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Pregnant Women's Knowledge and Attitude Towards Group B Streptococcus Screening in the Maternity Departments at Bethlehem Hospitals: Cross-Sectional Study

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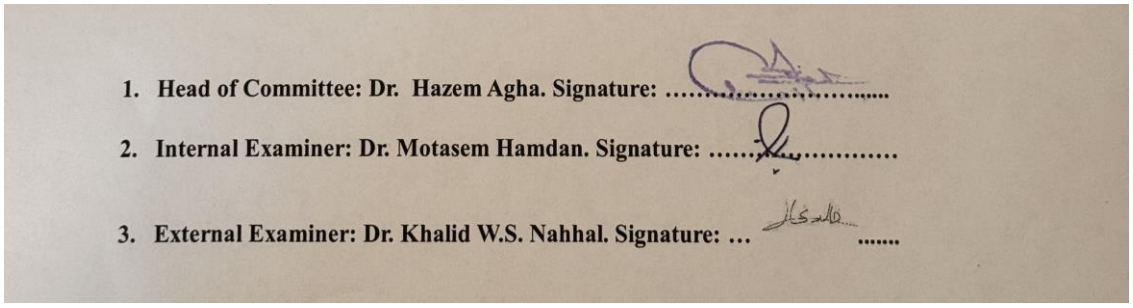

Jerusalem. Palestine.

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Dedication

I dedicate this work to my dear mother and father, the source of my endless love and support. They taught me that perseverance is the path to success, and I am proud and grateful to present them with the fruit of my efforts and achievements.

I dedicate this work to my life partner, Mohammad, in appreciation of your constant encouragement and unwavering support, and for standing by my side and supporting me through every step.

I dedicate this work to my beloved children, Sama and Oday, who patiently endured my absence and busy days throughout this journey, and to my precious daughter, Tuqa, who brightened my days along the way.

I also dedicate this work to my family, my brothers and sisters, who surrounded me with love, patience, and encouragement; and I dedicate it to my dear parents-in-law, whose support had the greatest impact on this success.

Finally, I dedicate this work to all my friends and colleagues who supported me along the way.

Nariman Mohammad Ahmad Dannoon

Declaration

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

Signed 

Nariman Mohammad Ahmad Dannoon

Date: 9/12/2025

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Abstract

Background: Group B Streptococcus (GBS) is a leading cause of neonatal sepsis, meningitis, and pneumonia worldwide. Despite global recommendations for universal screening and intrapartum antibiotic prophylaxis, many low- and middle-income countries, including Palestine, continue to adopt a risk-based approach, and Inconsistent screening practices. Pregnant women's knowledge and attitudes play a crucial role in the effectiveness of such preventive strategies.

Objective: This study aimed to assess pregnant women's knowledge and attitudes toward GBS screening and to investigate their association with demographic and obstetric variables in maternity departments at Bethlehem hospitals.

Methods: A descriptive cross-sectional study was conducted among 400 pregnant women, selected via stratified random sampling from four hospitals in the Bethlehem area. Data were collected through a validated, self-administered questionnaire consisting of three sections: sociodemographic variables, 15 knowledge items, and 12 attitude items. The data were analyzed using SPSS version 25. Descriptive statistics, the Pearson correlation coefficient, t-tests, and one-way ANOVA were applied, with a significance level of $p < 0.05$.

Results: The findings revealed an overall high level of knowledge among pregnant women regarding GBS screening (mean = 3.93 ± 0.46), with a ratio of 71.8%. Similarly, attitudes towards GBS screening were generally positive (mean = 3.74 ± 0.46). This indicates a strong acceptance of GBS testing and trust in healthcare providers. No significant associations were found among participants between knowledge levels and their age, education, residence, income, or parity ($p > 0.05$). However, attitudes were significantly influenced by education and monthly household income ($p < 0.05$). Women with higher levels of education and income showed more positive attitudes towards screening.

Conclusion: Pregnant women in Bethlehem hospitals demonstrated a high knowledge level and positive attitudes towards GBS screening. However, persistent knowledge gaps and attitude disparities remain, particularly among socioeconomically disadvantaged and lower educational levels. These findings emphasize the importance of ongoing antenatal education and awareness programs targeting vulnerable populations to improve understanding and overcome emotional barriers. Furthermore, the adoption of a clear national policy by the

Ministry of Health, whether through universal screening or a risk-based approach, and the integration of a standardized national protocol into antenatal care guidelines are essential to ensure consistent and equitable GBS screening practices across all healthcare settings.

Keywords: Group B Streptococcus, Knowledge, Attitude**,** Pregnant Women, Screening.

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List of Abbreviations

GBS	Group B Streptococcus
CDC	Centers for Disease Control and Prevention
WHO	World Health Organization
IAP	Intrapartum Antibiotic Prophylaxis
SPSS	Statistical Package for the Social Sciences
ANOVA	Analysis of Variance
SD	Standard Deviation
DF	Degrees of Freedom
p-value	Probability Value
MoH	Ministry of Health
CI	Confidence Interval
OR	Odds Ratio
LSHTM	London School of Hygiene & Tropical Medicine
NIS	New Israeli Shekel
IQR	Interquartile Range
β-hemolytic	Beta-hemolytic (type of *Streptococcus* reaction)
OGBSD	Early Onset Group B Streptococcal Disease
HBM	Health Belief Model
ACOG	American College of Obstetricians and Gynecologists

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Chapter One

Introduction

1.1 Background

Group B streptococcus (GBS) infection is one of the most prevalent and possibly fatal bacterial illnesses among neonates. GBS, also known as Streptococcus agalactiae, is a gram-positive bacterium of the Streptococcus genus, specifically a β-hemolytic, encapsulated, Gram-positive cocci belonging to Lancefield group B, that is commonly found in the human gastrointestinal and migrates down to the rectum, vagina, and urinary tract, usually without causing illness, so it can be transmitted vertically during childbirth. GBS thrives in the vaginal environment and rarely produces visible symptoms (Qadi et al., 2021; Zoli et al., 2023). This pathogen was initially identified by Edmond Nocard in 1887 as the cause of bovine mastitis, which led to agalactia, or insufficient milk production. Still, its effects on humans were not yet discovered until 1938, when Fry reported three fatal cases of postpartum sepsis, and the significance of this microbe was realized. Until the 1970s, several reports had linked this bacterium to neonatal infections. (Hanna & Noor, 2020).

The estimated global prevalence of group B streptococcus (GBS) among pregnant women is 18%, with regional variations range from 13% to 35%, with the highest recorded rates in Africa (7.2–48.2%), followed by the USA (20–35%), and then Asia (7.8–13.65%) (Husen et al., 2023). GBS can increase the risk of urinary tract infections, chorioamnionitis, endometritis, and sepsis during pregnancy. It is also a risk factor for miscarriage, preterm labor, and stillbirth. GBS often colonizes a pregnant woman's intestinal and/or genitourinary system, although it may spread to the amniotic fluid, placenta, cervix, or vagina (Pangerl et al., 2022).

The condition may appear early or late; the majority of neonatal GBS infections are caused by infections that occur within the first week of life. Also, GBS may remain a risk to the newborn for up to three months after birth, causing illnesses such as sepsis, pneumonia, and meningitis. Early-onset sepsis is estimated to afflict around 517 newborns in the UK each year. According to estimates, approximately 36% of babies born to GBS-colonized mothers will get colonized with the bacterium themselves, with 1% developing invasive GBS disease as a result (Constantinou et al., 2024).

According to a recent report in November 2021, from the World Health Organization (WHO) and the London School of Hygiene & Tropical Medicine (LSHTM), Group B streptococcus causes approximately 150,000 infant deaths each year, over half a million preterm births annually, at least 46,000 stillbirths, and severe long-term disabilities (World Health Organization, 2021). The overall infant mortality rate is approximately 8.4% globally, with marked geographic/economic variation; Africa bears the brunt (54% of cases and 65% of fetal/infant deaths), while infant deaths in high-income countries range from 4–10%. Among survivors of GBS meningitis, moderate/severe neurodevelopmental disorders are recorded at about 20–30%, and the percentage of any long-term disability may reach about 50%. (Russell et al., 2017; Mynarek et al., 2020).

Group B Streptococcus is the leading cause of invasive neonatal infection worldwide. 2 to 3 in every 50 babies (4–6%) who develop GBS disease die (Mynarek et al., 2021). Given the potential for significant morbidity and mortality, the screening for and management of GBS colonization during pregnancy has become a cornerstone of prenatal care.

Introducing universal screening guidelines and administering intrapartum antibiotic prophylaxis (IAP) to women colonized with Group B Streptococcus (GBS) has substantially reduced the incidence of early-onset GBS disease among newborns (CDC, 2016). Despite these advancements, gaps remain in the uptake of GBS screening and adherence to recommended preventive practices, which are attributed in part to varying levels of knowledge and attitudes among pregnant women (Constantinou et al., 2023; Giles et al., 2019).

Knowledge about GBS and its potential effects varies widely among pregnant women. Studies have shown that while many women are aware of GBS screening, their understanding of the reasons for screening and the potential consequences of GBS colonization is often limited (Constantinou et al., 2023; Giles et al., 2019; McQuaid et al., 2016). This lack of understanding may influence their attitudes toward the screening process and adherence to recommended practices, including the acceptance of IAP during labor.

Women's attitudes toward group B bacterial screening (GBS) and preventive measures are influenced by several factors, including cultural beliefs, trust in medical advice, previous experiences with the health system, and level of knowledge about infection and screening. Women who find screening and subsequent interventions helpful and aimed at protecting the newborn are more willing to adhere to recommendations. In contrast, women who are concerned about medical procedures, such as the use of antibiotics during pregnancy, or who have a lack of confidence in the health system, may be less committed to screening. International studies indicate that trust in physician guidance and awareness of the importance of screening are powerful factors influencing women's acceptance of screening (Ko et al., 2016; Giles et al., 2019). Systematic reviews also confirm that raising women's knowledge and addressing misconceptions is a key strategy for enhancing adherence to screening.

Current practices regarding GBS screening among pregnant women involve a universal screening method where all pregnant women are tested at 36-37 weeks of pregnancy and

receive the appropriate antibiotics (IAP) if their test results are positive during labor. This method is recommended by the World Health Organization and is currently used in 60 countries. In some countries, a risk-based approach is used, whereby routine screening is not performed, but antibiotics are given to labouring women with specific risk factors. These risk factors include the presence of GBS in the vagainga or urine, which can occur at any time during pregnancy, previously giving birth to a baby with early GBS, pre-term labor, fever during labor, prolonged rupture of membrane for almost 18 hours (Dekker, 2023; Morgan et al., 2024).

In Palestine, a risk-based or selective screening approach is used, where screening is only performed for pregnant women with specific risk factors, and so they are offered IAP (Ministry of Health of Palestine, 2024). The decision to adopt one strategy over the other is often based on national or regional health policies. For example, the United States follows a universal approach, while the United Kingdom, the Netherlands, and Saudi Arabia adopt a risk-based approach (Homer et al., 2013). Caregiver preferences and patient behavior also influence this choice. Studies have shown that most women are willing and prefer screening, but concerns about overtreatment may lead to a preference for a more specific approach (Kolkman et al., 2017). The present study aimed to evaluate pregnant women's current knowledge and attitudes toward GBS screening during pregnancy in the maternity departments at Bethlehem Hospitals.

1.2 Problem statement

According to the World Health Organization (WHO), GBS infection causes severe perinatal morbidity and mortality. The annual GBS burden in numbers for the year 2020 is 19,700,000 pregnant women colonized with Group B strep, 518,000 GBS-related premature births, 390,000 baby GBS cases, 91,000 neonatal deaths, 46,000 plus stillbirths, and 40,000 newborns with neurological damage due to GBS-associated illnesses. This shows the global importance of screening and the timeliness of antibiotic prophylaxis. However, the biggest incidence of GBS occurs in low- and middle-income countries, where screening and intrapartum antibiotic therapy are most difficult to adopt (WHO, 2021).

In Palestine, despite the established dangers of Group B Streptococcus (GBS) infection in newborns, such as sepsis, pneumonia, and meningitis, GBS screening is not applied to all pregnant women (Qadi et al., 2021). There is no clear national or standard policy for detecting GBS bacteria, but the Palestinian hospitals often adopt a risk-factor-based approach (Palestinian Ministry of Health, 2024). Local studies have reported variable colonization rates among pregnant women, with 21% at Al Shifa Hospital in Gaza (El Aila et al., 2017) and 12% at Rafidia Governmental Hospital in Nablus (Qadi et al., 2021).

There is limited information about Palestinian women’s knowledge, attitudes, and acceptance toward GBS screening. Additionally, there is a lack of antenatal classes that increase knowledge and enhance attitudes toward GBS screening. Also, understanding pregnant women's knowledge and attitudes toward GBS screening is essential, as these

factors directly influence their acceptance of screening and adherence to preventive measures such as intrapartum antibiotic prophylaxis. Finally, studying these variables is essential to identify barriers and facilitators for adopting a unified screening strategy, even a universal or risk-based strategy. And such research would provide invaluable insights to guide evidence-based strategies that enhance prevention and improve maternal and neonatal health outcomes.

1.3 Significance of the Study

Since the national health system in Palestine depends on a risk-based approach, this study highlights the importance of assessing knowledge and attitude toward GBS screening, as pregnant women constitute an essential component of preventive care in the preventive and therapeutic process, as they can report personal medical history related to GBS, which helps medical staff make appropriate preventive decisions. So, improving maternal knowledge and acceptance of screening may contribute to a reduction in neonatal morbidity and mortality rate. In addition, assessing pregnant women's level of knowledge and attitudes towards this screening provides a scientific basis for designing educational programs and awareness-raising consultations within antenatal care services, which will enhance women's awareness and improve prevention practices.

At the policy level, the study results may provide the Palestinian Ministry of Health with evidence highlighting the challenges and opportunities related to screening for group B streptococcal infection in resource-limited and conflict-affected settings. The findings can inform gradual improvements in preventive strategies, such as targeted awareness programs, structured antenatal education, and enhanced maternal engagement, which are feasible within the existing healthcare system and can contribute to better maternal and neonatal health outcomes.

Ultimately, the findings are expected to benefit pregnant women, healthcare providers, and decision-makers by strengthening preventive interventions, improving maternal and newborn health practices, and encouraging better communication and informed decision-making regarding GBS screening.

1.4 Aim of the study

This study aims to assess pregnant women's level of knowledge and attitude toward GBS screening in the maternity departments of Bethlehem area hospitals.

1.5 Study objective

1. To assess the level of knowledge among pregnant women regarding GBS screening.
2. To assess the level of attitudes and perceptions among pregnant women towards GBS screening during pregnancy.

3. To analyze the relationship between sociodemographic and obstetric variables (age, education, residence, income, parity) with the level of knowledge about GBS infection and screening.
4. To assess the relationship between sociodemographic and obstetric variables (age, education level, residence, income, parity) with the level of attitudes regarding GBS screening.
5. To examine the association between a previous diagnosis of GBS infection and pregnant women's level of knowledge and attitudes towards GBS screening.
6. To assess the relationship between pregnant women's level of knowledge and attitude regarding GBS screening.

1.6 Research questions

1. What is the level of knowledge and awareness among pregnant women regarding GBS
2. What are the levels of attitudes of pregnant women towards GBS screening?
3. Are sociodemographic and obstetric variables (age, education, residence, income, parity) associated with the level of knowledge about GBS screening?
4. Are sociodemographic and obstetric variables (age, education, residence, income, parity) associated with attitudes toward GBS screening?
5. Is a previous diagnosis of GBS infection associated with pregnant women's knowledge and attitudes about GBS screening?
6. What is the relationship between the level of knowledge and attitude of pregnant women regarding GBS screening?

