ORIGINAL ARTICLE

Miscarriage Prevalence and Public Perceptions in Eastern Province of Saudi Arabia

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ABSTRACT

Objective: To determine the prevalence and measure the perceptions of women regarding causes, emotional feelings, and emotional support following a miscarriage.

Study Design: Descriptive cross-sectional.

Place and Duration of the Study: The study was conducted in the eastern province of the Kingdom of Saudi Arabia from 15th May 2023 to 30th August 2023.

Materials and Methods: This cross-sectional study was conducted among women living in the eastern province of Saudi Arabia. A self-administered Arabic questionnaire was sent to the eastern population using Social Media platforms. Data was analyzed in Software Sciences (SPSS) version 26.

Results: A total of 402 women responded, and 32.3% (130) were aged between 26 and 35 years.

57% (229) had a history of miscarriage and 26.2% (60) encountered recurrent miscarriages.

Of the miscarried pregnancies 53.7% (216) were planned pregnancies. Approximately 78.4% (78) of women received medical care and (176) reported a miscarriage less than 7 weeks of pregnancy, The common perceived causes of miscarriage were spiritual 89.1% (358) and lifting heavy objects 60.3% (242). Almost 70.7% (284) had average emotional support after miscarriage, 16.2% (65) had high, and only 13.1% (52) had low emotional support received. Factors that influenced emotional support were the increasing parity, without a family history of miscarriage and repeated miscarriages (p<0.05).

Conclusion: A high prevalence of miscarriage is recorded in Saudi Arabia's eastern province, with perceived causes encompassing destiny, lifting heavy objects, and fetal genetic abnormalities. Identifying causes is vital for improving awareness and effective counseling and support at healthcare facilities.

Key Words: *Healthcare, Miscarriage, Perceptions, Prevalence.*

Introduction

Miscarriage of a pregnancy is a distressing event that can have significant physical and emotional consequences for women and their families worldwide.[1] Miscarriage or Abortion is described as a loss of a pregnancy before the age of viability which is defined as before 20 and 24 weeks of gestation as per the American College and Royal College of Obstetricians and Gynecologists respectively (ACOG and RCOG).[2,3] In Western countries, such as the United States and the United Kingdom the reported occurrence of miscarriage is approximately 11% to 25% of clinically recognized pregnancies.[3] The causes of sporadic and recurrent miscarriages (defined as two or more consecutive miscarriages) are well established and include chromosomal abnormalities, infections, environmental and immunological factors, uterine anomalies, fibroids, and polycystic ovarian syndrome.[2] Public understanding of these causes is often lacking, leading to widespread misconceptions.[4] These misunderstandings, encompass notions like the rarity of miscarriages, the potential link to lifting heavy objects, and the mistaken belief that there are no effective preventive treatments, which can be detrimental.[5,6] Experiencing a miscarriage often leads to psychological effects leading to isolation, with many women opting not to share the loss with family and friends and feeling ostracised.[7] Adequate counseling from healthcare professionals is essential to cope with grief.[8,9]

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Across the globe, several aspects are assessed, taking into account different regions and cultural contexts that may impact perceptions toward miscarriage.[9,10] Additionally in the hospital emergency room (ER), women displaying signs and symptoms of miscarriage are subjected to prolonged waiting, conveying a perception of marginalization.[11] Unfortunately, the demanding schedules at hospitals often hinder health professionals from conducting these awareness sessions adequately. Consequently, proposing an internet-based medical forum emerges as a viable alternative to effectively address and clarify these concerns and rectify their weird perceptions about the causes of miscarriages. Also will provide an effective opportunity for bereavement counseling.[12]

Limited research on miscarriage is available in the published literature from the Kingdom of Saudi Arabia (KSA). A study in the eastern province has primarily focused on the etiology and management of recurrent miscarriages.[13,14] Another study in the western province of Saudi Arabia has assessed women's miscarriage experience and perception.[20]

