- *Basic Research*

Knowledge and Behavioral Responses of Elderly Primigravida Women to Obstetric Warning Signs: A Descriptive Exploratory Study in Cairo, Egypt

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Abstract

Background: Pregnancy at advanced maternal age (AMA) is believed to be linked to poor maternal and perinatal outcomes. However, the number of pregnancies linked to AMA has increased in recent decades. To reduce these dangers, it is crucial to identify and manage obstetric warning signs appropriately. **Aim:** To assess the knowledge and behavioral responses of elderly primigravida women regarding obstetric warning signs and identify factors associated with awareness and response. **Research design:** A descriptive exploratory study was conducted among 200 elderly primigravida women. **Setting:** The present study was carried out in the Maternal and Child Health Centers in Badr City, Cairo. **Sample:** A convenience sampling approach was employed. **Tools of data collection:** The following four tools were used**: I)** Participants' socio-demographic characteristics **II)** Participants' obstetric and medical data. **III)** Participants knowledge regarding pregnancy warning signs. **IV)** Behavioral responses toward warning signs. **Results** showed that 96% of participants had good knowledge of pregnancy warning signs, with the most recognized being vaginal bleeding (99.5%), severe abdominal pain (97.5%), and abnormal fetal movement (94%), while signs like blurred vision, abnormal vaginal discharge, excessive vomiting, and epigastric pain were less recognized, with significant associations found between knowledge and factors such as residence, education, and antenatal care attendance. About 86% demonstrated appropriate behavioral responses, with significant differences observed by marital status and education. **Conclusion:** Most of the participants' knowledge and behavior levels were high, but knowledge gaps and inappropriate responses among certain subgroups were highlight. **Recommendation:** Health facilities should prioritize thorough and frequent counseling on all obstetric warning sings, with a focus on less well-known symptoms, during ANC visits.

Keywords: Elderly Primigravida, Behavioral Responses, Knowledge, Obstetric Warning Signs.

Introduction:

The global demographic landscape has undergone a significant transformation, marked by delayed marriage and postponed childbearing, contributing to a notable rise in maternal age at first pregnancy. This shift has implications for maternal and neonatal health, as maternal age is a critical determinant of obstetric outcomes. Advanced maternal age (AMA), typically defined as pregnancy at 35 years or older, has been associated with increased risks of maternal morbidity, obstetric complications, and adverse perinatal outcomes ***(Safwat et al., 2024)***. A particularly vulnerable subgroup within this demographic is elderly primigravida women experiencing their first pregnancy at an advanced age who face unique physiological, psychological, and social challenges.

The term "elderly primigravida" was first introduced in 1950 and remains clinically relevant due to the complex risk profile these women present ***(Hadiwinata et al., 2025)***. Fertility rates decline significantly after the mid-thirties, and conception often requires the use of assisted reproductive technologies (ART). Despite such interventions, women in this group are at elevated risk for complications such as gestational diabetes, preeclampsia, placental abnormalities, preterm labor, and increased cesarean delivery rates ***(Awoyesuku et al., 2024)***. These risks are compounded by a decreased physiological reserve and increased prevalence of comorbidities.

The increasing trend of delayed childbearing is driven by multiple factors, including higher educational attainment, career advancement, improved access to fertility treatments, and changing societal norms ***(Zabak et al., 2023)***. Consequently, the number of elderly primigravida pregnancies continues to rise globally, underscoring the need for targeted obstetric care and public health strategies that address this population's specific needs ***(Mihret and Wondimu, 2023)***.

A critical aspect of maternal health care particularly for high-risk groups like elderly primigravida women is the recognition of obstetric warning signs, which are early indicators of potential complications that may threaten the life or well-being of the mother and fetus. These include symptoms such as vaginal bleeding, severe abdominal pain, persistent headaches, blurred vision, seizures, high fever, swelling of the hands or face, and decreased fetal movement ***(Afolabi et al., 2023)***. Prompt identification and response to these signs can significantly reduce maternal and neonatal morbidity and mortality. The World Health Organization (WHO) highlights the importance of recognizing danger signs during pregnancy, as they may signal serious complications requiring urgent medical attention ***(WHO, 2016)***

Nurses play a pivotal role in maternal healthcare, particularly in educating and supporting pregnant women during the antenatal and perinatal periods. For elderly primigravida women, who face elevated obstetric risks, nurses serve as front-line professionals in identifying knowledge deficits and inadequate behavioral responses related to obstetric warning signs. Through routine assessments, antenatal counselling, and patient education sessions, nurses are uniquely positioned to evaluate women's understanding of danger signs such as vaginal bleeding, severe headaches, visual disturbances, or reduced fetal movement. ***(Kassa et al., 2020)***

Moreover, nurses can assess behavioral patterns such as delayed care-seeking or misinterpretation of symptoms that may compromise maternal and fetal outcomes. By identifying these gaps early, nurses can implement individualized, culturally sensitive educational interventions to enhance awareness, promote timely decision-making, and improve

perinatal health outcomes. Their continuous presence and trusted rapport with pregnant women make them key agents in bridging the knowledge-to-action gap, especially in high-risk groups such as elderly primigravida mothers***. (Bressal, 2024).***

Despite the growing number of elderly primigravida pregnancies, limited evidence exists regarding this population's awareness and behavioral response to obstetric warning signs. This knowledge gap may hinder timely care-seeking and contribute to preventable adverse outcomes. Evidence suggests that pregnant women's ability to recognize and appropriately respond to danger signs is a key component of birth preparedness and complication readiness ***(Tesega et al., 2024).*** Therefore, evaluating both knowledge and behavioral responses in this group is essential for informing antenatal education strategies and optimizing maternal health services.