Chapter Two

Literature Review

2.1 Introduction

This chapter presents a comprehensive overview of the literature review on GBS colonization among pregnant women, concentrating on the epidemiology, transmission, screening practice, and the level of knowledge and attitude toward GBS screening, it also addressed literature on the availability of a GBS vaccine and its acceptability by pregnant women, as research into these topics contributes to the development of maternal and neonatal outcomes in the Palestinian maternal care context.

2.2 Overview of Group B Streptococcus (GBS), Transmission, Signs and Symptoms, and Risk Factors

Group B Streptococcus (GBS), also known as Streptococcus agalactiae, is a gram-positive bacterium that has long been recognized as an important cause of infection among newborns, pregnant women, and older adults. Around one-third of pregnant women may carry the organism in the gastrointestinal or vaginal tract, which explains why GBS continues to represent a major maternal and neonatal health concern (By, 2010; Morgan et al., 2024). In settings such as Palestine, this risk is particularly relevant given the limited access to routine screening and follow-up services. In its 2017 report, WHO estimated that Group B Streptococcus was responsible for 319,000 neonatal infections in 2015, alongside 90,000 infant deaths and more than 57,000 stillbirths (WHO., 2017). Notably, Africa experienced nearly two-thirds of global losses, underscoring the unequal distribution of disease burden. These findings are particularly relevant to low-resource settings such as Palestine, where challenges in maternal and neonatal healthcare may amplify the risks associated with GBS.

Risk factors include low birth weight, prolonged membrane rupture, intraamniotic infection, young age of the mother, maternal black race, gestational age less than 37 weeks, GBS bacteriuria, and having a previous newborn affected by early-onset group B streptococcus disease (EOGBSD) (Prevention of Perinatal Group B Streptococcal Disease--revised Guidelines From CDC, 2010).

Clinical signs of GBS infection in pregnant women include chorioamnionitis, endometritis, or urinary tract infections secondary to GBS, maternal fever (temperature 100.4 °F (38 °C) or higher), uterine tenderness, maternal and fetal tachycardia, purulent amniotic fluid, dysuria, costovertebral tenderness, and maternal leukocytosis. Additionally, preterm labor, premature membrane rupture are further signs of an intra-amniotic infection. (Morgan et al., 2024).

In pregnant women colonized with S agalactiae, bacteria can ascend from the genitourinary tract to the uterus or bladder. If the bacteria reach the uterus, they can damage the fetal membranes, resulting in chorioamnionitis. If the bacteria infect the newborn, they can cause premature labor, miscarriage, or intrauterine fetal death. Alternatively, the bacteria can enter the respiratory system of the newborn through the amniotic fluid and result in GBS pneumonia or lung tissue inflammation, or they can come into contact with the mother after a vaginal birth and result in late-onset GBS disease. In some cases, S. agalactiae may use beta-hemolysin to disrupt the baby's alveolar lining and enter the bloodstream, leading to sepsis and concurrent bacteremia. Neonatal meningitis can also result when bloodstream bacteria cross the blood–brain barrier and enter the cerebrospinal fluid (Hanna & Noor, 2023).

2.3 Screening practices and their management

According to the 2010 Centers for Disease Control and Prevention (CDC) guidelines, GBS screening should begin at 35 weeks of gestation (CDC, 2010). The two main strategies practiced worldwide are universal culture-based screening and risk-based screening. The universal approach is recommended by the CDC and the American College of Obstetricians and Gynecologists (ACOG). The responsibility for updating the GBS guidelines has transferred from the CDC to the ACOG and others. ACOG currently recommends that all pregnant women undergo GBS screening between 36 and 37 weeks of pregnancy. Repeat screening is also recommended for women who do not give birth within this five-week window and have a negative initial GBS screening result. ACOG issued this update in 2020 to replace the 2010 CDC guidelines (ACOG, 2020; Hanna & Noor, 2023).

In contrast, risk-based screening uses maternal risk factors during labor, such as fever, preterm gestation, and prolonged rupture of membranes, to inform the use of antibiotic prophylaxis. Without a speculum, a single swab is used to take samples from the rectum and lower vagina for GBS culture collection (Morgan et al., 2024). These revised screening guidelines aim to reduce the prevalence of GBS colonization at birth and inconsistent antepartum culture results. Additionally, the updated guidelines recommend proper intrapartum antibiotic prophylaxis (IAP) for all women with positive GBS vaginal-rectal

cultures at 36–37 weeks of gestation, unless a caesarean delivery is performed before labor begins with intact membranes. Two hours of antibiotic exposure has been shown to reduce vaginal GBS colony counts and decrease the likelihood of a clinical diagnosis of newborn sepsis, although a shorter duration of intrapartum antibiotics is less effective than four or more hours of prophylaxis (CDC, 2010; ACOG, 2020).

Intrapartum antibiotics mitigate early-onset group B streptococcus (GBS) disease through three mechanisms: they temporarily reduce vaginal GBS colonization, prevent the bacterium from colonizing the neonate's skin and mucosal surfaces, and ensure sufficient antibiotic levels are transferred to the neonate's bloodstream to kill the bacteria (Puopolo et al., 2019). Penicillin is the antibiotic of choice due to its targeted antimicrobial spectrum, lower likelihood of fostering resistant organisms, and limited impact on gut bacterial flora. In the event of a penicillin allergy, clindamycin is recommended (Melin, 2011). A 3-gram intravenous loading dose of penicillin was administered during labor, followed by 1.8 grams every four hours until delivery, in line with the recommended prevention strategy (Morgan et al., 2018).

The incidence of early-onset neonatal disease has significantly decreased from 1.7 cases per 1000 live births in the early 1990s to 0.22 cases per 1000 live births in 2017, an 80% reduction as a result of the widespread screening of pregnant women for this organism during the third trimester and the subsequent antibiotic prophylaxis for maternal colonization (Noor & Hanna, 2023).

2.4 Reviewed studies assessing knowledge and attitudes among pregnant women about the GBS bacterium and its screening.

It is crucial to understand the attitudes and knowledge of pregnant women regarding GBS screening, since GBS poses a serious risk to maternal and neonatal health. Studies reveal that awareness and perception levels vary significantly between communities and are influenced by demographic variables such as level of education and cultural factors. This section reviews studies conducted in various settings, assessing the knowledge and attitudes of pregnant women towards GBS colonization and their understanding of the associated risks. It also examines their willingness to undergo screening or receive intrapartum antibiotic prophylaxis (IAP). The findings of the study shed light on common misconceptions and knowledge gaps, as well as identifying potential topics for public health campaigns aimed at improving screening rates and maternal and neonatal outcomes.

An epidemiological report by the Centers for Disease Control and Prevention analyzing data from North Carolina between 2002 and 2003 found that, despite the universal screening recommendations issued by the CDC in 2002, only 72% of pregnant women underwent GBS screening, and approximately 18–19% were unaware of whether they had been tested. The study also revealed significant variations in the implementation of GBS screening. Screening rates varied depending on: Age: younger women (especially adolescent girls and women under 25 years of age) were less likely to be screened than older women. Race and ethnicity: African-American and Latino women were less likely to be screened than white women.

Educational level: Women with a low level of education were more likely to be unaware of their screening status. Insurance coverage: Those without private insurance, or with public insurance, have decreased access to and awareness of GBS screening. Moreover, the research emphasized the need to enhance communication between patients and providers, particularly when discussing test results and public health measures targeting vulnerable population groups, improve documentation and monitoring systems to ensure that all pregnant women receive appropriate information and screening ("Disparities in Universal Prenatal Screening for Group B Strep - North Carolina, 2002-2003", 2005).

A study titled "Knowledge and Attitudes of Hong Kong Pregnant Women on Group B Streptococcus Screening," conducted by TY Chow, William WK To, and Daniel LW Chan, aimed to assess the knowledge and attitudes of pregnant women in Hong Kong regarding Group B Streptococcus (GBS) screening, comparing the views between women in their first and third trimesters. This cross-sectional study, conducted in December 2011, immediately before the implementation of universal GBS screening in Hong Kong, included 213 pregnant women who completed a self-administered questionnaire during their visit to the antenatal clinic for either a nuchal translucency examination in the first trimester or a cardiotocography in the third trimester. The findings revealed that only 36% of participants had heard about GBS, and the mean knowledge score about GBS was remarkably low, at 3 out of 17, with 41% of participants unable to answer any knowledge questions correctly. Despite the lack of awareness and knowledge, 81% of the participants were willing to undergo GBS screening during pregnancy, and 66% supported the implementation of universal GBS screening. Participants who had heard of GBS scored higher in knowledge about the infection and showed greater acceptance of screening practices. The study concluded that awareness and knowledge about GBS among Hong Kong pregnant women were notably poor, highlighting the need for public health initiatives to improve understanding and awareness of GBS screening and its benefits, with a particular focus on new immigrants and visitors from China who exhibited lower awareness and acceptance rates (Chow et al., 2013).

A similar quantitative study was conducted by de Mello et al. (2015) in a maternity ward in São Paulo, Brazil, to assess the extent to which pregnant women undergo group B streptococcal (GBS) screening and are aware of it. The study included 391 pregnant women who were interviewed and for whom the researchers reviewed pregnancy follow-up cards. The results revealed significant discrepancies in screening documentation and women's awareness of it. GBS screening was found to be undocumented in over half of the follow-up files (51.4%), with 43% of women reporting that they were unaware of the screening or could not recall undergoing it. While they did not explicitly refuse to be tested, their lack of awareness or certainty indicated poor health awareness and education by healthcare providers. The study recommended improving documentation practices within healthcare institutions and strengthening health education programs related to GBS screening during pregnancy (De Mello et al., 2015).

A cross-sectional survey was conducted at the maternity clinic of Queen Mary Hospital, a secondary teaching hospital in Hong Kong. It was conducted by Ko et al. The questionnaire was administered to 327 pregnant women attending GBS screening. After excluding seven questionnaires with frequent missing data, 320 questionnaires were analyzed. The mean age of the participants was 32.1 ± 4.7 years, and the median gestational age was approximately 35 weeks. Before completing the questionnaire, the researchers provided a visual presentation and an information leaflet about GBS infection and the importance of screening for it. A nurse was also available to answer questions. Participants were asked to return the questionnaire after the medical team had taken examination swabs. The questions asked included preferences regarding the method of examination (self-examination or examination by a doctor or nurse), comfort levels when performing self-swabbing, the reasons behind these preferences, and willingness to perform self-examination during subsequent pregnancies or to recommend it to others. The findings showed that only a minority of pregnant women were aware of GBS. 62.5% of women preferred to be tested by a clinician, 31.9% had no clear preference, and only 5.6% preferred self-swabbing. This indicates a culture of dependence on caregivers and a belief that they have experience, as well as higher trust in the health practitioner. Although currently, only a small percentage (5.6%) preferred self-swabbing, 68.1% expressed a desire to try self-swabbing in their next pregnancy, and 58.4% would recommend it to others. This suggests that self-examination may be accepted after the experiment or upon obtaining more information (Ko et al., 2015).

McQuaid et al. conducted a cross-sectional study in the United Kingdom in which an online survey was used to explore the factors that influence women's attitudes towards anti-vaccines, group B streptococcus, and participation in clinical trials during pregnancy. The study included 1,013 women aged 18–44 from England, Scotland, and Wales, of whom 500 were pregnant. All participants completed an electronic questionnaire. The findings showed that women with children were more aware of diseases such as GBS, whooping cough, and influenza (45%), compared to women without children (26%). Additionally, women with children were more accepting of vaccination: 77% were willing to receive a GBS vaccine, compared to 65% of non-mothers. Furthermore, 37% of women with children and 27% of women without expressed a willingness to participate in a GBS vaccine clinical trial. The study also indicated that providing women with information significantly increases their intention to receive the vaccine. It also showed that medical staff are the most influential source of information on these vaccinations for women (McQuaid et al., 2016).

In a study by Giles et al., the researchers explored the awareness and attitudes of pregnant women towards maternal vaccinations targeting Group B streptococcus (GBS) and respiratory syncytial virus (RSV). Conducted in Melbourne, Australia, in 2019, the study involved 495 women attending antenatal clinics. The sample was diverse, with 48% of participants born outside Australia and hailing from 48 different countries. The study revealed a significant lack of awareness among participants: 63% had never heard of GBS, and an even higher proportion (83%) were unfamiliar with RSV. However, older women, those born in Australia, and those with more than one child were more likely to be aware of these diseases. Notably, the study found that women who had received influenza or pertussis

vaccines during pregnancy were more willing to accept potential future RSV or GBS vaccines (Giles et al., 2019).

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In 2018, Amer Alshengeti et al conducted a cross-sectional study in Al-Madinah, Saudi Arabia, which assessed the awareness, attitudes, and practices of pregnant women regarding Group B Streptococcus (GBS) screening. A total of 377 women participated in the survey. The findings revealed that 66.8% of women were unaware of GBS, and 86.5% had never received information about GBS risk assessment during pregnancy. Women who were aware of GBS had a higher mean knowledge score than those who were not. Women with past exposure to GBS screening had significantly higher odds (OR 1.025, 95% CI 1.009 to 1.039) of achieving a score above the 75th percentile on the knowledge scale. For each additional point on the GBS screening exposure score, the odds of women being informed about GBS increased by 2.4% ($p = 0.001$). No statistically significant differences were found in the level of knowledge about GBS screening according to age, number of pregnancies, occupation type, or level of education. Despite limited awareness, 61.8% of participants expressed a preference for universal culture-based GBS screening over risk-based screening. The authors concluded that, although there is a significant knowledge and awareness gap about GBS among pregnant women, there is a preference for universal culture-based screening. The study emphasized the need for improved education on GBS screening strategies during pregnancy, suggesting that the results could inform the development of national GBS screening guidelines in Saudi Arabia (Alshengeti et al., 2020).

Yara Alamri et al. conducted an online cross-sectional survey in Jeddah, Saudi Arabia, in 2021, to evaluate awareness of antenatal screening for Group B Streptococcus (GBS) among women and physicians in Saudi Arabia. The study involved 745 participants, including 25 family medicine or obstetrics and gynecology physicians and 720 women of reproductive age, and used a cross-sectional design. The findings showed that women had a poor level of awareness, with a mean knowledge score of 50.7%, and that the majority were unaware of this infection (85.3%). While the physicians demonstrated a good level of understanding, half of them reported the need for training to correctly perform screens. The study highlighted a significant gap in awareness and knowledge of GBS screening among both groups, emphasizing the need for increased educational efforts to prevent complications associated with GBS infection (Alamri et al., 2021).

A cross-sectional study conducted by Zoli et al. in Jazan Governorate, Saudi Arabia, in 2023 aimed to assess women's awareness of Group B Streptococcus (GBS). The study involved surveying 995 women aged 18–45 years between January and April 2023. The findings revealed that awareness levels were low, with only 23% of women reporting that they had heard of GBS before. A significant association was found between awareness of GBS and certain sociodemographic factors. Women who were students (55.9%), married (55.5%), currently pregnant or had a history of pregnancy (51.1%), were aware of GBS risk factors (38.9%), and had received specialized medical follow-up (88.1%) showed significantly higher awareness. Regarding screening preferences, approximately 40% preferred comprehensive (universal) screening without prior approval, 31% preferred universal

screening with approval, 16% preferred a screening strategy for high-risk pregnant women with consent, and 13% preferred high-risk screening without consent. The study concludes that there is a significant gap in knowledge of GBS among pregnant women, but that most of them clearly prefer comprehensive screening, with or without consent (Zoli et al., 2023).