The prevalence and perceptions of miscarriage probably still have not been searched in all provinces of KSA. The eastern province of KSA, with its distinct socio-cultural characteristics, represents a unique setting to explore the prevalence of miscarriage and the public's perceptions of this phenomenon. The objective of the current study was to determine the prevalence of miscarriage and evaluate women's perceptions regarding the causes and emotional support received during miscarriage in the Eastern Province of Saudi Arabia. This assessment can illuminate cultural norms, and societal and personal perspectives, as well as the adequacy of counseling and support provided at healthcare facilities, facilitating the customization of support services and interventions to better address the needs of affected individuals and communities.

Materials and Methods

This research employed a cross-sectional study design and collected responses through an online self-administered questionnaire from 15th May to 30th August 2023 in the Eastern Province of Saudi Arabia utilizing convenience sampling. The ethical approval for the study was retrieved from the King Faisal University Research Deanship (KFU-REC-2022-NOV-ETHICS348). The minimum 385 sample size was calculated with a 95% Confidence Interval and a 5% margin of error. The inclusion criteria for participation in the study were married women aged 18 years or older who have experienced a miscarriage and reside in the Eastern Province. Females below 18 years old, without miscarriage events, and living in other provinces were excluded from the study. The questionnaire was taken from a published survey in 2015[10] which was modified and developed according to the religious and cultural aspects of Saudi Arabia. Later it was translated to the native Arabic language by the language experts and pilot-tested for its validity. The questionnaire included socio-demographic items, general and obstetric information, emotional support statements after a miscarriage on a 5-point Likert scale, perception statements for a cause of miscarriage on a 3-Likert scale, and feeling statements on a 3-point Likert scale.

The emotional support after miscarriage has been assessed using a 9-item questionnaire, a 5-point Likert scale category ranging from "strongly disagree," coded with 1, to "strongly agree," coded with 5 as an affirmative or positive emotional support. Negative questions have been re-coded inversely to avoid bias in the score. The total emotional support score has been calculated by adding all 9 items. Scores ranging from 9 to 45 points have been generated. The higher the score, the higher the emotional support. By employing 50% and 75% as cutoffs to assess the extent of emotional support. Respondents were considered as having low emotional support if the total score was less than 50%, while 50% to 75% were considered average, and a score of above 75% was considered as high emotional support.

The questionnaire was sent online to the eastern province population using Social Media platforms. The objectives of the study were explained to the participants before responding to the questionnaire. The participants were informed that submitting a response would indicate their consent to participate.

The data were analyzed using the software program Statistical Packages for Software Sciences (SPSS) version 26 (Armonk, New York, IBM Corporation, USA). Categorical variables were presented using

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numbers and percentages in descriptive statistics, whereas mean and standard deviation were employed for the calculation and summary of continuous variables. The differences between the emotional support score and the socio-demographic characteristics of the woman have been conducted using the Mann-Whitney Z-test. The normality test (statistical collinearity) was performed using the Shapiro-Wilk test as well as the Kolmogorov-Smirnov test. According to the results, the emotional support score followed the non-normal distribution. Thus, the non-parametric test was applied. Significance was attributed to values with a *p*-value less than 0.05.

Results

A total of 402 women responded to the questionnaire, 32.3% (130) were aged between 26-35 years old, with nearly 60% (239) residing in Al-Ahsa. Most women were married (92.3%), and about half (49.5%) had more than 10,000 SAR of family monthly income. Unemployed women constituted 44.5%, whereas 66.9% (269) were bachelor's degree holders. Only one woman had no previous pregnancy history, and 19.9% had at least two children. The prevalence of women who had chronic disease was 57% (Table I). Among those who had chronic disease (N=229), the most common chronic disease was anemia 26.5% (61), followed by hypertension 24.8% (57) G6PD 19.7% (45), and Diabetes 17.9% (41).

