should cover the following issues in addition to the issues covered by routine antenatal appointments.

- *first appointment* confirm viability of pregnancy and gestational age, take a clinical history to establish the extent Of diabetes complications, review medications for diabetes and its complications,
- *16 weeks: 20 weeks'* gestation – offer four-chamber view of the fetal heart and outflow tracts plus scans that would be offered at 18-20 weeks' gestation as part of routine antenatal care.
- *25 weeks gestation*: there is no different to routine antenatal care.
- *28weeks gestation*: offer ultrasound monitoring of fetal growth and amniotic fluid volume.
- *32 weeks gestation*: offer ultrasound monitoring of fetal growth and amniotic fluid volume plus all investigations that would be offered at 31 weeks' gestation as part of routine antenatal care (no appointment at 31 weeks' gestation for women with diabetes) (Williams , et al ,*2003*).
- *34 weeks gestation*: no different to routine antenatal care, 36 weeks gestation – offer ultrasound monitoring of fetal growth and amniotic fluid volume and offer information and advice about timing mode and management of birth, analgesia and anesthesia, changes to hypoglycemic therapy during and after birth,

- *38 weeks gestation*: offer induction of labor, or caesarean section if indicated, and tests of fetal wellbeing for women with diabetes who are awaiting spontaneous labor
- *40-41 weeks gestation*: no different to routine antenatal care.(Williams , et al , *2003)*

2.4. Complication of gestational diabetes.

2.4.1.maternal complication of gestational diabetes

Pre-term birth in women with gestational diabetes

Incidence of pre-term birth

Lauszus, et al 2006 describe a prospective cohort study examined the importance of glycemic control and risk of pre-term birth in women with diabetes who have normal albuminuria and no pre-eclampsia during pregnancy. The overall rate of pre-term birth was 23%; (Lauszus, et al 2006)

Antenatal steroids for planned pre-term birth*:*

Giugliano, et al' 1981 stated that antenatal steroids administered to women who have a spontaneous or planned pre-term birth to accelerate fetal lung development and prevent respiratory distress Syndrome. The use of steroids in women with diabetes is associated with a significant worsening of glycemic control requiring an increase in insulin dose. In addition, mentioned that two studies that reported on approaches to modifying insulin dose in women undergoing antenatal steroid treatment showed that glycemic control could be improved by increasing the insulin dose immediately prior to and during administration of antenatal steroids. However, the two protocols evaluated were only moderately successful in keeping blood glucose levels at the desired level (<7mmol/l) since the two protocols were only moderately successful in

achieving glycemic control, women receiving additional insulin during administration of antenatal steroids should be closely monitored in case the insulin dose requires further adjustment.(Giugliano, et al' 1981)

Tocolytic agents

Giugliano, et al' 1981 recommended that tocolytic agents be use to inhibit uterine contractions. They may help to delay birth and allow women to complete a course of antenatal steroids.

Betamimetics have been widely used for tocolysis, although they are not recommended as the first choice for general use. (RCOG, 2002) Betamimetics increase blood glucose concentrations (Giugliano, et al' 1981) and several cases of ketoacidosis reported in women with diabetes following administration of these drugs (Tibaldi, Lorber and Nerenberg, 1990). So when tocolysis indicated in women with gestational diabetes an alternative to betamimetics used to avoid hyperglycemia and ketoacidosis. (Schilthuis and Aarnoudse, 1980)

Hypoglycemia

Hypoglycemia significantly affects maternal quality of life and increases the risk of physical injury. During pregnancy the frequency of hypoglycemia may increase due to intensification of treatment, an impairment of counter-regulatory hormonal responses and an increased risk of hypoglycemia unawareness.(*Rosenn ,et al* ,1996)Pregnancy nausea and vomiting can also contribute to hypoglycemia due to fluctuations in carbohydrate ingestion.(Diamond , *et al*,1992)

Hyperemesis gravidarum

Severe nausea and vomiting in pregnant women with diabetes can lead to ketoacidosis, and DKA during pregnancy carries a risk of fetal death (Brimacombe and Midazolam, 1995). Two case studies were identified that reported healthy live births to women with diabetes and hyperemesis gravidarum following treatment with parenteral nutrition.(Zarkovic ,*et al* ,1995)One case study reported a fetal death in a woman with hyperemesis gravidarum and DKA following a delay in treatment (Carroll MA and Yeomans ,2005)

Diabetic ketoacidosis

A case series of 37 women admitted with DKA. (Rodgers and Rodgers, 1991) concluded that vomiting and the use of betamimetics drugs were the primary cause in 57% of cases. Non-adherence to treatment and physician management errors was the primary cause in 24% of cases and contributory in 16%. Common physician management errors included the use of urine instead of blood to monitor maternal glucose control, failure to adhere to pregnancy standards of glucose control and failure to employ home blood glucose monitoring. Although ketoacidosis affects only about 1 percent of diabetic pregnancies, it remains one of the most serious complications (Garner, et al, 1997). Diabetic ketoacidosis may occur because of hyperemesis gravidarum, use of -sympathomimetic drugs for tocolysis, infections, and use of corticosteroids to induce fetal lung maturation. The incidence of fetal loss is about 20 percent with ketoacidosis.

Cardiovascular complications

Women with gestational diabetes are also at risk for cardiovascular complications associated with abnormal serum lipids, hypertension, and abdominal obesity—the *metabolic syndrome* (Pallardo and colleagues, 1999).

Recurrence of gestational diabetes in subsequent pregnancies documented in 20 of 30 women reported by (Philipson and Super, 1989).

Preeclampsia

Sibai, et al, 2000 explained that Hypertension induced or exacerbated by pregnancy is the major complication that most often forces preterm delivery in diabetic women. The perinatal mortality rate is increased 20-fold for preeclamptic women with diabetes compared with those who remain normotensive. Special risk factors for Preeclampsia include any vascular complications and preexisting proteinuria, with or without chronic hypertension. (Sibai, et al, 2000)

Infections

Almost all types of infections increased in diabetic pregnancies. Common infections include Candida vulvovaginitis, urinary infections, respiratory tract infections, and puerperal pelvic infections. Antepartum pyelonephritis developed in 4 percent of women with gestational diabetes compared with 1 percent in those without diabetes. (Stamler, et al, 1990)

2.4.2. Fetal complication.

Congenital malformations:

Fetal death congenital malformations and unexplained fetal death—remain unchanged by medical intervention (Garner, 1995). Major congenital malformations affecting babies of women with gestational diabetes include cardiac, neural tube and genitourinary anomalies. As reported in published studies. (McLeod and Ray, 2002)

Abortion

Several studies have shown that first-trimester abortion is associated with poor glycemic control (Greene, et al, 1989 ;).

Unexplained Fetal Stillbirths

Stillbirths without identifiable causes are a phenomenon found in pregnancies complicated by gestational diabetes. These infants are typically large-for-gestational age and die before labor, usually at 35 weeks or later (Garner, 1995). In the Swedish study shown the incidence of unexplained stillbirths was 1 percent.

Polyhydramnios

Although Polyhydramnios often complicate diabetic pregnancies, the cause is unclear. A likely, although unproven explanation is fetal polyuria resulting from fetal hyperglycemia, in a study from Parkland Hospital, found that the amniotic fluid index parallels the amniotic fluid glucose level among women with diabetes. This finding suggests that the Polyhydramnios associated with diabetes is a result of increased amniotic fluid glucose concentration. (Dashe, et al, 2000)

Neonatal Effects

Before tests of fetal health and maturity became available, preterm delivery was deliberately affected to avoid unexplained fetal deaths. Although this practice has been abandoned, there is still an increased frequency of preterm delivery in women with diabetes (Sibai, et al, 2000).

Respiratory Distress

Conventional obstetrical teaching through the late 1980s generally held that fetal lung maturation was delayed in diabetic pregnancies. Thus, these infants were at increased risk for respiratory distress (Gluck and Kulovich, 1973). Subsequent observations have challenged this concept, and gestational age rather than overt diabetes is likely the most significant factor associated with neonatal respiratory distress (Berkowitz, et al, 1996), (Kjos, et al, 2001).

Hypoglycemia

A rapid decrease in plasma glucose concentration after delivery is characteristic of the infant of a diabetic mother. This is attributed to hyperplasia of the fetal -islet cells induced by chronic maternal hyperglycemia. (Taylor, et al, 2002)

Hyperbilirubinemia

The pathogenesis of hyperbilirubinemia in infants of diabetic mothers is uncertain (Salvesen, et al, 1992).

Macrosomia

The incidence of macrosomia rises significantly when mean maternal blood glucose concentrations exceed 130 mg/dL (Willman, et al, 1986). Infants of diabetic women more often required cesarean delivery for cephalopelvic disproportion. Fortunately, shoulder dystocia is uncommon, even in women with gestational diabetes. For example, (Magee, et al, 1993) diagnosed shoulder dystocia in 3 percent of women with class gestational diabetes. None of their infants sustained brachial plexus injuries

2.5. Importance of health provider's knowledge and competency

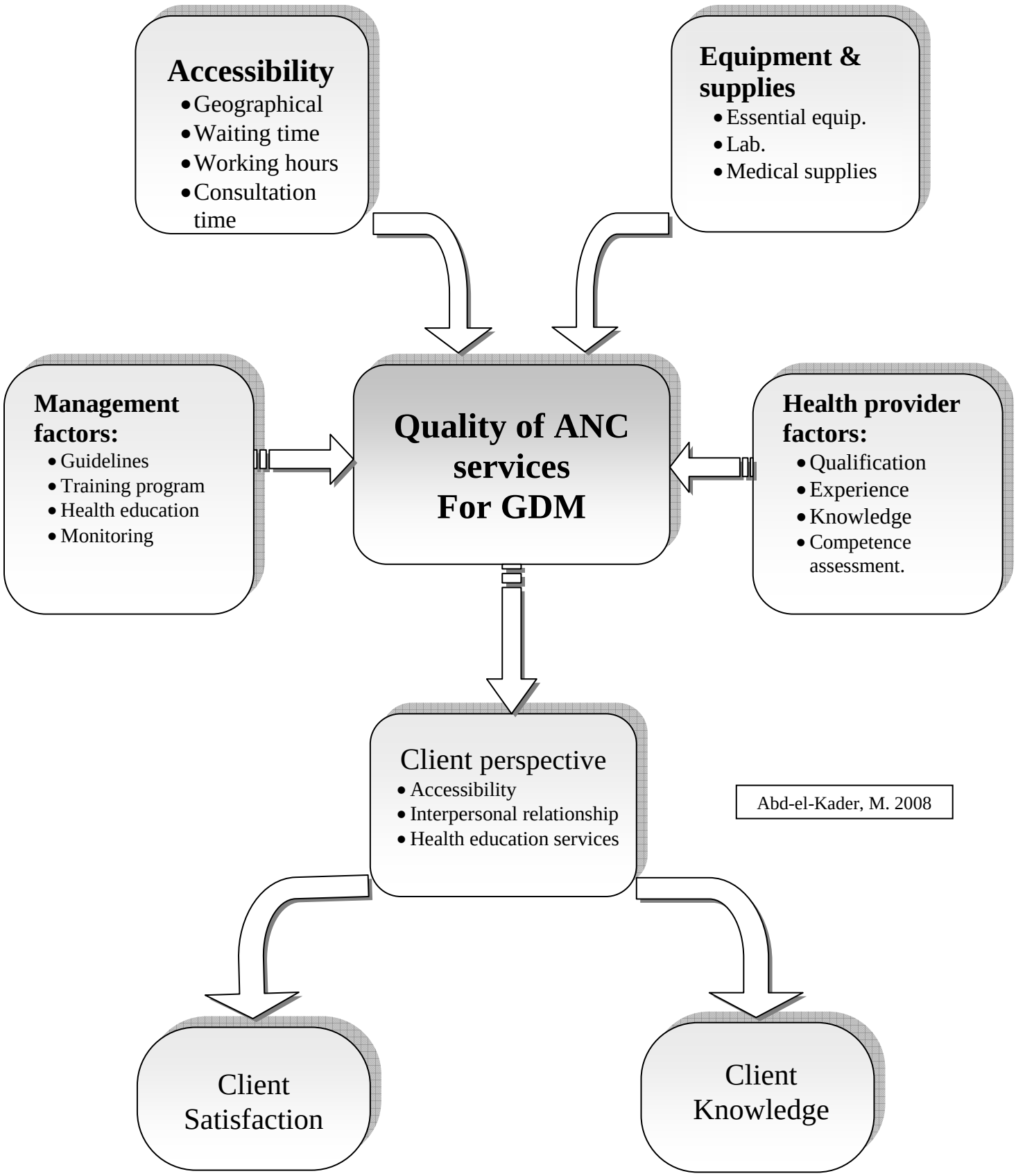
Cabana, 1999, discussed the Competence, knowledge, skills, abilities, that gained in the healthcare professions through pre-service education, in-service training, and work experience. Competence is a major determinant of provider performance as represented by conformance with various clinical, non-clinical, and interpersonal standards. Measuring competence is essential for determining the ability and readiness of health workers to provide quality services. A provider can have the knowledge and skill, but use it poorly because of individual factors (abilities, traits, goals, values, inertia, etc.) or external factors (unavailability of drugs, equipment, organizational support, etc.).

Periodic competence assessments considered for those areas that considered low-volume, high-risk, or critical (Central Health, 1999). Competency-related data derived from specialized tests, interviews, performance evaluations, quality improvement findings, patient satisfaction surveys, employee surveys, and other needs assessments. Based on the results of competency assessments, appropriate educational or remedial programs developed to meet identified needs or gaps and to improve overall performance. (Cabana, 1999)

Chapter 3

Conceptual framework

Framework: Factors affecting quality of antenatal care for gestational diabetes mellitus



Chapter 3: Conceptual framework.

3.1 Conceptual frameworks

A conceptual framework is a logical structure used in research to outline possible courses of action or to present a preferred approach to a system analysis project. The framework built from a set of concepts linked to a planned or existing system of methods, behaviors, functions, relationships, and objects. A conceptual framework might, be thought of as a relational model (Botha, 1989).

Conceptual frameworks are a type of intermediate theory that has the potential to connect to all aspects of inquiry (e.g., problem definition, purpose, literature review, methodology, data collection and analysis). Conceptual frameworks act like maps that give coherence to empirical inquiry. Because conceptual frameworks are potentially so close to empirical inquiry, they take different forms depending upon the research question or problem. Shields and Tajalli (2006) have identified several types of conceptual frameworks (working hypotheses, descriptive categories, practical ideal type, and models of operations research and formal hypotheses) for the field of public administration. When purpose and framework are aligned other aspects of empirical research such as choice of methodology (survey, interviews, analysis of existing data, direct observation, focus groups etc) and type of statistical technique become obvious (Shields and Tajalli, 2006).

3.2 Factors that affect quality of antenatal care provided to pregnant women with gestational diabetes.

3.2.1. Healthcare provider factors.

Healthcare providers in this study are health staffs who work at the antenatal care departments of UNRWA health centers, which include obstetricians, general practitioners, senior staff nurses and midwives. Healthcare provides have a great influence on the quality of antenatal care being the work force that drives and

conducts health plans and strategies. Main factors that influence the ability of healthcare providers to conduct a better ANC services include Qualification, experience in antenatal care, knowledge about GDM and the way they provide their antenatal care services.

Qualifications of healthcare providers:

It is obvious that being highly qualified personnel will have a great impact on the type of services you provide, because obstetricians have better knowledge and practice methods than other GPs and nurses especially when it comes to provide antenatal care to such challenging cases as pregnant women with GDM.

Biller, Wyss, Mtasiwa and Tanner, 2003, stated in their study that there was a clear relationship between the qualifications of the staff and the quality of the service provided. The more highly trained and qualified the personnel are the better their performance in the technical aspects of quality, with the doctors and medical assistants carrying out investigations more often to insure better services. (Boller, Wyss, Mtasiwa and Tanner, 2003)

Keeping that in mind, this will raise an issue to determine what kind of percentage should obstetricians and GPs constitute to be able to handle all the cases of high-risk pregnancy including GDM without having excessive workload problems and in the same time not wasting the resources on highly qualified staff that we might not need.

Experience

Experience is a main advantage to the healthcare providers, that enables them to deal with ease with any cases of GDM, knowing the right and shortest ways to deal with patient and to educate her about the different issues related to her illness. This is possible because having more experience means that the provider has seen cases through his career.

Knowledge:

Knowledge is a very important factor when managing pregnant women with GDM, a competent healthcare provider is supposed to know the true definition of GDM, risk factors, proper investigations, complications and the best way to manage GDM

Fort and Voltero.2004, study concludes that antenatal care performance of healthcare providers is strongly associated with having the practical knowledge and skills (Fort and Voltero, 2004).

3.2.2 Management factors:

It is hard to deny the importance of management in guiding different recourses "human, financial and materials" to apply health plans to promote clients health and to improve quality of services provided. Managerial factors that ensure guidelines availability and adherence enhance training programs, health education services and competence assessment for the health provider. The main factors identified as responsible for the poor quality of care in Uganda were inadequate pre-service and in-service training, lack of technical support supervision and absence of standard treatment guidelines (Kaye, 2000).

3.2.3 Accessibility

Accessibility is an essential determinant in providing health care, which has many dimensions such as geographical accessibility, financial, hours of services, waiting time, consultation time. Handler, Rosenberg, Raube, Kelley, in 1998, study Found that there is a clear association between client satisfaction and short waiting times at the prenatal care site, the availability of appointment system, and increased consultation time (Handler, Rosenberg, Raube and Kelley, 1998).

3.2.4 Essential equipments and supplies

Managing high-risk pregnancy brings the need for more than the basic equipment, supplies and lab services needed by ordinary ANC services .Consequently having those additional equipments and supplies address the capacity of UNRWA health centers to receive and provide care to patients with gestational diabetes. In addition, the presence of such equipment and supplies further improve the performance of the providers themselves Fort. In addition, Voltero study found that a significant relationship between performance and having the necessary equipment instruments and supplies for prenatal care (Fort and Voltero, 2004).

3.3 Client perspective:

There is no better judgment on the quality of any service other than the clients. So the research pay a lot of attention to the clients' perspective to the different factors influencing the quality of antenatal care and the degree of satisfaction of the clients regarding the different aspects of this services.

Accessibility

Clients on this study will give their opinions about accessibility of the services including: geographical accessibility, waiting time and appointment system.

Health education services

Health education is a cornerstone in the proper antenatal care of patient with GDM because of the frequent complications and the challenging management plan that depends a lot on the patient compliance, which will not be possible without the patient being educated and involved in their own management.

Inter personal relationship with the healthcare providers

Is a hugely important and easy way to increase the quality of service, and it depends much on the attitude of the providers themselves but its most accurately measured through the clients. Important points under this title include ensuring the patients

privacy, respecting the patient concerns and needs, explaining procedures and management to the client, treating the patient with respect.

In Leather and collogues , 2006, study the most important factors associated with patient dissatisfaction were interpersonal relations related factors such as: physicians' attitudes, the amount of information provided, and medical staffs' attitudes in particular, concerned a lack of communication skills in doctors and medical staff members. (Leather, *et al*, 2006)

3.3.1 Client knowledge:

Knowledge is assessed through patients' knowledge of definition, normal blood sugar values and complications of gestational diabetes, which is the kind of information that every patient with GDM is supposed to know. The degree of that knowledge is expected to give a clear idea about health education services provided to this particular group. in addition to that increasing the knowledge is directly related to decrease maternal and fetal complications of high risk pregnancy as GDM, Moraine , (2005) research conducted in Indonesia showed that the improvement of knowledge of pregnant women was significantly associated with healthy pregnancy , decrease pregnancy complications, safe birth and taking care of the newborn (Moraine, 2005)

3.3.2 Client satisfaction:

There is no single best indicator about the quality of service better than the client satisfaction about the services provided to them, the research should explore which factors affect the degree of satisfaction the most to have a good idea about the more crucial points that should be worked on in order to increase the quality of services effectively. Mawajdeh, Al-Qutob and Bin Raad, (2005) study conducted in Jordan highlights the relevance and value of women's reports and satisfaction as credible data sources for quality of care assessment. Health care systems that aim to provide services that transcend the traditional emphasis on technical competence of providers as the sole measure of quality of care ought to be attentive to women's inputs into the

health care delivery process by studying the factors that affects women satisfaction. (Mawajdeh, Al-Qutob and Bin Raad, 2005)

Chapter 4

Methodology

Chapter 4: Methodology

4.1 Study design

The design of the study is cross sectional analytical design, a research design where subjects are assessed at a single time in their lives this type of study is usually used for descriptive and assesment purposes. A Cross sectional study is fast and can study a large number of patients at little cost and effort. Also, we don't have to worry about patients dropping out during the course of the study, this study is efficient at identifying association (Simon, 2002)

Across sectional study is used to examine groups of subjects in various stages of process at the same point of time. This design is identifying the problem with the current situation, through getting information at various points of the process.

The result of this study will be useful to provide an evaluation and appraisal about the assessment of antenatal care services for managers and decision makers, and verifying the perspective of health care providers and the clients who receive the services.

4.2. Study population

The study population consists of two groups. The first group includes all healthcare providers worked in antenatal care of risk pregnancy. Obstetricians, general practitioner, female senior staff nurses and midwives. In UNRWA, health centers in Gaza governorates at the time of the study.

The second groups of the population are all pregnant women with gestational diabetes registered at UNRWA health centers, attending and receive anti natal care services during the pregnancy period in UNRWA health centers in Gaza governorates at the time of study.

4.3 Period of the study

The study was conducted in the year 2007/2008 started with literature review in June 2007 after the approval of the proposal by the school of public health Al Quds university, the pilot study was conducted in September 2007. Actual data collected in December 2007 through February 2008 .data analysis completed during February 2008; the study took almost one year from its beginning.

4.4 Setting of the study

The study conducted at UNRWA health centers during working hours in the antenatal care service department by face-to-face interview for two groups; the group included healthcare providers who provided services to the pregnant women with gestational diabetes at high-risk pregnancy clinic. The second group were pregnant women with gestational diabetes who attended health center for antenatal care in 15 clinics in Gaza governorates distributed as the follows: three clinics in Rafah ,two clinics in Khanyonis ,four clinics in the middle zone ,four clinics in Gaza, two clinics in the south of Gaza .