A qualitative study entitled 'Women's knowledge of and attitudes towards group B streptococcus (GBS) testing in pregnancy' was conducted in the UK by Georgina Constantinou et al. and published in BMC Pregnancy and Childbirth in 2023. The study involved semi-structured interviews with 19 women (five pregnant and 14 postpartum). The results revealed that approximately 58% of the women knew nothing about GBS before participating in the study and that the remainder had limited or inaccurate information. Some of the women who tested positive for GBS reported that the explanations provided by health professionals were inadequate. Most of the women acquired their knowledge through family or friends, the media, social media, or online platforms, and antenatal classes, rather than from doctors alone. Despite this, most participants had a positive attitude towards GBS testing, viewing it as a routine procedure that could potentially reduce the risk to their babies. However, concerns were raised about the invasiveness of the test, the potential risks of antibiotics, and how testing might impact birth plans, particularly for home births. The study concludes that there is an urgent need for clearer, more detailed information about GBS and its testing. It highlights that addressing women's concerns is crucial if routine GBS testing is to be implemented. The research underscores the importance of informed choice and the role of healthcare providers in facilitating these decisions (Constantinou et al., 2023).

The research article "Preparing for Group B Streptococcus vaccine. Attitudes of pregnant women in two countries" by Sarah Geoghegan, et al, published in Human Vaccines & Immunotherapeutics in 2023, explores the acceptability of a potential Group B Streptococcus (GBS) vaccine among pregnant women in the United States and Ireland. As a multicenter mixed-methodology cross-sectional study, this investigation aimed to understand the drivers and barriers to GBS vaccine acceptance and factors influencing pregnant attitudes toward the GBS vaccine to inform future targeted interventions for enhancing vaccine uptake. The study involved 502 pregnant women from Philadelphia, USA, and Dublin, Ireland, who completed an electronic survey and a Discrete Choice Experiment. Findings showed a general lack of awareness and understanding of GBS among participants, with 53% in the US and 30% in Ireland. Despite this, there was a high median likelihood score of 9 out of 10 for vaccine receipt in both regions. Among US participants, identifying as Black or African American was associated with a lower likelihood of vaccine receipt, whereas having a college degree increased the likelihood. This enhances the important need for targeted educational efforts to improve acceptance of GBS vaccine uptake (Geoghegan et al., 2023).

A systematic qualitative approach was conducted in 2023 to quickly examine and synthesize data regarding women's and healthcare professionals' knowledge, awareness, preferences, acceptability, and feasibility of implementing GBS screening programs. The GRADE-CERQual tool was used, and the data were analyzed using the convergent integration

method, which combines the results of quantitative and qualitative studies to provide an all-encompassing understanding of the topic. The study findings showed that GBS awareness varies by nation and demographic, typically being poor (below 40%). Women can learn about GBS from various sources, including health professionals, antenatal education, social media, online resources, work, family and friends, personal experience, and books or booklets. Knowledge of GBS seems to be positively correlated with educational level: five out of seven quantitative studies found that women with a higher level of education knew more about GBS and GBS screening programs. Three studies indicated that higher income correlates with greater knowledge. Two studies support the idea that spending more time in a rural area can enhance a woman's knowledge. However, there was no significant correlation between knowledge and age, employment status, living in a city or rural area, previous exposure to GBS, or parity. Four studies indicated negative attitudes towards testing. In De Mello et al.'s study, a very small percentage of women reported feeling embarrassed or afraid after testing. Women expressed concerns about screening due to the risk of increased stress and worry, and overtreatment. There is also a risk of over-medicalization and disruption to birth planning. Furthermore, the safety of swabbing and antibiotic prophylaxis may have detrimental consequences for both the mother and the baby. More than half of the women surveyed said they would accept swabbing. Providing clear information is critical in reducing fear. Qualitative data suggests that thorough explanations can alleviate anxiety surrounding testing and positive results. The majority of women surveyed support universal screening. Three studies found that the majority of women (61.8%–81%) advocate universal screening. Kolkman et al. (2017) reported that 86% of women favored a combined method. Two investigations, one quantitative and one qualitative, indicated that most women are willing to undergo GBS testing. Many believe that testing is important for protecting their children. Five studies examined women's acceptance of GBS screening and its methods, with results ranging from 81% to 100%. Additionally, the study assessed health professionals' views and organizational barriers and fears about potential consequences, including concerns about antibiotic screening and treatment. These consequences may include maternal discomfort and anxiety, overtreatment, antibiotic resistance, the medicalization of birth, and reduced options for home birth. There is also a lack of clear guidelines and training (Constantinou et al., 2024).

2.5 Conceptual Framework

The conceptual framework serves as the structural foundation on which the study is based, interpreting the relationships between key variables, and it provides a visual representation that illustrates how these variables interact with one another. In this study, the conceptual framework aims to clarify how the socio-demographic and obstetric characteristics of pregnant women may influence their level of knowledge and attitude about group B streptococcal screening (GBS), and thus how that knowledge may be reflected in their attitudes toward screening during pregnancy. This conceptual framework was developed based on the Health Belief Model, a fundamental framework used in research on health behavior. It was developed in the 1950s by social psychologists employed by the US Public

Health Service (USPHS) to better understand preventative health behavior. It depends on the idea that people evaluate the advantages of altering their behavior to reduce health risks and make decisions based on their assessment. Interpersonal decision-making on a range of health behaviors, including screening, immunization, surgery, and stopping any hazardous behaviors, is frequently investigated using this model (Alyafei & Easton-Carr, 2024).

Components of the Health Belief Model:

- **Perceived susceptibility**: estimating the likelihood of developing a disease or experiencing an unfavorable consequence. In the context of this study, this is represented by the extent to which pregnant women are aware of the possibility of being infected with the GBS bacteria or transmitting it to the newborn (Alyafei & Easton-Carr, 2024).
- **Perceived severity**: refers to the perception of the severity of a disease or condition, considering both its medical and social implications, which include recognizing the seriousness of GBS complications on the mother and newborn, such as sepsis, pneumonia, and meningitis (Alyafei & Easton-Carr, 2024).
- **Perceived benefits** indicate how people view the effectiveness of various possible activities to minimize the health risks, such as realizing the benefits of performing a GBS test during pregnancy to prevent its complications. (Alyafei & Easton-Carr, 2024).
- **Perceived barriers**: they include the barriers to performing a recommended health action that may prevent one from doing so, such as fear of testing, lack of information, or anxiety from the result (Alyafei & Easton-Carr, 2024).
- **Self-efficacy:** refers to an individual's belief in their ability to accomplish a given action or task properly. It is also related to the possibility that a person will engage in a desired behavior, such as women feel that they can take the test and deal with the result (Alyafei & Easton-Carr, 2024).
- **Action cues:** they come from one's environment or personal experiences. Many factors can influence a person's decision, such as advice from health care providers (Alyafei & Easton-Carr, 2024).

Framework Diagram

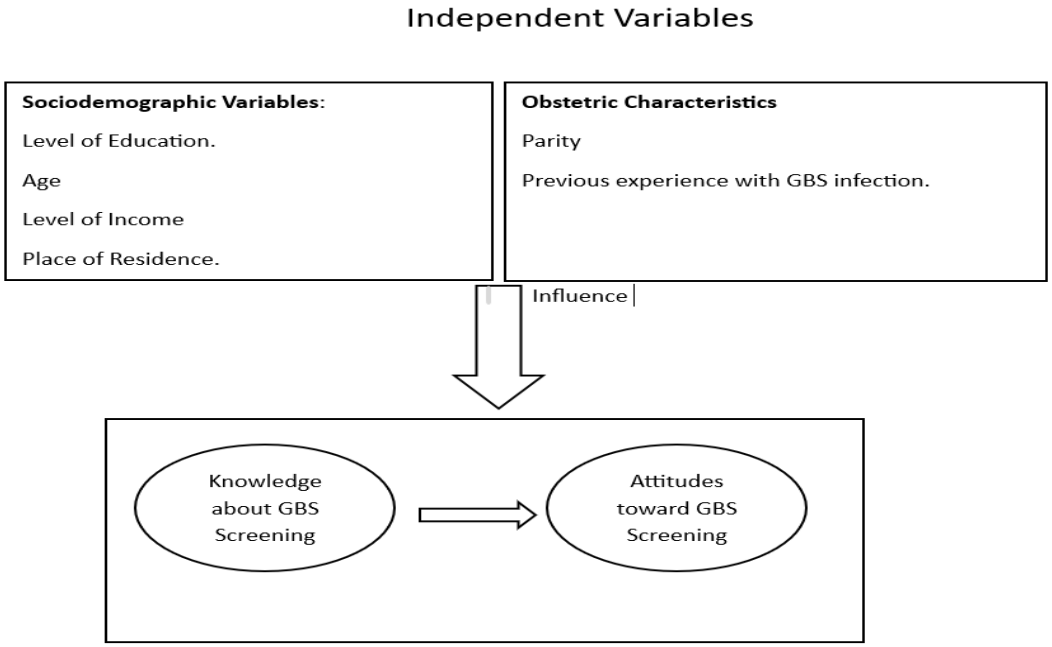

Figure (1.1) presents the conceptual framework illustrating the direct effects of socio-demographic and obstetric characteristics on pregnant women's knowledge and attitudes toward GBS screening, as well as the indirect effect of knowledge on attitude based on the Health Belief Model.

Key Variables

1. Socio-demographic variables (independent variables).
    - Age
    - Education level
    - Income
    - Place of residence
2. Obstetric variables (independent variables):
    - Number of previous births
    - Experience with GBS infection
3. Outcome variables (dependent variables):
    - Knowledge about GBS screening
    - Attitudes towards GBS screening

This conceptual framework clarifies how the socio-demographic characteristics (such as age, education, income, and place of residence) and obstetric characteristics (such as number of births and previous experience of GBS infection) influence pregnant women's knowledge and attitudes towards GBS screening. These relationships are explained by the Health Belief Model, in which personal characteristics and past experiences shape a woman's perception of her susceptibility to infection (perceived susceptibility), the severity of infection and complications (perceived severity), the benefits of screening (perceived benefits), and

potential barriers (perceived barriers). These perceptions influence the level of knowledge, which is an intermediate factor that contributes to shaping women's attitudes towards screening during pregnancy. Action cues, such as guidance from healthcare providers or past experiences, may also play a supportive role in promoting healthy decision-making. Finally, the conceptual framework illustrates how individual and cognitive factors influence pregnant women's knowledge and attitudes towards GBS screening.

2.6 Conclusion

This chapter provided an overview of Group B Streptococcus (GBS), transmission, signs and symptoms, risk factors, screening practices, and its management. Reviewed studies assessing knowledge and attitudes among pregnant women about the GBS bacterium and its screening**.** Studies showed that poor knowledge of group B streptococcal disease (GBS) is a major barrier to effective health decision-making by pregnant women, although most participants showed positive attitudes toward screening when sufficient and clear information was available.

This literature has emphasized the pivotal role of health care providers in offering clear and concise health education, which enables women to make informed decisions regarding their health and the health of their newborns. Hence, it is clear that the success of GBS prevention programs depends not only on medical aspects but also requires enhancing awareness, knowledge, and adjusting attitudes among pregnant women, which requires targeted and thoughtful health and awareness interventions.

Chapter Three

Research Methodology

3.1 Introduction

This chapter presents the research methodology employed to investigate the knowledge and attitudes of pregnant women towards screening for group B streptococcus (GBS) in maternity departments of Bethlehem hospitals. Research methodology that forms the framework for achieving the study's objectives and posing its research questions in a clear and specific manner (Bahishti, 2022). This chapter provides a detailed description of the study design, target sample, and data collection tools, as well as statistical analysis methods that allow accurate conclusions to be drawn. The chapter also addresses the reliability and validity of research tools, as well as the ethical considerations followed to ensure the protection of participants' rights and data confidentiality.

3.2 Research Approach

In this study, the researcher takes a quantitative approach to evaluate the knowledge and attitudes of pregnant women regarding the GBS screening test at the maternity hospital in the Bethlehem area. This approach makes use of numerical data to measure variables, examine phenomena, investigate correlations between variables, and test hypotheses using statistical techniques. This type of research aims to produce precise, widely applicable findings (Creswell, 2009).

3.3 Study Design

The study employed a descriptive cross-sectional study design, a kind of observational research design. In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same point in time. The advantage of this research design is that it is easy to conduct, takes less time, and facilitates easy data analysis (Setia, 2016).

3.4 The study Setting

The study was conducted at the antenatal clinic in four main hospitals in the Bethlehem area; three of the hospitals were private (the Holy Family Hospital, Al-Debs Hospital, and those are specialized in obstetrics and gynecology services and Shepherd's Field Hospital), and the fourth hospital is a governmental hospital, namely Beit Jala Governmental Hospital. These hospitals provide comprehensive medical care to a large number of pregnant women not only from the Bethlehem area, but also from other Palestinian governorates, including the urban, rural areas, and the camps. Their services include medical care in the prenatal, delivery, and postnatal stages. These hospitals were chosen due to the patient volume and for their central and effective role in providing maternal health services in the region, in addition to their ease of access. The study site contributed a diverse sample of pregnant women, thereby enhancing the sample's representativeness.

3.5 Study Population

The target population included pregnant women aged between 15-49 years who attend the antenatal clinic or maternity departments in the selected hospitals, regardless of level of education or working experience. The estimated average number of monthly attendances of pregnant women at each hospital was calculated from the data provided by the hospital's health information system (HIS) in the period May - July 2024, and these estimates were used as a reference for the study period (May–July 2025), assuming relatively stable attendance across these months. It was as follows: Beit-Jala Hospital was 320, Holy Family Hospital was 1000, Al Debis Hospital was 270, and Shepherd's Field Hospital was 140. The total average monthly number of pregnant women was 1730.

3.6 Study Sampling and Sample Size

A stratified random sampling method was applied at the hospital level, which depends on dividing the entire population into groups called strata, then drawing the sample from each stratum. This method minimizes the selection bias and is more representative (Singh & Mangat, 1996). The four selected hospitals were treated as distinct strata. The total sample size was proportionally allocated to the four participating hospitals according to their monthly antenatal attendance rates. After determining the required number of participants for each hospital, a Convenience sampling method was used at the facility level by selecting

the patients present during the data collection period who met the inclusion criteria, while ensuring equal opportunities for all eligible cases, which contributed to reducing the possibility of bias in the selection of the sample.

The calculation of the sample size was done by using the proportion sample size formula (Cochran's formula for estimating proportion).

$$n=\frac{z^{2x}p(1-p)}{e^2}$$

Confidence level = 95% ⟶ Z = 1.96

Population proportion (P) = 0.5

Margin of error (e) = 0.05

N = (1.96)2×0.5× (1−0.5)/ (0.05)2

N = 3.8416 X 0.25 / 0.0025 =0.9604/0.0025 = 384.16. The sample size was rounded up to 400 participants.

Table (1.3): Number of hospitals' monthly attendances (May – July, 2025).

Name of Hospital	**Number of monthly attendances**
Holy Family Hospital	1000
Beit Jala Hospital	320
Al-Debis Hospital	270
Shepherd's Field Hospital.	140
Total	**1730**

The proportion of each hospital was calculated by dividing the number of pregnant women from each hospital by the total population sample, as follows:

Holy Family Hospital 1000/1730 =57.8%

Beit Jala Hospital 320/1730 = 18.5%

Al- Debis Hospital 270/1730 =15.6%

Shepherd's Field Hospital 140/1730 = 8.1%

Then, the number of participants is calculated for each hospital by multiplying the ratio of each hospital by the required sample size, as shown in Table 2.

Table (2.3): Hospitals and the number of participants from each one.