Table I: Socio-Demographic Characteristics of the Women (N=402)

Study variables	N (%)
Age	
• 18 – 25 years	60 (14.9%)
• 26 – 35 years	130 (32.3%)
• 36 – 45 years	121 (30.1%)
• >45 years	91 (22.6%)
City of residence	
• Al Ahsa	239 (59.5%)
• Dammam	58 (14.4%)
• Khobar	37 (9.2%)
• Qatif	51 (12.7%)
• Jubail	10 (2.4%)
• Abqaiq	07(1.7%)
Marital status	
• Married	371 (92.3%)
• Divorced or widowed	31 (07.7%)
Family monthly income (SAR)	
• <5,000	50 (12.4%)
• 5,000 – 10,000	153 (38.1%)
• >10,000	199 (49.5%)
Occupational status	
• Student	41 (10.2%)
• Employed	163 (40.5%)
• Retired	19 (04.7%)
• Unemployed	179 (44.5%)
Educational level	
• Illiterate	05 (01.2%)
• Less than high school	12 (03.0%)
• High school	78 (19.4%)
• Bachelor's degree	269 (66.9%)
• Master's degree	25 (06.2%)
• PhD or higher	13 (03.2%)
Have ever been pregnant?	
• Yes	401 (99.8%)
• No	01 (0.20%)
Number of children	
• None	25 (06.2%)
• One	60 (14.9%)
• Two	80 (19.9%)
• Three	71 (17.7%)
• Four	64 (15.9%)
• Five	39 (09.7%)
• Six	38 (09.5%)
• More than 6	25 (06.2%)
Chronic disease	
• Yes	229 (57.0%)
• No	173 (43.0%)

In Table II, the prevalence of miscarriage was 57%. Among those who had a miscarriage, 26.2% had encountered repeated (recurrent) miscarriages. Of the miscarried pregnancies 53.7% were planned pregnancies. Approximately 43.7% had reported a miscarriage of less than 7 weeks of pregnancy, 78.4% of women who experienced a miscarriage received medical care and 78.4% had recorded a family history of miscarriage. Furthermore, respondents believed that fate and medical illness 30.1% were the most common causes of miscarriage.

In the assessment of emotional support and feeling after a miscarriage (Table III), the highest ratings were seen in the statement "I received appropriate emotional support from my partner." (mean score: 4.03), followed by the statement "I received appropriate emotional support from those I told." (mean score: 3.98) and "I felt ashamed" (mean score: 3.45). The overall mean score was 28.7 (SD ±

Table II: Obstetric Characteristics and Causes of Miscarriage (N=402)

Characteristics	N (%)
Previous history of miscarriage	
• Yes	229 (57.0%)
• No	173 (43.0%)
Frequency of miscarriage	
• None	173 (43.0%)
• One	127 (31.6%)
• Two	58 (14.4%)
• Three	18 (04.5%)
• More than three	26 (06.5%)
Have there been repeated miscarriages? (two or more consecutive miscarriages)	
• Yes	60 (26.2%)
• No	169 (73.8%)
Was the miscarried pregnancy a planned pregnancy? (N=229)	
• Yes	123 (53.7%)
• No	106 (46.3%)
When did the miscarriage occur? (N=229)	
• Less than 7 weeks	100 (43.7%)
• Between 7 - 14 weeks	96 (41.9%)
• Greater than 14 weeks	33 (14.4%)
Did you get medical care for your miscarriage? (N=229)	
• Yes	175 (76.4%)
• No	54 (23.6%)
Family history of miscarriage	
• Yes	315 (78.4%)
• No	87 (21.6%)
What do you think **one** of the most common causes of miscarriage? (select only one from the following)	
• Fate	121 (30.1%)
• Medical factors (examples include hormones, uterus)	120 (29.9%)
• Genetic and hereditary factors (examples include genetic problems in the fetus and syndromes)	99 (24.6%)
• Psychological problems (examples include a stressful event, depression, the mother not wanting to become pregnant)	41 (10.2%)
• Lifestyle (examples include drugs, alcohol, and smoking during pregnancy)	18 (04.5%)
• Punishment from God	03 (0.70%)

5.13), with low, average, and high emotional support constituting 13.1%, 70.7%, and 16.2%, respectively. Response has a range from "strongly disagree" coded with 1 to "strongly agree" coded with 5.