4.5 Sample size

The sample size was census sample of two groups:

The first group was all healthcare providers who provides antenatal care services for pregnant women in high-risk pregnancy, or exposed to provide these antenatal care services on rotation base, at UNRWA clinics in Gaza governorate, which was (103), calculated from the manning table from field office of health department at UNRWA. Then each health center asked separately about the exact numbers.

The second group was all clients who are pregnant women with gestational diabetes and registered for antenatal care at UNRWA H.Cs during study period calculated from third quarterly report 2007 from field family health office in UNRWA health department, they was (151) pregnant women with gestational diabetes .

4.6 Response rate

The number of respondent from the first group (healthcare providers) was 101 from 103, response rate was 98.1%, number of respondent from the second group (pregnant with gestational diabetes) was 145 from 151, and the Response rate was 96.1%

4.7 Instrument of the study (study methods)

Two face-to-face interview questionnaires were prepared, one for health provider who provides antenatal care services for pregnant women, other for pregnant women with gestational diabetes interview after they finished their antenatal visit and receiving services in the clinic.

The researcher or his assistants use both questionnaires by meeting health provider or pregnant women with gestational diabetes, ask them the questions face to face, and fill the answer of the questions in the questionnaire

This method enables the researcher to take accurate answers, saving time, less cost, decrease probability of missing in the answers and trust more the results, which help for more benefits and information.

4.8 Questionnaire design

Two face-to-face interviewed questionnaires used in the study, one for health provider, other for pregnant women with gestational diabetes.

The questions asked by the researcher or the assistant who filled the questionnaire, after the pregnant woman had received care directly. The questionnaires were developed with closed ended structured questions , It was designed in English language (annex 9,10) and then translated into Arabic language (annex 7,8) as it is easy language for assistants and all the target population in each questionnaire and an explanatory latter in Arabic was attached to cover the ethical issues for each questionnaire (annex 5,6).

The healthcare provider questionnaire included (eight areas of questions as follows: healthcare provider personal information ,provider training and experience ,provider opinion about the services ,essential equipment ,medicine ,laboratory services ,essential support services and health provider knowledge about gestational diabetes ,and his knowledge about UNRWA guidelines about gestational diabetes .

The pregnant woman interview contained five areas of questions, personal data, obstetric history, current antenatal care, laboratory investigations and knowledge of the pregnant women with gestational diabetes about gestational diabetes, management and complications.

4.9 Pilot study.

A pre-test study conducted, in preparation for the major study. Testing unambiguously, acceptability, applicability and time of administration, Piloting was conducted by the researcher interviewing a sample of twelve pregnant women with gestational diabetes for women questionnaire by exit interview during their visit to the health center and ten healthcare providers for healthcare provider's questionnaire, the pilot was done in UNRWA health centers of Gaza governorate. The senior staff nurse informs the participants of healthcare providers about the interview with the researcher: The researcher explains the study and carries face-to-face interview with healthcare providers. The aim was to test the validity and the suitability of the

questionnaire, which facilitate the sequence of procedures and activities of the study. Data analysis piloted for accuracy of output. Those who selected for pilot study excluded from the study sample.

4.10 Ethical consideration

Permission letter from chief field health program of UNRWA in Gaza obtained to conduct the study at UNRWA health centers (annex 4).

Ethical clearance from Helsinki committee in Gaza obtained (annex 3).

Explanatory letter for all participants as an informed consent after their agreement to participate was attached to every questionnaire, and before carrying out interview ,this letter explains the study aim and confidentiality, and includes researcher's identification, research purpose and explain the voluntarily nature (annex 5, 6).

4.11 Eligibility criteria

4.11.1 Inclusion criteria:

the eligible healthcare providers to be included in the study were all healthcare providers providing antenatal care services in high risk pregnancy including pregnancy with gestational diabetes in UNRWA health centers in Gaza governorates .This included all obstetricians in all health centers , general practitioners working in MHC , senior staff nurses, midwives at ANC in HRP.

Eligible women included in the study are pregnant women with gestational diabetes registered in the UNRWA health center during pregnancy and attending antenatal care services at the time of the study.

4.11.2 Exclusion criteria

All other healthcare providers in health centers whom are not working in HRP of ANC are excluded and all pregnant women other than pregnant with gestational diabetes mellitus and they are still pregnant at the time of implementation of the study.

4.12 Data collection

The data started to be collected on 15/12/2007, till 15/2/ 2008 by taking appointment with the health centers taking in consideration the number of the healthcare providers and the number of the clients in each health center.

The data collected using two face-to-face interview questionnaires by the researcher and six professional nurse assistants. The assistants were nurses who were trained on how to interview the pregnant. For healthcare providers questionnaire the researcher carried out data collection from the health provider by himself by visiting all health centers of UNRWA in Gaza governorates after giving the participants explanatory letter for identifying the researcher , the aim of the study ,and the voluntarily nature of participation .

Collection of data from the pregnant women with GDM attending H.Cs. of UNRWA in Gaza strip carried out partially by the researcher and partially by the assistants.

4.13 Data entry

Data entry carried out by using the computer software “Statistical Package for Social Science (SPSS)”; the variables of the questionnaires entered onto the computer by the researcher, data cleaning checking all the entered questionnaires and a random

selection of numbers of questionnaires reviewing the frequency tables for the variables of both questionnaires.

4.13 Data analysis

Data analysis was done with support from the supervisor .After testing the validity and reliability, starting by descriptive analysis, frequency tables conducted, means, median and standard deviation were computed for continuous numeric variables, recoding of data for all uncategorized variables.

For testing the relationship between the study advanced statistical analysis were conducted, independent t-test, one way ANOVA test, Chi square test for categorical variables , P value of less than 0.05 is statistically significant.

4.14 Validity

First, face validity, which appears in the questionnaire design. Second content validity, which was tested by sending the questionnaire with covering letter to twelve different experts, to assess the relevance, clarity and completeness of both questionnaires. Attached with the questionnaire were the objectives of the study and the UNRWA guidelines on management of gestational diabetes. The twelve experts were from different qualifications including health service researchers, managers, expert obstetricians, and experts in MHC fields. By the help of these experts some modification were done and some variable were added

4.15 Reliability

Reliability of the instrument ensured by standardization of the implementation of the instrument and standardization of the way by which the data collected by training the data collectors how to collect data similar to the researcher’s method.

Chapter 5

Results and discussion

Chapter 5: Results and Discussion

This chapter represents the results of statistical analysis of the characteristics and distributions of the respondent, from all UNRWA primary health care centers "high risk pregnancy antenatal care sessions" in Gaza governorate and include the relationships between variables concerning clients (pregnant with gestational diabetes) who were registered in UNRWA health centers of Gaza governorate during data collection period and healthcare providers who are working in antenatal care during the period of study.

5.1 results and discussion of client questionnaires

5.1.1 Socio demographic and economic characteristics of clients

The socio demographic variables studied were age, educational level, occupation, residency, and income as follows:

5.1.1.1 Characteristics of the clients by age

Pregnant with gestational diabetes in UNRWA health care centers classified to five age groups. First group “less than 20 years" constituted 0.7%. Second group from "20-less than 25” years " constituted 6.2% of the clients .The third group is "from 25-30 years " and accounts for 18.6 %, fourth group “ from 31- 40 years of age accounts for 51.7%, fifth group more than 40 years accounts for 22.8% of the clients with (M=34.6, Sd =5.8 , minimum 19, maximum 46 years). when compared with two studies conducted in Saudi Arabia and Cuba in antenatal care the clients mean age was in Saudi Arabia (28.2 year) while in Cuba the clients mean age was (26.7 year) respectively.(Nigenda , et al, 2003) .

Table 5.1: Socio demographic and economic characteristics of clients.

	Items	*No.*	*%*
1.	**Age**		
	Less than 20 Yrs	1	0.7
	From 20 to 24 Yrs	9	6.2
	From 25 to 30 Yrs	27	18.6
	From31to 40 Yrs	75	51.7
	More than 40 Yrs	33	22.8
	Total	145	100.0
2.	**Educational level**		
	Illiterate	8	5.5
	Primary	15	10.4
	Preparatory	37	25.5
	High school	56	38.6
	University graduate	29	20.0
	Total	**145**	**100.0**
3	**Occupation**		
	Housewife	128	88.3
	Employed	17	11.7
	Total	**145**	**100.0**
4	**Residency**		
	Inside camp	56	38.6
	Outside camp	89	61.4
	Total	**145**	**100.0**
5	**Income Average by NIS**		
	Less than 1000 NIS	66	45.5
	From 1000 to 1999	36	24.8
	From 2000 to 2999 NIS	23	15.9
	3000 and more NIS	20	13.8
	Total	**105**	**100.0**

5.1.1.2. Characteristics of the clients by education level

The distribution of the patients with gestational diabetes by education level shows that 5.5 % of them are illiterate while 10.4% are primary and 25.5 % preparatory school graduates, high school graduates accounts for 38.6%with the highest percentage and finally university graduates constitutes 20.0% of study population. Compared to the level of education in all women population in Palestine, which tell

that 3.4% of mothers reached to the level of primary school. 10.3% of mothers reached to the level of preparatory school, 74.8% of mothers finished secondary school and 11.5% of mothers completed the first university degree, Illiterate percent among mothers 0.03% .(MOH,2005).

This indicate that pregnant women with gestational diabetes refugee are more illiterate compared to all women population in Palestine (MOH,2005)

5.1.1.3. Characteristics of the clients by occupation.

Majority of the clients (88.3%) are housewives, while only 11.7 % of them are employed. 20% of the clients are university graduate as shown in table (5.1),

This study is consistent with Saudi Arabia and different with Cuba, when compared with study conducted in Saudi Arabia and Cuba in anti natal care 80% of the clients are housewives in Saudi Arabia and 20% are public workers, while in Cuba the clients 30% are Housewives and 70% are public workers in the study. Which conducted for Women's' opinions on antenatal care in developing countries: results of a study in Cuba, Thailand, Saudi Arabia and Argentina. (Nigenda, et al, 2003)

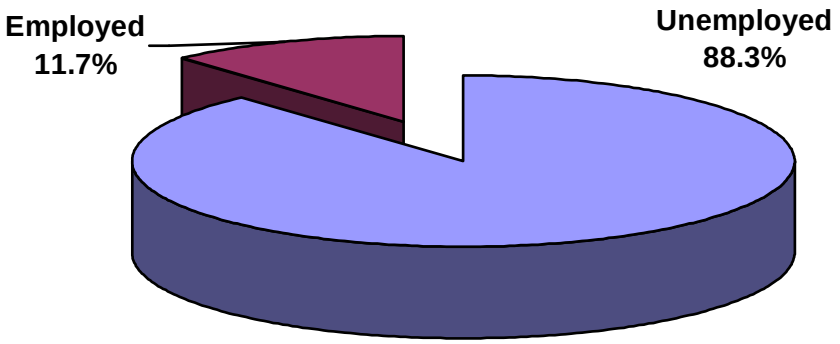


Figure 5.1: Distribution of Clients according to occupation

5.1.1.4 .Characteristics of the clients by residency.

61.4 % of the clients live outside camps while the other 38.6% live inside camp which gives a good idea about UNRWA covering its population of refugees whether they lives inside or outside the camps. The vast majority of population study(clients) are living outside camp , and the vast majority of population study (healthcare providers) are living outside camp ,this clarify the distribution of population in Gaza because camps is condensed with people so the people migrate outside camps , not so far from camps.

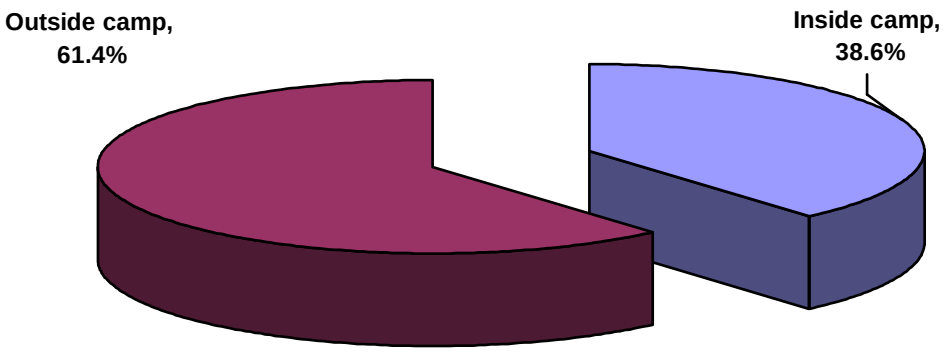


Figure 5.3: Distribution of Clients according to residency**.**

Distribution of Clients according to governorates.

Majority of clients are from Gaza and Rafah by 31.7%, from Khanyonis by 13.8%, from Midzone by 11.7% and from north of Gaza by 11%.

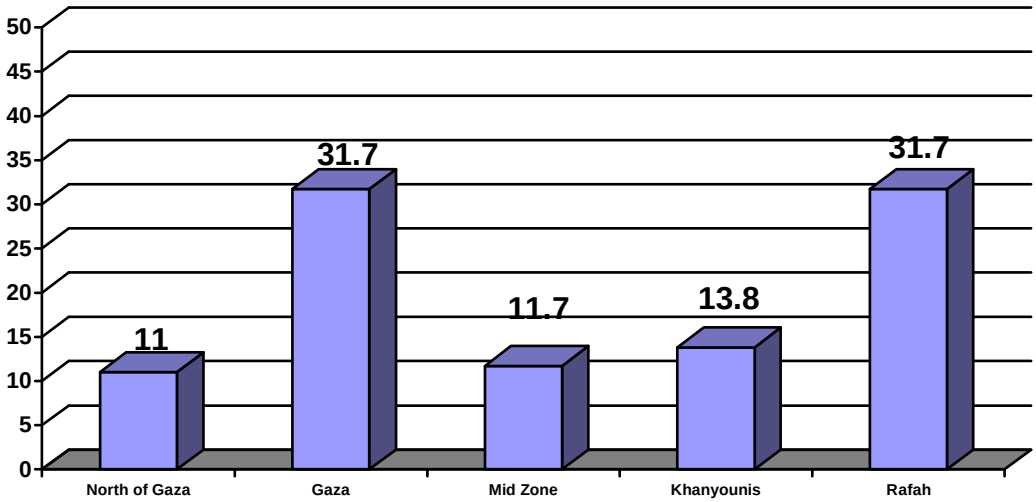


Figure 5.2: Distribution of Clients according to governorates

5.1.1.5 .Characteristics of the clients' monthly income

When the clients with gestational diabetes where distributed by their monthly income ,45.5% of them have an average income of " less than 1000 NIS ", while 24.8% have a " 1000-2000 NIS income", and 15.9% have an income of " 2000 -3000 NIS". 13.8% with 3000 and more (M=1244 NIC, Sd=1272.8). This indicate that clients with low income may choose UNRWA services due to (free of charge services) that is consistent with study conducted in Antenatal care by household wealth result that In all developing regions, the poorest 20% of the population are likely to use antenatal care than the richest 20%,(WHO ,2003).

Clients with gestational diabetes as the table below shown who receive their services at UNRWA health centers are mainly less educated, homemakers with a low monthly income. Which can be justified that UNRWA antenatal care services are free of charge and are provided during day shift with a huge workload, this might not be the best place to receive ANC by a well-educated working mother because it won't fit her tight schedule or her high expectations, which can be met in the private sector.

5.1.2 Clients Obstetric history

In most clients "58.6.0%" age of marriage of less than 20 years and 32.4% from 20 to 25 years. With (mean=19.8, Sd 4.4). 65.0 % of pregnant with gestational diabetes have from six pregnancies or more as shown in the table (5.2). With (mean =6.9, SD=3.3).

Regarding risk factors for GDM , when ask client about History of GDM only 23.4% have History of GDM ,History of macrocosmic baby 37.9% , History of baby with congenital anomaly 11.0% , Family history of 1st degree DM 69.0%,this indicates that the most important risk factor for GDM is Family history of 1st degree relatives with DM according to research results. Number of pregnancies more than (5) pregnancies denotes that may be there are other factors than that in UNRWA guidelines so universal screening may be beneficial in detecting GDM more than factor – based screening as the detection rate in UNRWA Gaza health field is 0.01% since(1999 until 2005) (annual reports , 1999and 2005). These results are consistent with the results of a study conducted in Iran, for Comparison of Universal and Risk Factor Based Screening Strategies for Gestational Diabetes Mellitus. The results of oral glucose challenge test (OGCT) in high-risk group with low risk group in Iran they found that universal screening for GDM identifies a higher number of GDM than risk factor based screening Khooshiedeh M. (2008)

Table 5.2: Distribution of Clients Obstetric history

1	**Age at first marriage**	***No***	**%**
	Less than 20 Yrs	85	58.6
	From 20 to 25 Yrs	47	32.4
	More than 25 Yrs	13	9.0
	Total	**143**	**100.0**
2	**Number of pregnancies including the current**		
	5 and less	50	34.5
	From 6 to 10	77	53.1
	More than 10	18	12.4
	Total	**145**	**100.0**
3	**History of GDM**		
	Yes	34	23.4
	No	111	76.6
	Total	**145**	**100.0**
4	**History of macrocosmic baby**		
	Yes	55	37.9
	No	90	62.1
5	**History of baby with congenital anomaly**		
	Yes	16	11.0
	No	129	89.0
	Total	**145**	**100.0**
6	**Family history of 1st degree DM**		
	Yes	100	69.0
	No	45	31.0
	Total	**145**	**100.0**

5.1.3 Current Antenatal history.

5.1.3.1. Registration time

When pregnant with gestational diabetes where asked about the time of first diagnosis of GDM, 66.2% of them stated that they diagnosed during the "1st trimester". This indicates early registration of pregnancy at UNRWA health center clinics, 27.6% of them diagnosed during the "2nd trimester" the remaining 6.2% were diagnosed during the "3rd trimester" as shown in the table (5.3).

This indicates that there is early registration of high risk pregnancy, which is consistent with registration of pregnant women at 1st trimester 53.3% ,2nd trimester was 44.9% ,in the 3rd trimester was 1.8%, (UNRWA annual report ,2005).

This is consistent with study in 45 developing countries for timing of first antenatal visit. Most women present for antenatal care in their first trimester**,** except in sub-Saharan Africa, in Latin America and the Caribbean and in the Middle East and North Africa, two thirds of women present for antenatal care in the first trimester, while the figure for Asia is nearly half. (WHO, 2003)

5.1.3.2. Place of diagnosis

Regarding the place where they were diagnosed 91.0% stated that they were diagnosed at the same UNRWA health centre they receive their current ANC in, which form the majority of detected cases.

5.1.3.3. Mode of treatment

Most of the clients "69.0%" said that they are on diet regimen only, 16.4 % on insulin treatment only and the remaining 14.6% said that they are on both modalities, which is not consistent with the knowledge of healthcare providers about management of GDM in which 21.8% did not mention diet as a part of their management. This explained by the fact that management plans for such patients are directed by specialists who have better knowledge than the rest of the staff in managing such cases. This is consistent with the literature, which denotes that between 82% and 93% of women with gestational diabetes will achieve blood glucose targets on diet alone (Veciana, *et al*, 1995).

Table 5.3: Current Antenatal care.

1.	When diagnosed with GDM was made	*No.*	%
	1st trimester	96	66.2
	2nd trimester	40	27.6
	3rd trimester	9	6.2
	Total	145	100.0
2.	**Where diagnosed with GDM**		
	At this facility	132	91.0
	In other facility	8	5.5
	Private obstetrician	5	3.5
	Total	**145**	**100.0**
3	**Treatment of GDM currently**		
	Insulin	24	16.4
	Diet regimen	100	69.0
	Both	21	14.6
	Total	**145**	**100.0**

5.1.3.4. Purpose for coming to ANC clinic

When asking the client about the Purpose for coming to health center, 95.1% of pregnant women with GDM said that they came for check up. 41.4% of them said that they came for Supplementation, the remaining 35.2% they came for Treatment of the problem , 100% of the clients mentioned that they were coming according to appointment system with health provider , this is consistent with healthcare providers opinion by 100% of the availability of appointment system .

Table 5.4: Purpose for coming to ANC clinic.

4	Purpose for coming to ANC clinic for	*NO*	%
4.1	**check up**		
	Yes	139	95.1
	No	6	4.9
	Total	**145**	**100.0**
4.2	**Supplementation**		
	Yes	60	41.4
	No	85	58.6
	Total	**145**	**100.0**
4.3	**Treatment of the problem**		
	Yes	51	35.2
	No	94	64.8
	Total	**145**	**100.0**
4.4	**Appointment system with the provider**		
	Yes	145	100.0
	No	0	0.0
	Total	**145**	**100.0**

5.1.4. Laboratory investigations

Laboratory investigations carried out during pregnancy with GDM are, blood glucose measurement (Mean =3.7 , Sd =2.5) , hemoglobin measurement (Mean =2.3 , Sd =1.2) , proteinuria measurement (Mean =5.6 , Sd =3.4) which are important investigation in case of pregnancy with gestational diabetes as shown in table (5.5) . This is consistent with health provider opinion about the availability of laboratory Investigation necessary for gestational diabetes, which will discussed later.

Table 5.5: Laboratory investigation

	Item	Mean	MD	Sd
1.	No. of blood glucose measurements	3.7	3.0	2.5
2.	No. of hemoglobin measurements	2.3	2.0	1.2
3.	No. of proteinuria measurements	5.6	5.0	3.4

5.1.5. Accessibility of antenatal care services in perspective of client.

5.1.5.1 Geographical accessibility of antenatal care services

The way of transportation to reach the clinic for the clients, 35.5% of the clients reach the health centers by walking and 64.5% of them reach the clinic by car. (Table, 5.6). Time for reaching the clinic the majority of clients 82.1% reach the facility within 20 Minutes and less, this is appropriate time & distance based on walking or using car . this indicates that the services are geographically accessible for the majority of UNRWA population whether inside or outside camps .while only 17.9% took more than 20 Minutes to reach the clinic ,those who took more than 20 minute to reach the clinic most likely go to the clinic by walking . This is consistent with the opinions of health care providers when we asked them about accessibility of services to the place of living to clients 97.0 % of providers told that services were accessible. Time to

reach to UNRWA clinics is consistent with the literature accessibility indicators, which is the core standard transport indicators relevant to the health sector are, Access to hospitals within 30 and 60 minutes from a hospital by public transport and Access to GPs is within 15 and 30 minutes from a GP by public transport plan (DfT, 2004).

