

Original Article

Knowledge of Obstetric Warning Signs and Associated Risks among Saudi Pregnant Women

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Abstract: Women must be aware of the risk factors of pregnancy complications and the negative maternal and fetal health consequences to take preventative measures and management strategies that will result in a successful pregnancy. This study aimed to assess the Level of Knowledge about obstetric warning signs and the associated factors among pregnant Saudi women attending antenatal care in a tertiary care maternity set-up in Riyadh City. Data for this cross-sectional study were obtained using a structured questionnaire from eligible pregnant women admitted to King Saud Medical City (KSMC) between August 2020 and March 2021. Data were analyzed using descriptive and inferential statistics. Out of a minimum estimated sample size of 170, researchers recruited 362 participants. As observed, only 92 people, or 25.4%, had enough knowledge about various educational levels. The majority (91.2%) lived in villages, had no history of chronic disease (74.0%), and said that it took them at least 30 minutes to commute from their home to the hospital (69.3%). Two hundred two (55.7%) lacked appropriate knowledge, although most women (76.2%) had one to four pregnancies. Poor psychological health resulted from 37 people's (10.2%) inadequate Awareness. Even though 139 (38.4%) had spent more than 15 minutes receiving education from medical staff and 200 (61.5%) had attended the prenatal care clinic more than four times, most lacked adequate knowledge. The variables education level ($P=0.000$), working status ($P=0.022$), and place of residence ($P=0.044$) showed a statistically significant association with the knowledge level, also only education level statistically significantly affected the likelihood of knowledge gaps. In conclusion, early identification of obstetric warning signs and associated risk factors of pregnancy complications is integral to prevention.

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1. Introduction

Pregnancy is a special time in the lives of women and their families because it reveals their unique, creative, and nurturing qualities as they endeavor to build a bridge to the future [1]. Nonetheless, obstetric warning signs, i.e., unanticipated signs resulting in maternal complications, may occur. These symptoms include severe vaginal bleeding, a gush or leak of amniotic fluid from the vagina, persistent vomiting, dull low back pain, severe diarrhea with intestinal cramping, severe persistent abdominal pain, edema of the face, hands, or feet, recurrent severe headaches, blurred vision, and pain or burning sensation

when urinating. In fact, unvaccinated patients with German measles or chickenpox exhibited fetal movement changes, high-grade fever ($>38^{\circ}\text{C}$), sudden weight loss or gain, elevated blood pressure, the vaginal passage of tissue, vertigo or fainting, dysuria/oliguria/anuria, and anemia [2-5].

All women must be aware of the risk factors of pregnancy complications and the adverse maternal and fetal health consequences to take appropriate preventive actions and management approaches that will yield a positive pregnancy outcome. Maternal risk factors include marked obesity, overweight, underweight, polycystic ovary syndrome, age <18 years or >35 years, subfertility, twin pregnancy, parity of >5 , surgical or medical history (e.g., diabetes mellitus; hypertension; cardiac disease; and hemolysis, elevated liver enzymes, and low platelets syndrome), obstetric history (e.g., uterine rupture, previous uterine surgery, disseminated intravascular coagulation, pregnancy-induced hypertension), family history (pregnancy complications), anemia, unsafe work environment, smoking, low education level, low use of health services, distance from a health care facility, domestic or other forms of abuse, inadequate support system, low family income, lack of antenatal care, and high caffeine intake [3]. In addition, Obstetric complications in previous pregnancies, health education, primiparity or multiparity, religion, and educated partner can also be risk factors [4, 6-9].

Enabling pregnant women and their families to recognize the warning signs of pregnancy complications is a primary step toward accepting appropriate and timely obstetric and newborn care referrals, thereby avoiding maternal and fetal/neonatal life-threatening complications [2, 4, 10, 11].

Not all women consider pregnancy complications abnormal due to the lack of perception regarding important obstetric warning signs. Thus, many unrecognized signs could be the leading cause of maternal death [12]. In Jordan, a cross-sectional study reported that 84.8% of 350 pregnant women aged ≥ 15 years were unaware of obstetric warning signs, which is a high percentage. This study defined Awareness of obstetric warning signs as being aware of at least four signs of pregnancy complications. Considering such results, the authors recommended that healthcare decision-makers implement more appropriate educational programs to increase the awareness level of women and decrease maternal mortality and morbidity rates. They also found an apparent gap between health education and pregnancy outcomes. Providing sufficient antenatal education to such women is also necessary to improve their knowledge, ensure safe motherhood, and reduce the rates of maternal mortality and morbidity [5].