In Figure 1, based on participants' ratings, the top three most common perceived causes of miscarriage were spiritual cases such as destiny or fate (agree: 89.1%), lifting heavy objects (agree: 60.3%), and

Table III: Assessment of Emotional Support and Feeling after a Miscarriage (N=229)

Statement	Mean ± SD
1. I received appropriate emotional support from those I told	3.98 ± 0.88
2. I received appropriate emotional support from my partner	4.03 ± 1.02
3. The medical facility provided appropriate medical support	3.26 ± 1.68
4. The medical facility provided adequate emotional support	2.41 ± 1.62
5. I felt guilty †	2.81 ± 1.34
6. I felt alone †	2.76 ± 1.30
7. I felt ashamed †	3.45 ± 1.27
8. I feel I did something wrong which caused the miscarriage †	2.98 ± 1.38
9. I feel that I could have prevented the miscarriage	3.00 ± 1.39
Total Emotional Support Score	**28.7 ± 5.13**
Level of emotional support	
• Low	30 (13.1%)
• Average	162 (70.7%)
• High	37 (16.2%)

† Reversed coded question.

genetic abnormalities of the fetus (agree: 58.5%), punishment from God had the least ratings (agree: 3.5%)

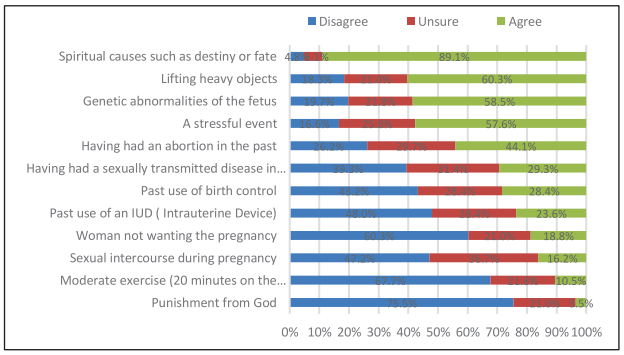

Figure 1: Perceived Most Common Causes of Miscarriage

In the combined Figure 2 responses were recorded on five and three point Likert scales.The first figure showed that 17.9% strongly agreed that they would feel less alone if a friend or family member had suffered the same miscarriage, while 24.9% agreed. When enquired about the emotional impact of miscarriage only 3.1% would feel extremely upset emotionally if they suffered a miscarriage, while 10.5% could be moderately upset shown in the second figure. Also, 79% of women would like to know the cause of miscarriage so that they could do

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something to prevent it from happening in the future, while 72.1% would like to know even if they could not do something to prevent it from happening again. When asked if they would want to know the cause of a miscarriage, regardless of prevention possibilities, 79% of women expressed interest in knowing to take preventive measures, while 72.1% indicated they would want to know even if they could not do something to prevent it from happening again displayed in the third figure.

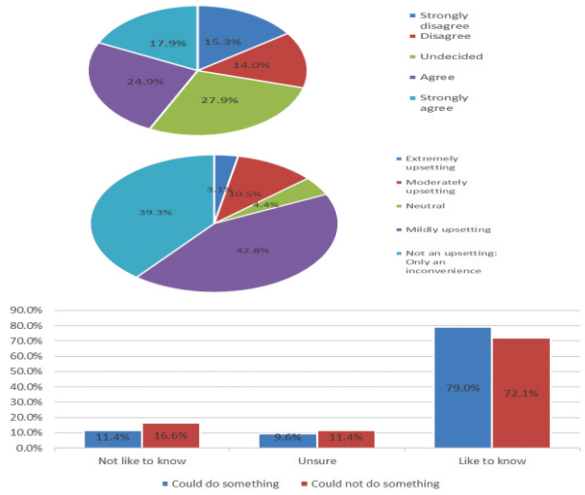

Figure 2: Participants' Response to Three Emotionally Based Questions on Five and Three-Point Likert Scales.