Significance of the Study:
Elderly primigravida women are particularly vulnerable due to age-related physiological changes, diminished reproductive resilience, and increased likelihood of coexisting medical conditions. These factors collectively contribute to a more complex and high-risk perinatal period, characterized by elevated incidences of preeclampsia, gestational diabetes, fetal growth restriction, preterm birth, and perinatal mortality.

In this context, timely recognition and appropriate response to obstetric warning signs are critical for preventing maternal and neonatal complications during the perinatal phase. However, existing literature reveals a concerning gap in elderly primigravida women's awareness of such warning signs, as well as inconsistencies in their health-seeking behaviors when complications arise. This gap poses a serious threat to maternal and fetal well-being, especially during a period when medical intervention is often time-sensitive and potentially lifesaving. This study is therefore significant in its effort to assess the level of knowledge and behavioral responses of elderly primigravida women regarding obstetric warning signs. This will provide key insights that can guide the development of targeted health education strategies and inform prenatal care policies aimed at improving maternal and newborn safety.

Aim of the Study:
This study aims to assess the knowledge and behavioral responses of elderly primigravida women to obstetric warning signs.

Research Questions:

- What is the level of knowledge regarding obstetric warning signs among elderly primigravida women?
- What are the behavioral responses of elderly primigravida women when they experience obstetric warning signs?
- Is there a significant relationship between the level of knowledge and the behavioral responses of elderly primigravida women to obstetric warning signs?
- What sociodemographic factors are associated with knowledge and behavioral responses among elderly primigravida women?

Research Methodology:
Study Design

This research utilized a descriptive exploratory study design aimed at identifying and describing the level of knowledge and behavioral responses among elderly primigravida women regarding obstetric warning signs. This design was chosen to allow for an in-depth assessment of participants' awareness, attitudes, and responses without manipulating any variables.

Setting:

The study was conducted at the Maternity and Child Health Centers in the Fifth District of Badr City, Cairo. This center was selected as it serves as a primary healthcare facility where women seek prenatal care, gynecological services, family planning assistance, and obstetric care for a diverse population of women.

Subjects:

The target population comprised primigravida women aged 35 years and above attending the Maternity and Child Health Centers in the pre-mentioned setting. Inclusion criteria; primigravida women at any trimester and aged ≥35 years and willing to participate and able to provide informed consent. Exclusion Criteria; Women who are unable to effectively communicate, or have cognitive or psychological impairments that hinder participation.

Sampling:
A convenience sampling approach was employed. All eligible women who attended the Maternity and Child Health Centers during the data collection period and met the inclusion criteria were invited to participate. The sample size consisted of 200 participants, selected based on their availability and willingness to join the study.

Sample Size:
The sample size was calculated using the single population proportion formula with a 95% confidence level (Z = 1.96), an estimated proportion (P) of 0.5, and a 7% margin of error (d = 0.07). The calculated minimum sample size was 196, which was rounded up to 200 to compensate for potential non-responses and ensure adequate statistical power.

$$196 \approx \frac{0.9604}{0.0049} = \frac{0.25 \times 3.8416}{0.0049} = \frac{(0.5-1) \times 0.5 \times {}^{2}(1.96)}{{}^{2}(0.07)} = n$$

Data Collection Tools:
Data were collected using a structured, self-administered questionnaire adopted from validated tools used in previous literature ***(Gesese et al., 2023)*** and ***(Abu-Shaheen et al., 2020)***. The questionnaire was translated into Arabic and pre-tested to ensure cultural and contextual relevance. It consisted of four tools:

Tool 1- It concerns participants' socio-demographic characteristics this section included data regarding (age, residence, education, occupation, and marital status).
Tool 2- It concerns participants' obstetric, and medical data as (gestational age, use of folic acid, gynecological history, antenatal care visits, satisfaction with services, planned mode and place of delivery. As well as the presence of medical ill conditions.
Tool 3-It concerning participants knowledge regarding pregnancy warning signs (e.g., vaginal bleeding, blurred vision, high fever …ect Participants were also asked to indicate their sources of information, such as healthcare providers, media, leaflets, or peers. Responses were

scored as: “Yes" = 1 and "No" = 0. A total score of >7 indicated good knowledge, while a score of ≤ 7 indicated poor knowledge.

Tool 4-It concerns behavioral responses toward warning signs this section assesses intended responses to pregnancy warning signs. Actions such as "going to a health facility" were scored as appropriate behavior (score = 1), while all other responses were scored as inappropriate behavior (score = 0).