5.1.5.2. Accessibility of antenatal care services by time spent.

Appointment system specification 70.4% of the client said that there is Appointment system by date and time, which is not enough and must reach to 100%, while 26.2% said that they receive appointments by date and 3.4% had Appointments by Time only. This is consistent with opinion of health care providers as they told that there is Appointment system by 100% .but there is lack of effectiveness of appointment system if it did not taken by day and time which lead to increase waiting time for patient and decrease consultation time ,excessive workload because client do not know when they will come . May be they came at the same time to the clinic. Waiting time for receiving ANC services 39.3% of the client said that Waiting time is (30 Min. and less), 44.8% of them told that Waiting time (From 31 to 60 Min), the remaining said that Waiting time is more than 60 Min 15.9%. This is nearly consistent with opinion of healthcare providers who told that Waiting time Less than 30 minutes about 36.6% of the healthcare providers, From 30 to 60 minutes 59.4 %, More than 60 minutes 4.0 %. 37.2% mentioned that Consultation time is (10 Min. and less), 44.8% told that it is (From 10 to 15 Min), while other 17.9% tell (More than 15 Min), rating client opinion in Consultation time 87.5% of them agree with that Consultation time is Right length.

5.1.5.3. Satisfaction with antenatal care services.

Satisfaction with waiting time there are variable degree of Satisfaction (Greatly satisfied 25.5%, Satisfied 31.7%, slightly satisfied 25.5%, not satisfied 17.2%).

Satisfaction with Consultation distributed as the following, Greatly satisfied 59.3%, Satisfied 27.6%, Slightly satisfied, 13.1% .

This is consistent with study for women and providers in four developing countries, (Are women and providers satisfied with antenatal care). Views on a standard and a simplified, evidence-based model of care, results was satisfied with antenatal care in which 78.3% of women told that they are satisfied by Waiting time and 85.7% of them are satisfied by Consultation time with confidence interval 95% CI (Langer , et al ,2002).

So increasing attention must given to patients' views in health care evaluation. Policymakers and program managers should know that women's views are important in greater acceptance and sustained use of services. also, health professionals' perspective needs careful evaluation before and during translating new care models into institutional protocols; being a conscious player in the process of change would certainly contribute to improving providers' commitment to their clinical work.

Table 5.6: accessibility of ANC services, time spend and satisfaction

	Items	*No.*	*%*
1.	**Way of transportation to reach the clinic**		
	Walk	51	35.5
	Car	93	64.5
	Total	**144**	**100.0**
2.	**Time for reaching the clinic**		
	20 Min. and less	119	82.1
	More than 20 Min.	26	17.9
	Total	**145**	**100.0**
3	**Appointment system specification**		
	Time	5	3.4
	Date	38	26.2
	Both	102	70.4
	Total	**145**	**100.0**
4.	**Waiting time**		
	30 Min. and less	57	39.3
	From 31 to 60 Min.	65	44.8
	More than 60 Min.	23	15.9
	Total	**145**	**100.0**
5.	**Satisfaction with waiting time**		
	Greatly satisfied	37	25.5
	Satisfied	46	31.7
	Slightly satisfied	37	25.5
	Not satisfied	25	17.2
	Total	**145**	**100.0**
6	**Consultation time**		
	10 Min. and less	54	37.2
	From 10 to 15 Min.	65	44.8
	More than 15 Min.	26	17.9
	Total	**145**	**100.0**
7	**Consultation time with health provider rating**		
	Too short	14	9.7
	Too long	4	2.8
	Right length	127	87.5
	Total	**145**	**100.0**
8	**Satisfaction with Consultation**		
	Greatly satisfied	86	59.3
	Satisfied	40	27.6
	Slightly satisfied	19	13.1
	Total	**145**	**100.0**

5.1.6. Quality of the Antenatal Care in the perspective of clients

When asking client about quality of the Antenatal Care 95.5% of them told that service is convenient and easy, 98.6% mentioned that Staff treated the patients with respect, 97.25% Staff cared about the pt wellbeing.

Staff asked the patient if she had any questions or concern by 93.1%, patient feel comfortable to ask questions 94.5%, Staff asked the patients to come back for another visit 97.9%.

Overall Satisfaction with the quality of service "according to the patients" is 91% and satisfaction with Consultation as shown in Table (5.7) 86.9%. This indicates that clients are satisfied by the quality of services.

This is consistent with the study performed in four developing countries, namely: Saudi Arabia, Cuba, Argentina and Mexico. In which overall satisfaction index showed that more than 90% of women said that they were "very satisfied". In antenatal care services model. (Langer, et al, 2002)

Table 5.7: quality of the Antenatal Care in the perspective of clients

1.	***Service is convenient and easy "according to patient."***		
	Yes	138	95.5
	No	6	4.5
	Total	**144**	**100.0**
2	**Staff treated the pt with respect**		
	Yes	143	98.6
	No	2	1.4
	Total	**145**	**100.0**
3	**Staff cared about the pt wellbeing**		
	Yes	141	97.2
	No	4	2.8
	Total	**145**	**100.0**
4	**Staff asked the pt if she had any questions or concern**		
	Yes	135	93.1
	No	10	6.9
	Total	**145**	**100.0**
5	**Pt feel comfortable to ask questions**		
	Yes	137	94.5
	No	8	5.5
	Total	**145**	**100.0**
6	**Staff asked the pt to come back for another visit**		
	Yes	142	97.9
	No	3	2.1
	Total	**145**	**100.0**
7	**Overall Satisfaction with the quality of service "according to the pt"**		
	Greatly satisfied	68	46.9
	Satisfied	64	44.1
	Slightly satisfied	13	9.0
	Total	**145**	**100.0**
8	**satisfaction with Consultation**		
	Greatly satisfied	86	59.3
	Satisfied	40	27.6
	Slightly satisfied	19	13.1
	Total	**145**	**100.0**

5.1.7. Why the patient choose the facility ?

When we asked the patient why she choose the facility, 73.8%of the clients choose the facility due to Good quality of care. 73.8% of them choose the facility because the facility is Convenient. While 60.7% due to Offering different services and 88.3% of the client because services are Free of charge, 53.1% due to facility Reputation, 42.1% of the client because others recommend the facility, while 55.9%For ration only as in Table (5.8).

This indicate that UNRWA health services by majority of patients perspectives is convenient and of good quality and necessary due to the bad economic conditions of the refugees. This indicates that the main cause in choosing the facility is that the services are free of charge. The second cause is due to good quality of care. The facility is Convenient. This is in difference with study conducted in UNRWA health centers in Gaza in(2003) which results that pt choose the facility because near location by 26.2% of the clients , due to Good quality of care by 26.2% of the clients , 47.6% of them due to Offering different services and 0% because the facility is Recommended by others, (El-Nakhal,2003).

Table 5.8: why the patient choose the facility

1	***Good quality of care***		
	Yes	107	73.8
	No	38	26.2
	Total	**145**	**100.0**
2	**Convenient**		
	Yes	107	73.8
	No	38	26.2
	Total	**145**	**100.0**
3	**Offers different services**		
	Yes	88	60.7
	No	57	39.3
	Total	**145**	**100.0**
4	**Free of charge**		
	Yes	128	88.3
	No	17	11.7
	Total	**145**	**100.0**
5	**Reputation**		
	Yes	77	53.1
	No	68	46.9
	Total	**145**	**100.0**
6	**Recommended by others**		
	Yes	61	42.1
	No	84	57.9
	Total	**145**	**100.0**
7	**For ration only**		
	Yes	81	55.9
	No	64	44.1
	Total	**145**	**100.0**

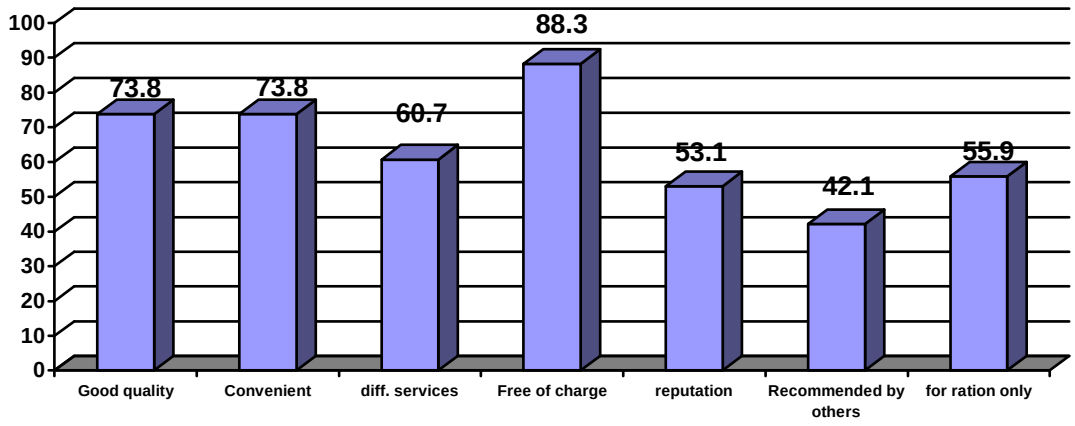


Figure 5.4: describing Reasons for choosing facility:

5.1.8. Staff performance during antenatal care visits

The activities that healthcare provider do for the clients during ANC visits, as follow: 97.9%of the clients told that healthcare providers Perform physical examination, 95.2% told that the health provider Asked about previous obstetric history, 95.9% told that the health provider Check BP, 96.6% said that the healthcare providers check weight, 91.7% of the client Carry out U/S.

95.2% mentioned Check fetal heart beat, 91.7% that health provider Carry out blood sugar test, 83.4% that health provider do Urine analysis, 82.8% Carry out CBC, 82.8% of the healthcare providers Provide iron and folic acid supplement, 55.2 % of the providers provide TT while 29.7% of them Provide insulin during antenatal visits. For all measures that mentioned above no reason to loss, any of them during ANC visits to provide equity of comprehensive care for all clients so more perfect ANC carried during visits .But for providing T.T not all pregnant women took T.T because it is every five years according to UNRWA policy. In addition, for providing insulin the majority of pregnant women managed by diet only, without using insulin as describe in Table (5.9).

Table 5.9: During anti natal care visits what the staff perform from the following

	Items	*No.*	*%*
1.	**Perform physical exam**		
	Yes	142	97.9
	No	3	2.1
	Total	**145**	**100.0**
2.	**Asked about previous obstetric history**		
	Yes	138	95.2
	No	7	4.8
	Total	**145**	**100.0**
3	**Check fetal heartbeat**		
	Yes	138	95.2
	No	7	4.8
	Total	**145**	**100.0**
4	**Check weight**		
	Yes	140	96.6
	No	5	3.4
	Total	**144**	**100.0**
5	**Carry out U/S**		
	Yes	133	91.7
	No	12	8.3
	Total	**145**	**100.0**
6	**Check BP**		
	Yes	139	95.9
	No	6	4.1
	Total	**145**	**100.0**
7	**Carry out blood glucose test**		
	Yes	133	91.7
	No	12	8.3
	Total	**145**	**100.0**
8	**Urine analysis**		
	Yes	121	83.4
	No	24	16.6
	Total	**145**	**100.0**
9	**Carry out CBC**		
	Yes	120	82.8
	No	25	17.2
	Total	**145**	**100.0**
10	**Provide iron and folic acid supplements**		
	Yes	120	82.8
	No	25	17.2
	Total	**144**	**100.0**
11	**Giving TT**		
	Yes	80	55.2
	No	65	44.8
	Total	**145**	**100.0**
12	**Provide insulin**		
	Yes	43	29.7
	No	102	70.3
	Total	**145**	**100.0**

5.1.9. Topics discussed during antenatal care visits.

Topics discussed during the pregnant women with GDM antenatal care visits to the UNRWA health centre, include advices about diet, which constituted 93.1%.

Gestational diabetes mellitus (GDM) management and expected date of delivery with 81.4 % of the clients stated that they discussed those topics during their ANC visits,

How the baby is growing discussed in 69.7% of the cases, danger signs during pregnancy, danger signs after delivery and where to go for medical help if any problem happened are parts of the discussed topics in 70.3 %, 53.1% and 71.0% of the clients respectively. Importance of planning for delivery was the least topic to bring to attention, which mentioned only by 42.1 %.

Table 5.10: Discussed topics during ANC visits:

	Item	*No*	*%*
1	**Information or advice about diet**		
	Yes	135	93.1
	No	10	6.9
	Total	**145**	**100.0**
2	**Expected date of delivery**		
	Yes	118	81.4
	No	27	18.6
	Total	**145**	**100.0**
3	**How the Baby growing**		
	Yes	101	69.7
	No	44	30.3
	Total	**145**	**100.0**
4	**GDM management**		
	Yes	118	81.4
	No	27	18.6
	Total	**145**	**100.0**
5	**Importance of Planning for delivery**		
	Yes	61	42.1
	No	84	57.9
	Total	**145**	**100.0**
6	**Danger signs during pregnancy**		
	Yes	102	70.3
	No	43	29.7
	Total	**145**	**100.0**
7	**Danger signs after delivery**		
	Yes	77	53.1
	No	68	46.9
	Total	**145**	**100.0**
8	**Where to go for medical help if any problem happened**		
	Yes	103	71.0
	No	42	29.0
	Total	**145**	**100.0**

5.1.10. Health Education received by pregnant with gestational diabetes.

Variables related to health education received by pregnant with GDM are described in (table 5, 11), 74.5% of the clients received health education during their ANC, while the remaining 25.5% did not receive any health education. Nurses “70.9 %”, while GPs contributed in the education of 54.4% of the clients and the least contribution in this field was by obstetricians who helped educating only 16.4% of their clients educated most of those who received health education.

As shown in the table the topics that dominated the context of the educations includes: diet and nutrition "89.1 %" and supplementations (iron &folic acid) required during pregnancy "88.2 %”.

Table 5.11: Health Education received by pregnant with gestational diabetes

1	***Patient ever received health education***		
	Yes	110	74.5
	No	35	25.5
	Total	**145**	**100.0**
1.1	**By Obstetrician**		
	Yes	18	16.4
	No	92	83.6
	Total	**110**	**100.0**
1.2	**By General practitioner**		
	Yes	60	54.4
	No	50	45.6
	Total	**110**	**100.0**
1.3	**By Staff/midwife**		
	Yes	78	70.9
	No	32	29.1
	Total	**110**	**100.0**
2	**Health education topics**		
2.1	**Diet and nutrition**		
	Yes	98	89.1
	No	12	10.9
	Total	**110**	**100.0**
2.2	**Supplementation(iron &folic acid)**		
	Yes	97	88.2
	No	13	11.8
	Total	**110**	**100.0**
2.3	**GD management and compliance**		
	Yes	87	79.1
	No	23	20.9
	Total	**110**	**100.0**
2.4	**Warning signs of pregnancy complications**		
	Yes	62	56.4
	No	48	43.6
	Total	**110**	**100.0**
2.5	**Infant warning signs**		
	Yes	49	44.5
	No	61	55.5
	Total	**110**	**100.0**

5.1.11. Problems to the pregnant with GDM in the health centers

Majority of pregnant women mentioned that they had problem in waiting time as shown in table (5.12) by 66.9%. 22.8% of the clients had problem in the ability to discuss concerns about pregnancy, 18.6% in quality of exam and treatment, 22.8% they had problem in Privacy during examination,

20.7% in the availability of medications, 17.9% of clients in availability of equipment, 31.7% of the clients had problems in hours of services, while 19.3% of them complains from the level of cleanliness of the facility, 20.7% had problems in the way staff treated them.

The fact that 88.9% of the UNRWA clinics have clients problem with waiting time during their visits to the clinic, and 31.7%of the clients have problems with hours of service indicate a possible relationship to excessive workload and unsuitable workplace in the majority of health centers .

Table 5.12: problems to the pregnant with GDM in the health centers.

	Item	*No*	*%*
1	**Waiting time**		
	Yes	97	66.9
	No	48	33.1
	Total	**145**	**100.0**
2	**Ability to discuss concerns about pregnancy**		
	Yes	33	22.8
	No	112	77.2
	Total	**145**	**100.0**
3	**Quality of exam and treatment**		
	Yes	27	18.6
	No	118	81.4
	Total	**145**	**100.0**
4	**Privacy**		
	Yes	33	22.8
	No	112	77.2
	Total	**145**	**100.0**
5	**Availability of medications**		
	Yes	30	20.7
	No	115	79.3
	Total	**145**	**100.0**
6	**Availability of equipment**		
	Yes	26	17.9
	No	119	82.1
	Total	**145**	**100.0**
7	**Hours of service**		
	Yes	46	31.7
	No	99	68.3
	Total	**145**	**100.0**
8	**Cleanliness of the facility**		
	Yes	28	19.3
	No	117	80.7
	Total	**145**	**100.0**
9	**How staff treated the patient**		
	Yes	30	20.7
	No	115	79.3
	Total	**145**	**100.0**

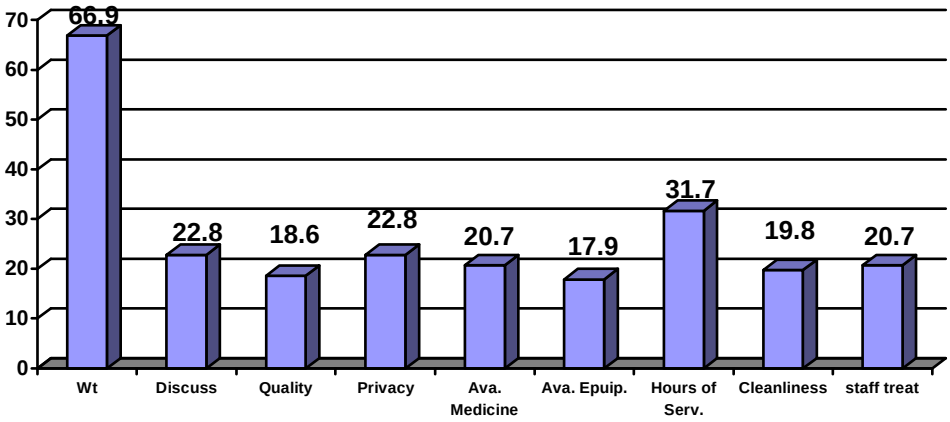


Figure 5.5: Problems facing the pregnant woman with gestational diabetes in the health centers

5.1.12. **Knowledge of pregnant with gestational diabetes about GDM**.

5.1.12.1. Knowledge of pregnant women to define gestational diabetes

50.3% of them defined GDM in correct way, while the remaining 49.7% did not know the correct answer. When asking the client what was the Normal value of FBS only 54.5% of the same clients knew the normal value, while 45.5% did not knew the correct answer .This indicates that their knowledge about GDM is not adequate and they are in need of more education and more knowledge about GDM by health care providers .

Table 5.13: Knowledge of pregnant with gestational diabetes about GDM.

1	***Definition gestational diabetes***		
	Diabetes found during pregnancy or after delivery	47	32.4
	Kind of diabetes can happen before pregnancy	25	17.2
	Increased glucose level in blood 1st detected during pregnant	73	50.3
	Total	**145**	**100.0**
2	**Normal FBS "according to pt knowledge"**		
	From 30-70mg/dl	39	26.9
	From 71-110 mg/dl	79	54.5
	More than 110 mg/dl	27	18.6
	Total	**145**	**100.0**

5.1.12.2..Knowledge of pregnant with gestational diabetes about gestational diabetes and complications

Clients who gave correct answer for each item calculated as shows in table (5.14), 50.3% knew the correct definition of gestational diabetes, 50.3% mentioned Normal FBS correctly.

Complications of gestational diabetes of those who prompted and not prompted the complications of GDM, 31.0% of the clients prompted Oversize baby as a complication of GDM, 58.6% of the clients mentioned Pregnancy related high blood pressure, 61.4%prompted Miscarriage as a complication of GDM And 74.4% tell polyhydramnios as a complication ,

While 73.8% of clients prompted Preterm delivery, 57.9% Stillbirth, 50.3% Delivered by CS, 64.1% mentioned that the baby might have breathing problems, 65.5% Jaundice, 29.0% Low blood sugar as the clients prompted.

This is consistent with a study, which evaluates the knowledge of pregnant women with GDM about complications of GDM. 56.3% of clients know C.S as a complication of GDM), and differ from this study in (18.3% of pregnant women know premature delivery as a complication of GDM which and abortion as a complication of GDM 17.5% only know that) for other complications 26.6% knows other complications which are many (Shaat,2000).

Client lack of knowledge about complications of GDM is a huge problem that makes such women underestimate their health problems, thus increasing their knowledge about the complication will increase their compliance and participation throughout their management, which lead to healthy pregnancy and healthy outcome.

Table 5.14: Knowledge of client about of GDM.

	Item	*No*	*%*
1	**Definition gestational diabetes**		
	True	73	50.3
	False	72	49.7
	Total	**145**	**100.0**
2	**Normal FBS "according to pt knowledge"**		
	True	73	50.3
	False	72	49.7
	Total	**145**	**100.0**
3	**Oversize**		
	prompted	45	31.0
	Non Prompted	100	69.0
	Total	**145**	**100.0**
4	**Pregnancy related high blood pressure**		
	prompted	85	58.6
	Non Prompted	60	41.4
	Total	**145**	**100.0**
5	**Miscarriage**		
	prompted	89	61.4
	Non Prompted	56	38.6
	Total	**145**	**100.0**
6	**polyhydramnios**		
	prompted	108	74.5
	Non Prompted	37	25.5
	Total	**145**	**100.0**
7	**Preterm delivery**		
	prompted	42	29.0
	Non Prompted	103	71.0
8	**Stillbirth**		
	prompted	84	57.9
	Non Prompted	61	42.1
	Total	**145**	**100.0**
9	**Delivered by CS**		
	prompted	73	50.3
	Non Prompted	72	49.7
	Total	**145**	**100.0**
10	**The baby may have breathing problems**		
	prompted	93	64.1
	Non Prompted	52	35.9
	Total	**145**	**100.0**
11	**Low blood sugar**		
	prompted	95	65.5
	Non Prompted	50	34.5
	Total	**145**	**100.0**
12	**Jaundice**		
	prompted	107	73.8
	Non Prompted	38	26.2

5.1.12.3. Overall Knowledge of clients about GDM

Overall knowledge of clients about GDM When we give one mark for every correct answer of knowledge of clients who are suffering from GDM , the overall marks about GDM equal 12 marks , the mean knowledge of clients is 4.97 marks , when divided into three groups , 1st group took 5 marks and less by 58.6% of total clients and 2nd group took 6 to 9 marks by 36.6% of them ,while 4.8% only had More than 9 marks as shown in Table (5.15) which represent lack of knowledge in the clients who are suffering from GDM a huge problem that makes such women underestimate their health problems which expose them to more complication for them and for their baby.