Name of Hospital	**Number of participants**
Holy Family Hospital	57.8% *400 = 231
Beit Jala Hospital	18.5% * 400 = 74
Al-Debis Hospital	15.6% * 400 = 62
Shepherd's Field Hospital.	8.1% * 400 = 33
Total	**400**

3.7 Inclusion Criteria

Pregnant women aged 15– 49 years who follow up in the antenatal clinics regularly at selected hospitals in the Bethlehem area and agree to participate.

3.8 Exclusion Criteria

1. Pregnant women with cognitive problems or disorders were excluded from participation in the study.
2. Any woman who is not pregnant but visits the clinic.

3.9 Instruments of the study

The instrument in this study was a structured self-administered questionnaire with closed-ended questions (see Appendix B). This instrument was developed after a thorough review of the literature and existing instruments to assess the level of knowledge and attitudes among pregnant women regarding the Group B Streptococcus Screening. The English version was categorized into three main sections: Section One: Sociodemographic and Obstetric Information (10 items). It included age, hospital of follow-up, educational level, number of previous pregnancies, current gestational age, monthly family income, place of residence, current job, previous knowledge of GBS screening, and previous medical diagnosis of GBS infection. Section Two: Knowledge of GBS infection and its screening (15 items). It covered the definition of GBS, methods of infection, signs and symptoms, risk factors, diagnostic methods, recommended examination timing, and potential complications for the mother and newborn. Knowledge responses were assessed using a five-point Likert scale: (strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1). Average scores are classified into three levels: (1.00–2.33) = Low knowledge, (2.34–3.67) = Moderate knowledge, (3.68–5.00) = High knowledge. Section Three: Attitudes toward GBS screening (12 statements) included Participants' attitudes toward the importance of

screening, its acceptance as a routine procedure, trust in health care providers, economic, social, and psychological barriers, and the impact of the expected outcome on the decision to undergo screening. It was assessed using a five-point Likert scale. For positive statements (items 1-6), scores were recorded as follows: (strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1), while for negatively phrased statements (items 7–12) were reverse-coded during data analysis to ensure that higher scores consistently reflected more positive attitudes. It calculated in reverse: (strongly agree = 1, agree = 2, neutral = 3, disagree = 4, strongly disagree = 5). The grades were then classified as follows: (1.00–2.33) = low attitude, (2.34–3.67) = moderate attitude, and (3.68–5.00) = high attitude toward Group B Streptococcus screening. This classification was adopted based on the method used by Sini, Almansour, and Almansour (2015) and is commonly applied in studies using Likert scales to facilitate the interpretation of results (Sini et al., 2015).

3.10 The Validity

According to Robinson (2014), validity refers to the extent to which an instrument measures what it is intended to measure. To ensure the validity of the questionnaire, several steps were taken. Firstly, the questionnaire was reviewed and discussed with the research supervisor to assess its suitability, clarity, and alignment with the study objectives. Next, a specialist in obstetrics and gynecology evaluated the questionnaire to ensure the medical accuracy and relevance of the items. The instrument was also reviewed by four academic staff to assess its overall validity. Two of these experts were faculty members from Al-Quds University. One was academic staff from Bethlehem University, and one was academic staff at the Palestine Polytechnic University (see Appendix C). They evaluated the questionnaire for clarity, consistency, content coverage, and relevance to the research objectives. Based on their constructive feedback, minor modifications were made to improve the wording and structure of the questionnaire. The questionnaire was written in simple Arabic to ensure clarity and prevent misunderstandings.

3.11 The Reliability

Reliability refers to the consistency of results over time. To ensure reliability in this study, a pilot study was conducted with 20 pregnant women who met the inclusion criteria. These women did not participate in the main study. Cronbach's alpha, a measure of internal consistency, was used to assess the reliability of the questionnaire. This test determines the extent to which all items in the questionnaire measure the same construct. In this study, Cronbach's alpha for the pilot was 0.82 for knowledge-related questions, 0.68 for attitude-related questions, and 0.79 overall.

Table (3.3): Cronbach's Alpha Reliability Coefficients for Study Variables

	Number of cases	Number of items	Cronbach Alpha
General Knowledge about Group B Streptococcus (GBS)	**400**	**15**	**0.82**
Attitudes and Perceptions toward GBS Screening and Prevention	**400**	**12**	**0.68**
Total degree	**400**	**27**	**0.79**

3.12 Data Collection Methods

Before collecting data, the researcher obtained formal approval from the hospital administrations of the four hospitals and the Palestinian Ministry of Health, ensuring compliance and permission to distribute the questionnaires. Ethical approval was also obtained from Al-Quds University. An assistant nurse was trained to assist the researcher in distributing the questionnaires. Upon arrival, they introduced themselves to the respondents and provided a brief explanation of the study's purpose and significance, and the voluntary nature of participation. The data was collected over a period of three months (May to July 2025). To ensure that each participant only responded once, pregnant women were first asked if they had completed the questionnaire before. They were clearly informed that the questionnaire should only be completed once. The Arabic version of the questionnaire was distributed to participants, and the researcher and her assistant were available to collect the completed forms; they were also available to answer any questions and made every effort to ensure that participants fully understood their role, respecting their rights and privacy at all times.

3.13 Data Management and Analysis

The data collected were coded and analyzed using version 25.0 of the Statistical Package for the Social Sciences (SPSS). All questionnaires were checked for completeness before analysis. Descriptive statistics, including frequencies and percentages, were used to summarize the participants' socio-demographic and obstetric characteristics, as well as their knowledge of and attitudes towards GBS screening. Inferential statistical tests, such as the t-test, one-way ANOVA, Multivariate Logistic Regression, and Pearson's correlation coefficient, were applied to examine relationships and differences between variables at a significance level of 0.05. The analysis aimed to determine whether socio-demographic factors, such as age, monthly income, educational level, place of residence, and obstetric variables, have a significant effect on knowledge and attitudes regarding GBS screening.

3.14 Ethical Considerations

Ethical approval was obtained from Al-Quds University (Research Ethics Committee). Additionally, the researcher obtained permission to conduct the study from the Palestinian Ministry of Health, including Beit Jala Hospital, and formal approval was also obtained from Holy Family Hospital, Al Debis Hospital, and Shepherd's Field Hospital administrations. The participants were provided with an information sheet about the study that provided a detailed explanation of the purpose of the study and the procedures followed. Participation was voluntary, and the participants were informed that they had the right to refuse to participate in the study and could withdraw from the study whenever they felt they did not want to continue. The researcher made it clear to participants that their information would be kept confidential, and they would be assured that data from this study would be used for study purposes only. In addition, the researcher explained that there is no effect on receiving health care services due to their participation in this study. A Consent form was obtained verbally from each participant before responding to the questionnaire. Participants were asked to thoroughly read the consent form, which_clarified their rights as study participants. The participants were also informed that submitting the questionnaire was considered consent for participation.

Chapter Four

Findings of the Study

4.1 Introduction

This chapter presents the findings from the data collected through questionnaires completed by pregnant women regarding Group B Streptococcus (GBS) screening in maternity departments at Bethlehem hospitals. Four hundred participants (n=400) responded, and the results are organized in tables according to the study objectives. The chapter begins with an analysis of the participants' sociodemographic characteristics, followed by findings related to the study objectives and interpretation of the results.

4.2 Sociodemographic Characteristics of the Participants

The study sample consisted of 400 pregnant women participants. The largest group of participants was aged 20-29, accounting for 56.4% of the sample. The next largest group was 30-39 years, with 37.7%. A smaller proportion (4.0%) were aged less than 20 years, and just 2.3% of participants were 40 years and older, regarding the place for antenatal follow-up. Most women received antenatal care at Holy Family Hospital, 57.8%, followed by Beit Jala Governmental Hospital, 18.5%, Al-Dibs Hospital, 15.5%, and Shepherd's Field Hospital, 8.3%. For employment status, the majority were housewives, 77.9%. While government sector employees were 8.0%, private sector employees were 11.0%, and others 3%. Regarding monthly income, the largest group earned less than 2000 Israeli shekels (ILS), accounting for 45.7% of the participants. while 35.0% earned 2000–2999 (ILS), 11.9% earned between 3000-4000 ILS. Only 7.4 % of the respondents earned above 4000 ILS. The participants' educational backgrounds varied, with 65.5 % holding a university degree, 28.0% completing secondary education, 5% having preparatory education, and 1.5% elementary education. The place of residence showed that 51.8% of the participants lived in

villages, 37.8% in cities, and 10.5% in camps. Regarding the number of previous pregnancies, nearly half, 49.9% had three or more pregnancies, while 30.1% were in their second pregnancy, and 20.1% were experiencing their first pregnancy. During the current pregnancy trimester, the majority of participants were in the third trimester (64.4%), followed by the second trimester (20.5%), and the first trimester (15.1%). Regarding the GBS the 70.5% reported having heard of the GBS screening test; however, 29.5% had not heard of it. The most common source of information about GBS was medical staff, 35.8%. Other sources included the internet/social media 15.5%, family 11.3%, friends 8.0%, and media 2.3%. Finally, the result of having been diagnosed with GBS was that 83.6% had not been diagnosed, while 10.8% reported a positive diagnosis of GBS, and 5.5% were unsure.

Table (4A.4): Socio-demographic characteristics of the study participants (n=400)

Variables	Number	Valid percent
Age		
Less than 20	16	4.0
20-29	225	56.4
30-39	149	37.3
40 and above	9	2.3
Follow-up during pregnancy at		
Beit Jala Governmental Hospital	74	18.5
Holy Family Hospital	231	57.8
Al-Dibs Hospital	62	15.5
Shepherd's Field hospital	33	8.3
Educational level		
Primary education	6	1.5
Preparatory education	20	5.0
Secondary education	112	28.0
University education	262	65.5

Table (4B.4): Socio-demographic characteristics of the study participants.

Variables	Number	Valid percent
Number of previous pregnancies		
First pregnancy	80	20.1
Second pregnancy	120	30.1
Three or more	199	49.9
Current pregnancy trimester		
First trimester (1–3 months)	59	15.1
Second trimester (3–6 months)	80	20.5
Third trimester (6–9 months)	251	64.4
Monthly household income (NIS)		
Less than 2000	180	45.7
2000-2999	138	35.0
3000-3999	47	11.9
4000 and above	29	7.4
Place of residence		
Camp	41	10.5
Village	203	51.8
City	148	37.8
Current occupation		
Housewife	311	77.9
Government sector employee	32	8.0
Private sector employee	44	11.0
Other	12	3.0
Have you ever heard of the GBS screening test?		
Yes	282	70.5
No	118	29.5
If yes, where did you get the information? (You may select more than one)		
Medical staff	143	35.8
Internet / social media	62	15.5
Friends	32	8.0
Family	45	11.3
Media (TV, radio, newspapers(	9	2.3
Other sources	20	5.0
Have you ever been diagnosed with GBS during your current or any previous pregnancies based on medical tests?		
Yes	43	10.8
No	332	83.6
I don’t know	22	5.5

4.3 Level of knowledge among pregnant women regarding GBS screening.

The majority of participants, 287 (71.8%), have a high level of knowledge about (GBS) screening, while 110 (27.5%) have a moderate level of knowledge, and only 3 (0.8%) have a low level of knowledge, as shown in Table 5. These results reflect a good awareness of the importance, timing, method, and follow-up of screening.

Table (5.4): Level of knowledge among pregnant women toward Group B Streptococcus (GBS) screening in maternity departments in Bethlehem hospitals

Variables	Number	Valid percent
Knowledge		
Low Level	3	0.8
Moderate level	110	27.5
High level	287	71.8

Table 6 presents the means, standard deviation, rates, and degrees for each knowledge item. The overall mean knowledge score was 3.93 with SD =0.46, representing 78.6% indicating a high level of knowledge. The highest mean scores were observed in statements such as "The doctor should be informed of a previous GBS infection in past pregnancies" (Mean = 4.52, SD = 0.65, 90.4%), and "Screening for GBS is important during pregnancy and before delivery" (Mean = 4.38, SD = 0.77, 87.6%, high). And the lower statement mean score was" GBS is not classified as a sexually transmitted infection" (Mean 3.37=, SD = 1.04), and" GBS infection may cause pneumonia or meningitis in newborns" (Mean = 3.43, SD =0.92).

Table (6.4): mean and the standard deviation for the knowledge questions regarding GBS screening.

	Statement	Mean	St. Deviation	Percent	Degree
q13	The doctor should be informed of a previous GBS infection in past pregnancies.	4.52	0.65	90.4%	High
q3	Screening for GBS is important during pregnancy and before delivery	4.38	0.77	87.6%	High
q4	GBS is diagnosed through a vaginal swab sent to the laboratory.	4.31	0.70	86.2%	High
q12	Screening and receiving appropriate treatment during Labor reduces the risk of GBS transmission to the baby	4.25	0.75	85.0%	High
q1	GBS is a bacterial infection in the cervix that can be transmitted from the mother to the baby	4.24	0.73	84.8%	High
q5	It is recommended to perform GBS screening between weeks 35–37 of pregnancy.	4.01	0.85	80.2%	High
q11	The likelihood of transmitting GBS from mother to baby increases during delivery.	4.00	0.85	80.0%	High
q6	GBS infection may present as urinary tract infections during pregnancy.	3.94	0.81	78.8%	High
q14	GBS infection may occur without noticeable symptoms.	3.76	0.95	75.2%	High
q10	GBS infection does not prevent the mother from breastfeeding after delivery.	3.75	0.98	75.0%	High
q8	GBS infection does not prevent natural vaginal delivery.	3.71	0.97	74.2%	High
q15	A previous pregnancy with GBS infection increases the likelihood of recolonization in the current pregnancy.	3.71	0.98	74.2%	High
q7	A symptom of GBS infection during labor is maternal fever.	3.65	0.84	73.0%	Moderate
q9	GBS infection may cause pneumonia or meningitis in newborns.	3.43	0.92	68.6%	Moderate
q2	GBS is not classified as a sexually transmitted infection	3.37	1.04	67.4%	Moderate
	Total degree	3.93	0.46	78.6%	High

4.4 Attitudes and perceptions among pregnant women towards GBS screening during pregnancy.

The study results indicated that pregnant women generally had positive attitudes towards GBS testing during pregnancy. Around half of the participants (49.8%, n = 199) had a moderate attitude towards GBS screening, while a slightly higher proportion (50.2%, n = 201) had a high attitude. Notably, none of the participants were classified as having a negative attitude towards GBS screening. These results are shown in Table 7.

Table (7.4): Level of Attitude toward GBS Screening among Pregnant Women.

Variables	Number	Valid percent
Moderate	199	49.8
High	201	50.2

The total mean attitude score was 3.74 (SD = 0.46), indicating a generally high level of positivity towards GBS screening. The highest mean score was related to awareness of the importance of screening, i.e., the belief that 'GBS screening is important during pregnancy' (M = 4.48, SD = 0.73, 89.6%) and that 'GBS screening should be clearly explained at antenatal visits' (M = 4.41, SD = 0.67, 88.2%). Other strongly positive attitudes were trusting the information received from healthcare providers (M = 4.38, SD = 0.70, 87.6%) and being willing to undergo GBS screening if recommended by a doctor (M = 4.31, SD = 0.75, 86.2%). These findings indicate the general acceptance of, and trust in, the significance of GBS screening among pregnant women. In contrast, a lower mean score was associated with items measuring potential concerns or barriers, e.g. fear of test results (M = 2.83, SD = 1.29, 56.6%; moderate), embarrassment (M = 2.93, SD = 1.21, 58.6%), and concern over receiving intravenous antibiotics during childbirth (M = 2.99, SD = 1.32, 59.8%). as shown in Table 8. Overall, these results suggest positive attitudes, but emotional and practical barriers influence women's willingness to undergo screening.