Validity and Reliability:

The questionnaire was reviewed for content and face validity by three experts in maternal and reproductive health. Internal consistency was evaluated using Cronbach’s alpha, with a score of (0.76) considered acceptable for reliability.

Pilot Study:

A pilot test was conducted on 20 women (10% of the sample) to assess the clarity and feasibility of the data collection tool. The results were used to make minor refinements, and these participants were included in the final analysis.

Data Collection Procedure:

Data collection was performed in three phases:

1. Preparatory Phase: reviewing the related literature, tool development, translation, and obtaining ethical approvals.
2. Implementation Phase: Eligible participants were approached during ANC visits. The study’s purpose was explained, and informed consent was obtained. The questionnaire took approximately 20 minutes to complete.
3. Evaluation Phase: Completed questionnaires were collected and prepared for analysis. The study lasted three months, from the beginning of August to the end of October 2024.

Ethical Considerations

The Maternity and Child Health Centers and the Institutional Review Board (IRB) of the Modern University for Technology and Information (MTI), Egypt (FAN/129/2024). Participation was voluntary, with informed consent obtained from all participants. Confidentiality was ensured, and participants retained the right to withdraw at any time.

Statistical Analysis

Data were analyzed using SPSS version 26 (IBM Corp., Chicago, IL, USA). Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to summarize participant characteristics and knowledge/behavioral scores. Inferential statistics (e.g., Chi-square test) were employed to examine associations between demographic variables and knowledge or behavior. A p-value < 0.05 was considered statistically significant.

Results

Table (1) reveals that the majority of the studied women (92.0%) were between 35 and <40 years of age, and 8.0% between 40 - <50 years with a mean age of 36.69 ± 1.857 years. In terms of residence, 60.0% lived in urban areas while 40.0% resided in rural settings. Educational attainment varied notably among participants: over half (54.0%) had a university-level education, whereas 35.0% were illiterate. Regarding occupational status, a large majority (88.0%) identified as housewives, while only 12.0% were employed. Marital status was overwhelmingly skewed toward marriage, with 98.0% of women being married and only 1.0% each being divorced or widowed.

Table (2) shows that nearly half of the studied women were in the second trimester of pregnancy (43.0%), followed by the first trimester (36.0%) and the third trimester (21.0%). In terms of delivery preferences, two-thirds (66.0%) planned for a cesarean section, while only 34.0% anticipated a vaginal birth. The vast majority of women (99.0%) intended to deliver in a health facility. Regarding chronic medical conditions, 27.0% reported having at least one chronic illness, with hypertension (55.6%) and diabetes (33.3%) being the most prevalent, followed by anemia (11.1%). Furthermore, 10.0% of participants reported a family history of pregnancy-related warning signs.

Table (3) demonstrates that the majority of the studied women (78.0%) reported attending antenatal care (ANC) visits, among those who attended ANC (n = 156), 85.9% initiated their first visit during the first trimester, only a small proportion began ANC in the second (12.8%) or third trimester (1.3%). Regarding the frequency of visits, 44.9% of women reported attending four or more ANC visits. However, a considerable portion (55.1%) had fewer than four visits. In terms of the place of ANC services, the majority (60.9%) received care at Maternal and Child Health (MCH) centers, followed by private clinics (32.1%), and a smaller proportion (7.0%) at governmental hospitals. A notably high percentage (94.5%) of the studied women reported receiving counselling on obstetric warning signs during their ANC visits. Furthermore, satisfaction with healthcare provider approaches was overwhelmingly positive, with 96.8% of respondents expressing satisfaction.

The results reveal varying levels of awareness among the studied women regarding key obstetric warning signs. Table (4) shows that the women's knowledge was highest for vaginal bleeding, with nearly all participants (99.5%) correctly identifying it as a danger sign, followed by severe abdominal pain (97.5%) and abnormal fetal movement (94.0%). A high level of awareness was also reported for sudden gush of fluids (85.0%). Moderate levels of awareness were observed for signs such as swollen hands and face (68.0%), severe headache (63.0%), and difficulty of breathing (58.5%). Meanwhile, warning signs such as blurring of vision (52.5%), abnormal vaginal discharge (55.0%), and epigastric pain (49.0%) had lower recognition rates, suggesting gaps in knowledge regarding symptoms commonly associated with preeclampsia and infection. Similarly, excessive vomiting, a potential indicator of hyperemesis gravidarum, was recognized by only 41.5% of the studied women.

Table (5) indicates that the vast majority of the studied women (96.0%) demonstrated good overall knowledge regarding warning signs of pregnancy, while only a small proportion (4.0%) exhibited poor knowledge**.** The mean total knowledge score was 11.43 with a standard deviation of ± 2.253, suggesting a generally high level of awareness with moderate variability among participants.