Table 5.15: overall Knowledge of clients about GDM

Item	No.	%	Mean	MD	Sd
5 marks and less	85	58.6	4.97	5.0	2.6
From 6 to 9 marks	53	36.6			
More than 9 marks	**7**	**4.8**			
Total	**145**	**100.0**			

5.1.13. The relationship between knowledge and other variables

5.1.13.1. The relationship between knowledge and governorates distribution

. One-way ANOVA test between overall Knowledge of client about GDM and governorates distribution in table (5.16) illustrate that the best knowledge is in Rafah mean knowledge is 5.5, while the least is in Khanyonis the mean knowledge is 4.4 marks .There is **no** statistical significant relationship between client knowledge and governorates distribution(P-value = 0.480).

5.1.13.2. Relationship between client knowledge and age

The mean knowledge for less than 20 of age is two. In addition, the mean knowledge From 20 to 25 Yrs of age is 5.7, while the mean knowledge from 25-30 Yrs of age is 4.6. the mean knowledge from 30-40 Yrs of age is 5.0 ,and the mean knowledge of 40 years and above is 4.9 There is **no** statistical significant relationship between client knowledge and age (P-value = 0.71).

5.1.13.3. Relationship between client knowledge and income

The mean knowledge for client with income Less than 1000 NIC and less is 4.9, and the mean knowledge for client with income from 1000 to 2000 NIC is 4.5while the mean knowledge for client with income from 2000 to 3000 NIC is 5.6 , the mean knowledge for client with income More than 3000 NIC is 5.4. There is no **statistical** significant relationship between client knowledge and income (P-value = 0.733).

5.1.13.4. Relationship between client knowledge and education level

The mean knowledge for the client who are illiterate is 3.5 and The mean knowledge for the client who are primary educated is 4.1 , for that who educated prep school is 4.3 ,for those who finished high school is 5.2 , lastly for those who finished university graduate is 6.1, according to the level of education increase the knowledge increase. There is statistical significant relationship between client knowledge and education level (P-value = 0.01).

Table 5.16: One-way (ANOVA) between overall knowledge of client about GDM and "governorates, Age group, Income and Education".

	Items	N	M		Sum of Squares	df	Mean Square	F	Sig.
Governorate	Gaza	46	4.8	Between Groups	24.6	4	6.1	0.876	0.480
	North of Gaza	16	5.3	Within Groups	982.3	140	7.01		
	Mid zone	17	4.5	Total	100.8	144			
	Khanyonis	20	4.4						
	Rafah	46	5.5						
	Total	145	5.0						
Age group	Less than 20 years	1	2.0	Between Groups	15.12	4	3.77	0.53	0.71
	From 20 to 24	7	5.7	Within Groups	991.71	140	7.08		
	From 25 to 29	21	4.6	Total	1006.8	144			
	From 30 to 40	83	5.0						
	More than 40	33	4.9						
	Total	145	5.0						
Income	Less than 1000 NIC	66	4.9	Between Groups	21.77	3	7.26	1.04	0.377
	From 1000 to 1999	36	4.5	Within Groups	985.05	141	6.99		
	From 2000 to 2999	23	5.6	Total	1006.83	144			
	More than 3000	20	5.4						
	Total		5.0						
Education	illiterate	8	3.5	Between Groups	87.934	4	22.0	3.5	0.01
	primary	15	4.1	Within Groups	918.893	140	6.6		
	Prep. school	37	4.3	Total	1006.828	144			
	high school	56	5.2						
	university graduate	29	6.1						
	Total	145	5.0						

5.1.13.5. Relationship between overall knowledge of the clients, and health education received by healthcare providers' categories.

One-way ANOVA between the knowledge of the clients who received health education At general by all healthcare providers (all categories) and those who did not received there is no statistical significant differences (p-value = 0.508). This will indicate that the overall knowledge is not increase in general by all categories. When we differentiate the different categories, we find that there is statistical significant differences between the knowledge of the clients who received health education by obstetrician and those did not received (p-value = 0.03). Table (5.17) this indicate that obstetrician have more knowledge and give more knowledge to the client more than any healthcare providers give.

Table 5.17: Independent T .test between knowledge of clients (due to health education by Healthcare provider categories.

	Item	N	Mean	Sd	T	Df	Sag
Heath education receiving	Yes	108	4.9	2.7	0.667	143	0.508
	No	37	5.2	2.6	0.680	64.616	
By Obstetrician	Yes	18	5.2	2.2	0.47	108	0.03
	No	92	4.9	2.8	0.56	29.1	
GP	Yes	60	5.2	2.7	1.4	108	0.82
	No	50	4.5	2.7	1.4	104.43	
Nurse	Yes	78	4.7	2.7	1.23	108	0.84
	No	32	5.4	2.7	1.23	58.6	

5.1.14. Relation between problems facing the client with GDM and governorates

Show One-way ANOVA between problems facing the client with GDM and governorates. There is a statistically significant difference between problems facing clients in the health centers and the governorates (p value- 0.003) .more in Khanyonis by means (4.7) and the least in Rafah by means of (1.9). These differences reflect many factors, which need more investigation and effort in UNRWA health centers Table (5.18).

Table 5.18: One-way ANOVA between problems facing the client with GDM and governorates.

	Items	**N**	**M**		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Governorate	Gaza	46	2.2	Between Groups	120.537	4	30.1	4.263	0.003
	North of Gaza	16	2.1	Within Groups	989.698	140	7.069		
	Mid zone	17	2.9	Total	1110.234	144			
	Khanyonis	20	4.7						
	Rafah	46	1.9						
	Total	145	2.5						

5.1.15. Relation between activities carried out during visit for client with GDM in ANC and governorates.

Table (5.19) One-way ANOVA between During visit of client with GDM in ANC and governorates There is statistically significant differences between what is done for the client During visit in ANC in the health centers and the governorates (p value- 0.002) .more in Rafah by means (10.8) and the least in the north of Gaza by means of(9.1). These differences reflect many factors, which need more investigation and effort in UNRWA health centers.

Table (5.19) One-way ANOVA between activities carried out during visit of client with GDM in ANC and governorates.

	Items	N	M		Sum of Squares	df	Mean Square	F	Sig.
Governorate	Gaza	46	9.7	Between Groups	51.414	4	12.85	4.52	0.002
	North of Gaza	16	9.1	Within Groups	397.524	140	2.839		
	Mid zone	17	9.9	Total	448.938	144			
	Khanyonis	20	9.5						
	Rafah	46	10.8						
	Total	145	9.9						

5.2 Results and discussion for Healthcare provider questionnaire

5.2.1 Characteristics of Healthcare provider

Socio demographic variables were studied age, sex, technical qualifications, marital status, residency, years of experience as follows:

5.2.1.1 Characteristics of Healthcare provider by technical qualification

Doctors (obstetrician and GP) were 23.8% of healthcare providers while 76.2% were Nurses (SSN& senior midwives) as shown in table (5.20). These results are different from those of (ozavaris .and Akin, 2002) study in turkey when they found 6.9% of healthcare providers to be midwives/nurse and 60.8% of them were physician as the majority of them attending private doctor clinic (ozvaris And Akin, 2002).

This is consistent with a study conducted in AL-Quads University in Palestine for "assessment of antenatal care services provided at the ministry of health and UNRWA clinics in Gaza province".

When the researcher found that 70% of the healthcare providers were either midwives 46.2% or nurse/ midwives 23.1%and low proportion were physician 15.4%, (Shaheen, 2005). Regarding UNRWA policy guidelines, midwives provide most of ANC to uncomplicated normal pregnancies, while GP and specialists steps in to provide the ANC to women with high-risk pregnancy. This ratio has reflected itself in many of the aspects of ANC such as increasing workload on doctors; only 5% of the ANC staff is obstetricians increasing responsibility of obstetricians. Rising prevalence of risky pregnancies "including GDM" (high risk pregnancy equal to 14.5% of all pregnant attending ANC , and alert pregnancy 23.8% " which is seen by obstetricians once at least during pregnancy and followed by GP ", the remaining

normal pregnancies care followed by midwives which form 61.7% of all pregnancies (UNRWA , 2005) . This has its impact on waiting time, consultation time and other aspects of service provided by them.

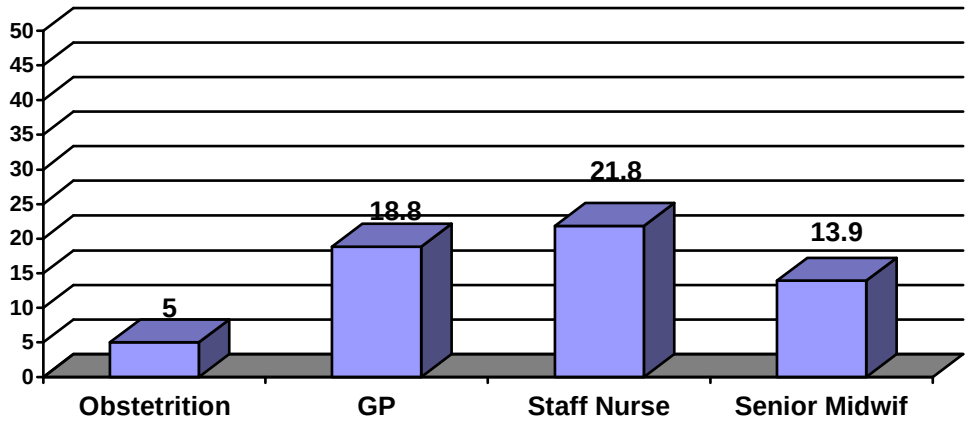


Figure 5.6: Qualification of the healthcare providers.

5.2.1.2 Characteristics of Healthcare provider by sex.

The vast majority of the study sample was females (97%), while males represent only (3%) all were Gyn/ obstetrician. This clarifies the UNRWA policy in hiring female staff in ANC, which is suitable for Palestinian culture. this agrees with a study conducted in Saudi Arabia for women in anti natal care about their opinion in expressing a clear preference for being seen by female doctors in antenatal care, they said that they felt more comfortable with them in the physical examinations and when they asked questions about pregnancy ,breast feeding and so on. However, male doctors also accepted as long as a female nurse is present in the consultation. (Nigenda. et al, 2003).

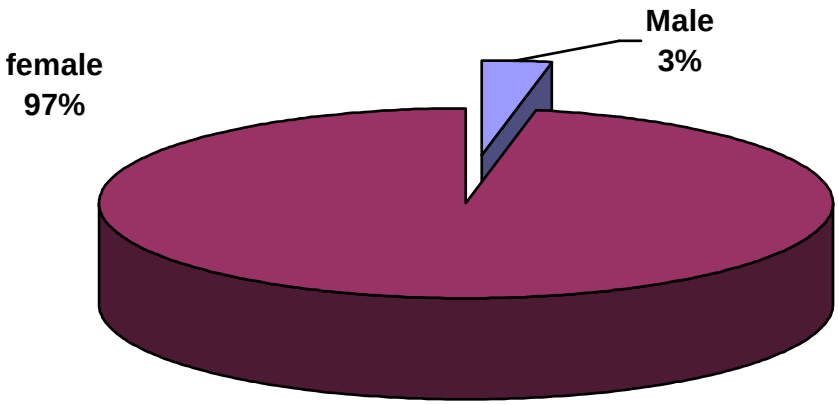


Figure 5.7: distribution of Health care providers by sex

5.2.1.3. Characteristics of Healthcare provider by age.

Regarding the age of the healthcare providers as shown in table (5.20).the age of healthcare providers ranged from 23 to 59 years with (mean age of 40.95 years and a standard deviation of 8.83).

From the age group less than 35 years represented 21.8%, while providers from the age group 35-50 represented 59.4%, and over the age of 50 years represented low proportion 18.8% this clears the expansion of UNRWA health services in due to continues growth of population and increase needs for recruitment of employee, growth rate in Gaza governorate is (3.8%). (MOH, 2006) Most of healthcare providers are between 35-50 years which is a suitable age group that have both adequate experience and age enable them to take their opportunity through training and educational programs to update their knowledge and practice and which can lead to best achievement in health program .

5.2.1.4. Characteristics of Healthcare provider by marital status.

The majority of respondent healthcare providers were married and represented 85.1% of healthcare providers, singles represented 14.9 %.as the previous table shows.

This may reflect the services provided and the effect of the outcome of their services, their responsibility ,and social concept and problems in life may affect providers productivity and knowledge ,they need continuous effective training and testing their knowledge for inspiring them for more productivity .

5.2.1.5. Characteristics of Healthcare providers by Residency.

For residency of the healthcare providers, 34.7% of the healthcare providers live inside camps, while 65.3 % lives outside camps “city or village". This distribution is consistent with clients distribution which is 61.4% are outside camp while 38.6% of them are inside camp, this reflect the nature of living for Palestinian refugees, due to growth of refugee population from eight refugee camps that contain two thirds of population number In Gaza Strip. Camps are not sufficient for refugees which obliges them to live outside camps (MOH, PHIC, 2006)

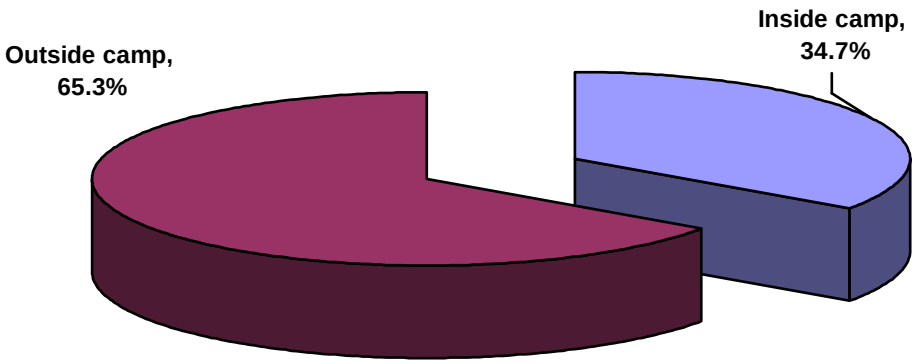


Figure 5.8: Residency of the healthcare providers living.

The figure below represent the distribution of the health care providers in five governorates four health centers in Gaza , four health centers in the Midzone , two health centers in the north of Gaza , three health centers in Khanyonis , two health centers in Rafah.

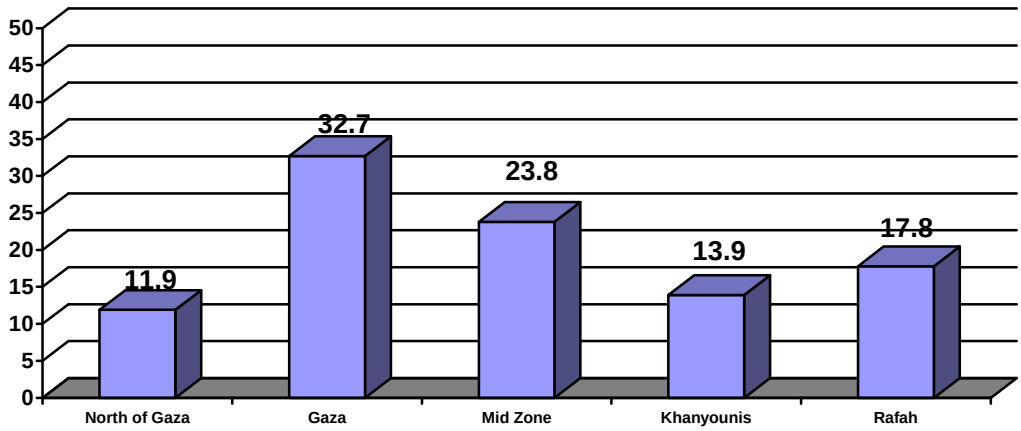


Figure 5.8: represents the distribution of the healthcare providers according to their workplace Governorates:

5.2.1.6. Characteristics of Health care provider by experience

The distribution of healthcare providers by experience years in the antenatal care were represented by three categories, the first (less than 10 years of experience) represented 31.7%, the second category (10-20 years of experience) constituted 43.6% with the biggest share. As illustrate in table (5.20). The third category (More than 20 years of experience) represented 24.7 % of the providers (mean = 14.7, MD= 14, SD= 9.8). More experience only did not mean better knowledge, but knowledge and experience are important for best practice this will be discussed later when we study the relationship between experiences and knowledge of the healthcare providers.

Table 5.20: Socio demographic characteristics of Healthcare providers.

	Items	*No.*	*%*
1.	**Technical qualification**		
	Doctor	24	23.8
	Nurse	77	76.2
	Total	**101**	**100.0**
2.	**Sex of health worker**		
	Male	3	3.0
	Female	98	97.0
	Total	**101**	**100.0**
3	**Age**		
	Less than 35 Yrs	22	21.8
	From 35 to 50 Yrs	60	59.4
	More than 50 Yrs	19	18.8
	Total	**101**	**100.0**
4	**Marital Status**		
	Married	86	85.1
	Single	15	14.9
	Total	**101**	**100.0**
5.	**Residential status**		
	Inside camp	35	34.7
	Outside camp	66	65.3
	Total	**101**	**100.0**
6.	**Years of experience**		
	Less than 10 Yrs	32	31.7
	From 10 to 20 Yrs	44	43.6
	More than 20 Yrs	25	24.7
	Total	**101**	**100.0**

5.2.2. Training of Health care providers

Majority of healthcare providers 70.3% stated that they have received in- service training in ANC during the last five years of working at UNRWA, while the remaining 29.7% have not received any training. Of the 70.3% of the UNRWA ANC providers who received in-service training during the last 5 years, 94.4 % received training in antenatal care, 49.3% received training in health education and counseling and 45.1% received training in management of high-risk pregnancy, Table (5.21) show.

Training is a continuous process at UNRWA health department, as we mentioned before, 38.3% of the pregnancies are risk pregnancies " high risk and moderate ", so all of the workers in the ANC must be qualified to handle such cases so having only 45.1% of the trained "70.3 % of the providers" trained in management of high risk pregnancy is by far unacceptable.

Table 5.21: Distribution of Healthcare provider training:

1	***Receiving in services training during the last five years***		
	Yes	71	70.3
	No	30	29.7
	Total	**101**	**100.0**
2	**In Antenatal Care**		
	Yes	67	94.4
	No	4	5.6
	Total	**71**	**100.0**
3	**Counseling / Health education**		
	Yes	35	49.3
	No	36	50.7
	Total	**71**	**101**
4	**Management of high risk pregnancy**		
	Yes	32	45.1
	No	39	54.9
	Total	**71**	**100.0**

5.2.3. Accessibility of antenatal care services in the perspective of healthcare providers.

5.2.3.1. Geographical Accessibility of antenatal care

Accessibility of antenatal care services in the perspective of healthcare providers. 97% of the ANC providers stated that their services are accessible to the clients (easily reachable) and at any time throughout the duty hours (open door strategy), while the remaining 3% of the providers disagreed on that as table (5.22) describes. Recognizing that health is a human right, must ensure access to high

quality and safe medical services and facilities for all pregnant women with gestational diabetes. All services of antenatal care are accessible whether inside or outside camps in the opinion of health care providers.

5.2.3.2 Accessibility of antenatal care services by time spend

When asked about the availability of appointment system, 100% of provides agreed on the presence of such system. Mean waiting time to receive service was 34.6 minutes; Described in three groups as shown in the table (5.22). According to which 36.6% of the care providers said that the client waiting time is less than 30 minutes, while most of them (59.4%) stated that average waiting time is between 30 and 60 minutes and the remaining 4% of the providers said that the waiting time is more than an hour. (Mean = 34.6, SD= 23.7).

This indicates that 63.4% of the clients told that waiting time is 30 minutes or more, which is consistent with the client opinion by 60.7% of the clients, which is a long time in presence of appointment system by 98.0% of the healthcare provider's opinion. , but there is differences with the client opinion in waiting time more than an hour as 15.9% of the client told that Waiting time more than an hour and 4% the healthcare providers told that pregnant women waited for more than an hour .

The client opinion is more near the truth because they are suffering from that. Consultation time which is the time that the ANC provider spend with his client during antenatal visits. Described in to 3 groups, according to which 12.8% of the care providers considered that the consultation time is "less than 10 minutes", another 71.3% of them considered that they spent "10-20 minutes" with their clients and the remaining 6.9% said that they spend "more than 20 minutes" with their clients.

(Mean =13.5, SD= 9.5). From the table below approximately all of healthcare providers mentioned that services are accessible, appointment system is available, but the majority told that waiting time is between 30-60 minute by 59.4% and

consultation time from 10-20 minutes by 71.3%, this indicate that waiting time is long time if the client have appointment by date and time , for consultation time, this study is consistent with study that conducted for assessment of antenatal care services provided at ministry of health and UNRWA clinics in Gaza province in which 65% of providers told that waiting time up to one and half hours as long time ,and consultation time is adequate.(Shaheen, 2005).

Table 5.22: accessibility of antenatal care services in the perspective of healthcare providers.

	Items	***No.***	**%**
1.	**accessibility of service**		
	Yes	98	97.0
	No	3	3.0
	Total	**101**	**100.0**
2.	**Appointment system availability"**		
	Yes	101	100%
	No	0	0.0%
	Total	**101**	**100.0**
3.	**Average waiting time to offer care**		
	Less than 30 minutes	37	36.6
	From 30 to 60 minutes	60	59.4
	More than 60 minutes	4	4.0
	Total	**101**	**100.0**
4.	**Average time spend to provide care**		
	Less than 10 minutes	22	21.8
	From 10 to 20 minutes	72	71.3
	More than 20 minutes	7	6.9
	Total	**101**	**100.0**

5.2.4. Guidelines availability and implementation for gestational diabetes mellitus

Variables related to GDM guidelines availability and implementation including health education, screening and recoding systems concerned with GDM patients.