In Tanzania, women's Awareness was assessed for obstetric warning signs and identified some associated factors. In their study, almost half of their 1118 participants (51.1%) were only aware of one warning sign (51.1%), and 26% knew at least one. Vaginal bleeding was the most common visible sign. These results revealed the low Level of Awareness of Tanzanian women and highlighted the need to conduct educational programs to increase their Level of Knowledge regarding obstetric warning signs [11]. While in another study, results showed a low proportion of women knowledgeable about such warning signs. Therefore, they recommended designing and distributing maternal health booklets highlighting the obstetric warning signs and encouraging antenatal care providers and community health workers to provide frequent health education to increase pregnant women's Knowledge about such signs [2].

In 2010, Ethiopia adopted a strategy to empower women, their families, and communities to recognize pregnancy-related risk factors. One of its primary purposes was to ensure that approximately 80% of families should know at least three obstetric warning signs by the year 2010. However, despite the emphasis given by the national strategy, the current Level of Knowledge and the influencing factors remain unclear. Therefore, many studies aimed to fill this gap by assessing current knowledge about warning signs among pregnant women in their respective areas. Unfortunately, results showed that women's

knowledge levels remain low, possibly hampering access to obstetric care when they encounter obstetric complications [13].

Educated women understand different health issues, have better exposure to information resources, and make more sound decisions than uneducated women. However, according to the abovementioned Jordanian study, young age, low education level, unemployment, and family size (<5 members) are factors that are significantly associated with low Awareness of pregnancy complications ($P < .001$) [5].

Another study showed that the awareness level was higher among older, multigravida, and multipara women because they gained important information from their pregnancy and delivery experiences. Additionally, educated working women were more aware of warning signs than uneducated ones. However, 90% of these pregnant women attended antenatal visits, and only very few received information, education, and communication about antenatal care from their healthcare providers [14]. Also, it was found that age and education affected the awareness level of Ugandan women [15]. Furthermore, many emergency obstetric care services were unavailable. For example, some units did not have running water, electricity, or a functional operating theater [16]. Additionally, some women still adhered to traditional birth practices and believed that pregnancy is a test of endurance and that death is an unfortunate but regular event. Mistreatment and negligence in hospitals and viewing women as ignorant forced these women to consider a final resort carefully [17].

In Saudi Arabia, it was reported that the most significant identified barriers to utilizing antenatal clinic (ANC) services were high stress, previous negative ANC experience, unplanned pregnancy, and short birth intervals. Conversely, women with adequate ANC visits were more likely to have planned pregnancies and be aware of available ANC services and obstetric warning signs. Perinatal mortality is lower in Saudi Arabia's private setup than in the public setup. As a result, the socioeconomic and demographic characteristics of the population served by the public and private sectors are different, and the quality of treatment offered by each sector also varies [18].

According to the antenatal care model of Tanzania, 46 minutes should be allotted to each antenatal woman to meet the World Health Organization (WHO) standards [19]. These studies showed that the problem is global and not only in Saudi Arabia, reflecting a low level of knowledge about obstetric warning signs, poor antenatal educational services provided, and the urgent need for extensive educational programs and interventions during such critical periods.

The present study is the first to assess the knowledge level of pregnant Saudi women regarding obstetric warning signs and the associated risk factors. The findings of this study will highlight the importance of integrating health education as one of the roles of nurses and other health care providers. In addition, healthcare professionals also need proper pregnancy-related health educational strategies at antenatal healthcare institutions in Saudi Arabia to increase Awareness among Saudi women to prevent complications and promote normal pregnancy and outcomes [19].

2. Materials and Methods

The Cross-sectional study was conducted among antenatal women visiting a tertiary care Maternity hospital in Riyadh from August 2020 to March 2021. The inclusion criteria were Saudi women aged ≥ 18 years, currently pregnant regardless of the gestational age, literate in Arabic, low-risk pregnancy, and no history of pregnancy complications with written informed consent to participate in the study. Those who refused to partake in the study were admitted to the hospital's prenatal department due to prenatal issues or had psychiatric disorders were excluded.