Table (6) shows that while the majority of women across different subgroups had good knowledge, certain variations were observed among specific demographic categories. A statistically significant relationship was found between place of residence and knowledge level ($p = 0.023$), with urban residents demonstrating a higher rate of good knowledge (97.7%) compared to those living in rural areas (90.0%). Educational attainment also revealed a notable pattern: 97.1% of women with a university education were knowledgeable about warning signs, in contrast to just 10.0% of those who were illiterate. Additionally, half of the women with only primary education exhibited poor knowledge. Employment status appeared to have an effect as well 99.0% of employed women showed good knowledge compared to 95.5% of housewives though this difference was not statistically significant ($p = 1.000$). No significant differences in knowledge levels were observed across age groups or marital status ($p > 0.05$).

Table (7) indicates that good knowledge is generally more prevalent among women who engage actively with healthcare services. Notably, women who attended antenatal clinic visits (95.7%) and those who received counselling during antenatal clinic demonstrated markedly higher levels of knowledge compared to their counterparts who did not attend antenatal clinic (5.5%) or did not receive counselling (5.5%), with both comparisons yielding statistically significant p-values (1.000). Similarly, an increasing number of antenatal clinic visits correlated with better knowledge, peaking at 100% for those who had four or more visits. Additionally, the planned place of delivery showed a significant association with knowledge ($p = 0.04$), where women planning to deliver at health facilities had substantially higher knowledge levels (97.0%) compared to those planning home deliveries (0%).

Table (8) shows that a significant majority (86.0%) reported that they would seek care at a health facility upon experiencing a warning sign. However, a small but noteworthy proportion of participants expressed alternative, less appropriate responses such as consulting family or friends (9.0%), seeking help from a traditional birth attendant (3.0%), taking self-medication (0.5%), or taking no action at all (2.5%). Regarding the timing of care-seeking, 77.0% of women stated they would seek medical attention immediately upon noticing a warning sign. However, 20.0% indicated they would wait until their next scheduled appointment and 3.0% would only seek care if the condition became severe.

Table (9) shows that the majority of the studied women (86.0%) exhibited appropriate behavior in response to pregnancy warning signs, while a smaller proportion (14.0%) demonstrated inappropriate behavior. The mean behavioral score was 0.86 with a standard deviation of ± 0.359.

Table (10) presents the relationship between socio-demographic characteristics and women's behavioral responses to pregnancy warning signs. Overall, the majority of women across most subgroups demonstrated appropriate behavior; however, differences were observed across certain categories. A statistically significant association was found between marital status and behavior ($p = 0.021$). While 86.7% of married women reported appropriate behavior, all divorced and widowed participants (100.0%) exhibited inappropriate behavior. Although not statistically significant, educational level showed a clear trend ($p = 0.073$), with inappropriate behavior highest among illiterate women (100.0%) and decreasing as education level increased. Only 4.4% of university-educated women showed inappropriate behavior. Residence and occupation were not significantly associated with behavior ($p = 0.253$ and $p = 0.687$, respectively), but rural women and housewives showed slightly higher rates of inappropriate behavior compared to their urban and employed counterparts. Age differences approached significance ($p = 0.096$), with inappropriate behavior most evident in the youngest and oldest age categories, particularly among women aged 45- <50, where all demonstrated inappropriate behavior.

Table (11)illustrates the association between pregnant women's behavioral responses and their knowledge of warning signs. While 13.3% had low knowledge, 86.7% of those acting inappropriately in response to warning indications had strong knowledge. In contrast, only 2.4% of participants were identified as having inadequate knowledge, while 97.6% of participants who exhibited proper behavior were classed as having strong knowledge. Even though women with strong knowledge exhibited a higher percentage of proper behaviors, there was no statistically significant correlation between behavior and knowledge level.

Table (1): Distribution of the Studied Women According to their Socio-Demographic Characteristics (n=200).

Socio-Demographic Data	No	%
Age:		
▪ 35 - < 40 years	184	92.0
▪ 40 - <45 years	15	7.5
▪ 45 - <50 years	1	0.5
Mean ± SD:	36.69 ± 1.857	
Residence:		
▪ Urban	120	60.0
▪ Rural	80	40.0
Educational level:		
▪ Illiterate	70	35.0
▪ Primary school	4	2.0
▪ Preparatory school	4	2.0
▪ Secondary school	14	7.0
▪ University	108	54.0
Occupational status:		
▪ Housewife	176	88.0
▪ Employed	24	12.0
Marital status:		
▪ Married	196	98.0
▪ Divorced	2	1.0
▪ Widowed	2	1.0

Table (2): Distribution of the Studied Women According to Historical Data (n=200):

Variable	No	%
Gestational age of the current pregnancy:		
▪ 1st trimester	72	36.0
▪ 2nd trimester	86	43.0
▪ 3rd trimester	42	21.0
Use of folate before conception and currently:		
▪ No	156	78.0
▪ Yes	44	22.0
Planned mode of delivery:		
▪ Vaginal delivery	68	34.0
▪ Cesarean delivery	132	66.0
Planned place of delivery:		
▪ Health facility	198	99.0
▪ Home	2	1.0
Having any chronic disease		
▪ Yes	54	27.0
▪ No	146	73.0
If yes, the chronic disease (n=54)		
▪ Diabetes	18	33.3
▪ Hypertension	30	55.6
▪ Anemia	6	11.1
Do you have any experience with the pregnancy warning signs?		
▪ Yes	20	10.0
▪ No	180	90.0
If so, what are these warning signs?		
▪ High blood pressure	9	45.0
▪ Vaginal bleeding	4	20.0
▪ Convulsion	7	35.0