When asking healthcare providers if there is guidelines for the management of GDM? And if they had seen it? 39.6% of the providers stated that these guidelines are available, and they had read it. While 57.4% of the providers did confirm the presence of such guidelines but they had never read it, the remaining 3% denied the availability of GDM management guidelines 94.1% of the providers saw that GDM guidelines are useful in the management of GDM, but the reminding 5.9% thought they were not. Table (5.23) shows that most providers (63.4%) stated that they adhered to the guidelines through their practice, while 36.6% adhered to it to some extent, none of the healthcare providers stated that they did not adhere to it at all. Regarding duration between antenatal visits of a GDM patient 3.0% of the providers said that a monthly visit is sufficient, while most of them (57.4%) stated that the duration should be 2 weeks, 7.9% of the same group said that antenatal visits should be weekly the remaining 31.7% considered that it should be "as needed". The number of antenatal visits for clients according to the ANC providers described in 3 groups, the first is "less than 7 visits" which represents 20.8% of providers, the second group "7 to 14 visits" described 65.3% of providers' practice and the third group "more than 14 visits" represented only 13.9% of the providers (Mean =9.6, SD= 4.1). When healthcare providers asked whether they were satisfied with their GDM patients compliance with ANC, 86.1% of them said that they are satisfied with patients compliance, while the other 13.9% said they were not satisfied. As table (5.23) shows most of the ANC healthcare providers stated that health education service provided to clients with GDM during their antenatal visits with this group representing 94.1%, while the reminder 5.9% said that they did not provide health education service to

their clients. When asked about how often health education service provided 68.3% of the ANC providers confirmed they always provided such service, while 29.7% provided health education sometimes and 2% never provide any health education. Regarding the availability of screening system for GDM in their UNRWA health centers, all of the healthcare providers (100%) confirmed the availability of such system. Recording system for patients data from each antenatal visits was available in almost all (99%) the health centers according to the providers as well. 87.1% of the ANC providers are satisfied with quality of services they provide to their clients, while the remaining 12.9% aren't satisfied. This table indicate that majority of the healthcare providers knew that there is guidelines for pregnancy with gestational diabetes in UNRWA. The researcher can see with effort the availability of guidelines with 39.6% of them.

They told by 94.1% that the guidelines are useful, in spite of that 60.4% of the providers did not see the guidelines. 57.4% knew the duration between ANC visits for pregnant with GDM according to the guidelines, and only 13.9% of the healthcare providers knew that number of ANC visits for pregnant with GDM all through pregnancy is 14 visits or more according to guidelines. So decrease adherence to the guidelines appear from detailed questions more than direct question for adherence to the guidelines, This is consistent with a study conducted in Remote Northern Community for healthcare professionals involved in the care of pregnant Aboriginal women. Educational Strategies to Improve Screening for Gestational Diabetes Mellitus in Aboriginal Women in done for adherence to a standard of care for screening for GDM. But adherence to the guidelines was generally poor and was not significantly (Cleary, Ludwig, Riese and Grant, 2006)

Table 5.23: Guidelines availability and implementation for GDM.

	Items	***No.***	**%**
1	**availability of written guidelines for GDM**		
	Yes seen	40	39.6
	Yes not seen	58	57.4
	No	3	3.0
	Total	**101**	**100.0**
2	**Guideline useful for management of GDM**		
	Yes	95	94.1
	No	6	5.9
	Total	**101**	**100.0**
3	**Adherence to the guideline**		
	To great extent	64	63.4
	To some extent	37	36.6
	Not at all	0	0.0
	Total	**101**	**100.0**
4	**Duration between antenatal visits for GDM**		
	A month	3	3.0
	Two weeks	58	57.4
	A week	8	7.9
	As needed	32	31.7
	Total	**101**	**100.0**
5	**Number of antenatal visits for GDM patient**		
	Less than 7	21	20.8
	From 7 to 14	66	65.3
	More than 14	14	13.9
	Total	**101**	**100.0**
6	**Satisfaction of health provider with pt. compliance**		
	Yes	87	86.1
	No	14	13.9
	Total	**101**	**100.0**
7	**Health education service**		
	Yes	95	94.1
	No	6	5.9
	Total	**101**	**100.0**
8	**How often health education service is provided**		
	Yes Always	96	68.3
	Sometimes	30	29.7
	Never	2	2.0
	Total	**101**	**100.0**
9	**Screening system for GDM**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
10	**Clients information from antenatal visit is recorded**		
	Yes	100	99.0
	No	1	1.0
	Total	**101**	**100.0**
11	**Satisfaction with the quality of service**		
	Yes	88	87.1
	No	13	13.9
	Total	**101**	**100.0**

5.2.5. The most important issues addressed for improving services.

Healthcare providers mentioned important issues to improve services for GDM, more staff was mentioned by the most providers (77.2%) to be an important issue to improve quality of ANC, and decrease waiting time which is most problem for clients as we will see later and increase consultation time ,during antenatal visit. 65.3% of care providers agreed that they need more training this appear clearly with studying relationship between knowledge and training later which did not reach statistically significant as training was not effective ,so they are in need for effective efficient training 60.4%

Better equipment and supplies, 61.4% of the staff better physical environment constituted and demands respectively, finally only 31.7% mentioned the need for better appointment system while the remaining 68.3% are satisfied with the current appointment system. As appear in the figure the majority of staff feel first need to more staff, 2nd need for more training.

This indicates awareness of the staff about the important needs to improve the quality of health services but they cannot solve the problems because out of their ability Table (5.24) shows.

Table 5.24: The most important issues to be addressed for improving services.

	Items	*No.*	*%*
1.	**More staff**		
	Yes	78	77.2
	No	23	22.8
	Total	**101**	**100.0**
2.	**More training**		
	Yes	66	65.3
	No	35	34.7
	Total	**101**	**100.0**
3	**More / better equipment or supplies**		
	Yes	61	60.4
	No	40	39.6
	Total	**101**	**100.0**
4	**Better physical environment**		
	Yes	62	61.4
	No	39	38.6
	Total	**101**	**100.0**
5.	**Better appointment system**		
	Yes	32	31.7
	No	69	68.3
	Total	**101**	**100.0**

5.2.6. Availability of essential equipment and in working order to provide ANC Services

the availability of essential equipments Sphygmomanometer Examination bed and Weight scale by 100%,for Height scale 84.2% of healthcare providers agree for its availability, thermometer availability in ANC session 70.3% tell that is available, Ultrasound, Sonic aid for fetal monitoring, Measuring tape by 96.0%,98.0%,96.0% respectively Table (5.25) illustrates. Therefore, thermometer and height scale and all of the above equipment must be available and in working order, this obtained by periodic maintenance of equipments.

Table 5.25: Availability of essential equipment and in working order to provide ANC services

	Items	*No.*	*%*
1.	**Examination bed**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
2.	**Sphygmomanometer**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
3	**Weight scale**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
4	**Height scale**		
	Yes	85	84.2
	No	16	15.8
	Total	**101**	**100.0**
5.	**Thermometer**		
	Yes	71	70.3
	No	30	29.7
	Total	**101**	**100.0**
6	**Ultrasound**		
	Yes	97	96.0
	No	4	4.0
	Total	**101**	**100.0**
7	**Sonic aid for fetal monitoring**		
	Yes	99	98.0
	No	2	2.0
	Total	**101**	**100.0**
8	**Measuring tape**		
	Yes	97	96.0
	No	4	4.0
	Total	**101**	**100.0**

5.2.7. Availability of medicine, laboratory services and essential support services

5.2.7.1. Availability of medicine.

When healthcare provider asks was asked about Availability of medicine, insulin, Iron and folic acid by 100%, while, Oral hypoglycemic agents 96.0% which has no rule in GDM management.

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5.2.7.2. Availability of Laboratory services

Laboratory services that needed for the management of GDM are illustrated by the table (5.26), which shows that all of the providers stated the availability of such lab. Services by

5.2.7.3. Availability essential support services.

.Regarding teaching aids used for educating women about GDM most of the providers (63.4%) said that it's not available , which leads to lack of knowledge of the clients , and consequently leads to less compliance for ANC visits which exposes clients for complications ,while the rest 36.6% of healthcare providers said that it's available. Most of the healthcare providers (76.2%) confirmed that ANC health education materials about GDM are available in their clinics; the remaining 23.8% denied the availability of any health education materials about GDM, lack of health education material also lead to decrease level of knowledge, which increase morbidity and mortality of both pregnant women and pregnancy outcome .

Table 5.26: Availability of medicine, laboratory services and essential support services

	Items	*No.*	*%*
1	**Medication availability**		
1.1	**Insulin**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
1.2	**Oral hypoglycemic agents**		
	Yes	97	96.0
	No	4	4.0
	Total	**101**	**100.0**
1.3	**Iron and folic acid**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
2	**Laboratory services availability**		
2.1	**CBC**		
	Yes	95	94.1
	No	6	5.9
	Total	**101**	**100.0**
2.2	**Blood chemistry**		
	Yes	98	97.0
	No	3	3.0
	Total	**101**	**100.0**
2.3	**Urine analysis**		
	Yes	101	100.0
	No	0	0.0
	Total	**101**	**100.0**
2.4	**FBS**		
	Yes	100	99.0
	No	1	1.0
	Total	**101**	**100.0**
2.5	**OGTT**		
	Yes	100	99.0
	No	1	1.0
	Total	**101**	**100.0**
3.	**Essential support services**		
3.1	**Teaching aids for ANC**		
	Yes	37	36.6
	No	64	63.4
	Total	**101**	**100.0**
3.2	**ANC health education materials**		
	Yes	77	76.2
	No	24	23.8
	Total	**101**	**100.0**

5.2.8. Healthcare provider knowledge about GDM

5.2.8.1. Healthcare provider knowledge about GDM principles.

When asking healthcare providers about the definition of GDM, 12.9% of care providers choose to define GDM as "having diabetes during pregnancy with percentage 1%", while 42.6% of providers defined GDM as "diabetes with 1st onset during pregnancy" which is the true definition, the remaining 44.6% defined GDM as " diabetes that occurs during pregnancy or after delivery". Table (5.27) shows, therefore only 42.6% of healthcare providers knew the correct definition of GDM while the remaining 57.4% defined it incorrectly. This means that the majority of healthcare providers do not know what gestational diabetes is? This lack of knowledge leads to decrease detection of GDM and decrease quality of service.

There were 3 questions for healthcare provider's knowledge about investigations for GDM as illustrated in table (5.27).

When asked about fasting period required for FBS test only 37.6% of the providers answered correctly stating that 10 to 12 hours are the recommended fasting period.

While (54.5%) answered "6-8 hours" which is not enough period, the rest 7.9% of the same group said 12 to 14 hours in which is too long so 62.4% of the providers answered incorrectly , this lack of knowledge lead to wrong instruction to the client for preparing herself for investigation which lead to less detection of GDM.

Most of the providers (57.4 %) stated that a FBS more than 126 mg/dl is sufficient to diagnose GDM. While 39.6% thought 85-125 mg/dl would be enough, which is incorrect as well as the remaining 3% who answered 30-89 mg/dl, making a total of 42.6% answered this questioned incorrectly .like said before this emphasize lack of knowledge.

Most of the ANC providers (77.2%) told that OGTT needed if the FBS result was 85-125 mg/dl which is true according to the guidelines, while 19.8% and 3.0% stated

they will perform the test if the FBS value is > 126 mg/dl and 30-89 mg/dl respectively, both are incorrect (22.8 %) according to the GDM management guidelines.

Table 5.27: Healthcare provider knowledge about GDM principles**.**

	Items	***No.***	**%**
1	**Definition of GDM** ***(GD is glucose intolerance that is occurs during pregnancy)***		
	True	43	42.6
	False	58	57.4
	Total	**101**	**100.0**
2	**Fasting period for a FBS** ***(10-12 hours)***		
	True	38	37.6
	False	63	62.4
	Total	**101**	**100.0**
3	**GDM defined when FBS** ***(=> 126 mg/dl)***		
	True	58	57.4
	False	43	42.6
	Total	**101**	**100.0**
4	**OGTT indicated when FBS is** ***(85-125mg/dl)***		
	True	78	77.2
	False	23	22.8
	Total	**101**	**100.0**

5.2.8.2. Health provider knowledge about GDM prevalence

As shown table (5.28) only 26.7 % of the healthcare providers have an idea about the prevalence of GDM worldwide, which is (2-5 %), while most of them (73.3 %) had no clue about that epidemiological data as knowledge of the magnitude of the problem lead to provide more importance in dealing with so the healthcare providers must know the real magnitude of prevalence taking in consideration that prevalence of GDM is mentioned in technical guidelines of UNRWA as 2-5% worldwide , this indicate that they are not aware of UNRWA guidelines .this condition is in need for

urgent intervention from higher level to improve knowledge in every guidelines to translate . knowledge into practice.

Table 5.28: Health provider knowledge about GDM prevalence.

	Item	*NO*	*%*
1	**Prevalence of GDM worldwide** ***(2 to 5% worldwide)***		
	True	27	26.7
	False	74	73.3
	Total	**101**	**100.0**
2	**Prevalence of GDM in UNRWA compared to the world**		
	Less than world wide	59	58.5
	Equal to the world wide	16	15.8
	More than world wide	26	25.7
	Total	**101**	**100**

5.2.8.3. Knowledge of the healthcare providers about risk factor for GDM

knowledge of risk factor for GDM Regarding the knowledge of risk factors of GDM among healthcare providers ,Table (5.29) shows that 66.3% of ANC providers mentioned "age more than 25" as a risk factor of GDM, while 33.7% didn't consider it as a risk factor of GDM making it the least recognized risk factor . 80.2% of the same group mentioned, "Being overweight" as a risk factor, the remaining 19.8% did not. 85.1% agreed on the fact that a "family history" is a risk factor for GDM, but the remaining 14.9% disagreed Table (5.29) shows. "History of GDM" mentioned as a risk factor by 95.0% of the providers and not mentioned by the remaining 5.0%. While 81.2% of the ANC providers mentioned "previous macrosomic baby" to be among the risk factors, the rest of the group (18.8%) did not include it among the risk factors.

about half of the providers (49.5%) successfully mentioned all the risk factors, other 26.7% mentioned 4 out of five risk factors, 9.9% were able to mention 3 risk factors, 4.0% mentioned 2 risk factors and a 9.9% of the healthcare providers knew only one

risk factor of GDM. Knowledge about risk factors for GDM, which written clearly in the guidelines, is of great importance, because screening program in UNRWA is risk, factors based screening.

Table 5.29: knowledge of the healthcare providers about risk factor for GDM

1	***Age>25 yrs***		
	Yes	67	66.3
	No	34	33.7
	Total	**101**	**100.0**
2	**Overweight**		
	Yes	81	80.2
	No	20	19.8
	Total	**101**	**100.0**
3	**Family history**		
	Yes	86	85.1
	No	15	14.9
	Total	**101**	**100.0**
4	**History of GDM**		
	Yes	96	95.0
	No	5	5.0
	Total	**101**	**100.0**
5	**Macrosomic baby**		
	Yes	82	81.2
	No	19	18.8
	Total	**101**	**100.0**

5.2.8.3 . Knowledge of healthcare providers about management plan of GDM.

According to table (5.30) ANC healthcare providers were asked about four different management lines for GDM and whether they use it or not through there management "diet, exercise, insulin and oral hypoglycemic agents ". 78.2% of the care providers agreed on the fact that diet regulation is a line of management for GDM this is Correct but the other 21.8% disagreed despite the fact that diet control is the first line for management for GDM in UNRWA guidelines. Exercise mentioned by 59.4% of providers as a part of the management plan, but the remaining 40.6% did not mention it indicating that they have no knowledge about management plane. Insulin was agreed on by almost all the healthcare providers (99%) to be part of the management, .while most of the ANC providers stated that oral hypoglycemic agents are not part of their management, 12.9% of the same group agree that it is part of their management, which is contraindicated for GDM**.**

Table 5.30: knowledge of management plan of GDM includes

1	***Diet Plan***		
	Yes	79	78.2
	No	22	21.8
	Total	**101**	**100.0**
2	**Physical Activity**		
	Yes	60	59.4
	No	41	40.6
	Total	**101**	**100.0**
3	**Insulin**		
	Yes	100	99.0
	No	1	1.0
	Total	**101**	**100.0**
4	**OHA**		
	Yes	13	12.9
	No	88	87.1
	Total	**101**	**100.0**

5.2.8.4. Health provider knowledge about Complication of gestational diabetes

Healthcare provider knowledge about Complications of GDM is Illustrated by the table (5.31), which shows that 96% of providers mentioned macrosomic baby as one of the complications of GDM.

While 94.1% of the same group mentioned CS delivery among the complications, baby respiratory distress mentioned by 69.3% of them and neonatal hypoglycemia was considered one of the complications by 83.2%. 47.5% of the providers recognized neonatal jaundice as a complication of GDM making it the least recognized complication. While 64.4% agreed on the fact that miscarriage is another complication of GDM, about the same percentage (63.4%) mentioned PIH as shown table (5.31), Polyhydramnios, preterm delivery, still birth was mentioned by 62.4%, 75.2%, 77.2% of healthcare providers respectively as a complications of GDM.

Total number of complications recognized by healthcare providers, the mean was 7.3 complications mentioned (SD=2.24) in which 34.7% of the providers knew more than 8 out of ten complications.

This level of knowledge in complication did not enable the healthcare providers to give any knowledge about complications of GDM to client which lead to lack of knowledge about complications of GDM to client also , lack of knowledge for both healthcare providers and clients lead to decrease detection of GDM ,and more complication for mothers and fetus .

Table 5.31: Health provider knowledge about Complication.

	Items	*No.*	*%*
1	**Oversized baby**		
	Yes	97	96.0
	No	4	4.0
	Total	**101**	**100.0**
2	**CS delivery**		
	Yes	95	94.1
	No	6	5.9
	Total	**101**	**100.0**
3	**Baby respiratory distress**		
	Yes	69	68.3
	No	32	31.7
	Total	**101**	**100.0**
4	**Baby hypoglycemia**		
	Yes	84	83.2
	No	17	16.8
	Total	**101**	**100.0**
5	**Jaundice**		
	Yes	48	47.5
	No	53	52.5
	Total	**101**	**100.0**
6	**Miscarriage**		
	Yes	65	64.4
	No	36	35.6
	Total	**101**	**100.0**
7	**PIH**		
	Yes	64	63.4
	No	37	36.6
	Total	**101**	**100.0**
8	**Polyhydramnios**		
	Yes	63	62.4
	No	38	37.6
	Total	**101**	**100.0**
9	**Preterm delivery**		
	Yes	76	75.2
	No	25	24.8
	Total	**101**	**100.0**
10	**Still birth**		
	Yes	78	77.2
	No	23	22.8
	Total	**101**	**100.0**

5.2.9. Overall knowledge of healthcare providers about GDM.

To assess the overall knowledge of healthcare providers about GDM definition, risk factors, investigation, epidemiology, treatment and complication. Each of questions related to that knowledge was given a mark of one mark according to marks which is taken by each health provider. The overall knowledge of healthcare providers about GDM grouped in to three groups.

Bad knowledge (Less than 15 Marks) with 18.8%, moderate knowledge 37.6% **(**From 15 to 19 Marks) and Good knowledge 43.6% **(** 20 marks and more) out of 26 mark. This results indicate that there is lack of knowledge among healthcare providers, only 43.6% of the healthcare providers had 20 marks and more, included doctors who form 23.8% with mean knowledge (mean 21.6) as seen later , this indicate that all healthcare providers are in need of improving their knowledge especially nurses ,because nurses form the majority of healthcare providers in ANC cession for high risk pregnancy.

Table (5.32), this study come in consistent with a study conducted in Gaza UNRWA and government which detect that there is lack of knowledge among healthcare providers and clients both in UNRWA and government (sha'at, 2000), since that time nothing is improved , the problem is still present. the decision maker must take this important issue into consideration for further intervention to improve healthcare providers knowledge ,which result for quality improvement in health services, knowledge and practice for decreasing both morbidity and mortality among risk pregnancy and their outcome especially pregnant with gestational diabetes .

Table 5.32: overall knowledge of healthcare providers about GDM.

Item	No.	%	Mean	MD	SD
Less than 15 Marks(bad)	19	18.8	**18.4**	**19.0**	**4.4**
From 15to19 Marks(moderate)	38	37.6			
20 marks and more(good)	44	43.6			
Total	101	100.0			

5.2.10. Relationship between knowledge of health provider and governorates and experience

5.2.10.1. Relationship between Knowledge of healthcare provider and governorates.

The relationship between Knowledge of health provider and governorates indicate that there is no statistical significant difference between health provider knowledge and governorates distribution, Table (5.33) shows. (P-value = 0.883). The mean knowledge in Rafah is 18.9 and Midzone while the mean knowledge in Khanyonis is 17.6, which are the least of all.

5.2.10.2. The relationship between Knowledge of health provider and experience

There is no statistical significant differences between health provider knowledge and Years of experience (P-value = 0.762). The mean knowledge for less than 10 years of experience is 19.1. so more experience did not increase the level of knowledge .this result is consistent with study which indicate more experience of providers does not always mean having good knowledge and this reflects the importance of more training and continuous education. (El-Nakhal , 2003) , This match the literature that stated that age or length of working years does not mean greater learning or better experience(Foot and Hook,1999).

5.2.10.3. The relationship between Knowledge of healthcare provider and age.

There is no statistical significant relationship between health provider knowledge and Age group (P-value = 0.09). The mean knowledge less than 35 Yrs group19.9 and the mean knowledge From 35 to 50 Yrs group17.7, and more than 50 Yrs group mean is 19.2, so did not depend on age less age and more age had more Knowledge, it depends on person himself willing and ability and supervisors' guidance and support.