Following the convenience sampling method, data were collected on the days scheduled for antenatal care, and participants were asked to complete a structured questionnaire while waiting for their appointment without any intervention within 15-25 minutes.

After completing the questionnaire, each participant received a leaflet to expand their awareness of obstetric warning signals.

2.1. Measurement Tool

A structured questionnaire based on an extensive review of relevant literature was developed by the researchers—this questionnaire comprised two sections. Section 1 was based on sociodemographic, obstetric, and gynecologic information. This data includes age, educational level, occupation, family income, place of residence, gravidity, parity, number of antenatal visits, and presence of pregnancy-related health problems.

Section 2 comprised 60 questions and was divided into two parts: Part A comprising 20 closed-ended questions, and Part B comprising 40 Yes/No questions divided into two scales. Scale 1 had 21 Yes/No questions related to the Knowledge of obstetric warning signs, and Scale 2 had 19 Yes/No questions related to the Knowledge of high-risk mothers. Every correct answer corresponds to 1 point, and every wrong answer to 0 points. Thus, the maximum possible score was 21 and 19 for Scales 1 and 2, respectively.

2.2. Validation of Tool

The questionnaire was translated from English to Arabic and back translated by freelance English and Arabic literature. The agreement among the three experienced researchers in obstetrics and gynecology, with a kappa value of 0.98, served as a test of the tool's content validity. Their suggestions were included, and the face validity of the tool was done by a pilot study among 10 participants from a different region, revised based on some limitations in conducting the study, and finally attained the current questionnaire. The tool's reliability was tested with the data obtained from the pilot study and the data from 10 women from the main study with a Cronbach's alpha of 0.97.

2.3. Sample Size

For the present study, the researchers assumed that 50% (P) of the antenatal women would know the obstetric warning signs and associated risk factors. For $\alpha = 5\%$, $\beta = 15\%$, 95% confidence limit, Limit of accuracy $L=15\%$, and a Power of $(1 - \beta) = 85\%$, using the formula below, the minimum required sample size was estimated as 170. However, we had 362 participants in this study.

$$N = \frac{Z\alpha^2(P)(1-P)}{[L\%(P)]^2}$$

2.4. Statistical Analysis

The data was analyzed using (IBM SPSS Statistics for Windows version 25.0. Armonk, NY: IBM Corp). The Part I-demographic variables and Part II-Obstetric history were presented as frequencies and percentages. In Part III-level of Knowledge, from item 25 to 45, each correct response favoring the obstetric warning signs and risk factors for pregnancy complications were provided a score of '1'. Hence the total score was 92. The Knowledge Score out of 92 obtained by each woman was estimated and converted to a percentage. Researchers assessed the Level of Knowledge as 'INADEQUATE' if the Knowledge Score was less than 50% or 'ADEQUATE' if it was 50% or more.

The Chi-Square test was performed to determine the relationship between demographic factors, Obstetric history, and Level of Knowledge. Researchers also quantified the exposure variables in Parts I and II, and Pearson/Spearman correlation was computed using every participant's precise scores. The mean, standard deviation, and P-value were used to quantify the results. The Level of Knowledge (Inadequate/Adequate) was used as the dependent variable in the Univariate and Multivariate Binary Logistic Regression Analysis, and the elements from Parts I and II were used as the independent variables.

The Regression coefficients with Odds Ratio (OR) with a 95% confidence interval for univariate analysis and Adjusted Odds Ratio for multivariate analysis were interpreted. All the tests were applied for and observed for their statistical significance at a 5% level.

3. Results

The majority of participants, 197 (82%) of 362, were between 21-30 years, with an average age of 30.3 ± 0.37 (mean \pm SD). Two hundred and forty-six of them had an education diploma or less. One hundred and fifty-five (42.9%) never worked, and the rest worked either in Schools or Private companies. Nearly 78% had a family income above SAR 5000/- per month, and a majority, 72%, had family members of four or fewer. **Table 1** shows the participants' demographic characteristics and knowledge level regarding obstetric warning signs and associated risk factors.