Table (8.4): Means and the standard deviations for the attitude questions of the study, as ordered by their importance

	Statement	Mean	Std. Deviation	Rate%	Degree
q1	I believe that GBS screening is important during pregnancy.	4.48	0.73	89.6%	High
q4	I believe that GBS screening should be clearly explained during antenatal visits.	4.41	0.67	88.2%	High
q6	I believe that GBS screening greatly protects the newborn's health.	4.40	0.68	88.0%	High
q3	I trust the information I receive from healthcare providers about GBS and the importance of screening.	4.38	0.70	87.6%	High
q5	I am willing to undergo GBS screening if recommended by my doctor.	4.31	0.75	86.2%	High
q2	I agree that GBS screening should be routinely conducted for all pregnant women.	4.28	0.78	85.6%	High
q10	Lack of awareness about GBS risks among pregnant women may lead to not performing the screening.	4.22	0.87	84.4%	High
q7	Economic conditions may be a reason for not performing GBS screening.	3.47	1.14	69.4%	Moderate
q11	I believe that GBS screening may cause unnecessary stress during pregnancy.	3.31	1.24	66.2%	Moderate
q12	If my GBS test result is positive, I would feel concerned about receiving intravenous antibiotics during delivery.	2.99	1.32	59.8%	Moderate
q8	Feeling embarrassed may prevent me from undergoing GBS screening.	2.93	1.21	58.6%	Moderate
q9	Fear of test results may prevent me from undergoing GBS screening.	2.83	1.29	56.6%	Moderate
	Total degree	**3.74**	**0.46**	**74.8%**	**High**

4.5 Relationship between sociodemographic and obstetric variables with the Level of Knowledge about GBS Screening

One-way ANOVA was used to examine the relationship between demographic variables and the level of knowledge of GBS screening. The results in Table 8 indicated that there were no statistically significant differences at $\alpha = 0.05$ in the level of knowledge according to age, educational attainment, monthly household income, place of residence, or number of pregnancies (parity). In other words, the aforementioned socio-demographic variables did not significantly impact the level of knowledge concerning GBS screening among pregnant women.

Table (9.4): Differences in the level of knowledge of pregnant women toward Group B Streptococcus (GBS) screening according to demographic variables, tested by One-way ANOVA ($\alpha = 0.05$).

Variable	Level of knowledge					Significance
	Number	Mean	St deviation	DF	F \ T	P-value
Age						
Less than 20	16	3.72	0.80	3	F 1.488	= 0.217
20-29	225	3.93	0.43	395		
30-39	149	3.96	0.45	398		
40 and above	9	3.82	0.40			
Educational level						
Primary education	6	3.85	0.50	3	F=1.590	= 0.191
Preparatory education	20	3.80	0.47	396		
Secondary education	112	3.88	0.56	399		
University education	262	3.97	0.40			
Monthly household income (NIS)						
Less than 2000	180	3.88	0.48	3	F= 2.471	= 0.061
2000-2999	138	3.98	0.40	390		
3000-3999	47	3.98	0.44	393		
4000 and above	29	4.07	0.41			
Place of residence						
Camp	41	3.91	0.40	2	F= 0.073	= 0.929
Village	203	3.93	0.45	389		
City	148	3.94	0.48	391		
Number of previous pregnancies						
First pregnancy	80	3.90	0.41	2	F=0.667	=0.514
Second pregnancy	120	3.93	0.51	396		
Three or more	199	3.92	044	398		

To further examine factors associated with knowledge of GBS screening and to control for potential confounding variables, a multivariate logistic regression analysis was performed. Knowledge level was categorized as adequate or inadequate, and this was entered as the dependent variable. Socio-demographic and obstetric variables were included in the model based on the results of the bivariate analysis.

The multivariate analysis showed that none of the examined variables were significantly associated with knowledge level after adjustment. Age, educational level, monthly household income, place of residence, history of GBS, and number of previous pregnancies showed no statistically significant association with knowledge level ($p > 0.05$ for all variables), as shown in Table 10.

Table (10.4): Multivariate Logistic Regression Results for Factors Affecting Pregnant Women's Knowledge about GBS

Variables	B	df	Significance P-value
Age	-2.142	1	0.099
Educational level	-2.184	1	0.177
Monthly household income (NIS)	-15.300	1	0.992
Place of residence	1.215	1	0.454
Number of previous pregnancies	2.134	1	0.480

4.6 The relationship between sociodemographic and obstetric variables with the attitudes regarding GBS screening.

The one-way ANOVA has been used to investigate the correlation between attitudes regarding Group B Streptococcus (GBS) screening and demographic variables, as shown in Table 9. The one-way ANOVA output revealed that attitudes across different ages ($p = 0.100$), place of residence ($p = 0.295$), and number of pregnancies ($p = 0.813$) did not reveal significant differences at $\alpha = 0.05$; However, the results revealed significant differences in attitudes based on educational level ($F = 2.626$, $p = 0.050$) and monthly household income ($F = 9.261$, $p < 0.001$).

To identify the source of these differences, post-hoc tests and LSD analysis were conducted. The Least Significant Difference (LSD) test showed that women with a university degree reported significantly more positive attitudes toward GBS screening ($M = 3.78$, $SD = 0.47$), compared to women with a preparatory degree ($M = 3.52$, $SD = 0.42$), and no significant differences were found among the other educational groups (see LSD post-hoc test in Appendix F).

Moreover, the Tukey post-hoc test for monthly household income showed that women with higher income levels exhibited more attitudes than women with lower income levels. Accordingly, women who received an income level of 3000–3999 NIS and 4000 NIS and above showed significantly better attitudes compared to women who received an income level below 2000 NIS. The best attitudes were those exhibited by women who received 4000 NIS or above. Moreover, women who received an income level between 2000–2999 NIS

showed less favorable attitudes compared to women who received 4000 NIS and above (See a Tukey table in Appendix F).

These findings suggest that, although age, residence, and parity did not significantly impact women's attitudes, higher levels of education and household income were strongly associated with a more positive attitude towards GBS screening and prevention.

Table (11.4): Differences in the level of attitudes and perceptions toward GBS screening and prevention according to demographic variables, with post-hoc LSD and Tukey tests (α = 0.05).

Variable	Level of Attitudes					Significance
	Number	Mean	St deviation	DF	F \ T	P-value
Age						
Less than 20	**16**	**3.76**	**0.52**	**3**	**F2.100**	**=0.100**
20-29	**225**	**3.69**	**0.44**	**395**		
30-39	149	3.82	0.47	398		
40 and above	9	3.72	0.59			
Educational level						
Primary education	6	3.55	0.51	3	F=2.626	= 0.050
Preparatory education	20	3.52	0.42	396		
Secondary education	112	3.70	0.44	399		
University education	262	3.78	0.47			
Monthly household income (NIS)						
Less than 2000	180	3.64	0.44	3	F= 9.261	= 0.000
2000-2999	138	3.77	0.46	390		
3000-3999	47	3.92	0.42	393		
4000 and above	29	4.03	0.46			
Place of residence						
Camp	41	3.69	0.47	2	F= 1.224	= 0.295
Village	203	3.71	0.46	389		
City	148	3.79	0.46	391		
Number of previous pregnancies						
First pregnancy	80	3.73	0.43	2	F=0.207	=0.813
Second pregnancy	120	3.73	0.50	396		
Three or more	199	3.76	0.45	398		

4.7 The Association between Previous GBS Diagnosis and Pregnant Women's Knowledge and Attitudes

A one-way ANOVA was performed to investigate whether a previous GBS diagnosis was linked to variations in knowledge and attitudes regarding GBS screening among pregnant women.

Table 10 shows the results of the analysis of knowledge scores. The analysis revealed significant statistical differences between groups ($F = 5.009$, $p = 0.007$). Women with a previous GBS diagnosis had significantly higher mean knowledge scores ($M = 4.13$, $SD = 0.43$) than those without a diagnosis ($M = 3.90$, $SD = 0.46$) or those who were unsure ($M = 3.96$, $SD = 0.36$). These findings suggest that a previous GBS diagnosis contributes to greater knowledge of the infection and its screening.

Table 11 presents the results for attitudes. ANOVA found no significant differences in attitudes towards GBS screening among the three groups ($F = 1.109$, $p = 0.897$). Attitude scores were similar for women with a previous GBS diagnosis ($M = 3.78$, $SD = 0.48$), women with no diagnosis ($M = 3.74$, $SD = 0.47$), and uncertain women ($M = 3.74$, $SD = 0.37$). This indicates that a previous GBS diagnosis does not influence pregnant women's attitudes towards GBS screening.

To identify the source of the statistically significant difference with precision, an LSD post-hoc test was used to make pairwise comparisons between knowledge scores and women's history of previous GBS diagnosis. The results indicated a significant correlation between women who had previously been diagnosed with GBS and those who had not (mean difference = 0.233, $p < 0.05$), with the former achieving higher scores (see the LSD post hoc test in Appendix F). However, no statistical differences were observed between women who had been diagnosed and those who were unsure (mean difference = −0.176, $p > 0.05$) or between those who had not been diagnosed and those who were unaware (mean difference = −0.057, $p > 0.05$).

Overall, the LSD post hoc analysis confirmed that the large difference in knowledge identified by the one-way ANOVA was primarily due to women with a previous GBS diagnosis having higher knowledge levels than those without.

Table (12.4): One-Way ANOVA Results of Pregnant Women's Knowledge about GBS Screening According to Previous Diagnosis

History of GBS Diagnosis during Pregnancy	Number	Mean	St deviation	DF	F \ T	p- value
Yes	43	4.13	0.43	2	F=5.009	= 0.007
No	332	3.90	0.46	394		
I don't know	22	3.96	0.36	396		

Table (13.4): One-Way ANOVA Results of Pregnant Women's Attitudes toward GBS Screening According to Previous Diagnosis

History of GBS Diagnosis during Pregnancy	Number	Mean	St deviation	DF	F \ T	p- value
Yes	43	3.78	0.48	2	F=109	= 0.897
No	332	3.74	0.47	394		
I don't know	22	3.74	0.37	396		

4.8: The relationship between attitude and knowledge regarding GBS screening

A Pearson correlation was calculated to determine the relationship between general knowledge and attitudes and perceptions towards Group B Streptococcus, as shown in Table 12. The results revealed a positive, statistically significant correlation between knowledge and attitudes ($r = 0.216$, $n = 400$, $p < 0.001$). The findings suggest that greater knowledge of GBS is associated with more positive attitudes and greater support for screening and prevention measures among pregnant women.

Table (14.4): Pearson correlation between knowledge of GBS and attitudes toward GBS screening

	Number	Pearson Correlation	Sig
Correlation between General Knowledge about GBS and Attitudes toward GBS Screening	400	0.216**	P< 0.001

** **Correlation is significant at the 0.01 level (2-tailed).**

4.9 Conclusion

This chapter presents the study findings with data analyzed using SPSS version 25 and displayed in tables organized according to the study's objectives. The results indicated that there were a high level of knowledge and a high level of positive attitude among pregnant women regarding the GBS screening test at Bethlehem Maternity Hospitals, which reveals good awareness among pregnant women.

Chapter Five

Discussion

5.1 Introduction

This chapter discusses the study's findings related to assessing pregnant women's knowledge and attitudes toward screening for Group B Streptococcus at the maternity department of Bethlehem Hospital. The discussion centers on the study's objectives, situating them within a broader theoretical and public health framework.

5.2 The socio-demographic profile of the participants.

The socio-demographic profile of participants in this study provides important context for interpreting the findings and reflects several key features of Palestinian society, particularly in the Bethlehem area. The majority of respondents were aged 20–29 (56.4%), followed by those aged 30–39 (37.7%). This age distribution is consistent with Palestine's young population structure, where relatively high fertility rates mean that a significant proportion of the population is under 30 years old (PCBS, 2023). This demographic profile highlights the importance of improving maternal health services, given that younger women make up the majority of women of reproductive age in Palestine. Most participants were housewives77.9%, while a smaller proportion worked in the government or private sectors. Employment status may influence women's exposure to health information: women who do not hold formal employment may rely more heavily on healthcare providers as their primary source of medical knowledge. This is consistent with the study's finding that medical staff were the main source of information.

In terms of economic status, almost half of the participants, 45.7% reported a monthly household income of less than 2,000 Israeli shekels, while only 7.4% reported incomes above 4000 ILS. Low-income levels may potentially affect health behaviors and access to preventive services. These findings are consistent with national reports highlighting widespread economic hardship in Palestine, where high unemployment, political instability, and movement restrictions limit household income and contribute to high poverty rates (PCBS, 2023). This result guided to highlights the importance of ensuring that GBS

screening information and services are integrated into routine antenatal care and provided equitably, regardless of a woman's economic status.

In terms of place of residence, more than half of the participants lived in villages, followed by37.8 % living in cities, and 10.5 % in refugee camps. This relatively low representation may be explained by the fact that many women living in refugee camps primarily rely on UNRWA health centers for antenatal care rather than hospital-based maternity services. Differences in place of residence may influence access to maternal healthcare services and related information. The participants had relatively high levels of educational attainment, with 65.5% holding university degrees and 28% having completed secondary education. This reflects broader national trends in Palestine, where education is highly valued, and literacy rates are among the highest in the region (PCBS, 2023). High levels of female education may contribute positively to awareness of health issues, including GBS screening, as demonstrated by the strong overall knowledge scores in this study. However, the presence of women with lower levels of education (6.5% had received only an elementary or preparatory education) highlights the need for community-based health education programs to raise awareness of GBS among all women, regardless of their level of education. In terms of their reproductive history, nearly half of the participants (49.9%) had experienced three or more pregnancies previously, while 30.1% were in their second pregnancy, and 20.1% were experiencing their first pregnancy. This reproductive pattern is indicative of the larger family size that is characteristic of Palestinian households, with an average family size of around five people estimated in Palestine (PCBS, 2023). The high rate of fertility and repeated pregnancies may increase women's exposure to antenatal care services, providing an opportunity for healthcare professionals to educate women about infections such as GBS as part of routine maternal care. Finally, the study found that 11% of women had a history of GBS infection and that 70% had heard of GBS screening. This indicates relatively strong awareness compared to international studies. However, the fact that nearly one-third of women had not heard of GBS underscores persistent gaps in health communication. It is suggested by these findings that public health initiatives in Palestine should make GBS screening and awareness campaigns a priority. This should be done by ensuring that all women receive consistent, culturally sensitive education from both governmental and private maternal care providers.

5.3 Level of Knowledge of Pregnant Women about GBS Screening

The study found that most participants had high knowledge of GBS screening: 71.8% had high-level knowledge, 27.5% moderate-level knowledge, and 0.8% low-level knowledge. The overall mean score (M = 3.93, SD = 0.46). Most participants correctly recognized that GBS is a bacterial infection transmissible from mother to infant, that screening is optimally conducted between weeks 35–37 of pregnancy, and that intrapartum antibiotic prophylaxis can significantly reduce neonatal complications. These findings suggest that women in this

sample were generally well-informed about the disease, timing, and its prevention. The ratio of pregnant women who had heard of GBS in this study was 70.5%, and 29.5% who had not heard of it previously.

These findings contrast with those of other studies, which highlighted low levels of knowledge. For example, a study conducted in Hong Kong reported that only 36% of the women had previously heard of GBS, with a mean score of 3 out of 17 (Chow et al., 2013). Similarly, a study from Brazil reported that 43% of the women were not aware of screening for GBS or did not remember that they were assessed (De Mello et al., 2015). In addition, a study in Saudi Arabia also reported that nearly 67% of respondents had never heard of GBS (Alshengeti et al., 2020). More recently study in Saudi Arabia found that only 23% of women had ever heard of GBS, demonstrating significant knowledge gaps even in relatively well-resourced healthcare systems (Zoli et al., 2023).