5.2.10.4. The relationship between Knowledge of healthcare provider and Availability of Guideline.

There is statistical significant differences between health provider knowledge and Availability of Guideline seen or not seen (P-value = 0.05). The mean knowledge for the health provider who told that they have seen Guideline 19.6 and the mean knowledge for those who they did not see Guidelines 17.8. Availability of Guidelines denied by whom mean knowledge 15.7. This indicate that more adherent to guidelines lead to more knowledge to health provider. This is consistent with the study developed for Gestational Diabetes Mellitus in Aboriginal Women in a Remote Northern Community to improved glycolic control and decreases adverse outcomes As the result show that increase the level of adherence to the guidelines ensure that knowledge is translated in to practice (Cleary, Ludwig ,Riese and Grant ,**200**6)

Table 5.33: One-way ANOVA between Knowledge of health provider and governorates and experience

	Items	N	M		Sum of Squares	df	Mean Square	F	Sig.
Governorate	Gaza	33	18.1	Between Groups	23.2	4	5.809		
	North of Gaza	12	18.6	Within Groups	1911.6	96	19.91		
	Mid zone	24	18.9	Total	1934.8	100		0.292	0.883
	Khanyonis	14	17.6						
	Rafah	18	18.9						
	Total	**101**	**18.4**						
Experience	Less than 10 Yrs	32	19.1	Between Groups	22.9	3	7.6		
	From 10 to 20 Yrs	44	18.4	Within Groups	1911.9	97	19.7		
	From 21 to 30 Yrs	20	18.2	Total	1934.8	100		0.39	0.762
	More than 30 Yrs	5	17.8						
	Total	**101**	**18.4**						
Age group	Less than 35 Yrs	22	19.9	Between Groups	93.154	2	46.57		
	From 35 to 50 Yrs	60	17.7	Within Groups	1841.678	98	18.79		
	More than 50 Yrs	19	19.2	Total	1934.832	100		2.5	0.09
	Total	**101**	**18.4**						
Available of Guideline	Yes seen	40	19.6	Between Groups	102.479		51.23		
	Yes not seen	58	17.8	Within Groups	1832.353		18.69	2.7	0.05
	No	3	15.7	Total	1934.832				
	Total								

5.2.10.5. The relationship between Knowledge of healthcare provider and qualification:

Independent T Test relationship between knowledge of healthcare provider and qualification, Training .There is statistical significant relationship between health provider knowledge and qualification, Table (5.34) (P-value = 0.001). The mean knowledge for doctor is 21.6, mean knowledge for nurses 17.4 , so nurses are in need of effective training and education, this is important issue even asked by majority of healthcare providers when asking them about important issue for improving the health services , as we see in the above relation that the mean knowledge for those who had training approximately similar to mean knowledge that who had no training , no benefit from training , so training must be effective by well qualified personnel out of the field with teaching ability to improve knowledge for healthcare providers who will consequently provide knowledge to the clients and perform good practice .

5.2.10.6. The relationship between Knowledge of health provider and training.

Independent T -Test shows that there is no statistical significant relationship between health provider knowledge and Training in general (P-value = 0.847). The mean knowledge of the healthcare providers, which had training, is 18.4 who had not training is 18.6 , this indicate that training which was taken in the last five years by the healthcare providers did not differentiate their knowledge from those who did not take .Training is not so effective this is in difference with Study is conducted for assessment of training interventions designed to increase the knowledge of obstetrical nurses and nurse-midwives about the maternal serum triple screen ,

The purpose of this study was to assess the effects of training interventions designed to improve nurses' and nurse-midwives' knowledge, Knowledge was assessed at baseline and one month following the interventions. Forty-seven nurses, nurse-midwives and nursing assistants participated. (34 %) who obtained a score of less than 70 per cent on the knowledge questionnaire at baseline assessment .study resulted in

an increase in participants' knowledge this study presents evidence that improvements in health care professionals' knowledge can be made with brief educational interventions (John, Wiley and Sons, 1998.) (Kennedy, Blough, Kenner and Walker, 1998) There is no statistical significant differences between health provider knowledge and Training in ANC (P-value = 0.214). The mean knowledge of the healthcare providers, which had training in ANC, is 18.4. Who haven't trained in ANC mean are 18.3. There is statistical significant differences between health provider knowledge and Training in health education (P-value = 0.013). The mean knowledge of the healthcare providers, which had training in Health education, is 19.4. In addition, who had not training in Health education are 17.4. There is no statistical significant differences between health provider knowledge and Training in management in high-risk pregnancy (P-value = 0.124). The mean knowledge of the healthcare providers, which had training in management in high-risk pregnancy, is 19.2. In addition, who had not training in management in high-risk pregnancy is 17.7%. This indicates that training is not effective and must improve the methods and materials of training to the healthcare providers.

Table 5.34: Independent T Test relationship between knowledge and qualification And Training

Item		N	Mean	Sad	T	Sig
qualification	Doctor	24	21.6	3.5	4.431	0.001
	Nurse	77	17.4	4.2	4.87	
Training	Yes	71	18.4	4.1	0.194	0.847
	No	30	18.6	5.1	0.178	
ANC	Yes	67	18.4	4.1	0.07	0.214
	No	4	18.3	5.7	0.05	
Health education	Yes	35	19.4	3.2	2.17	0.013
	No	36	17.4	4.7	2.18	
Training of High risk pregnancy	Yes	32	19.2	3.5	1.5	0.124
	No	39	17.7	4.5	1.5	

5.2.10.7. Relationship between knowledge of healthcare providers about oral hypoglycemic agent and qualification.

Relationship between knowledge of healthcare providers about OHA and Qualification. There is a statistically significant relationship between knowledge of healthcare providers about OHA as a line of management for gestational diabetes and qualification of healthcare providers, which show that all healthcare providers who agree for oral hypoglycemic agents as a line of management for GDM are nurses. Table (5.35) shows which I,s contraindicated according to UNRWA guidelines while no doctor did which is identical to the guidelines , Oral hypoglycemic agents are contraindicated throughout pregnancy . (DCC, 2000)

Table 5.35. Relationship between knowledge of healthcare providers about OHA and Qualification.

OHA	Doctor		Nurse		Total		X^2	Sig
	No.	%	No.		No.	%		
Yes	0	0.0	13	100.0	13	100.0	4.651	0.023
No	24	27.3	64	72.7	88	100.0		

5.2.10.8. Relationship between Important issues needed of healthcare provider and Governorates& qualification

Relationship between Important issues needed of health provider and governorates

Important issues needed of health provider and (governorates& qualification) .There is no a statistically significant differences between Important issues and governorates the mean for Gaza (3.2) followed by Midzone with mean (2.5).

Relationship between Important issues needed of health provider and qualification.

There is statistically significant differences between Important issues needed for improving health services quality in the opinion of health provider and health provider qualification Table (5.36), for GP with mean (4.1) followed by Obstetrician with mean (3.0). The least is the need in the opinion of midwives, which mean is (2.6). These results indicate that more qualification gives more evaluation for the needs of the services and the need of SSN/midwives for more knowledge reflects that truth.

Table 5.36: One-way ANOVA between Important issues needed of healthcare Providers and (governorates& qualification).

	Items	N	M		Sum of Squares	df	Mean Square	F	Sig.
Governorate	Gaza	33	.3	Between Groups	8.506	4	2.127	1.114	0.355
	North of Gaza	12	3.1	Within Groups	183.335	96	1.910		
	Mid zone	24	2.5	Total	191.842	10			
	Khanyonis	14	2.9						
	Rafah	18	2.9						
	Total	101	2.9						
Qualification	Obs.	5	3.0	Between Groups	32.261	3	10.754	6.53	.000
	GP	19	4.1	Within Groups	159.580	97	1.645		
	Staff Nurse	22	2.9	Total	191.842	100			
	Senior midwife	55	2.6						
	Total	101	2.9						

5.2.11. Relationship between important issues needed in healthcare provider opinion and healthcare provider qualification

Figure (5.9), shows relationship between important issues needed according to healthcare provider opinion and qualification.

The graph show that GP find that there is needs by mean of 4.1, while obstetrician and senior midwife find that the need mean is 3, the least thinking in needs are SSN.

This reflect healthcare providers needs for improvement, the researcher consider that if there is real trial from decision maker for improvement of health care this will inspire the majority of healthcare providers and motivate them for improvement , but centralization, Neglecting the lower level of workers ,decrease the level of commitment and initiatives between all healthcare providers.

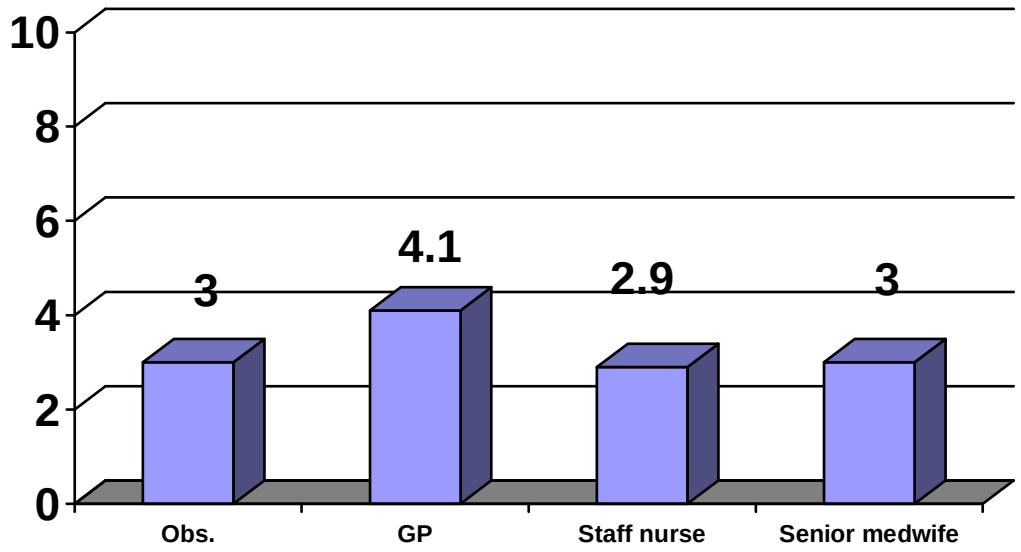

Figure 5.9: relationship between important issues needed in health provider opinion and health provider qualification

5.2.12. Opinion of the healthcare provider about the availability of essential equipment and medical supply and lab. Investigation.

Figure (5.10) shows the opinion of the health provider about the availability of essential equipment and medical supply and lab Investigation the opinion of the health provider about the availability of essential equipment and medical supply and lab. Investigation distributed on the graph above by means almost all agree upon all availability with mild variations, this indicate that there is essential equipment, medical supply, lab. Investigation, which are necessary for ANC services for pregnant women with GDM

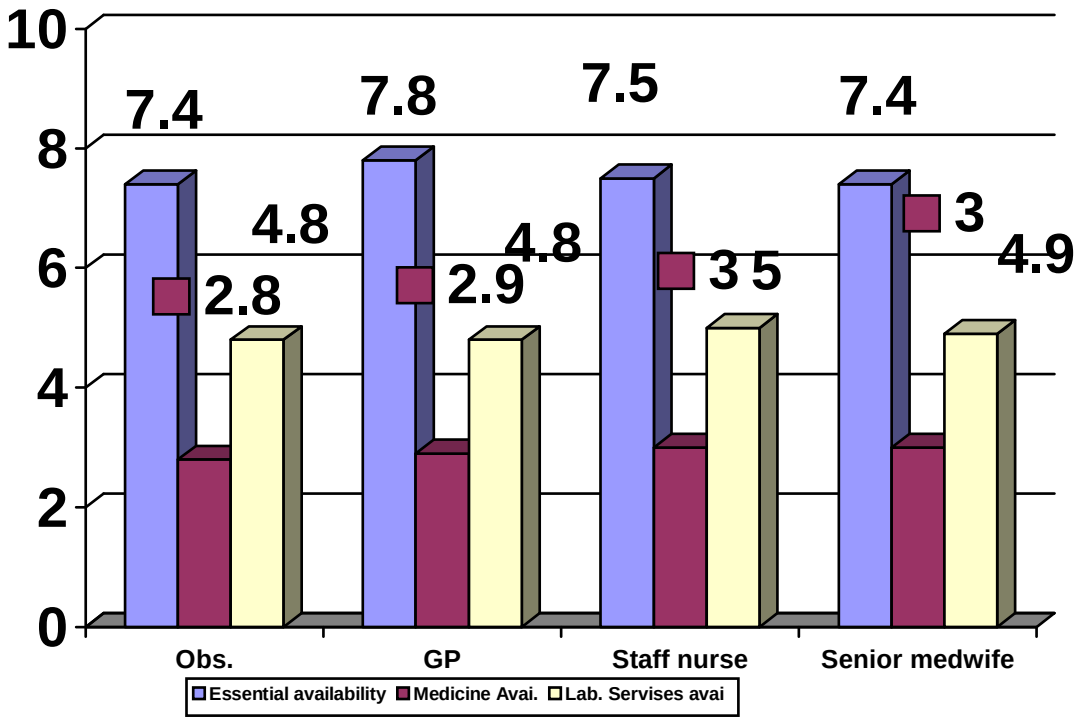

Figure 5.10: relationship between availability of essential equipment, medical supply and laboratory investigations in health provider opinion and healthcare provider qualification.

5.2.13. Comparison between the opinion of healthcare provider and client about accessibility of health services.

Healthcare providers mentioned that services are accessible by 97%, and the majority of clients mentioned that services are accessible by 82.1%, this indicates that ANC services are accessible and this is give strength and opportunity for improvement of quality of health services in UNRWA clinics. As the figure below shows

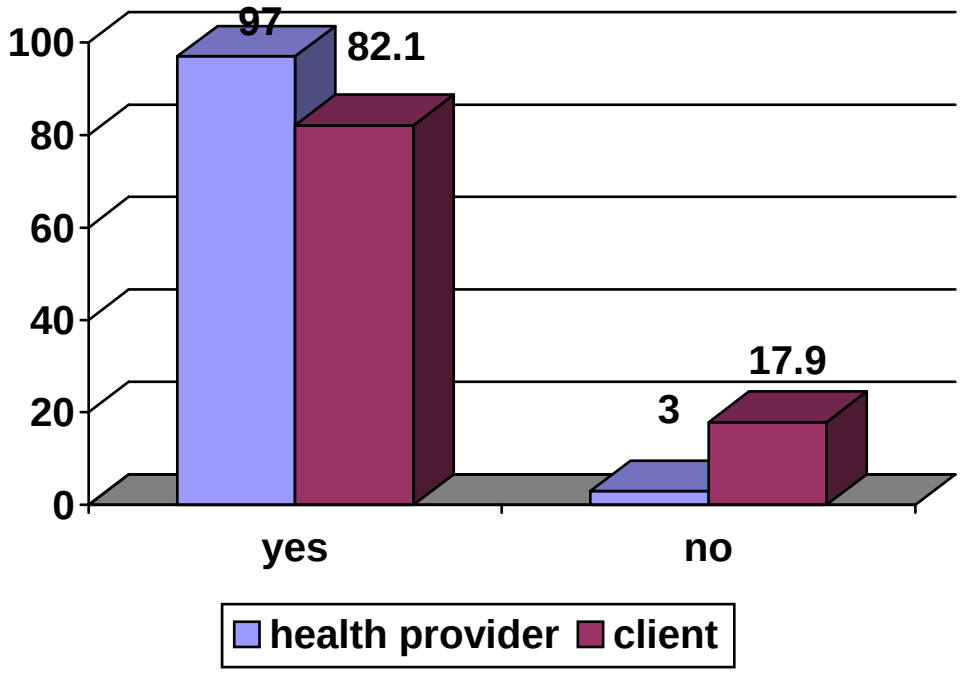

Figure 5.11: Comparison between the opinion of health provider and opinion of client about accessibility of health services.

5.2.14. Comparison of Overall Knowledge between the health provider and the Clients.

Overall good Knowledge in 43.6% in all the healthcare providers and overall good Knowledge of the clients is 4.8% of all clients, this level of Knowledge is not suitable for high risk pregnancy for healthcare providers and client and may lead to serious complications. For the moderate Knowledge approximately similar both healthcare providers and client , for bad knowledge 18.8% of the healthcare providers had bad knowledge and this is a serious condition in the health field may lead to increase the bad knowledge of the clients to 68.6% of the pregnant with gestational diabetes, Figure (5.12) shows. This indicates that both the healthcare providers are in needs of more education about GDM.

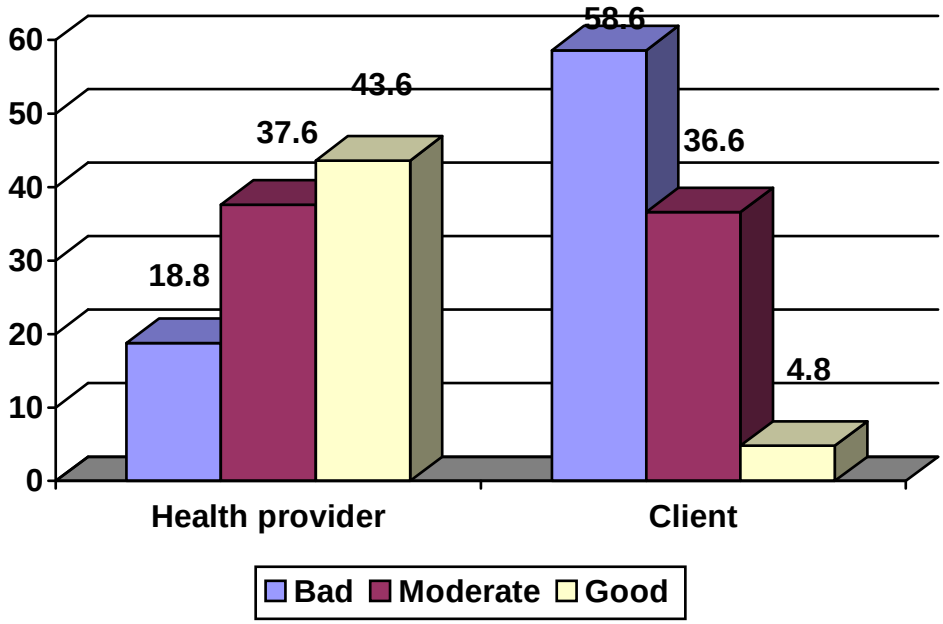

Figure 5.12: for comparison of Overall Knowledge between the health provider and the clients.

Chapter 6

Conclusion and Recommendations

Chapter 6: Conclusions and Recommendations

6.1 Conclusions

The results of the study give a clear picture of the quality of health services in antenatal care of high-risk pregnancy including gestational diabetes mellitus through perspectives of both healthcare providers working in high-risk pregnancy sessions and the clients' perspective that are pregnant with gestational diabetes. The results of the study show that the majority of healthcare providers are nurses/midwives, which represents 76.2% and the smallest group, are the obstetricians, which form 5% only.

- The waiting time is so long and this appears as a problem for the majority of the clients.
- Adherence to the guidelines is generally poor which appear from detailed questions on adherence to the guidelines.
- Clients with GDM who receive their ANC services at UNRWA health centers are mainly less educated, homemakers, with a low monthly income. Which explained by fact that UNRWA antenatal care services are free of charge, provided during day shift with a huge work load, this might not be the best place to receive ANC by a well educated working mother because it won't fit her tight schedule nor her high expectations which can be met in the private sector.
- Percentage of the healthcare providers who received training through the last 5 years was 70.3%; only 45.1% received training in high-risk pregnancy, which does not seem to have improvement their performance in providing health care of GDM. Even though this percentage is a low one, there were no statistically significant difference in knowledge between those who were trained and those

weren't which gives a clear clue about the weakness in the quantity and the quality of the training program.

- Both healthcare providers and clients in terms of geographical accessibility, appointment system availability, open door strategy and financial accessibility described the ANC services to be accessible. The majority of equipments, lab investigations and medical supplies needed to manage GDM patients found to be available according to both the healthcare providers and the clients.
- There is early registration of GDM cases in the first trimester by 66.2% of the clients and 91% of the clients was diagnosed by the same health centre which raise some questions about the affectivity of the screening system that depends on the risk factors profile of the clients and carried out during the first visit.
- Most of the healthcare providers 87.1% were satisfied with the quality of their services but they addressed several ways how their services might be improved whish was mainly the need for more staff by 77.2% other issues were more training better equipments and better physical environment. In the clients perspective most of them were satisfied with waiting time being the most important problem affecting the quality of service.
- As the study shows there is a lack of knowledge about gestational diabetes among majority of healthcare providers, which result in bad impact on the client knowledge which appear in the study as 58.6% of the clients had bad knowledge , these results lead to less detection rate of cases with less prevalence , and increase complications for pregnant and fetus .
- There is lack in teaching aids by 63.4% of health provider's opinion, and some of them told that there is lack in health education material; this reflected on client knowledge with underestimation to the magnitude of the problem.

6.2 Recommendations

The study clarifies that there are areas for potential improvement in antenatal care services in UNRWA health centers in Gaza governorate, which is important issues to face this public health problem so the researcher recommends.

- This results highlighted the strict needs for more qualified healthcare providers like obstetricians GPs , and senior midwifes to improve quality of antenatal care, decrease waiting time and increase consultation time especially according to the need of high risk pregnancy including pregnancy with gestational diabetes which is followed up by obstetricians and GPs in their antenatal care according to the UNRWA guidelines
- Periodic assessment of healthcare providers' competency and knowledge, which will encourage continuous willingness for learning by the providers themselves, which will have a great impact in improving their practice.
- Updating the healthcare providers' knowledge by effective training, especially those who are working in ANC unit of H.P cession, focusing especially on gestational diabetes mellitus detection and management as one of the core competencies of such training to improve care for pregnant women with GDM.
- Decision makers in UNRWA health department should take in consideration the needs of healthcare providers and their perspective to improve ANC services because solving their problems such as: shortage of staff, need for training, improving physical environment and providing better equipment is crucial to improve their performance and thus the overall quality of service.
- Providing the health centers with health education materials for GDM and teaching aids such as multimedia equipments to enable them to hold health education sessions on gestational diabetes care and complication among other

ANC important educational issues in order to make the health education process easier and more effective to serve the purpose of improving the client's knowledge.

- As the client waiting time is being a huge problem because of excessive workload, a better appointment system that include both date and time of consultation might help to solve the problem, with incorporation of computer based system in this process to make it more applicable for both clients and providers.
- Training the healthcare providers to discuss important issues with GDM patient during their consultation time such as: danger signs during pregnancy or after delivery, emergency that the patient might have being a GDM patient and their diet control which issues that were found to be under discussed through this research.
- Increase the health provider's skills on interpersonal relations and consultation with the client in communication and privacy for the pregnant woman and education.
- Enforcement of adherence to the UNRWA management guidelines for gestational diabetes mellitus by following up and continuous assessment of healthcare providers performance wither consistent with the guidelines they should follow by encouraging the senior medical officers to supervise their staff members strictly.
- Review the screening program for gestational diabetes mellitus as more efficient for improve detection rate.