Table 1. Sociodemographic characteristics of the participants along with the knowledge level regarding obstetric warning signs and associated risk factors (N=362)

Demographic Characteristics		n (%)	Knowledge Level		Demographic Characteristics		n (%)	Knowledge Level	
			Inadequate	Adequate				Inadequate	Adequate
Age	< 20	33(9.1%)	30(8.3%)	3(0.8%)	Number of family members	2-Jan	114(31.5%)	82(22.7%)	32(8.8%)
	20 - 30	149(41.2%)	112(30.9%)	37(10.2%)		4-Mar	148(40.9%)	111(30.7%)	37(10.2%)
	31- 40	148(40.9%)	103(28.5%)	45(12.4%)		7-May	77(21.3%)	57(15.7%)	20(5.5%)
	>40	32(8.8%)	25(6.9%)	7(1.9%)		≥ 8	23(6.4%)	20(5.5%)	3(0.8%)
Level of Education	Secondary or below	172(47.5%)	148(40.9%)	24(6.6%)	Family monthly income (SAR)	< 5000	73(20.3%)	62(17.2%)	14(3.9%)
	Diploma	74(20.4%)	53(14.6%)	21(5.8%)		5000 - 8000	160(44.3%)	120(33.1%)	40(11%)
	University	102(28.2%)	61(16.9%)	41(11.3%)		>8000	125(34.5%)	88(24.3%)	38(10.5%)
	Graduate	14(3.9%)	8(2.2%)	6(1.7%)	History of chronic illness	Yes	91(25.1%)	69(19.2%)	22(6.1%)
Working Status	Working currently	115(31.9%)	81(22.4%)	34(9.4%)		No	268(74%)	199(55.3%)	70(19.4%)
	Working in the past	91(25.2%)	62(17.2%)	29(8%)	Type of Chronic illness	DM and HTN	4(1.1%)	4(1.1%)	0
	Never Worked	155(42.9%)	127(35.2%)	28(7.8%)		DM and Thyroid disease	2(6%)	2(0.6%)	0
Place of Work	Schools	42(26.8%)	27(17.2%)	15(9.6%)		DM and others	1(0.3%)	0	1(0.3%)
	Hospitals	65(41.4%)	44(28%)	21(13.4%)	HTN and Thyroid disease	1(0.3%)	1(0.3%)	0	
	Private Company	49(31.8%)	36(22.9%)	14(8.9%)	Travel time from home to the hospital	< 30 minutes	111(30.7%)	84(23.2%)	27(7.5%)
Place of residence	City	32(8.8%)	30(8.3%)	3(0.8%)		≥ 30 minutes	251(69.3%)	186(51.4%)	65(18%)
	Village	329(91.2%)	240(66.3%)	89(24.6%)	Travel time from home to the nearest health care center	10 -15 minutes	172(47.5%)	133(36.7%)	39(10.8%)
						≥ 15 minutes	189(52.2%)	137(37.8%)	53(14.7%)

We observed only 92(25.4%) had adequate Knowledge, which is presented in **Figure 1** for different levels of education. Additionally, most of them were living in villages (91.2%), had no history of chronic illness (74.0%), and reported the time duration from their home to reach the hospital was 30 minutes or more (69.3%).