When measuring the association between the emotional support score and the socio-demographic characteristics of the women who had a miscarriage (Table IV), it was found that a higher emotional score was more associated with having more than 3 children (Z=2.013; *p*=0.044), those without a family history of miscarriage (Z=2.030; *p*=0.042) and those who had no repeated miscarriage (Z=2.030; p=0.011). No statistically significant association was retrieved between miscarriages and sociodemographic characteristics, obstetrics features, and chronic diseases.

Discussion

The findings of the study revealed a high prevalence of miscarriage among women living in the Eastern Province of Saudi Arabia. Nearly 60% suffered at least one miscarriage. Of them, more than one-quarter (26.2%) experienced repeated miscarriage. This is almost consistent with the study of Taybeh et al.[15] According to reports, 53.1% experienced at least one miscarriage, 27% experienced at least two, and 19.2% had three or more incidences. On the contrary, a study by Arck et al.[16] reported lower miscarriage prevalence at 6.8%. Supporting this report, Strumpf et al.[18] documented incidences of miscarriage between 2003 and 2014 at 11.3%.

According to the study by Alam et al.[18], increasing age and better education were at higher risk for miscarriage. Corroborating these reports in Arck et al. [16] increasing age was also found associated with miscarriage, lower BMI, and repeated miscarriages were linked to higher stress/demands. However, in our study, we did not find a significant association of miscarriages with age, chronic diseases, parity, and all other socio-demographic characteristics of the

Table IV: Association Between Emotional Support Score with the Socio-Demographic Characteristics and other Study Variables of the Women who had a Miscarriage (N=229)

Factor	Emotional Support Score (45) Mean ± SD	Z-test	p-value §
Age group			
• ≤35 years	28.4 ± 4.87	0.749	0.454
• >35 years	28.9 ± 5.34		
City of residence			
• Inside Al Ahsa	28.7 ± 5.55	0.380	0.704
• Outside Al Ahsa	28.9 ± 4.64		
Marital status			
• Married	28.8 ± 5.03	0.780	0.435
• Divorced or widowed	27.3 ± 6.39		
Family monthly income (SAR)			
• ≤10,000	28.3 ± 4.98	1.266	0.206
• >10,000	29.0 ± 5.28		
Occupational status			
• Employed/Student	28.9 ± 4.87	0.768	0.433
• Unemployed/Retired	28.4 ± 5.37		
Educational level			
• High school or below	28.5 ± 5.30	0.180	0.857
• Bachelor or higher	28.7 ± 5.08		
Number of children			
• Three	28.1 ± 5.17	2.013	**0.044** **
• More than 3	29.5 ± 4.99		
Chronic disease			
• Yes	28.3 ± 4.70	0.827	0.408
• No	28.8 ± 5.32		
Family history of miscarriage			
• Yes	28.3 ± 4.99	2.030	**0.042** **
• No	30.0 ± 5.43		
Repeated miscarriage			
• Yes	27.3 ± 5.62	2.555	**0.011** **
• No	29.2 ± 4.87		

§ P-value has been calculated using Mann Whitney Z-test.
** Significant at p<0.05 level.

women, which did not coincide with aforementioned findings.