Table (3): Distribution of the Studied Women According to Attendance of Antenatal visits (n=200)

Antenatal care attendance	No	%
Attending antenatal care (ANC) visits:		
Yes	**156**	78.0
No	44	22.0
Time of the initial visit: (n=156)		
1st trimester	**134**	85.9
2nd trimester	20	12.8
3rd trimester	2	1.3
Number of ANC visits: (n=156)		
One visit	14	9.0
Two visits	42	26.9
Three visits	30	19.2
≥ Four visits	**70**	44.9
Place of antenatal care		
Governmental hospital	11	7.0
Private doctor's clinic	50	32.1
MCH	**95**	60.9
Counselling during ANC visit about Obstetric Warning Signs		
Yes	**189**	94.5
No	11	5.5
Satisfaction by the health care provider approaches:		
Yes	**151**	96.8
No	5	3.2

Table (4): Distribution of Knowledge Among Studied Women Regarding Key Warning Signs During Pregnancy (n=200)

Items	Yes		No	
	N	%	N	%
Vaginal bleeding	199	**99.5**	1	0.5
A sudden gush of fluids	170	**85.0**	30	15.0
Swollen hands and face	136	**68.0**	64	32.0
Abnormal fetal movement	188	**94.0**	12	6.0
Excessive vomiting	83	41.5	117	**58.5**
Blurring of vision	105	52.5	95	**47.5**
High-grade fever	70	35.0	130	**65.0**
Severe headache	126	**63.0**	74	37.0
Severe abdominal pain	195	**97.5**	5	2.5
Epigastric pain	98	49.0	151	**75.5**
Abnormal vaginal discharge	110	**55.0**	90	45.0
Difficulty of breathing	117	**58.5**	83	41.5
Convulsion	18	9.0	182	**91.0**

Table (5): Distribution of the total knowledge scores concerning warning signs of pregnancy among the studied women (n=200)

Total knowledge of the women	Frequency	%
Levels of total knowledge:		
▪ Poor knowledge	8	4.0
▪ Good knowledge	192	96.0
Mean ± SD:	11.43 ± 2.253	

Table (6): Association between socio-demographic data of the studied women and their knowledge concerning warning signs of pregnancy (n=200):

Socio-demographic data	Knowledge concerning warning signs of pregnancy		P-value
	Poor knowledge	Good knowledge	
	%	%	
Age:			
▪ 35 - < 40 years	8.6	91.4	1.000*
▪ 40 - <45 years	4.3	95.7	
▪ 45 - <50 years	2.5	97.5	
Residence:			
▪ Urban	2.3	97.7	**0.023***
▪ Rural	10.0	90.0	
Educational level:			
▪ Illiterate	90.0	10.0	0.144*
▪ Primary school	50.0	50.0	
▪ Preparatory school	6.3	93.7	
▪ Secondary school	4.8	95.2	
▪ University	2.9	97.1	
Occupational status:			
▪ Housewife	4.5	95.5	1.000*
▪ Employed	1.0	99.0	
Marital status:			
▪ Married	4.1	95.9	1.000*
▪ Divorced	15.0	85.0	
▪ Widowed	0.0	100.0	

Table (7): Relationship between various obstetric and antenatal care (ANC) factors and pregnant women's knowledge concerning warning signs of pregnancy (n=200):

Obstetric data & ANC	Knowledge concerning warning signs of pregnancy		P-value
	Poor knowledge	Good knowledge	
	%	%	
Gestational age of the current pregnancy:			
▪ 1st trimester	2.8	97.2	**0.536***
▪ 2nd trimester	7.0	93.0	
▪ 3rd trimester	0.0	100.0	
Attending antenatal care (ANC) visits:			
▪ Yes	3.4	95.7	**1.000***
▪ No	94.5	5.5	
Number of ANC visits:			
▪ One visit	10.0	90.0	**0.711***
▪ Two visits	13.8	96.2	
▪ Three visits	2.9	97.1	
▪ ≥ Four visits	0(0.0)	100.0	
Counselling during ANC visit about Obstetric Warning Signs			
▪ Yes	2.3	97.7	**1.000***
▪ No	94.5	5.5	
Planned mode of delivery:			
▪ Vaginal delivery	1(2.9)	33(97.1)	**1.000***
▪ Cesarean delivery	3(4.5)	63(95.5)	
Planned place of delivery:			
▪ Health facility	3(3.0)	96(97.0)	**0.04***
▪ Home	1(100.0)	0(0.0)	

Table (8): Distribution of Studied Women According to Behavioral Responses to Pregnancy Warning Signs (n=200):