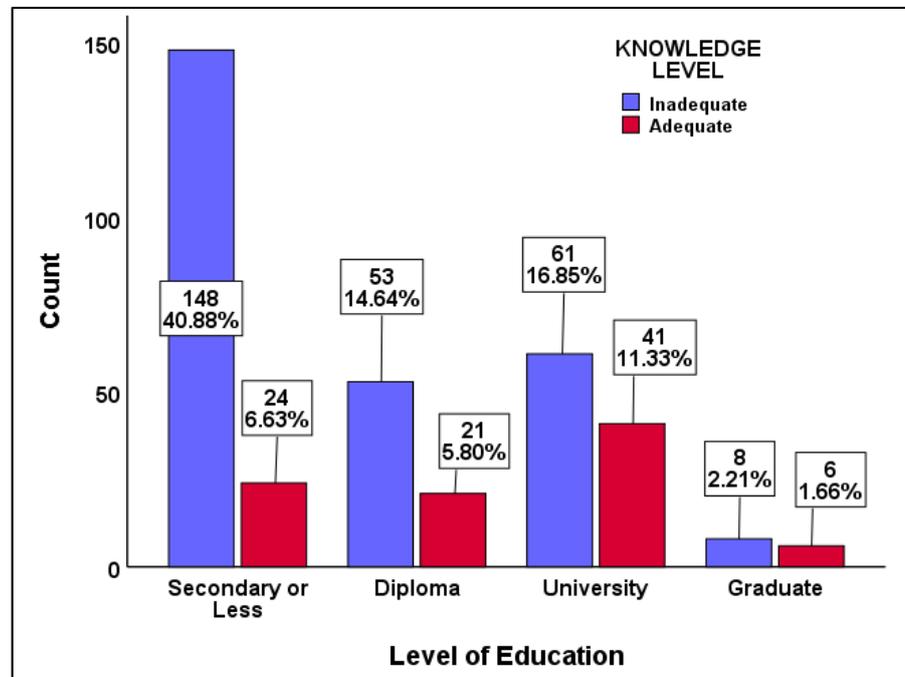


Figure 1. The Knowledge level about Obstetric warning signs and associated risk factors of the participants based on their Level of education (N=362).

Table 2 summarizes the participants' obstetric history and awareness level about obstetric warning signs and associated risk factors. The majority (76.2%) had 1 to 4 pregnancies, but 202 (55.8%) had inadequate knowledge. The inadequacy of awareness among 37 (10.2%) resulted in poor psychological health. Two hundred and twenty-two (61.5%) had no history of abortion, and even though 57.6% had visited the antenatal care clinic more than four times, and 139 (38.4%) had received education from the health care personnel more than 15 minutes, the majority were lacking adequate knowledge. Furthermore, the participants were mostly between 28 and 36 gestational weeks (47.4%) and had delivered healthy babies (90.0%).

Table 2. The participants' obstetric history and knowledge level about obstetric warning signs and associated risk factors (N=362).

Variables		n (%)	Knowledge Level		Variables		n (%)	Knowledge Level	
			Inadequate	Adequate				Inadequate	Adequate
Number of pregnancies	2-Jan	138(38.1%)	105(29%)	33(9.1%)	Physical health status during previous pregnancy	Excellent	39(11.5%)	31(9.1%)	8(2.4%)
	4-Mar	138(38.1%)	97(26.8%)	41(11.3%)		Very good	134(39.4%)	102(30%)	32(9.4%)
	6-May	57(15.7%)	46(12.7%)	11(3%)		Good	134(39.4%)	97(28.5%)	37(10.9%)
	9-Jul	29(8%)	22(6.1%)	7(1.9%)		Poor	33(9.7%)	26(7.6%)	7(2.1%)
Number of Births	None	74(20.4%)	53(14.6%)	21(5.8%)	Psychological health	Excellent	43(12.7%)	38(11.2%)	6(1.8%)
	2-Jan	142(39.2%)	106(29.3%)	36(9.9%)		Very good	114(33.6%)	85(25.1%)	29(8.6%)
	4-Mar	86(23.8%)	64(17.7%)	22(6.1%)		Good	142(41.9%)	100(29.5%)	42(12.4%)

	6-May	51(14.1%)	39(10.8%)	12(3.3%)	status during previous pregnancy	Poor	39(11.5%)	32(9.4%)	7(2.1%)	
	9-Jul	9(2.5%)	8(2.2%)	1(0.3%)	Number of abortions	None	222(61.5%)	164(45.4%)	57(15.8%)	
Gestational age(weeks)	< 27	140(38.8%)	107(29.6%)	33(9.1%)		2-Jan	118(32.7%)	91(25.2%)	27(7.5%)	
	28 - 36	171(47.4%)	125(34.6%)	46(12.7%)		4-Mar	17(4.7%)	12(3.3%)	5(1.4%)	
	> 36	50(13.9%)	37(10.2%)	13(3.6%)		6-May	4(1.1%)	2(0.6%)	1(0.3%)	
Physical health status during current pregnancy -	Excellent	45(12.5%)	35(9.7%)	10(2.8%)	Number of babies born with health problems	9-Jul	1(0.3%)	2(0.6%)	1(0.3%)	
	Very good	129(35.7%)	95(26.3%)	34(9.4%)		None	324(90%)	241(66.9%)	26(7.2%)	83(23.1%)
	Good	161(44.6%)	118(32.7%)	43(11.9%)		1	34(9.4%)	241(66.9%)	26(7.2%)	8(2.2%)
	Poor	26(7.2%)	21(5.8%)	5(1.4%)		2	2(0.6%)	241(66.9%)	26(7.2%)	1(0.3%)
Psychological health status during current pregnancy	Excellent	44(12.2%)	38(10.5%)	6(1.7%)	Infant health problems (if present)	Congenital malformation	3(8.8%)	3(8.8%)	0	
	Very good	115(31.9%)	81(22.4%)	34(9.4%)		Small for gestational age	9(26.5%)	9(26.5%)	0	
	Good	154(42.7%)	113(31.3%)	41(11.4%)		Mental retardation	6(17.6%)	3(8.8%)	3(8.8%)	
	Poor	48(13.3%)	37(10.2%)	11(3%)		others	15(44.1%)	11(32.4%)	4(11.8%)	
Number of antenatal visits during current and previous pregnancies	< 4 visits	151(41.8%)	122(33.8%)	29(8%)	Time spent by the health care provider to provide education -	< 15 minutes	222(61.3%)	163(45%)	59(16.3%)	
	≥ 4 visits	208(57.6%)	146(40.4%)	62(17.2%)		15 - 30 minutes	127(35.1%)	97(26.8%)	30(8.3%)	
						≥ 30 minutes	12(3.3%)	9(2.5%)	3(0.8%)	