When interpreting these results within the participants' characteristics, several factors may explain the relatively high knowledge scores. First, the nature of the health institutions from which the sample was selected. The vast majority of women received pregnancy care at the Holy Family Hospital, a hospital specializing in gynecology and obstetrics that provides comprehensive obstetric services and places great emphasis on health education and counseling during pregnancy. Regular exposure to health awareness and education sessions during pregnancy follow-up visits may help raise awareness and understanding among pregnant women about Group B Streptococcus (GBS) screening. Secondly, most participants in this study had university-level education (65.5%)**,** which is notably higher than in many other comparable studies. thirdly, the trusting in healthcare providers who emphasize maternal infections and perinatal risks, as the findings found that the main source of information about GBS and its screening was from the healthcare providers (35.8%). Followed by social media (15.5%). These findings are supported by studies indicating that when medical staff are the main source of information, knowledge levels tend to be higher. For example, Ko et al. (2015) highlighted that when visual presentations and information leaflets were distributed during antenatal visits in Hong Kong, participants demonstrated greater understanding of GBS screening (Ko et al., 2015). Similarly, a study in Australia observed that women who had already received other maternal vaccines (influenza or pertussis) were more likely to show good awareness of GBS and related preventive practices (Giles et al., 2019). Also, these findings are supported by a study in Saudi Arabia showed that the main sources of information are social media, 32.7% and health care providers 27%, (Alamri et al., 2021).

This highlighted the major role of health professionals in educating the public, as well as the growing dependency on social media as a supportive platform for healthcare providers to spread awareness among pregnant women. It also noted the increasing reliance of mothers on social media and the internet to obtain health-related information. Finally, the high ratio of pregnant women who had heard of GBS in this study was 70.5 may contribute to increasing the level of knowledge. It is aligned with a study's findings in Hong Kong by

which revealed that the Participants who had heard of GBS scored higher in knowledge about the infection and showed greater acceptance of screening practices (Chow et al., 2013).

But, despite a high level of awareness among participants, misconceptions still exist regarding whether GBS is a sexually transmitted disease, with 67.4% believing so, and about its role in causing neonatal meningitis or pneumonia, at 68.6%. This finding is supported by a study conducted by Alshengeti et al., which revealed that 60.5% believed GBS is a sexually transmitted disease, and 62% did not answer questions correctly about meningitis and complications of GBS in neonates (Alshengeti et al., 2020). Also, similar results in the study in Jadda, Saudi Arabia, revealed that 59.2% had incorrect answers about meningitis, and 50.8% believed that GBS is a sexually transmitted disease (Alamri et al., 2021). The presence of partial knowledge gaps in our sample suggests that although Palestinian women demonstrate higher-than-expected awareness, they need more focused education at antenatal visits.

On the other hand, Palestinian society faces barriers that most notably include economic hardship and limited public health campaigns, which may restrict individuals' access to information. The study findings showed that approximately 30% of participants had never heard the term GBS screening, which is in line with global reports indicating persistent awareness gaps (Alshengeti et al., 2020; Alamri et al., 2021). So, while the results indicate a large percentage of Palestinian pregnant women demonstrate a good level of knowledge, there is a vulnerable group that still lacks sufficient awareness, particularly those of low economic status or who do not receive regular follow-up during pregnancy.

5.4 Attitudes of Pregnant Women toward GBS Screening

The study results revealed that pregnant women generally had a positive attitude towards GBS screening at an overall mean score of 3.74 (74.8%). The highest agreement rates related to the belief that screening is important during pregnancy, and that explanation of screening at antenatal visits is necessary. Furthermore, the majority of respondents also expressed high trust in information from professional healthcare sources and a willingness to undergo screening if their doctor recommended it. These findings suggest that not only are Palestinian women knowledgeable about GBS, but they also hold favorable perceptions of its screening and prevention strategies.

These results are supported by other country studies. For example, two studies conducted in Saudi Arabia found that 61.8% of respondents believed that universal culture-based screening was the most effective way to reduce the risk of GBS in newborns (Alamri et al., 2021). Similarly, a study in Saudi Arabia reported that while most women were unaware of GBS, 61.8% preferred universal culture-based screening over risk-based approaches (Alshengeti et al., 2020). Moreover, a study conducted in Hong Kong revealed that even though knowledge levels among Hong Kong pregnant women were low, 81% expressed willingness to undergo screening, and 66% supported universal implementation (Chow et al., 2013). These results support the idea that pregnant women are more likely to agree to GBS testing when they recognize its importance in protecting neonatal health. Our results

also align with those of Ko et al. (2015), who found that pregnant women in Hong Kong trusted healthcare providers' judgment and preferred clinician-collected swabs to self-sampling.

Nonetheless, some issues and concerns were found. Moderate scores were recorded for feelings of embarrassment (M = 2.93), fear of test results (M = 2.83), and concern about intravenous administration of antibiotics at delivery (M = 2.99). The results suggest that while women are ready to be screened, emotional and psychological issues may contribute to acceptability levels and decision-making. Similar results were reported in the UK, where women expressed positive attitudes towards GBS testing but raised concerns about the invasiveness, use of antibiotics, and potential effects on birth plans (Constantinou et al., 2023). Likewise, a study in Brazil reported that anxiety or uncertainty was felt by women after testing (De Mello et al., 2015).

These findings highlight that while attitudes are generally positive, cultural and psychological factors can generate ambivalence that should not be overlooked. Within the Palestinian society**,** such ambivalence may be explained by several cultural and social factors. First, issues of embarrassment during gynecological procedures are common, especially in conservative communities, which may explain why some women expressed reluctance toward screening. Second, the economic hardship faced by many families could amplify concerns about the cost of medical procedures, even if the test is recommended by doctors. Indeed, in this study, 45.7% of participants reported household incomes below 2000 ILS, which could shape perceptions of affordability. Third, the sociopolitical environment in Palestine, with its fragmented healthcare system and limited health promotion campaigns, means that screening practices are not always standardized, contributing to both knowledge gaps and mixed attitudes.

Despite these contextual challenges, the strong positive attitudes found in this study suggest that Palestinian women are generally open to screening when it is framed as a means of protecting infant health. This reflects broader global findings (Constantinou et al., 2024) that women are more likely to accept GBS testing when they perceive it as routine, safe, and beneficial for their child’s well-being. Importantly, the participants in this sample appear to share this maternal orientation, prioritizing neonatal health even amid personal or economic discomfort.

5.5 Impact of sociodemographic and obstetric variables on the level of Knowledge and attitude among pregnant women toward GBS screening.

The current study revealed that the sociodemographic and obstetric variables of age, education, income, parity, and place of residence did not significantly influence pregnant women's knowledge of GBS screening. This finding contrasts with those of other studies, which show that higher education and socioeconomic status are linked with increased knowledge. These results contrast with multiple international studies that reported sociodemographic disparities in GBS knowledge. For example, the Centers for Disease

Control and Prevention (2005) found in North Carolina that younger women, women with lower educational attainment, and those without private health insurance were significantly less aware of GBS screening recommendations (Disparities in Universal Prenatal Screening for Group B Streptococcus, North Carolina, 2002--2003, 2005). Similarly, a study reported higher knowledge levels among Hong Kong women who had previously heard of GBS (Chow et al., 2013). Also, another study found a significant association between awareness and factors such as marital status, pregnancy history, and education (Zoli et al., 2023), and a synthesized data showing that a higher level of education and income are correlated with greater knowledge, while variables such as age and parity have little effect (Constantinou et al., 2024).

By contrast, the present study found that women's attitudes towards GBS screening were significantly influenced by their level of education and household income. Individuals with a university-level education and those from higher-income households exhibited more positive attitudes, as reflected in their greater acceptance of the screening procedure. The one-way ANOVA test indicated that women with higher educational attainment demonstrated more positive attitudes toward GBS screening ($p = 0.050$). Post-hoc analysis further confirmed that individuals with a university-level education had significantly higher mean attitude scores compared to those with preparatory education. This result suggests that education enhances women's understanding of the importance of preventive health behaviors, thereby fostering greater acceptance of screening practices. Women with higher educational backgrounds may have better access to health information, greater confidence in interacting with healthcare professionals, and stronger motivation to participate in maternal screening programs. These findings align with previous literature indicating that educational attainment is a major determinant of women's awareness and attitudes toward GBS screening (Constantinou et al., 2024; Chow et al., 2013).

Furthermore, the analysis demonstrated a statistically significant association between women's household income and their attitudes toward GBS screening ($p < 0.001$). The Tukey post-hoc test showed that women with higher income levels (≥4000 NIS) exhibited the most positive attitudes toward screening compared to those with lower income (<2000 NIS). Financial stability may contribute to a stronger sense of empowerment and reduced perceived barriers to accessing healthcare services. In contrast, women with limited financial resources may perceive screening as an additional burden, particularly in the Palestinian context, where economic hardship and restricted healthcare accessibility are persistent challenges (PCBS, 2023). The observed link between income and attitudes is therefore consistent with global evidence suggesting that socioeconomic status can shape women's health behaviors and acceptance of preventive interventions (Alshengeti et al., 2020; Zoli et al., 2023).

Other variables, such as age, parity, and place of residence, were found to have no significant influence on pregnant women's attitudes. The study findings support this, revealing that age and parity were not good predictors of women's acceptance of GBS screening (McQuaid et al., 2016; Alamri et al., 2021).

Therefore, these findings confirm the importance of education and socioeconomic empowerment in shaping women's attitudes toward maternal health interventions. Promoting educational opportunities and providing targeted counseling to low-income women would lead to improved attitudes and participation in GBS screening programs. The absence of other demographic differences is a positive indicator that Palestinian antenatal care services actively reach diverse population groups. However, continued efforts are needed to address the social disparities that continue to limit strategic participation in health services.

5.6 Impact of Previous GBS Diagnosis on Knowledge and Attitudes

The findings of the current study revealed that women with previous experience of GBS diagnosis had significantly higher knowledge scores when compared with never-diagnosed women or those who were unsure about their status ($F = 5.009$, $p = 0.007$). These findings suggest that personal experience of GBS increases awareness and knowledge of this condition, its risk, and its management and prevention. This result is supported by a study in Madinah, Saudi Arabia, in 2020, which found that women with past exposure to GBS showed significantly higher odds of scoring above the 75th percentile (Alshengeti et al., 2020). In contrast, a qualitative study showed that not always prior exposure to GBS is indicative of knowledge; the participating women stated that they still require more comprehensive information, and more information about it (Constantinou et al., 2023).

On the other hand, the study findings revealed that the past diagnosis of GBS didn't have statistical significance on pregnant women's attitude ($F=1.109$, $p=0.897$). This suggests that while previous experience of GBS contributes to increased knowledge and awareness, it does not mean a greater positive attitude toward screening. These results were noted in qualitative studies across the United Kingdom in 2023, which revealed that despite their experience, women may not feel comfortable and still be concerned or feel embarrassed around the testing for the baby, fear of the results, or fear of antibiotics (Constantinou et al., 2023).

It is also important to note that a small subgroup of women in this study (5.5%) reported uncertainty regarding their GBS diagnosis. This reflects the findings of de Mello et al. (2015), who found that almost half of Brazilian women were unaware of their screening status. Such uncertainty highlights persistent communication gaps between healthcare providers and patients, even in hospital-centered settings. In Palestine, where antenatal visits may be rushed and under-resourced, women may receive test results without thorough explanations, resulting in an incomplete understanding. Moreover, in some cases, GBS swabs are taken during labor without prior notification, further limiting women's awareness and their ability to make informed decisions about their care.

These findings highlight the need to improve antenatal counseling. Although a previous diagnosis raises awareness, physicians must also address psychological and emotional factors to ensure that increased awareness results in a more positive attitude and better adherence to screening guidelines.

5.7 The relationship between attitude and knowledge regarding GBS screening

The study results revealed a positive, statistically significant correlation between knowledge and attitudes ($r = 0.216$, $n = 400$, $p < 0.001$). In practical terms, women with greater knowledge tend to have a more positive attitude towards GBS screening. This finding is consistent with the results of a study in Hong Kong/China, which also revealed a positive relationship between women's knowledge and their attitudes towards GBS screening. Participants who had heard of GBS were more likely to accept screening (Chow et al., 2013). These results can be explained by the Health Belief Model, which assumes that perceived knowledge, seriousness, and potential risks influence health behavior (Alyafei & Easton-Carr, 2024; Chow et al., 2013). Similarly, another study found that informed women are more likely to adopt preventive health behaviors and view screening positively (Constantinou et al., 2024). These results emphasize the vital role of education and information provision in shaping maternal attitudes towards GBS prevention. They also highlight the crucial role of education and information provision in shaping maternal attitudes towards GBS prevention.

In contrast, the data indicate that a positive attitude depends not only on knowledge but is also influenced by social, cultural, and economic factors. Some studies suggest that the relationship between knowledge and attitude towards GBS screening is not always straightforward. For example, a study showed that many women lacked sufficient knowledge about the infection and their screening status, yet still agreed to undergo screening (De Mello et al., 2015). This indicates that positive attitudes towards screening can emerge even in the absence of in-depth knowledge. Similarly, other findings showed that despite having poor knowledge of GBS, women were more likely to support screening when it was presented as part of routine pregnancy care in the UK (Constantinou et al., 2023).

These findings suggest that trust in healthcare providers may be a critical factor in shaping women's attitudes, even when their knowledge is limited. In the Palestinian context, great trust in medical staff plays a major role in encouraging women to accept screening, even in light of poor knowledge. However, some barriers, such as modesty, fear of outcomes, and difficult financial circumstances, still limit some women's willingness to participate. Therefore, enhancing knowledge must be accompanied by effective human communication that takes into account the privacy of Palestinian women and turns GBS screening into a familiar and acceptable routine procedure in pregnant care.

5.8 Conclusion

This chapter provided the perspective that knowledge and attitudes among pregnant women in Bethlehem hospitals are high, with education and income influencing knowledge but not attitudes. Previous GBS diagnosis was found to raise knowledge but not change attitudes,

and knowledge and attitudes were found to be positively related. The results emphasize the requirement for targeted antenatal education and effective provider communication to dispel misconceptions, reduce concerns, and further increase the acceptance of GBS screening among women.

Chapter Six

Recommendations and limitations

6.1 Introduction

This chapter will present the strengths, limitations, recommendations, and a conclusion of the study.

6.2 Strengths and Limitations

This study has several points of strength. For example, this study is one of the few studies that were conducted in Palestine to assess the level of knowledge and attitude among pregnant women toward GBS screening, so it therefore contributes significantly to filling a gap in the local literature and provides a foundation for future research. Another key strength is that this study provides valuable evidence for policymakers, as Palestine currently lacks a national policy or standardized approach for GBS screening. By showing that women have relatively high levels of knowledge and positive attitudes toward GBS screening despite the absence of an official screening program, this study provides an evidence-based basis that could support the development of national guidelines and policies. Furthermore, the study involved a large and demographically diverse sample (governmental, private sectors) from four major hospitals in the Bethlehem area. This enhances the representativeness of the findings and increases the reliability and relevance of the results for the wider population of pregnant women in the district.