Area for further research

- To study the actual prevalence of gestational diabetes among Palestinian refugees at UNRWA health centers in Gaza governorates.
- Further studies on assessments of postnatal care for pregnant woman with gestational diabetes at UNRWA health centers in Gaza governorates.
- Reassessment of the same subjects to compare the level of correction, after implementation of the results of study.
- Further studies on effectiveness of universal screening program in UNRWA health centers in Gaza governorates

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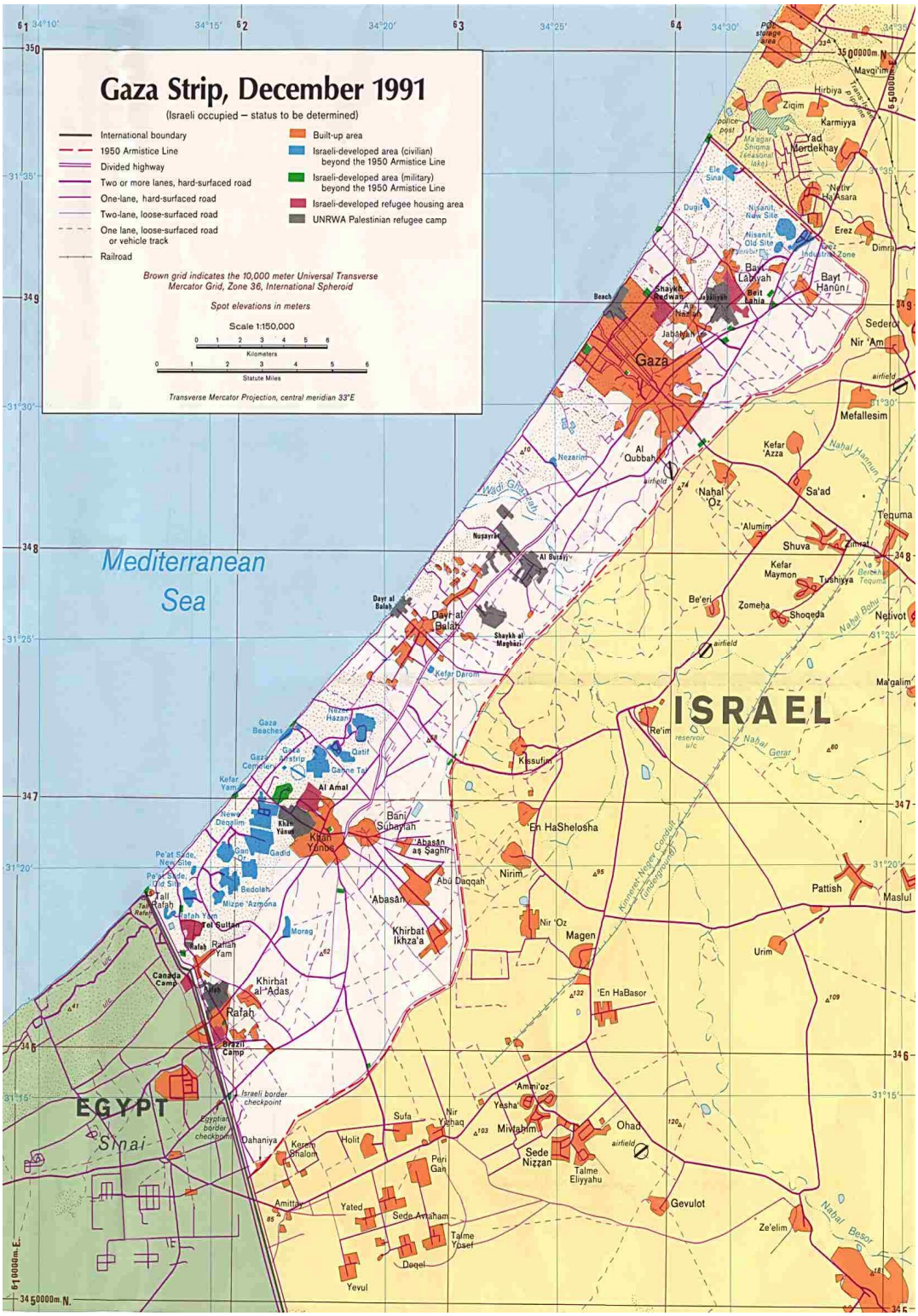
Annex 1: Map of Palestine

Annex 2: Map of Gaza Strip



Annex 3: Helsinki committee approval letter

Palestinian National Authority
Ministry of Health
Helsinki Committee

السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

Date: 25 / 6 /2006

التاريخ: 2006/6 / 25

Mrs./ Miriam Abdelkader

السيدة: مريم عبد القادر

I would like to inform you that the committee has discussed your application about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:-

Assessment of antenatal care services provided to pregnant women with gestational diabetes mellitus at UNRWA health centers in Gaza Strip.

In its meeting on June 2006
and decided the Following:-
To approve the above mention research study.

و ذلك في جلستها المنعقدة لشهر يونيو 2006
و قد قررت ما يلي:-
الموافقة على البحث المذكور عاليه.

Signature
توقيع

Member
عضو

Member
عضو

Chairperson

Ministry of Health
Helsinki Committee

Conditions:-
- Valid for 2 years from the date of approval to start.
- It is necessary to notify the committee in any change in the admitted study protocol.
- The committee appreciate receiving one copy of your final research when it is completed.

Gaza Etwam – Telefax 972-7-2878166

Palestinian National Authority
Ministry of Health
Helsinki Committee

السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

التاريخ: 2006/6/26
الرقم: 10/06

السيد/ة ..... المحترم

تحية طيبة وبعد:

الموضوع: قرار لجنة هلسنكي

مرفق طيه قرار لجنة هلسنكي للبحوث الصحية بخصوص بحثكم المقدم بعنوان:

Assessing of antenatal Care Services provided to pregant women with gestational DM at UNRWA health Sectors in Gaza Strip.

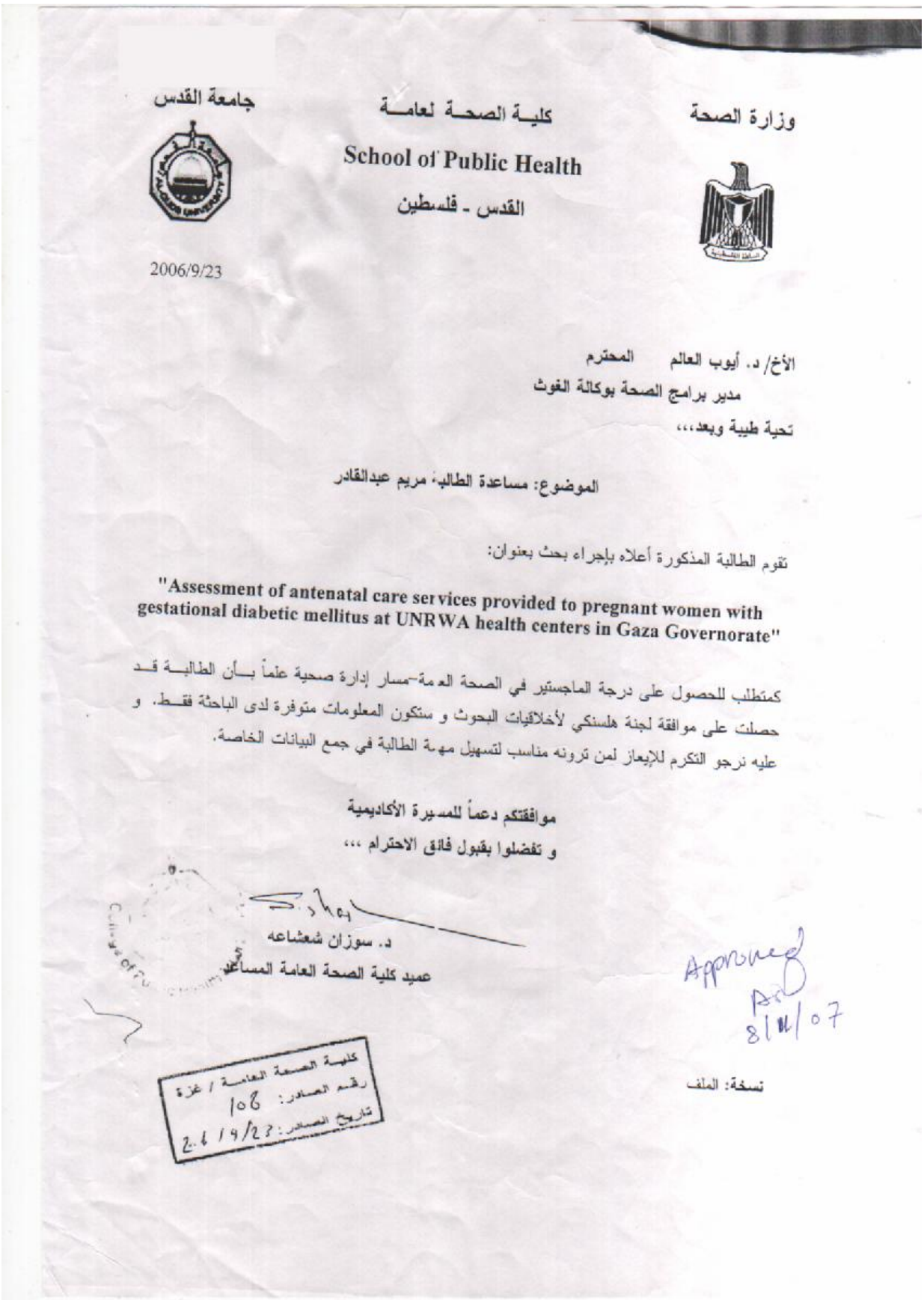
واقبلوا التحية

منسق اللجنة

د.سوزان شعشاعة

Gaza Etwam – Telefax 972-7-2878166

Annex 4: Ethical approval letter to the CFHP - UNRWA



وزارة الصحة

كليـة الصحـة لعامـة

School of Public Health

القدس - فلسطين

جامعة القدس

2006/9/23

الأخ/ د. أيوب العالم المحترم

مدير برامج الصحة بوكالة الغوث

تحية طيبة وبعد،،،

الموضوع: مساعدة الطالبة مريم عبدالقادر

تقوم الطالبة المذكورة أعلاه بإجراء بحث بعنوان:

"Assessment of antenatal care services provided to pregnant women with gestational diabetic mellitus at UNRWA health centers in Gaza Governorate"

كمتطلب للحصول على درجة الماجستير في الصحة العامة-مسار إدارة صحية علماً بأن الطالبة قد حصلت على موافقة لجنة هلسنكي لأخلاقيات البحوث و ستكون المعلومات متوفرة لدى الباحثة فقط. و عليه نرجو التكرم للإيعاز لمن ترونه مناسب لتسهيل مهمة الطالبة في جمع البيانات الخاصة.

موافقتكم دعماً للمسيرة الأكاديمية

و تفضلوا بقبول فائق الاحترام ،،،

د. سوزان شعشاعه

عميد كلية الصحة العامة المساعد

Approved

8/11/07

نسخة: الملف

كلية الصحة العامة / غزة

رقم الصادر: 108

تاريخ الصادر: 2006/9/23

Annex 5: providers consent form

بسم الله الرحمن الرحيم

استبيان

عزيزي/تي المشارك/ة:

أنا الطالبة مريم حسن عبد القادر ملتحقة ببرنامج ماجستير في الصحة العامة/تخصص إدارة صحية– جامعة القدس أبو ديس .فلسطين.

أقوم بإعداد بحث بعنوان **تقييم الخدمات الصحية المقدمة للمرأة الحامل التي تعاني من مرض سكري الحمل في المراكز الصحية التابعة لوكالة الغوث الدولية في محافظات غزة.**

تهدف هذه الدر اسه تقييم مستوي الخدمات الصحية المقدمة للمرأة الحامل التي تعاني من مرض سكري الحمل في عيادات الوكالة في قطاع غزة و الخروج بتوصيات للرقي بهذه الخدمة إلي مستوي أفضل.

أشكر لك مشاركتك وأرجو الإجابة علي الأسئلة المطروحة عليك بكل دقة و التي قد يستغرق من وقتك الثمين من خمسة عشر إلى عشرين دقيقة.

مشاركتك اختيارية و لديك الحق في المشاركة أو الرفض، أو وقف مشاركتك في أي وقت، كما لديك الحق في رفض الإجابة عن أي سؤال.

ما ورد من بيانات سيبقى سرا، ولا حاجة إلى ذكر اسمك الاستبيان سيستعمل لأغراض علمية فقط، لذا أرجو منك أن تجيبي عن الأسئلة وفق ما ترينه مناسبا سيكون رأيك موضع تقدير.

ان مشاركتك معنا ستساهم في تطوير الخدمات الصحية المقدمة لنا ولأجيالنا القادمة.

شكرا لمشاركتكم

الباحثة:

د.مريم حسن عبد القادر

Annex 6: client's consent form

بسم الله الرحمن الرحيم

استبيان

عزيزتي المشاركة:

أنا الطالبة مريم حسن عبد القادر ملتحقة ببرنامج ماجستير في الصحة العامة/تخصص إدارة صحية- جامعة القدس أبو ديس .فلسطين.

أقوم بإعداد بحث بعنوان تقييم الخدمات الصحية المقدمة للمرأة الحامل التي تعاني من مرض سكري الحمل في المراكز الصحية التابعة لوكالة الغوث الدولية في محافظات غزة.

تهدف هذه الدر اسه تقييم مستوي الخدمات الصحية المقدمة للمرأة الحامل التي تعاني من مرض سكري الحمل في عيادات الوكالة في قطاع غزة و الخروج بتوصيات للرقي بهذه الخدمة إلي مستوي أفضل.

أشكر لك مشاركتك وأرجو الإجابة علي الأسئلة المطروحة عليك بكل دقة و التي قد يستغرق من وقتك الثمين من خمسة عشر إلى عشرين دقيقة.

مشاركتك اختيارية و لديك الحق في المشاركة أو الرفض ، أو وقف مشاركتك في أي وقت ، كما لديك الحق في رفض الإجابة عن أي سؤال ، مشاركتك لا تؤثر سواء سلبا أو إيجابا علي تلقيك الخدمة في العيادة .

ما ورد من بيانات سيبقى سرا ، ولا حاجة إلى ذكر اسمك ، الاستبيان سيستعمل لأغراض علمية فقط ، لذا أرجو منك أن تجيبي عن الأسئلة وفق ما ترينه مناسبا، سيكون رأيك موضع تقدير، مشاركتك معنا ستساهم في تطوير الخدمات الصحية المقدمة لك ولأجيالنا القادمة.

شكرا لمشاركتكم

الباحثة:

د.مريم حسن عبد القادر

Annex 7: providers' questionnaire "Arabic version"

كلية الصحة العامة

School of public health

القدس– فلسطين

الرقم المسلسل..... التاريخ.....

تعريف بالمؤسسة	
اسم العيادة: _____ **المحافظة:** 1= غزة 2=الشمال 3=الوسطى 4=خان يونس 5=رفح	☐
بيانات مقدم الخدمة	
1.المؤهل العلمي الحالي: 1=طبيب عام. 2=اخصائي نساء وولادة. 3=ممرضه مؤهلة. 4= قابلة قانونية.	☐
2. الجنس: 1=أنثى 2= ذكر	☐
3. **العمر:**_____ سنة.	☐
4. الحالة الاجتماعية: 1=متزوج 2=أعزب 3=مطلق 4=أرمل	☐
5. السكن: 1= مدينة 2= مخيم 3= قرية	☐
خبرات ومؤهلات مقدم الخدمة الصحية	
6. عدد سنوات الخبرة في تقديم هذه الخدمة	☐

7. هل تلقيت أي تدريب في مجال رعاية الحوامل في الخمس سنوات الماضية؟ 1= نعم 2= لا **إذا كانت اجابتك بنعم ، هل تلقيت تدريبا في احد المجالات التالية** 1. رعاية الحوامل. 2.التثقيف الصحي.. 3.رعاية الحمل الخطر.	☐ .....1 .....2 .....3 4
رأي مقدم الخدمة	
8 .هل تعتقد ان الخدمة الصحية متاحة؟ 1= نعم 2= لا	☐
9. هل تعتمد مؤسستك الصحية نظام المواعيد ؟ 1= نعم 2= لا	☐
10. هل يوجد مقاييس او قواعد مكتوبة لعلاج سكري الحمل؟ 1= نعم ، و تم الاطلاع عليها. 2=نعم، و لكن لم يتم الاطلاع عليها 3= لا	☐
11. هل تجد تلك المقاييس او القواعد مفيدة في علاج مرضى سكري الحمل ؟ 1= نعم 2= لا	☐
12. إلى أي مدى يتم التقيد بتلك المقاييس او القواعد عند علاج مرضى سكري الحمل ؟ 1= الى مدى كبير 2= إلى حد ما 3= على الاطلاق.	☐
13. حسب تلك المقاييس او القواعد ، عدد زيارات ما قبل الولادة للسيدة الحامل هي:	☐ زيارة
14. الفترة الزمنية ما بين زيارات ما قبل الولادة لمريضة سكري الحمل هي: 1=شهر. 2=اسبوعان. 3= أسبوع واحد. 4= حسب الحاجة.	☐
15. مقدار الفترة الزمنيه التي تنتظرها السيدة الحامل لتلقي الخدمة:	☐ دقيقة
16.مقدار الوقت التي تقضيه مع السيدة الحامل لتقديم الخدمة	☐ دقيقة
17.هل انت مقتنعة باستجابة مريضة سكري الحمل للمتابعة في رعاية الحوامل . 1=نعم 2=لا	☐
18.هل تقدم عيادتك خدمات تثقيف صحي للحوامل ؟ 1=نعم 2=لا	☐

19.هل انت عادة تقدم التثقيف والمشورة اللازمة للسيدة الحامل . 1= نعم ، دائما 2= احيانا 3= لا ابدا	☐
20.هل تتوفر الفحوصات الروتينية و التحاليل الاساسية اللازمة للسيدة الحامل داخل العيادة ؟ 1=نعم 2= لا	☐
21.هل يوجد سجل تسجل فيه معلومات عن زيارة السيدة الحامل بانتظام ؟ 1=نعم 2= لا	☐
22.هل انت مقتنع/ة بمستوى الخدمة التي تقدم لمريضة سكري الحمل في عيادتك ؟ 1=نعم 2= لا 3=لا اعرف	☐
23.ماهي اهم المواضيع التي تشعر/ي باالحاجة لها لتحسين الخدمة ؟ 1.زيادة الطاقم الصحي 2. زيادة التدريب 3.تحسين الاجهزة و الامدادات 4.تحسين بيئة العمل 5.تحسين نظام المواعيد.	.....1 .....2 .....3 .....4 .....5 6
اجهزة ضرورية	
24.هل يوجد في عيادتك الاجهزة الاتية وتعمل بشكل جيد لتقديم خدمة رعاية الحوامل ؟ 1.سرير فحص 2.جهاز لقياس الضغط 3.جهاز لتحديد الوزن 4.جهاز لقياس الطول 5.ترمومتر لقياس الحرارة 6.جهاز الموجات الصوتية 7.جهاز لقياس نبض الجنين 8.شريط قياس	.....1 .....2 .....3 .....4 .....5 .....6 .....7 8
الادوية	
25.هل يوجد في عيادتك الادوية الاتية ؟ 1.انسولين 2.اقراص لعلاج السكري 3.اقراص حديد وحامض فوليك	.....1 .....2 3

خدمات التحاليل المخبرية	
26.هل تقدم في عيادتك التحاليل المخبرية الاتية ؟	
1.تحليل دم كامل	1
2.كيمياء الدم	2
3.تحليل بول	3
4.تحليل سكر الدم صائم	4
5.تحليل سكر الدم بعد اعطاء المريض جرعة سكر	5
الخدمات الضرورية الداعمة	
27.هل لديك في عيادتك الخدمات الداعمة الاتية ؟	
1.مواد تعليمية مساعدة لرعاية الحوامل	1
2.مواد تثقيفية لرعاية الحوامل	2
معلومات مقدمي الخدمة	
28.ما هو التعريف الصحيح لسكري الحمل ؟	
1.سكري الحمل هو نوع من السكري الذي يحدث خلال الحمل بنسبةعالمية تبلغ 1% .	1
2.نوع من السكري يحدث خلال مدة الحمل	2
3.نوع من السكري يظهر لاول مرة خلال الحمل او بعد الولادة	3
29.اي من التحاليل التالية تستعمل في عيادتك لتاكيد تشخيص سكري الحمل ؟	
1.فحص سكر دم صائم	☐
2. فحص سكر دم بعد الاكل بساعتين	
3. فحص سكري الدم بعد اعطاء المريض 75 جرام سكر	
30.ماهي عوامل الخطر لمرض سكري الحمل ؟	
1.عمر>25 سنة	1
2.زيادة الوزن	2
3.تاريخ المرضي للعائلة	3
4. الاصابة بسكري الحمل في الحمولات السابقة	4
5.ولادة طفل يزن >4 كيلو جرام	5
31.حسب المقاييس والقواعد المتبعة في الوكالة ماهي الخطة العلاجية لسكري الحمل ؟	
1. تنظيم الغذاء	1
2.الرياضة البدنية	2
3.الانسولين	3
4.اقراص خفض السكر	4

32.ماهي مضاعفات سكري الحمل ؟	
1.زيادة وزن المولود	***1*****.....**
2.ولادة قيصرية	***2*****.....**
3. مشاكل في جهاز المولود التنفسي	***3*****.....**
4.نقص السكر في الدم عند المولود	***4*****.....**
5.الصفراء	***5*****.....**
6.الاجهاض	***6*****.....**
7. زيادة ضغط الدم الحمل	***7*****.....**
8.زيادة السائل الاميونوتي حول الجنين	***8*****.....**
9. ولادة مبكرة	***9*****.....**
10.ولادة ميتة	***10*****.....**
33. عندما يطلب تحليل سكر صائم يجب ان يصوم المريض	
1. 8–10 ساعات	☐
2. 10–12 ساعة	
3. 12–14 ساعة	
34.يعرف سكري الحمل اذا كانت نسبة السكري الصائم في الدم :	
1. 30–89 ملجم/ديسيلتر	1.....
2. 85–125 ملجم/ديسيلتر	2.....
3. >126 ملجم/ديسيلتر	3.....
35.تحليل السكر في الدم بعد اخذ 75 سم من السكر بالفم يعمل اذا كان سكري الدم صائم =	
1. 30–89 ملجم/ديسيلتر	1.....
2. 85–125 ملجم/ديسيلتر	2.....
3. >126 ملجم/ديسيلتر	3.....
36. ما نسبة وجود سكري الحمل في العالم ؟	☐ %
37. هل تعتقد ان نسبة وجود سكري الحمل في عيادات الوكالة =	
1. اقل من نسبته في العالم	☐
2. يساوي نسبته في العالم	
3.. اكثر من نسبته في العالم	

Annex 8: client's questionnaire "Arabic version"

استبانه السيدات

الرقم المسلسل..... التاريخ.....