The variables education level ($P=0.000$), working status ($P=0.022$), and place of residence ($P=0.044$) showed a statistically significant association with the knowledge level. When the demographic and obstetric history variables were quantified and applied in the univariate binary logistic regression model, we observed that women with less than university level had a 1.34 times risk of inadequate Knowledge compared to graduates. Those who worked in Schools and private companies had 1.37 times the risk compared to an employee from hospitals. As village residents, they had the highest risk of 3.7 times, and if their psychological status during the current pregnancy was poor, they were at 2.65 times the risk of inadequate Knowledge. **Table 3** depicts the risk factors related to the knowledge level. When these four factors were applied in the multivariate binary logistic

regression model for the combined effect, we observed that only education level statistically significantly influenced the risk of lacking in their knowledge level.

Table 3. Univariate and Multivariate Logistic Regression model for the Knowledge level of the participants (N=362)

Variables	Univariate			Multivariate		
	Regression Coefficient	OR (95%CI)	p-value	Regression Coefficient	Adjusted OR (95%CI)	p-value
Education in years (University or less)	0.293	1.34* (1.18 - 1.51)	0.000*	0.27	1.31* (1.14 - 1.51)	0.000*
Occupation (Schools, Private companies)	0.32	1.37* (1.04 - 1.81)	0.023*	0.06	0.94 (0.67 - 1.31)	0.727
Residence (Village)	1.31	3.70* (1.10 - 12.45)	0.034*	0.91	0.4 (0.11 - 1.38)	0.149
Psychological status during the current pregnancy (Poor)	0.978	2.65* (1.02 - 6.87)	0.044*	0.122	1.13 (0.51 - 2.48)	0.762

OR-Odds Ratio; *Statistically Significant at 5% level.

4. Discussion

KSMC is considered a referral center within cluster one in the Riyadh region, with 6000 deliveries and approximately 18,389 maternity clinic visits annually, according to KSMC statistics in 2020. Maternity clinics provide education, screening, and medical consultation services for pregnant and non-pregnant women. Education is provided by physicians, nurses, and allied health practitioners. The maternity clinics in KSMC offer such services to populations within and outside Riyadh. However, our study included participants mostly from villages outside Riyadh city, owing to the lack of specialized clinics in their respective areas. In addition, the majority of our participants were homemakers. According to national estimates by the General Authority for Statistics (GASTAT) based on the Labor Force Survey, the unemployment rate of women in Saudi Arabia was 20.2% in the fourth quarter of 2020 [20].

This study's important finding showed that most of our participants (74.6%) were unaware of the early warning signs and associated risk factors of pregnancy complications. This high percentage could be explained by the fact that most of them only finished secondary education or less and lived in villages. Additionally, most reported that 61.3% of healthcare providers spent less than 15 minutes providing education. Again, this percentage seems very high compared with those of other studies.