However, the study has some limitations. It employs a cross-sectional study, which provides a snapshot of the relationship between variables at a single time; it doesn't establish a causal relationship between variables of knowledge, attitudes, and demographic factors. Also, it used a self-administered questionnaire that may introduce the possibility of recall bias or socially desirable responses. Although the stratified random sampling at the hospital level enhances the representativeness, a convenience sampling at the individual level increases

the possibility of selection bias, as only pregnant women who attended antenatal clinics during the data collection period and agreed to participate were included. Therefore, women who did not regularly attend antenatal care or who attended services outside the study period may be underrepresented, which may limit the generalizability of the study findings. Furthermore, the study focused on the knowledge and attitude variables without assessing actual practices regarding GBS screening, and we did not conduct interviews with healthcare personnel to investigate the cause of the low GBS screening request rate.

6.3 Recommendations

Based on the study findings, which revealed generally high knowledge and positive attitudes toward GBS screening among pregnant women in Bethlehem, yet with noticeable disparities influenced by education and income, several practical and policy-oriented recommendations are proposed. These recommendations guide policymakers, healthcare providers, and researchers toward strengthening GBS prevention and improving maternal and neonatal health outcomes in Palestine:

- ✓ The Ministry of Health should develop a clear national policy for detecting GBS bacteria through Universal Screening or a risk factor-based approach and incorporate a standardized unified national protocol in antenatal care guidelines to ensure consistency across all hospitals and health centers.
- ✓ Implement targeted training programs for healthcare providers on GBS screening. Emphasize effective and culturally sensitive communication to improve women's acceptance of screening and treatment.
- ✓ Implement awareness programs for all pregnant women, with particular focus on low-income and less-educated groups, to reduce disparities in knowledge and attitudes toward GBS screening.
- ✓ Establish a shared database or information system between public and private hospitals that allows effective documentation, tracking, and follow-up of GBS screening results to ensure continuity of care between different healthcare institutions.
- ✓ Future qualitative or mixed-method studies should explore in depth the cultural, social, and psychological factors that influence pregnant women's acceptance or refusal of GBS screening.

6.4 Conclusion

This study aimed to evaluate the knowledge and attitudes of pregnant women towards Group B Streptococcus (GBS) screening in maternity departments in Bethlehem. The findings revealed that most participants had a high level of knowledge and were positive about the screening, showing that they were well aware of its importance and trusted healthcare providers. However, gaps were observed among women with lower educational attainment

and income, indicating the influence of socioeconomic factors on health perceptions and behaviors.

The results showed no statistically significant differences in knowledge levels across various demographic variables, but a significant association was found between attitudes and both education and income. This finding emphasizes that improving educational attainment and empowering women economically can foster more positive attitudes towards preventive health practices.

These outcomes highlight the importance of strengthening antenatal health education programs focusing on GBS awareness, transmission, and prevention. Furthermore, improving communication between healthcare providers and pregnant women is crucial to reducing knowledge gaps, overcoming psychological and social barriers, and ensuring that all women, regardless of their background, are well-informed and motivated to participate in GBS screening.

In conclusion, sustaining and expanding health education efforts within antenatal care, together with policy initiatives to standardize screening practices, could play a vital role in improving maternal and neonatal health outcomes in Bethlehem and across Palestine.

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Appendices

Appendix A: Study Questionnaire

Consent Form

جامعة القدس

كلية الصحة العامة

الموافقة على المشاركة في الدراسة

أنا الباحثة ناريمان محمد دنون؛ أقوم بإجراء دراسة بعنوان **"دراسة مدى المعرفة والتوجهات لدى النساء الحوامل تجاه الفحص المسحي لجرثومه عنق الرحم GBS في أقسام النسائية والتوليد في مستشفيات بيت لحم"** وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير تخصص سياسات وإدارة صحية، لذا ارجو من حضرتكم التعاون بتعبئة الاستبيان علماً بأن المشاركة في هذه الدراسة طوعية ويحق للمشاركة الانسحاب باي وقت تشاء، وأن جميع المعلومات التي أقدمها ستحاط بالسرية التامة ولن يتم استخدامها ألا لأغراض الدراسة والبحث العلمي.

ومن المهم معرفة ان هذا البحث يهدف **لدراسة مدى المعرفة والتوجهات لدى النساء الحوامل تجاه الفحص المسحي لجرثومه عنق الرحم GBS في أقسام النسائية والتوليد في مستشفيات بيت لحم، و GBSهي اختصار لاسم بكتيريا تُعرف بـ "المجموعة ب من العقديات."(Group B Streptococcus) ؛ وان** نتائج البحث قد تساهم في تحسين الإجراءات المتبعة لتعزيز الوعي حول فحص جرثومة عنق الرحم، ولن يترتب على مشاركتك في هذا البحث أي ضرر لك أو أي تأثير سلبي على الخدمات التي يتم تقديمها لك.

إذا كانت لديك اي استفسارات حول حقوقك كمشارك في البحث بإمكانك التواصل مع لجنة اخلاقيات البحث العلمي في جامعة القدس من خلال جوال 0545636341 ولمزيد من التوضيح لاي بند تريده يمكنك التواصل مع الباحثة عبر الاتصال المباشر من خلال جوال رقم (0597614026) او الايميل الشخصي المرفق

nariman.dannoon@students.alquds.edu

أقدر عاليا مشاركتك بهذا البحث..

القسم الأول: المعلومات الديموغرافية

1. **العمر(سنة):**

- □ أقل من 20
- □ 20-29
- □ 30-39
- □ 40فأكثر

2. تتم المتابعة من خلال الحمل في مستشفى:

- □ مستشفى بيت جالا الحكومي
- □ مستشفى العائلة المقدسة
- □ مستشفى الدبس
- □ مشفى حقل الرعاة الطبي

3. **المستوى التعليمي:**

- □ ابتدائي
- □ تعليم اعدادي
- □ تعليم الثانوي
- □ تعليم جامعي

4. **عدد مرات الحمل السابقة:**

- □ أول حمل
- □ ثاني حمل
- □ 3مرات أو أكثر

5. **عمر الحمل الحالي:**

- □ الثلث الأول (من 1 – 3 شهور)
- □ الثلث الثاني (6-3 شهور)
- □ الثلث الثالث (6- 9 شهور)

6. - **الدخل الشهري للأسرة بالشيكل:**

- □ أقل من 2000
- □ 2999-2000
- □ 3999-3000
- □ 4000 وما فوق

7. مكان الإقامة:

- ☐ مخيم
- ☐ قرية
- ☐ مدينة

8. الوظيفة الحالية لديكِ:

- ☐ ربة منزل
- ☐ موظفه في القطاع الحكومي
- ☐ موظفه في القطاع الخاص
- ☐ اخرى حددي_____

9. **هل سبق وأن سمعتِ عن فحص جرثومة عنق الرحم (GBS)؟**

- o نعم
- o لا

إذا كانت الإجابة نعم، من أين حصلتِ على المعلومة؟ *(يمكن اختيار أكثر من خيار)*

- o الطاقم الطبي
- o الانترنت/ ووسائل التواصل الاجتماعي
- o الأصدقاء
- o العائلة
- o وسائل الإعلام (التلفزيون، الراديو، الصحف)
- o مصادر أخرى (يرجى التحديد)_____ :

10. هل سبق أن تم تشخيص إصابتكِ بجرثومة عنق الرحم (GBS) خلال حملكِ الحالي أو أي من حملاتكِ السابقة بناءً على الفحوصات الطبية؟

- ☐ نعم
- ☐ لا
- ☐ لا أعلم

القسم الثاني: قائمة الأسئلة العامة ذات العلاقة بمدى المعرفة حول جرثومة عنق الرحم (GBS)

(الرجاء قراءة كل عبارة بدقة، واختيار الوصف الأفضل للعبارة)

العبارة	اوافق بشده	اوافق	محايد	اعارض	اعارض بشدة
1. جرثومة عنق الرحم عبارة عن عدوى بكتيريا في عنق الرحم قد تنتقل من الام الى الجنين					
2. لا تُصنّف جرثومة عنق الرحم GBS من ضمن الأمراض المنقولة جنسيًا					

3. يُعد الكشف عن جرثومة GBS أمرًا مهمًا أثناء الحمل وقبل الولادة					
4. يتم تشخيص جرثومة عنق الرحم من خلال مسحة مهبليه وارسالها الى المختبر					
5. يوصى بإجراء فحص عنق الرحم للكشف عن جرثومة عنق الرحم GBSفي الاسابيع 35-37 من الحمل					
6. قد تظهر الاصابة بجرثومة عنق الرحم على شكل التهابات في المسالك البولية اثناء الحمل					
7. من أعراض الإصابة بجرثومة عنق الرحم GBSارتفاع درجة حرارة الحامل أثناء المخاض					
8. لا تمنع الاصابة بجرثومة عنق الرحم من الولادة الطبيعية					
9. قد تؤدي الإصابة بجرثومة عنق الرحم GBS إلى التهاب رئوي أو سحايا عند المولود					
10. لا تمنع الاصابة بجرثومة عنق الرحم GBS الام من ارضاع طفلها بعد الولادة					
11. تزداد احتمالية انتقال جرثومة عنق الرحم GBS من الام للجنين خلال الولادة					
12. إجراء الفحص وأخذ العلاج المناسب أثناء المخاض يقللان من احتمال انتقال جرثومة عنق الرحم GBSللجنين					
13. يجب إبلاغ الطبيب في حال الإصابة السابقة بجرثومة عنق الرحم GBSفي حمل سابق					
14. قد تظهر الإصابة بجرثومة عنق الرحم GBS بدون أعراض محسوسة.					
15. وجود حمل سابق مصاب بجرثومة عنق الرحم يزيد من احتمالية إعادة الاستعمار في الحمل الحالي.					

القسم الثالث: قائمة الأسئلة ذات العلاقة بالتوجهات والمواقف تجاه الفحص والوقاية (الرجاء قراءة كل عبارة بدقة، واختيار الوصف الأفضل للعبارة).

العبارة	اوافــق بشدة	اوافق	محايد	غـــــير موافق	غير موافق بشدة

					1. اعتقد ان فحص جرثومه عنق الرحم (GBS) مهمة أثناء الحمل.
					2. أوافق على تطبيق فحص جرثومه عنق الرحم (GBS) لجميع النساء الحوامل بشكل روتيني.
					3. أثق في المعلومات التي أتلقاها من مقدمي الرعاية الصحية حول جرثومه عنق الرحم (GBS) واهميه اجراء الفحص.
					4. أعتقد أن فحص جرثومة عنق الرحم GBSيجب أن يتم شرحه بوضوح خلال زيارات متابعة الحمل
					5. . لدي الرغبة بإجراء فحص جرثومه عنق الرحم (GBS) إذا أوصى به الطبيب بذلك.
					6. أعتقد أن فحص جرثومة عنق الرحم (GBS) يحمي صحة المولود بشكل كبير.
					7. الوضع الاقتصادي قد يكون سببًا لعدم إجراء جرثومه عنق الرحم (GBS).
					8. الشعور بالحرج قد يمنعني من إجراء فحص جرثومه عنق الرحم (GBS).
					9. الخوف من نتيجة الفحص قد يمنعني من إجراء فحص جرثومه عنق الرحم (GBS).
					10. عدم وعي النساء الحوامل بمخاطر جرثومه عنق الرحم GBS قد يؤدي إلى عدم إجراء الفحص.
					11. أعتقد أن فحص جرثومة عنق الرحم (GBS) قد يسبب توترًا غير ضروري خلال الحمل
					12. إذا كانت نتيجة مسحة عنق الرحم GBS لديك إيجابية، أشعر بالقلق من أخذ مضاد حيوي عبر الوريد أثناء الولادة.

Appendix: B Study Questionnaires in English version

Section One: Demographic Information

1. Age (years):
   - Less than 20
   - 20–29
   - 30–39
   - 40 and above

2. Follow-up during pregnancy at:
   - Beit Jala Governmental Hospital
   - Holy Family Hospital

- Al-Dibs Hospital
- Shepherd's Field hospital

3. Educational level:
   - Primary education
   - Preparatory education
   - Secondary education
   - University education

4. Number of previous pregnancies:
   - First pregnancy
   - Second pregnancy
   - Three or more

5. Current pregnancy trimester:
   - First trimester (1–3 months)
   - Second trimester (3–6 months)
   - Third trimester (6–9 months)

6. Monthly household income (NIS):
   - Less than 2000
   - 2000–2999
   - 3000–3999
   - 4000 and above

7. Place of residence:
   - Camp
   - Village
   - City

8. Current occupation:
   - Housewife
   - Government sector employee
   - Private sector employee
   - Other (please specify): _____

9. Have you ever heard of the GBS screening test?
   - Yes
   - No

   If yes, where did you get the information? (You may select more than one):
   - Medical staff
   - Internet / Social media

- Friends
- Family
- Media (TV, radio, newspapers)
- Other sources (please specify): _____

10. Have you ever been diagnosed with GBS during your current or any previous pregnancies based on medical tests?
    - Yes
    - No
    - I don't know

Section Two: General Knowledge about Group B Streptococcus (GBS)

Please read each statement carefully and select the most appropriate response:

Statement	Strongly Agree	Agree	Neutral	Strongly disagree	Disagree
1. GBS is a bacterial infection in the cervix that can be transmitted from the mother to the baby.					
2. GBS is not classified as a sexually transmitted infection.					
3. Screening for GBS is important during pregnancy and before delivery					
4. GBS is diagnosed through a vaginal swab sent to the laboratory.					
5. It is recommended to perform GBS screening between weeks 35–37 of pregnancy.					
6. GBS infection may present as urinary tract infections during pregnancy.					
7. A symptom of GBS infection during labor is maternal fever.					
8. GBS infection does not prevent natural vaginal delivery.					
9. GBS infection may cause pneumonia or meningitis in newborns.					
10. GBS infection does not prevent the mother from breastfeeding after delivery.					
11. The likelihood of transmitting GBS from mother to baby increases during delivery.					
12. Screening and receiving appropriate treatment during					

Labor reduces the risk of GBS transmission to the baby					
13. The doctor should be informed of a previous GBS infection in past pregnancies.					
14. GBS infection may occur without noticeable symptoms.					
15. A previous pregnancy with GBS infection increases the likelihood of recolonization in the current pregnancy.					