اسم العيادة: _____ **المحافظة:** 1= غزة 2=الشمال 3=الوسطى 4=خان يونس 5=رفح	☐
بيانات شخصية	
***1*-العمر:** _____ سنة.	☐
2- مستوي التعليم 1-غير متعلم 2- ابتدائي 3- إعدادي 4- ثانوي 5- جامعي	☐
3- المهنة 1-ربة منزل 2- تعمل	☐
4-السكن 1= مدينة 2= مخيم 3= قرية	☐
5- معدل الدخل شهريا	☐ شيكل
تاريخ الحمولات السابقة	
6-- **العمر عند أول زواج**	☐ سنة
7-**عدد مرات الحمل بما فيها الحمل الحالي**	☐ مرة
8 -**الأصابة بسكري الحمل في الحمولات السابقة** 1 =نعم 2= لا 3=لا اعرف	☐
9- **ولادة طفل يزن 4 كيلو جرا م أو أكثر** 1 =نعم 2= لا 3=لا اعرف	☐
10- ولادة طفل لدية تشوهات خلقية 1 =نعم 2= لا 3=لا اعرف	☐
11-اصابة أحد أفراد العائلة درجة أولي بالسكر 1 =نعم 2= لا	☐
رعاية الحمل الحالي	
12-ما مدة الحمل الحالي بالشهر	☐ شهر

13-كم زيارة حضرت لرعاية الحوامل في هذا الحمل	مرة ☐
14-متي شخصت حالة سكري الحمل لديك وأين؟ 1- في هذة العيادة 2- في مكان آخر 3- بواسطة أخصائى	1-أول ثلاث شهور 2-ثاني ثلاث شهور ☐ 3-ثالث ثلاث شهور ☐
15-**ما نوع العلاج الذي تأخذينة لسكرى الحمل؟** 1- أنسولين 2-اتباع نظام غذائى 3-كليهما	☐
16- ما هى الطريقة التى تحضرين بها الى العيادة؟	1- سير على الأقدام 2- بواسطة سيارة ☐ 3- أخرى(حدد).....
17-كم الوقت الذى تستغرقينة للوصول للعيادة	☐
18- ماهو هدف الزيارة لرعاية الحوامل؟ ممكن أكثر من اجابة	1=للفحص 2=لتزويدي بما يلزم الحامل 3- لعلاج مشكلة صحية لدي
19- هل لديك موعد مع مقدم الخدمة؟ 1 =نعم 2= لا **اذا كان نعم حدد اذا كان** 1= بالوقت 2= بالتاريخ 3= كليهما	☐ ☐
20- هل تعتقدى أن خدمة رعاية الحوامل في العيادة متوفرة وسهلة 1 =نعم 2= لا 3=لا اعرف	☐
21-كم تمضى من الوقت في انتظار الدخول لمقدم الخدمة؟	دقيقة ☐
22- هل أنت مقتنعة بوقت الأنتظار هذا؟ 1=مقتنعة جدا 2=مقتنعة 3=مقتنعة قليلا 4=غير مقتنعة	☐
23- كم المدة التى تقضينها مع مقدم الخدمة؟	دقيقة ☐
24- هل تعتقدي أن المدة التى تقضينها مع مقدم الخدمة 1= قصيرة جدا 2= طويلة جدا 3=كافية	☐

25-هل أنت مقتنعة بزيارة رعاية الحوامل؟ 1=مقتنعة جدا 2=مقتنعة 3=مقتنعة قليلا 4=غير مقتنعة	☐
26- خلال زيارتك للعيادة هل تعامل معك مقدم الخدمة باحترام وثقة ؟ 1 =نعم 2= لا	☐
27- هل تشعرين أن مقدم الخدمة يعتنى بك و بصحتك؟ 1 =نعم 2= لا	☐
28-هل يسألك مقدم الخدمة اذا كان لديك أى تساؤل أو اهتمام؟ 1 =نعم 2= لا	☐
29- هل تشعرى بالراحة عند سؤالك لمقدم الخدمة؟ 1 =نعم 2= لا	☐
30-هل يعطيك مقدم الخدمة موعد لزيارة أخرى؟ 1 =نعم 2= لا	☐
31-عموما هل أنت مقتنعة بمستوى الخدمة التي تتلقينها في العيادة؟ 1=مقتنعة جدا 2=مقتنعة 3=مقتنعة قليلا 4=غير مقتنعة	☐
32- لماذا اخترت هذه العيادة؟ ممكن أكثر من إجابة 1. لجودة مستوى الخدمة 2. ملائمة و مريحة 3- تقدم خدمات مختلفة 4-خدمات مجانية 5- لسمعته الحسنة 6-لتشجيع الآخرين لي 7- من أجل بطاقات التغذية	**1**..... **2**..... **3**..... **4**..... **5**..... **6**..... **7**..... **8**.....
33-أريدك أن تفكري خلال زتاراتك لمتابعةهذا الحمل في العيادةهل قام مقدم الخدمة بعمل الآتي؟	
1-أجراء فحص طبي 2-سألك عن سيرة الحمولات السابقة.	1.....

3-فحص نبض الجنين. 4-قياس وزنك. 5-فحص بالموجات الصوتية 6-قياس الضغط. 7-فحص نسبة السكر في الدم 8- تحليل بول كامل. 9-صورة دم كامتة. 10-تزويدك بالحديد وحامض الفوليك 11-اعطائك تطعيم ضد الكزاز. 12-اعطائك انسيولين.	.....2 .....3 .....4 .....5 .....6 .....7 .....8 .....9 .....10 11

34-أريدك أن تفكري خلال زتاراتك لمتابعةهذا الحمل في العيادةهل قام مقدم الخدمة بمناقشتك بأي من هذة المواضيع؟

اعطائك نصيحة عن التغذية أثناء الحمل؟	1 =نعم	2= لا	3=لا اعرف .....
اخبارك عن التاريخ المتوقع للولادة؟	.....	.....	.....
اخبارك عن كيفية نمو الجنين؟	.....	.....	.....
توضيح كيفية التعامل مع سكري الحمل؟	.....	.....	.....
مناقشة أهمية التخطيط للحمل؟	.....	.....	.....
أخبارك عن علامات الخطورة خلال الحمل؟	.....	.....	.....
أخبارك عن علامات الخطورة بعد الولادة؟	.....	.....	.....
نصيحتك أين تذهبي لمساعدتك في حين حدوث أي مشكلة؟	.....	.....	.....
35-هل سبق لك أن تلقيت تثقيف صحي؟ 1 =نعم 2= لا إذا كان نعم من الذي زودك بهذا التثقيف الصحي؟ .	☐ 1=أخصائي النساء والتوليد. 2=طبيب عام. 3=حكيمة/قابلة.		
36- في أي المواضيع تلقيت تثقيف صحي أو مشورة؟ ممكن أكثرمن اجابة 1.النظام الغذائي 2. التزود بالحديد وحامض الفوليك	1 =نعم	2= لا	3=لا اعرف .....

3. كيفية التعامل مع سكري الحمل 4-العلامات المنذرة بمضاعفات الحمل 5.علامات الخطورة على الجنين.	....

37- والآن أريد أن أسألك عن بعض المشاكل التي تقابل المرضى في المراكز الصحية أرجو ذكر إذا كنت تعانين من أي من هذه المشاكل؟

	نعم	لا	لا أعرف
وقت الأنتظار			
القدرة على مناقشةالمشاكل التي تخص الحمل مع مقدمي الخدمة			
جودة الفحص والعلاج المقدمة			
سرية الفحص			
تواجد العلاج في العيادة			
تواجد أجهزة الفحص			
وقت(ساعات) تقديم الخدمة			
نظافة العيادة			
معاملة مقدم الخدمة			

التحاليل المخبرية

39-كم مرة أجري لك فحص سكر صائم في الدم	☐ مرة
40 كم مرة أجري لك فحص هيموجلوبين الدم	☐ مرة
41 كم مرة أجري لك فحص الزلال في البول	☐ مرة

معلومات مريضة سكري الحمل

42.ما هو سكري الحمل ؟ 1.سكري الحمل هو السكري الذي يكتشف لاول مرة في فترة الحمل او بعد الحمل 2.هو نوع من السكري الذي يمكن حدوثه قبل الحمل 3.سكري الحمل هو زيادة السكر في الدم الذي يكتشف خلال الحمل	☐

43. القيمة الطبيعية لسكري الدم الصائم : 1. 30–70 ملجم / ديسيلتر 2. 70–110 ملجم /ديسيلتر 3. >110 ملجم /ديسيلتر		☐
44. ماهي مضاعفات سكري الحمل ؟ 1. زيادة وزن الجنين 2. ارتفاع ضغط الدم للحامل 3. الاجهاض 4. زيادة السائل الاميونتي 5.ولادة ميتة 6. ولادة مبكرة 7. ولادة قيصرية 8. يعاني المولود من مشاكل في التنفس 9. نقص السكر في الدم للمولود 10. اصفرار في لون المولود	ذكرت 1..... 2..... 3..... 4..... 5..... 6..... 7..... 8..... 9..... 10.....	لم تذكر 1..... 2..... 3..... 4..... 5..... 6..... 7..... 8..... 9..... 10.....

Annex 9: provider's questionnaire "English version"

كلية الصحة العامة

School of public health

القدس– فلسطين

Serial No: …… **Date:** …….....

FACILITY IDENTIFICATION	
` **Name of the facility**_____ **GOVERNERATES** 1= Gaza city 2=North 3=Midzone 4=Khanyonis 5=Rafah	☐
Health Provider Information	
1. What is your current technical qualification? 1=General practioner 2=Obestetrician 3=Senior Staff Nurse 4= Senior Midwife	☐
2. Sex of health worker: 1=female 2=male	☐
3. Age: …… years	☐
4. Marital status: 1= Married 2= Single 3= Divorced 4= Widow	☐
5. Residential status: 1=City 2=Camp 3=village	☐
Provider Training and Experience	
6. For how many years have you provided this service?	**Years** ☐

7. Have you received any in-service Training in the last five years in antenatal care? 1=Yes 2=No **If yes, did you receive the following subjects in the last 12 month?** 1. Antenatal care 2. Counseling/health education 3. Management of high risk pregnancy	☐ 1…… 2…… 3…… 4……
Provider Opinion	
8. Do you think that the services are accessible? 1=Yes 2=No	☐
9. Does your facility adopt an appointment system? 1=Yes 2=No	☐
10. Do you have written guidelines for GD? 1=Yes, seen 2=Yes, not seen 3= No	☐
11. Do you find these guidelines useful for management of diabetic women? 1=Yes 2=No	☐
12. To what extent do you adhere with the guidelines? 1= to great extent 2= To some extent 3=Not at all	☐
13. Based on the guidelines, the numbers of antenatal visits for pregnant women's are?	☐ **Visits**
14. The duration between antenatal visits for GD should be: 1=One month 2=Two weeks 3=one week 4=As needed	☐
15. The average waiting time to offer antenatal care is:	☐ **Minutes**
16. Actually, the average time you spend to follow up each woman?	☐ **Minutes**
17. Are you satisfied with the compliance of diabetic women with the antenatal care? 1=Yes 2=No	☐
18. Does your facility provide health education service? 1=Yes 2=No	☐

19. Are you routinely provided health education/ counseling? 1=Yes always 2=sometimes 3= never	☐
20. Does this facility have a routine system for screening of ANC clients? 1=Yes 2=No	☐
21. Is there a register where client's information from antenatal visit is recorded? 1=Yes 2=No	☐
22. Are you satisfied with the quality of services provided for diabetic women in your facility? 1=Yes 2=No	☐
23. What are the most important issues, which you feel, need to be addressed for you to improve the services? 1. More staff 2. More training 3. More/better equipment or supplies 4. Better physical environment 5. Better appointment system	1…… 2…… 3…… 4…… 5…… 6…….
Essential Equipment	
24. Does this facility has the following equipment available and in working order to provide ANC services? 1. Examination bed 2. BP machine 3. Weight scale 4. Height scale 5. Thermometer 6. Ultrasound 7. Sonic aid for fetal monitoring 8- measuring tap	1…… 2…… 3…… 4…… 5…… 6…… 7…… 8…….
Medicine	

25. Does the facility have the following items? 1. Insulin 2. Oral hypoglycemic agents 3. Iron & Folic Acid supplements	1…… 2…… 3……
Laboratory services	
26. Does this facility offer the following laboratory services? 1. Cell Blood Count (CBC) 2. Blood chemistry 3. Urine Analysis 4. FBS test 5. OGT test	1…… 2…… 3…… 4…… 5……
Essential support services	
27. Does the facility have the following support services? 1. Teaching aids for ANC 2. ANC health education materials	1…… 2……
Healthcare providers Knowledge	
28. Which of the following statement is correct definition of GD? 1. GD is a kind of diabetes that happen during pregnancy and one woman only out of 100 women develop GD. 2. GD is a glucose intolerance that is occurs during pregnancy. 3. GD is diabetes that is found for the first time during pregnancy or after delivery.	1…… 2…… 3……
29. Which of the following tests are used in your facility to confirm the diagnosis of GD? 1. FBS 2. 2 hour plasma glucose 3. 75g GTT	☐
30. What are the risk factors for GD? 1. Age >25 years 2. Overweight 3. Family history 4. History of GD in previous pregnancy 5. Gave birth to >4 kg baby in the last pregnancy	1…… 2…… 3…… 4…… 5……

31. Based on GD guidelines, what is the management guideline of GD? 1. Diet plan 2. Physical activity 3. Insulin 4. OHA	1…… 2…… 3…… 4……
32. What are the complications of GD? 1. Oversized baby 2. Delivery by CS 3. Baby respiratory distress 4. Baby hypoglycemia 5. Jaundice 6. Miscarriage 7. Pregnancy induced hypertension 8. Polyhydramnios 9. Preterm delivery 10. Stillbirth	1…… 2…… 3…… 4…… 5…… 6…… 7…… 8…… 9…… 10……..
33. When FBS is requested, clients should fast: 1. 8-10 hours 2. 10-12 hours 3. 12-14 hours	1…… 2…… 3……
34. Pregnant women is defined GD when the value of FBS is: 1. 30-89mg/dl 2. 85-125mg/dl 3. >126mg/dl	1…… 2…… 3……
35. OGTT should be done for women if the value of FBS is: 1. 30-89mg/dl 2. 85-125mg/dl 3. >126mg/dl	1…… 2…… 3……
36. What is the prevalence of GD worldwide?	☐ **%**
37. Do you think the prevalence of GD in UNRWA facilities is: 1. Less than worldwide 2. Equal worldwide 3. More than worldwide	☐

Annex 10: clients' questionnaire "English version"

Antenatal Care client's interview

Serial No: **Date: / /**

	Name of the facility_____ **GOVERNERATES** 1= Gaza city 2=North 3=Midzone 4=Khanyonis 5=Rafah	☐
	Personal Data	
1	**Age** …….. Years	☐
2	**Educational level** 1=Illiterate 2= Primary 3=Secondary 4= tertiary 5=University	☐
3	**Occupation** 1=Not employed (Housewife) 2=Employed	☐
4	**Residency** 1=City 2=Camp 3=Village	☐
5	**Household average monthly income**	☐ NIS
	Obstetric History	
6	**Age at 1st marriage**	☐ Years
7	**Number of pregnancies including current pregnancy**	☐ Time
8	**History of GD in previous pregnancy** 1= yes 2=No	☐
9	**History of delivery of 4kg baby or more** 1= yes 2=No	☐
10	**History of delivery baby with congenital anomalies?** 1= yes 2=No	☐
11	**Family history of 1st degree DM** 1= yes 2=No	☐
	Current Antenatal care	
12	**How long have you been pregnant?**	☐ Months
13	**How many times have you come for ANC for this pregnancy?**	☐ Time (s)
14	**When you are diagnosed as a GD?** **And where?** 1. At this facility 2. In other facility 3. By private obstetrician	1=1st trimester 2=2nd trimester 3=3rd trimester ☐ ☐

15	**What kind of treatment for GD you were on:** 1=Insulin 2= Diet regimen 3=Both	☐
16	**What form of transportation did you use to get the clinic?**	1=Walk 2=Automobile ☐ 3=other (specify):……..
17	**How long did it take you to reach this facility?**	☐ Minuets
18	**What is the main purpose of coming for ANC?** Tick all that apply, do not read them.	1= For check up 2= for supplementation 3=for treatment of problem 4= other (specify)
19	**Do you have an appointment with providers?** 1=Yes 2=No if yes, specify whether it was 1=by time 2= by date 3= both	☐ ☐
20	**Do you think that the services at this facility are convenient and easy?** 1=Yes 2=No	☐
21	**How much time did you spend waiting to meet with health provider today?**	☐ Minuets
22	**Are you satisfied with the waiting time?** 1=greatly satisfied 2=satisfied 3=slightly satisfied 4=Not satisfied	☐
23	**How long was your consultation with the health provider?**	☐ Minuets
24	**Did you think your consultation was too short, too long or the right length of time?**	1= too short 2=too long ☐ 3=right length
25	**Are you satisfied with the consultation?** 1=greatly satisfied 2=satisfied 3=slightly satisfied 4=Not satisfied	☐
26	**During your visit to this facility, did the staff treat you with respect?** 1=Yes 2=No	☐
27	**Did you feel that the staff cared about you and your wellbeing?** 1=Yes 2=No	☐
28	**Did the staff ask you if you had any questions or concern?** 1=Yes 2=No	☐
29	**Did you feel comfortable to ask questions?** 1=Yes 2=No	☐

30	**Did the staff ask you to come back for another visit?** 1=Yes 2=No	☐
31	**Generally, are you satisfied with the quality of the services you received in this facility?** 1=greatly satisfied 2=satisfied 3=slightly satisfied 4=Not satisfied	☐
32	**Why did you choose this facility?** Tick all that apply 1. Good quality of care 2. Convenient 3. Offers different services 4. Free of charge 5. Reputation 6. Recommended by others 7. For ration only	1. …… 2. …… 3. …… 4. …… 5. …… 6. …… 7. …… 8. ……

33. I would like you to think about all of your visits during this pregnancy, during any of these visits did the staff:

	Yes	No	DK
1. Perform physical examination	1. ……	……	…….
2. Ask you about your previous obstetric history	2. ……	……	…….
3. Check fetal heartbeat	3. ……	……	…….
4. Check your weight	4. ……	……	…….
5. Carry out ultrasound	5. ……	……	…….
6. Check your blood pressure	6. ……	……	……
7. Carry out Blood sugar test	7. ……	……	…….
8. Carry out Urine analysis	8. ……	……	…….
9. Carry out CBC	9. ……	……	…….
10. Provide iron & folic supplementation	10. ……	……	…….
11. Give you TT	11. ……	…….	……..
12. Provide insulin	12. ……	……..	…….

34. I would like you to think about all the topics you have discussed with health providers including today, During any of your consultation did the staff:

	Yes	No	DK
Give you information or advice about diet and nutrition during pregnancy?	…….	…….	……..
Tell you your expected date?	…….	…….	……..
Tell you how the baby is growing?	…….	…….	……..
Explain how to manage gestational diabetes?			
Discuss the importance of planning for delivery?	…….	…….	……..
Inform you of danger signs during pregnancy?	…….	…….	……..
Inform you of danger signs after delivery?	…….	…….	……..
Advise you where to go for medical help if you have problem?	…….	…….	……..

35	**Have you ever received health education?** 1=Yes 2=No **If yes, specify who provide you the health education?**	☐ 1= obstetrician 2=GP 3=Staff/Midwife ☐ 4=DK
36	**In which subjects did, you received health education or counseling.** Tick all that apply 1. Diet &Nutrition 2. Supplementation (Iron & Folic acid) 3. GD management &compliance 4. Warning signs of pregnancy complications 5. Infant warning signs	Yes No DK 1. …… ……. ……. 2. …… ……. ……. 3. …… ……. ……. 4. …… ……. ……. 5. …… ……. …….

37 Now I am going to ask about some problems clients have at health facilities. Please tell me if any of these were problems for you?

		yes	No	DK
	Time you waited?			
	Ability to discuss problems or concerns about your pregnancy with the Provider?			
	Quality of the examination and treatment provided?			
	Privacy?			
	Availability of medicines at the facility?			
	Availability of equipment			
	The hours of services?			
	Cleanliness of facility?			
	How staff treated you?			

Lab investigation			
39	How many times was FBS measured	☐	Time
40	How many times was Hg% measured	☐	Time
41	How many times was proteinuria measured	☐	Time
Knowledge			
42	**What is gestational diabetes?** 1. Gestational diabetes is diabetes that is found for the first time when a woman is pregnant or after pregnancy. 2. Gestational diabetes is a kind of diabetes that can happen before pregnancy. 3. Gestational diabetes mellitus is defined as increase glucose level in the blood that is first detected during pregnancy.	☐	

43	**The normal value of FBS is:** 1. 30-70mg/dl 2. 70-110mg/dl 3. >110mg/dl	☐	
44	**What are the complications of GD?** 1. Oversized babies 2. pregnancy-related high blood pressure 3. miscarriage; 4. polyhydramnios 5. preterm delivery; 6. Stillbirth. 7. delivered by cesarean section 8. the baby may have breathing problems, 9. Low blood sugar. 10. jaundice	**Non promted** 1=……. 2=……. 3=……. 4=……. 5=……. 6=……. 7=……. 8=…….. 9=…….. 10=……	**prompted** 1=……. 2=……. 3=……. 4=……. 5=……. 6=……. 7=……. 8=…….. 9=…….. 10=……