Studies conducted in India and Tanzania showed poor Knowledge about obstetric danger signs among women because of the lack of exposure to formal health counseling [2, 21]. A study conducted in 4 countries (Argentina, Cuba, Thailand, and Saudi Arabia) found that women wanted more information on the psychosocial aspects of pregnancy [22]. Moreover, studies of maternal deaths suggested that low levels of Awareness of dangerous signs of pregnancy and delivery lead to high maternal mortality rates [23]. Health education and counseling are identified as the significant gap between the current performance and the proper performance of focused ANCs [24]. In 4 developing countries, pregnant women reported that although their physicians were their primary source of information, nurses provided most of the data [25].

However, statistics revealed that Saudi women constitute 51.8% of Saudi university students, with 551,000 women studying for their bachelor's degrees compared with 513,000 men. Most of our patients attended more than four ANCs during their pregnancy,

in line with the internal recommendation. However, the WHO recommendation increased the required number of antenatal visits to at least eight [23]. Other studies found that 81.1% of pregnant women in Canada [26] and 93% of those in Italy attended at least four antenatal visits [27].

According to one study from the Riyadh region, 48% of women did not attend at least one antenatal visit, and 34% started late antenatal visits [6]. In the Madinah region, 80% of pregnant women followed their antenatal visit schedule regularly, 16% had irregular visits, and 4% did not attend [23]. Our study showed that 38.1% had 1 to 4 pregnancies, and the majority (61.2%) did not have incidences of abortion. This finding is comparable to other reports that showed that Saudi women's fertility rate was 2.58 in 2015 [20]. Many Saudi women even desired to have large families [27].

Nurses should have adequate Knowledge and understanding of pregnancy complications to advise women appropriately on strategies to help them cope with their condition and minimize the adverse effects. In addition, a good deal of risk will allow the formulation of care plans specific to the population's needs and assist nurses in bridging the gap in communication between the provider's and pregnant woman's interpretation of risk [28].

Educating nurses can be best achieved by incorporating health information dissemination and client counseling using advanced educational technology integrated into the curriculum. For example, group discussion, brainstorming, audiovisual materials, and PowerPoint presentations can be very useful. In addition, training courses and in-service educational programs should be organized for nurses working with pregnant women.

Antenatal care mainly aims to maintain the physiology of pregnancy, and to prevent or detect and treat any untoward complications that may arise. Knowledge about risks associated with pregnancy among women can help them seek maternal care services at the right time, thereby reducing maternal mortality and morbidity. Hence, health education should be regarded as a primary function of health care providers to promote health among antenatal women and attain optimum well-being.

5. Conclusions

Pregnant women in KSMC were poorly aware of the early warning signs and associated risk factors of pregnancy complications despite having access to free antenatal care. Thus, providing information, education, and national campaigns targeting women, families, and the general community is recommended. In addition, social media can be helpful for information dissemination.

5.1. Recommendations

There is a need for extensive and in-depth nursing research in maternal education, particularly for the early detection and prevention of pregnancy and childbirth complications. Moreover, it is possible to replicate the study on a larger sample to confirm the findings and generalize. However, healthcare providers must integrate health education into their care for pregnant women in KSMC antenatal clinics. It is imperative to develop health-promoting programs based on pregnant women's requirements. The preparation of innovative teaching methods, improved nursing care practices, developmental goods, and effective teaching material, as well as the establishment of multimedia centers for client education, should be the subject of research.

5.2. Study Limitations

The strength of this study is that it was conducted in a tertiary referral center in Riyadh. However, the limitations were the use of a cross-sectional design with no national baseline information, and it was focused on one center only, limiting the generalizability of study results. Moreover, Self-administered questionnaires are subject to self-report bias.

5.3. Ethical approval

Ethical approval for this study was obtained from the institutional review board of the Ministry of Health, King Saud Medical City (KSMC), Saudi Arabia (IRB Registration Number with KACST, KSA: H-01-R-053, IRB Registration Number U.S. Department of HHS IORG #: IORG0010374). All procedures performed in studies involving the patients were by the ethical standards of the governmental guidelines and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

5.4. Informed consent

Written informed consent was obtained from the participants.

Supplementary Materials: N/A.

Author Contributions: NMA had a substantial contribution to the concept and design and has the correspondence. MA drafted the article. AH revised and proofread the manuscript. MB conducted the statistical analysis. FA reviewed the references and helped in data collection. All authors actively participated in the acquisition of data and have read and approved the final draft of the manuscript for publishing.

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