Behavioral Responses-related statements	Frequency	%
What should you do when you experience a pregnancy warning sign??		
▪ I will go to a health facility	172	**86.0**
▪ I will consult the family/friends	18	9.0
▪ I will Sleep on my back and don't take action	3	2.5
▪ I will consult a traditional birth attendant	6	3.0
▪ I will get self-medication	1	0.5
If warning pregnancy signs appear, when should you seek medical care?		
▪ Immediately	77	77.0
▪ I will wait until the next appointment day	20	20.0
▪ I will go to a health facility only when the condition becomes severe	3	3.0

Table (9): Distribution of Studied Women According to the Total Behavioral Responses to Pregnancy Warning Signs (n=200):

Behaviors of the women	Frequency	%
Levels of behavior:		
▪ Inappropriate behavior	28	14.0
▪ Appropriate behavior	172	86.0
Mean ± SD:	**0.86 ± 0.359**	

Table (10): Association between socio-demographic data of the studied women and their Behavioral Responses to warning signs of pregnancy

Socio-demographic data	Behavior concerning warning signs of pregnancy		P-value
	Inappropriate behavior %	Appropriate behavior %	
Age:			
▪ 35 - < 40 years	15.2	84.8	0.096*
▪ 40 - <45 years	0.0	100.0	
▪ 45 - <50 years	100.0	0.0	
Residence:			
▪ Urban	11.7	88.3	0.253**
▪ Rural	20.0	80.0	
Educational level:			
▪ Illiterate	100.0	0.0	0.073*
▪ Primary school	20.0	80.0	
▪ Preparatory school	14.3	85.7	
▪ Secondary school	0.0	100.0	
▪ University	4.4	95.6	
Occupational status:			
▪ Housewife	15.9	84.1	0.687*
▪ Employed	8.3	91.7	
Marital status:			
▪ Married	13.3	86.7	**0.021***
▪ Divorced	100.0	0.0	
▪ Widowed	100.0	0.0	

Table (11): The Relationship Between Knowledge of Pregnancy Warning Signs and Behavioral Responses Among the Studied Women (n=200):

Behavior concerning warning signs of pregnancy	Knowledge concerning warning signs of pregnancy		P-value
	Poor knowledge %	Good knowledge %	
Behaviors regarding warning signs of pregnancy:			
▪ Inappropriate behavior	13.3	86.7	0.106*
▪ Appropriate behavior	2.4	97.6	

Discussion

All women in underdeveloped nations are essentially vulnerable to obstetric problems. These issues are difficult to prevent and nearly impossible to predict. The identification of risk indicators is the first step in the medical and nursing management of women with obstetric problems. Because ignorance of the warning signs of obstetric problems frequently causes delays in seeking medical attention, there are terrible outcomes, such as women dying at home or while travelling to a medical institution.

Therefore, the current study aimed to assess the knowledge and behavioral responses of elderly primigravida women regarding obstetric warning signs, to identify gaps in awareness and response that may impact maternal and fetal health outcomes. The findings shed light on significant gaps and strengths in the awareness and response behavior of these women, highlighting the need for targeted interventions in certain demographic groups to improve maternal health outcomes. The majority of the participants in the study (92.0%) were aged between 35 and 40 years, and 8.0% between 40-< 50 with a mean age of 36.69 ± 1.857 years. This aligns with the definition of elderly primigravida women, as these women are often considered high-risk pregnancies due to advanced maternal age. Similar age demographics were observed in other studies on elderly primigravida women, who are known to experience higher maternal risks and complications compared to younger women **(Taha and Adam, 2022)**.

A considerable portion of the women in the study (60.0%) resided in urban areas, while 40.0% lived in rural areas. Studies have shown that women in rural areas often face significant barriers in accessing healthcare, which can affect their knowledge and response behaviors towards obstetric warning signs ***(AlNayef et al., 2023)***. This was reflected in our results, where women in urban areas demonstrated significantly higher knowledge levels compared to their rural counterparts. Regarding educational attainment, over half of the participants (54.0%) had a university-level education, while a substantial proportion (35.0%) were illiterate. This educational disparity reflects the broader socio-economic divide that exists in many regions. A higher educational level has been consistently associated with better health knowledge and more appropriate health behaviors ***(Abdelhalim et al., 2023)***.

In our study, women with higher education demonstrated better awareness of obstetric warning signs, in contrast to illiterate women, who had lower knowledge. This is completely in coherence with ***Gesese et al., (2023)*** study in Ethiopia who found that 89% of the women lives in urban and nearly 73% of them had at least a primary and above educational level, thus may contribute to the higher knowledge of the danger sign of pregnancy. This could be expected that living in an urbanized area and being educated will increase the chances of having information related to health. These results are also supported by ***Moga Rogoz et al., (2025)*** who mentioned that preventing pregnancy warning signs and lowering maternal death rates depend heavily on women's education. By increasing women's awareness of healthy living, access to health-related information, and opportunities for healthcare, education can lower maternal mortality.