Section Three: Attitudes and Perceptions toward GBS Screening and Prevention

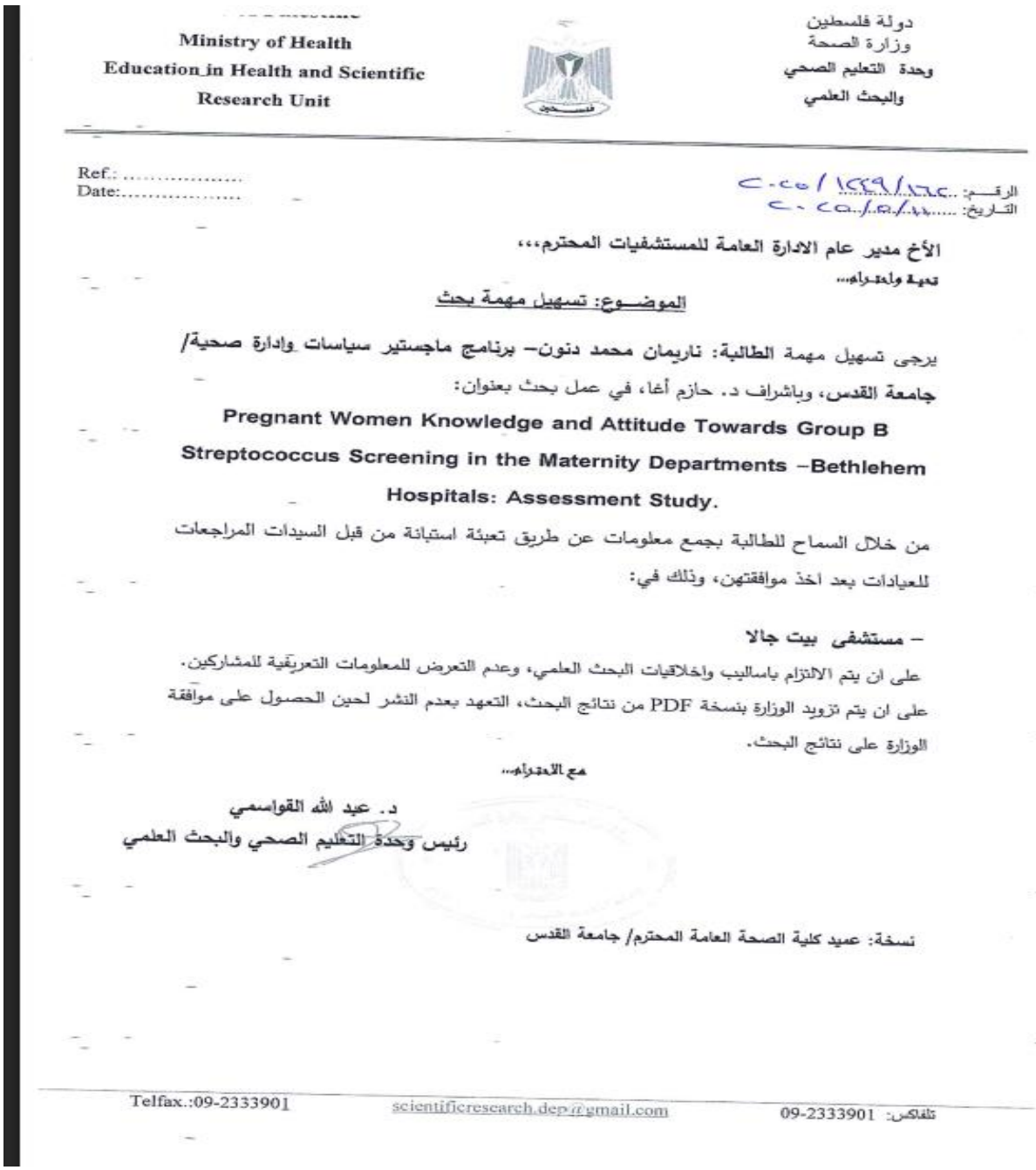
Please read each statement carefully and tick the most appropriate response:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1. I believe that GBS screening is important during pregnancy.					
2. I agree that GBS screening should be routinely conducted for all pregnant women.					
3. I trust the information I receive from healthcare providers about GBS and the importance of screening.					
4. I believe that GBS screening should be clearly explained during antenatal visits.					
5. I am willing to undergo GBS screening if recommended by my doctor.					
6. I believe that GBS screening greatly protects the newborn's health.					
7. Economic conditions may be a reason for not performing GBS screening.					
8. Feeling embarrassed may prevent me from undergoing GBS screening.					
9. Fear of test results may prevent me from undergoing GBS screening.					
10. Lack of awareness about GBS risks among pregnant women may lead to not performing the screening.					
11. I believe that GBS screening may cause unnecessary stress during pregnancy.					
12. If my GBS test result is positive, I would feel concerned about receiving intravenous antibiotics during delivery.					

Appendix C: Names of Experts who reviewed the questionnaire for content validity

Experts Names	*Job description*	*Email address*
Dr. Hazem Agha	*Asst. Prof. of Public Health Nutrition* *Dean, Faculty of Public Health* *Al-Quds University, Jerusalem*	*hagha@staff.alquds.edu*
Dr. Asma Imam	*PhD* *Associate Professor of Health and Community Studies, Al-Quds University;* *Coordinator of the Master's Program in Health Management and Policy, Al-Quds University.*	*aimam@staff.alquds.edu*
Dr. Abed Alkareem Ashaira	*Chair of the department of education and psychology* *Palestine Polytechnic University*	*Abedasherah@ppu.edu*
Dr. Buthayna Alsurkhi	*MPH, PhD* *Assistant Professor, School of Public Health, Al-Quds University.*	*balsurkhi@staff.alquds.edu*
Dr. Etaf Maqboul	*Lecturer, College of Nursing and Health Sciences, Bethlehem University, Palestine.* *Master's degree in Nursing from the University of Southern California (USC).*	*etafm@bethlehem.edu*
Dr. Bashar Rishmawi	*Gynecologist & obstetrician in the Holy Family Hospital.*	*dr.bashar.rishmawi@gmail.com*

Appendix D: Hospital's permission.



دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي
والبحث العلمي

Ministry of Health
Education in Health and Scientific
Research Unit

Ref.: .....
Date:.....

الرقم: ٢٠٢٥/١٢٩/١٦٤
التاريخ: ٢٠٢٥/٩/١١

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام،،،

الموضـــوع: تسهيل مهمة بحث

يرجى تسهيل مهمة الطالبة: ناريمان محمد دنون– برنامج ماجستير سياسات وإدارة صحية/ جامعة القدس، وباشراف د. حازم أغا، في عمل بحث بعنوان:

Pregnant Women Knowledge and Attitude Towards Group B Streptococcus Screening in the Maternity Departments –Bethlehem Hospitals: Assessment Study.

من خلال السماح للطالبة بجمع معلومات عن طريق تعبئة استبانة من قبل السيدات المراجعات للعيادات بعد اخذ موافقتهن، وذلك في:

– مستشفى بيت جالا

على ان يتم الالتزام باساليب واخلاقيات البحث العلمي، وعدم التعرض للمعلومات التعريفية للمشاركين.
على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة الوزارة على نتائج البحث.

مع الاحترام،،،

د. عبد الله القواسمي
رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الصحة العامة المحترم/ جامعة القدس

Telfax.:09-2333901 scientificresearch.dep@gmail.com تلفاكس: 09-2333901

بسم الله الرحمن الرحيم

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2025/5/17

حضرة الدكتور سابا أبو فرحة المحترم
المدير الطبي لمستشفى العائلة المقدسة

الموضوع: تسهيل مهمة الطالبة ناريمان دنون

تحية طيبة وبعد،،

تقوم الطالبة ناريمان محمد دنون الرقم الجامعي 22312090 من برنامج ماجستير سياسات وادارة صحية/ كلية الصحة العامة/ جامعة القدس، بإعداد بحث الرسالة بإشراف د. حازم اغا وبعنوان:

"Pregnant Women's Knowledge and Attitude Towards Group B Streptococcus Screening in the Maternity Departments -Bethlehem Hospitals: Assessment Study "

تهدف الدراسة الى معرفة مدى المعرفة والتوجهات لدى النساء الحوامل تجاه الفحص المسحي لجرثومه عنق الرحم GBS في أقسام النسائية والتوليد في مستشفيات بيت لحم. وهي بحاجة الى توزيع استبانة الدراسة على النساء الحوامل المراجعات للعيادة النسائية في مستشفى العائلة المقدسة. لذا نرجو من حضرتكم تسهيل مهمة الطالبة والسماح لها توزيع الاستبانة على عينة الدراسة، علماً بأن المعلومات ستكون سرية ولأغراض البحث العلمي فقط.

وتفضلوا بقبول فائق الاحترام،،

كلية الصحة العامة
Faculty of Public Health

د. حازم اغا

عميد كلية الصحة العامة

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School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2025/5/17

حضرة الدكتور رفيق رشماوي المحترم
المدير الطبي لمستشفى حقل الرعاة

الموضوع: تسهيل مهمة الطالبة ناريمان دنون

تحية طيبة وبعد،،

تقوم الطالبة ناريمان محمد دنون الرقم الجامعي 22312090 من برنامج ماجستير سياسات وادارة صحية/ كلية الصحة العامة/ جامعة القدس، بإعداد بحث الرسالة بإشراف د. حازم اغا وبعنوان:

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وتفضلوا بقبول فائق الاحترام،،

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Faculty of Public Health

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جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2025/5/17

حضرة الدكتور غسان نافز الدبس المحترم
المدير الطبي لمستشفى الدبس

الموضوع: تسهيل مهمة الطالبة ناريمان دنون

تحية طيبة وبعد،،

تقوم الطالبة ناريمان محمد دنون الرقم الجامعي 22312090 من برنامج ماجستير سياسات وادارة صحية/ كلية الصحة العامة/ جامعة القدس، بإعداد بحث الرسالة بإشراف د. حازم اغا وبعنوان:

"Pregnant Women's Knowledge and Attitude Towards Group B Streptococcus Screening in the Maternity Departments -Bethlehem Hospitals: Assessment Study "

تهدف الدراسة الى معرفة مدى المعرفة والتوجهات لدى النساء الحوامل تجاه الفحص المسحي لجرثومه عنق الرحم GBS في أقسام النسائية والتوليد في مستشفيات بيت لحم. وهي بحاجة الى توزيع استبانة الدراسة على النساء الحوامل المراجعات للعيادة النسائية في مستشفى الدبس. لذا نرجو من حضرتكم تسهيل مهمة الطالبة والسماح لها توزيع الاستبانة على عينة الدراسة، علماً بأن المعلومات ستكون سرية ولأغراض البحث العلمي فقط.

وتفضلوا بقبول فائق الاحترام،،

كلية الصحة العامة
Faculty of Public Health

د. حازم اغا
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Appendix E: Al-Quds University Ethical approval

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2/3/2025
الرقم: REF.15/25

عزيزتي الطالبة ناريمان دنون المحترمة
برنامج ماجستير السياسات والادارة الصحية

الموضوع: موافقة لجنة اخلاقيات البحث العلمي

قامت اللجنة الفرعية لأخلاقيات البحث التابعة لكلية الصحة العامة بمراجعة مشروع الرسالة بعنوان:
"Pregnant Women's Knowledge and Attitude Towards Group B Streptococcus Screening in the Maternity Departments -Bethlehem Hospitals: Assessment Study "

المقدم من (مشرف البحث/د.حازم اغا).
يعتبر مشروعك مستوفيًا لمتطلبات أخلاقيات البحث في جامعة القدس.
نتمنى لكم كل التوفيق في تسيير المشروع.
ملاحظة: في حالة الحاجة الى موافقة من اللجنة المركزية في الجامعة، تستطيع التقدم باستخدام هذه الموافقة على الرابط.https://research.alquds.edu/en/ethics/48-how-to-apply.html

رئيسة اللجنة الفرعية لاخلاقيات البحث
كلية الصحة العامة
د. نهى الشريف

نسخة/ أعضاء لجنة البحث

Appendix F: LSD post-hoc & Tukey Tables

LSD post-hoc test results for differences in attitudes and perceptions toward GBS screening according to educational level.

Educational level	Primary education	Preparatory education	Secondary education	University education

Primary education		-0.02639	-0.15203	-0.22880
Preparatory education			-0.17842	*-0.25518
Secondary education				-0.07676
University education				

Tukey test results for bilateral comparisons post hoc of the level of the Attitudes and Perceptions toward GBS Screening and Prevention according to the Monthly household income (NIS)

Monthly household income (NIS)	Less than 2000	2000-2999	3000-3999	4000 and above
Less than 2000		-0.12740	*-0.27523	*-0.38485
2000-2999			-0.14783	*-0.25745
3000-3999				-0.10962
4000 and above				

LSD Post-hoc Test Results for Bilateral Comparisons of Pregnant Women's Knowledge about GBS Screening According to Previous Diagnosis

	Have you ever been diagnosed with GBS during your current or any previous pregnancies based on medical tests?	Yes	No	I don't know
General Knowledge about Group B Streptococcus (GBS)	Yes		*0.23271	-0.17590
	No			-0.05681
	I don't know			

العنوان: "دراســة مدى المعرفة والاتجاهات لدى النســاء الحوامل تجاه الفحص المســحي لجرثومه عنق الرحم GBS في أقسام الولادة في مستشفيات بيت لحم"

إعداد: ناريمان محمد دنون.

إشراف: د. حازم الأغا.

الملخص

الخلفية :جرثومة المجموعة ب (GBS) تُعد سبباً رئيسياً للإنتان الوليدي، والتهاب السحايا، والالتهاب الرئوي في جميع أنحاء العالم. على الرغم من التوصيات العالمية للفحص الشامل وإعطاء المضادات الحيوية أثناء الولادة، فإن العديد من البلدان منخفضة ومتوسطة الدخل، بما في ذلك فلسطين، ما زالت تعتمد نهجاً قائمًا على تقييم المخاطر. قد تعزى الممارسات غير المتسقة للفحص إلى محدودية الوعي بين النساء الحوامل.

هدف الدراسة :تهدف هذه الدراسة إلى تقييم معرفة وتوجهات النساء الحوامل تجاه فحص GBS في أقسام الولادة في بيت لحم، وفحص مدى ارتباط هذه المعرفة والتوجهات بالعوامل الاجتماعية والديموغرافية والتوليدية.

تصميم الدراسة :أُجريت دراسة وصفية مستعرضة على 400 امرأة حامل تم اختيارهن باستخدام طريقة العينة العشوائية الطبقية من أربعة مستشفيات في منطقة بيت لحم. تم جمع البيانات باستخدام استبيان معتمد يتم تعبئته ذاتياً، ويتكون من ثلاثة أقسام: المتغيرات الاجتماعية والديموغرافية، 15 سؤالاً حول المعرفة، و12 سؤالاً حول التوجهات. تم تحليل البيانات باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS) الإصدار 25، مع استخدام الإحصاءات الوصفية، معامل ارتباط بيرسون، اختبار t، وتحليل التباين الأحادي (One-way ANOVA) عند مستوى دلالة.$p < 0.05$

النتائج :أظهرت النتائج مستوى عالٍ من المعرفة بشكل عام حول فحص GBS (المتوسط = 3.93 ± 0.46، 78.6%)، حيث صنف 71.8٪ من المشاركات ضمن ذوات المعرفة العالية. وبالمثل، كانت التوجهات تجاه الفحص إيجابية بشكل عام (المتوسط = 3.74 ± 0.46، 74.8%)، مما يشير إلى قبول قوي لاختبار GBS وثقة مقدمي الرعاية الصحية. لم تُظهر النتائج وجود ارتباط معنوي بين مستويات المعرفة والعمر أو التعليم أو مكان السكن أو الدخل أو عدد الولادات السابقة .($p > 0.05$) ومع ذلك، تأثرت التوجهات بشكل معنوي بالتعليم ($p = 0.050$) والدخل الشهري للأسرة($p = 0.000$) ، حيث أظهرت النساء ذوات المستويات التعليمية والدخل الأعلى توجهات أكثر إيجابية نحو الفحص.

الخلاصة :أظهرت النساء الحوامل في مستشفيات بيت لحم معرفة جيدة وتوجهات إيجابية تجاه فحص GBS، إلا أن هناك فجوات معرفية وتوجهيه بين من ينتمين إلى مستويات اجتماعية واقتصادية أقل. تؤكد هذه النتائج على أهمية برامج التثقيف والتوعية المستمرة قبل الولادة لتحسين الفهم، والتغلب على الحواجز العاطفية، إضافة إلى ذلك، تبرز الحاجة إلى قيام وزارة الصحة بتبني سياسة وطنية واضحة لفحص جرثومةGBS ، سواء من خلال الفحص الشامل أو القائم على عوامل الخطورة، ودمج بروتوكول وطني موحّد ضمن إرشادات رعاية الحوامل، بما يضمن توحيد الممارسات وتحقيق العدالة في تطبيق فحص جرثومة GBS في جميع المستشفيات والمراكز الصحية.

الكلمات المفتاحية: جرثومة المجموعة ب العقدية، التوجهات، المعرفة، النساء الحوامل، الفحص المسحي.