One of the hallmark findings of this study was about emotional support received and feelings after miscarriage. In this study, two-thirds of our respondents received an average emotional support score, more than one-third had a high, and a slightly lower proportion had low emotional support post-miscarriage. These findings are comparable with Taybeh et al.[15] findings where more than half had indicated receiving adequate support from their partners and families. In a study by Mayor S.[19], less than half expressed receiving emotional support, 41% thought they had done something wrong, while 38% believed they could do something to prevent it. In contrast with Mayor et al., the current study's findings showed a large number of women received emotional support and were interested in knowing the cause of a miscarriage irrespective of could or could not do anything in this matter. Similar to our finding, the majority of the respondents in a United States survey conducted by Bardos et al.[10] expressed a desire to determine the cause of miscarriage, even if they couldn't take any action to address it. This demonstrates their eagerness to acquire awareness and knowledge regarding the causes of a miscarriage.

Women with more children, no repeated miscarriages, and no family history of a miscarriage were more likely to have better emotional support scores in this study. Banno et al.[7] indicated that married educated females and healthy participants provided significantly higher correct responses to the perception questionnaire whereas in the USA survey,[10] perception and understanding of miscarriage were significantly related to the gender and their level of education.

Regarding the specific details of emotional support, the highest emotional support received based on respondents' ratings was the support provided by their partners, followed by other individual support. However, emotional feelings post-miscarriage were also seen to affect women, particularly feeling ashamed, guilty, and alone. Consistent with our results, Bano et al.[7] and Bardos et al.[10] reported that the predominant emotional responses following a miscarriage were feelings of guilt and loneliness.

Awareness about the different causes of miscarriage is necessary to eliminate different misconceptions about it. In this study, spiritual causes (destiny/fate), lifting heavy objects, genetic abnormalities of the fetus, stressful events, and previous history of abortion were the top five most perceived causes of miscarriage. In a USA[10] survey genetic abnormalities of a fetus were, a stressful event, long stress, lifting heavy, and past sexually transmitted diseases were the top five perceived causes in a USA survey.Genetic fetal malformations were correctly perceived by a heavy majority reflecting a better awareness than our participants due to the adequate availability of health issues-related information in online medical leaflets and forums. However, Mayor S[19] reported stressful events or longstanding stress as the most prominent causes of miscarriage. A study in Jeddah by Rouzi et al.[20] on the perception of causes and feelings almost aligns with the current study findings and concluded that women possessed insufficient knowledge regarding the causes of miscarriage but in contrast to our respondents, women in the mentioned study received better support from healthcare facilities. This divergence might be attributed to the possibility of more effective healthcare delivery in Jeddah.

Present study findings indicate that the emotional and medical management support offered by treating healthcare professionals was not remarkable after a miscarriage. Similarly a study conducted by Bilradi et al.[21] in Australia, the majority of women expressed dissatisfaction with emotional support, counseling services, and follow-up care provided by healthcare professionals following a miscarriage.

The dissemination of information regarding well-established causes of miscarriages is crucial to prevent individuals from engaging in self-blame, self-pity, stress escalation, and ultimately, the development of depression. Effectively delivering such sensitive awareness necessitates comprehensive counseling for those affected. This approach has the potential to elevate awareness about the causes of miscarriages, empowering individuals to navigate their loss with a positive outlook and resilience.

Conclusion

A high prevalence of miscarriage is recorded in the eastern province of Saudi Arabia. Perceived causes of

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miscarriage included destiny, lifting heavy objects, and genetic abnormalities of the fetus. Identifying the potential causes of miscarriage may positively affect the emotional state of the patients and could lead to better prevention. The study provided valuable insights that can contribute to improved healthcare services and community support structures.

Limitation of Study

As an online cross-sectional study, the findings lack generalizability, and there may be a potential for recall bias among some women.

Recommendation

Researches need to be conducted in all other provinces of Saudi Arabia to calculate a valid prevalence and perception of miscarriages which can help to devise awareness and supportive measures post-miscarriages in all health care systems throughout the country.

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CONFLICT OF INTEREST

Authors declared no conflicts of Interest.

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DATA SHARING STATMENT

The data that support the findings of this study are available from the corresponding author upon request.

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