In terms of knowledge, the study revealed that most women had high awareness of key obstetric warning signs. Specifically, vaginal bleeding (99.5%), severe abdominal pain (97.5%), and abnormal fetal movement (94.0%) were recognized by the vast majority of participants, which is consistent with findings from other studies that identified these symptoms as critical warning signs of pregnancy complications ***(Mihret & Wondimu 2023)***. These findings are in line with those of ***Abdelhalim et al., (2023)*** who showed that the highest percentage of pregnant women's

knowledge about dangerous clinical features was for items "sudden gush of fluid before labor, loss of fetal movement, vaginal bleeding, oliguria/anuria, premature onset of contraction & severe headache. It might be due to these dangerous clinical features being the most prevalent and frequent during pregnancy, leading to pregnancy complications.

However, other warning signs such as excessive vomiting, blurring of vision, and epigastric pain were less recognized in our study, with only 41.5% of women identifying excessive vomiting as a significant concern. In this regard ***Alsabi, et al., (2025)*** mentioned that, there are still gaps in pregnant women awareness, particularly regarding symptoms associated with preeclampsia and hyperemesis gravidarum, which are common complications in elderly primigravida women. In this respect, ***Gesese et al., (2023)*** showed that more than half of pregnant women may know at least one or more danger signs of pregnancy, while the remaining even may not be known one danger sign of pregnancy.

The lack of awareness among advanced-age primigravida women regarding key obstetric warning signs such as preeclampsia and hyperemesis gravidarum poses significant health risks. ***Glick et al. (2021)*** highlighted that advanced maternal age is a well-established risk factor for hypertensive complications like preeclampsia, which affects around 2–8% of pregnancies and is a major contributor to both maternal and neonatal morbidity and mortality. Likewise, hyperemesis gravidarum can result in serious outcomes such as dehydration and nutritional deficiencies. ***Roshdi et al. (2023)*** found that structured prenatal education substantially improved women's understanding of hyperemesis gravidarum, raising symptom recognition from 19% to over 80% post-intervention, along with a noticeable decrease in symptom severity. Therefore, Maternity and Child Health Centers must urgently address these knowledge gaps by enhancing educational efforts regarding these life-threatening symptoms.

In terms of total knowledge score, the study revealed that 96.0% of participants exhibited good knowledge about the most of pregnancy warning signs, which aligns with a study by ***(Karapanos et al., 2023)***, where 94.0% of women demonstrated adequate knowledge of obstetric emergencies. However, the observed variability in knowledge based on educational status suggests that educational interventions could play a crucial role in bridging these gaps.

Findings from this study showed that the pregnant women who attended antenatal care (ANC) visits and received counselling were significantly more likely to possess good knowledge, with 95.7% and 97.7% demonstrating awareness, respectively. In contrast, women who did not utilize ANC services or receive counselling exhibited alarmingly low levels of awareness (5.5%).

These results are consistent with previous studies emphasizing the pivotal role of ANC in improving maternal knowledge. Recently, ***Yoseph et al., (2025)*** demonstrated that regular ANC attendance significantly enhances pregnant women's understanding of pregnancy danger signs, largely due to structured health education during these visits.

According the current study findings the number of ANC visits was also positively correlated with knowledge levels. Women who had attended four or more visits showed 100% awareness of obstetric warning signs. In this regard, ***Koovimon et al., (2023)*** reported that pregnant women who had antenatal care visits greater than or equal 4 times had two times better knowledge than women with less than 4 times. This supports the World Health Organization's (WHO) recommendation of a minimum of four focused ANC visits to ensure both maternal and fetal well-being, including the dissemination of critical health information. It is worth

pointing out, ***Yoseph et al. (2025)*** noted that women may not visit ANC at all because of a lack of financial access, which reduces the number of necessary ANC follow-ups or even initiates ANC in late pregnancy.

Concerning the pregnant women's behavioral responses, 86.0% of the women in the study reported that they would seek care at a health facility if they experienced a warning sign, which is consistent with findings from other recent studies in Ethiopia that highlight the high preference for institutional care in cases of obstetric emergencies ***(Yosef, and Tesfaye 2021)***. However, a small percentage of women indicated they would consult family or friends, rely on traditional birth attendants, or self-medicate, suggesting that not all pregnant women fully understood the importance of immediate medical intervention. In this context, ***Gesese et al. (2023)*** found that mothers were 3.97 times more likely to have strong understanding of the danger signals of pregnancy if they were aware that they needed to see a health facility right away if they encountered them.

In terms of the timing of seeking medical care, 77.0% of the women indicated they would seek immediate care upon noticing a warning sign. This aligns with the recommendation that timely medical intervention is critical for addressing obstetric emergencies ***(Abdelhalim et al., 2023)***. However, the 20.0% who would wait until their next appointment and the 3.0% who would wait for the condition to worsen underscore the need for improved awareness about the urgency of responding to warning signs.

The study found that marital status had a statistically significant impact on the behavioral responses of women, with divorced and widowed participants exhibiting inappropriate behavior in response to warning signs. This may be due to a lack of support from a partner or a greater likelihood of social and economic challenges, as noted by ***Yosef, and Tesfaye (2021)***, who identified marital status as an important factor influencing healthcare-seeking behavior. The educational level also showed a trend in influencing behavior, with illiterate women more likely to demonstrate inappropriate behavior compared to their university-educated counterparts. This finding echoes similar studies that indicate a direct correlation between education and health-seeking behavior, with better-educated individuals more likely to recognize the importance of timely medical care ***(Awoyesuku et al., 2024).***

Although the results of the current study did not show a statistically significant correlation between knowledge and behavioral reactions, the general trend seems to be that more suitable behaviors are the result of greater information. The notion that health education is essential to enhancing maternal health outcomes is supported by the fact that the majority of women with good knowledge (97.6%) behaved appropriately. This result is in line with recent research that highlights the beneficial effects of greater awareness of obstetric warning indicators on care-seeking behavior ***(Yoseph et al., 2025).***

According the current study finding 86.7% of those acting inappropriately in response to warning sings indications had strong knowledge This finding highlights a crucial aspect of maternal health behavior: knowledge alone may not be sufficient to drive appropriate action. Several underlying factors such as cultural norms, fear of social stigma, limited decision-making autonomy, mistrust in healthcare systems, and accessibility challenges—can hinder women from acting on their knowledge. Thus, we agree that combining educational interventions with culturally sensitive strategies and systemic improvements is essential for promoting effective behavioral change among elderly primigravida women.

Conclusion:
These results show that awareness is often high, especially when it comes to well-known symptoms like vaginal bleeding, excruciating abdominal discomfort, and irregular fetal movement. A significant percentage of participants exhibited proper behavioral responses. Significant associations were found between knowledge levels and demographic variables, particularly education and place of residence. Urban residents and women with higher education levels displayed better awareness and behavior. Antenatal care attendance and counseling emerged as pivotal factors in improving both knowledge and responses. Despite the lack of a statistically significant correlation between knowledge and behavior, the observed trend suggests that increased awareness positively influences care-seeking practices.

Recommendations:
Health facilities should prioritize thorough and frequent counseling on all obstetric warning sings, with a focus on less well-known symptoms, during ANC visits. Specialized educational interventions (such as visual aids, audio materials, and community engagement) should be given to women in rural regions. Future studies should investigate the psychological, cultural, and social factors that may influence decision-making, particularly among those with adequate knowledge but poor behavioral responses. Future research should employ longitudinal designs to evaluate how antenatal counselling over time influences knowledge retention and behavioral changes throughout pregnancy and into the postpartum period. Digital platforms (e.g., social media, SMS-based reminders, mobile health apps) should raise the awareness and support positive behavioral outcomes among pregnant women.

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الملخص العربي

المقدمة: تُعرَّف النساء الحوامل لأول مرة في سن متقدمة (35 عامًا فأكثر) بأنهن أكثر عرضة للإصابة بمضاعفات مرتبطة بالحمل. ويُعد التعرف المبكر على علامات الخطر المرتبطة بالحمل والاستجابة المناسبة لها أمرًا بالغ الأهمية للحد من معدلات المراضة والوفيات بين الأمهات وحديثي الولادة. **الهدف من الدراسة :**تقييم مستوى المعرفة والاستجابات السلوكية لدى النساء الحوامل لأول مرة في سن متقدمة فيما يتعلق بعلامات الخطر التوليدية، وتحديد العوامل المرتبطة بمستوى الوعي والاستجابة. **منهجية الدراسة:** أُجريت دراسة وصفية استكشافية على عينة مكونة من 200 امرأة حامل لأول مرة في سن متقدمة، ممن يترددن على مراكز رعاية الأمومة والطفولة بمدينة بدر، القاهرة. **أدوات جمع البيانات:** تم جمع البيانات باستخدام استبيان منظم شمل الخصائص الاجتماعية والديموغرافية والتوليدية، والمعرفة بعلامات الخطر التوليدية، والاستجابات السلوكية المرتبطة بها. **النتائج :**أظهرت الدراسة أن 96% من المشاركات أبدين مستوى جيدًا من المعرفة، مع تباين في الوعي وفقًا لمستوى التعليم ومكان السكن وعدد زيارات المتابعة أثناء الحمل. وكانت أكثر علامات الخطر التي تم التعرف عليها هي: النزيف المهبلي (99.5%)، ألم البطن الشديد (97.5%)، والحركة غير الطبيعية للجنين (94%). كما أن حوالي 86% من المشاركات أظهرن استجابات سلوكية مناسبة، مع وجود فروق ذات دلالة إحصائية ترتبط بالحالة الاجتماعية والتعليم. **الخلاصة والتوصيات:** أظهرت معظم المشاركات مستويات مرتفعة من المعرفة والسلوك، إلا أن وجود فجوات معرفية واستجابات غير ملائمة لدى بعض الفئات يشير إلى الحاجة لتعزيز التثقيف الصحي الموجه، لا سيما في المناطق الريفية وبين ذوي المستوى التعليمي المنخفض.

الكلمات المفتاحية: المعرفة – الاستجابات السلوكية – الحوامل لأول مرة في سن متقدمة – علامات الخطر التوليدية – رعاية ما قبل الولادة (ANC)