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Original Research

Miscarriage perceptions and experiences among Saudi women

A. A. Rouzi[1], R. Alamoudi[1], J. Turkistani[1], N. Almansouri[1], S. Alkafy[1], N. Alsinani[1], A. Wazzan[1]

[1]*Department of Obstetrics and Gynecology, King Abdulaziz University, Jeddah (Saudi Arabia)*

Summary

Objectives: To assess miscarriage perceptions and experiences of Saudi women. *Materials and Methods:* Between June 1, 2015, and August 30, 2016, women attending the obstetrics and gynaecology clinics at King Abdulaziz University Hospital in Jeddah (KAUH), Saudi Arabia were asked to participate in a cross-sectional survey. Demographic information, miscarriage opinions, and perceived causes were acquired from the entire cohort. Miscarriage data were obtained from women with miscarriage experience. *Results:* In a convenience sample of 296 women aged 18 to 57 years, 247 (83.4%) had never become pregnant, of whom 81 (32.8%) had a miscarriage history. Guilt, shame, and feeling alone were reported by 35%, 14%, and 22% of women after a miscarriage, respectively, and 10% reported all three, and 47% reporting none of these feelings. Only 14 (17%) were given a medical cause for the miscarriage, of whom five (36%) believed they had done something to cause it or could have done something to prevent it, compared with 35 of 67 (52%) women who were not given a reason for their miscarriage ($p = 0.260$). In the entire cohort, the most commonly agreed to causes of miscarriage were stressful event (72%), destiny/fate (65%), long-term stress (64%), lifting (57%), and past abortion (57%). *Conclusions:* While most participants with miscarriages reported receiving adequate support, there was inadequate knowledge about the causes of miscarriage. New education and support policies are warranted, particularly with regards to behaviours that do not need to be avoided for fear of miscarriage.

Key words: Miscarriage; Knowledge; Saudi; Women; Perception; Experience.

Introduction

Miscarriage, or fetal loss at < 24 weeks of gestation, is a common complication of pregnancy [1]. In Western countries such as the United States and the United Kingdom, miscarriage has been reported to occur in 11% to 22% of clinically recognized pregnancies [2]. In a survey of 468 pregnant women in Riyadh, Saudi Arabia, approximately one-fourth had a previous miscarriage [3]. Miscarriage risk factors have been studied extensively, with occasionally variable results; however, genetic defects are widely accepted as causing more than 50% of miscarriages [4-6]. Specific medical conditions including uterine abnormalities, thrombophilias, endocrine disorders, and autoimmune disorders are often cited but may be less clearly supported. For example, large prospective studies have not shown a significant association between thrombophilias and sporadic pregnancy loss [7]. Previous miscarriage and ad-vanced maternal age increase the risk of miscarriage, with a substantially increased rate in women ≥ 35 years [7, 8]. Emerging evidence supports a significant causative impact of overweight and obesity on miscarriage, which persisted after adjustment for maternal age [2, 9, 10]. Despite these associations, identifying the specific cause of a miscarriage is often elusive. Accordingly, public perceptions of the causes of miscarriage may be founded more on folklore than on fact, which may contribute to additional emotional trauma for a woman experiencing a miscarriage. Little is known about Saudi women's experiences with and understanding of the causes of miscarriage. This information can be important for identifying healthcare needs and assuring proper support and education are provided for women who experience this common complication of pregnancy and pregnant women in general. Accordingly, the present authors performed a cross-sectional study to assess miscarriage perceptions and experiences of Saudi women attending the obstetrics and gynaecology clinics at King Abdulaziz University Hospital (KAUH) in Jeddah, Saudi Arabia.

Materials and Methods

The study was approved by the KAUH institutional review board. Married, divorced, or widowed Saudi women were recruited from women attending the KAUH obstetrics and gynaecology clinics. The survey instrument included some of the items contained in a recent online U.S. survey, [5] with adjustments made for cultural and other considerations. In addition to demographic information, participants were asked about their pregnancy and miscarriage histories. Women with more than one miscarriage were asked to provide information about their most recent miscarriage. Information was acquired on who was told about the miscarriage, the perceived level of support received, experience with negative feelings associated with the miscarriage, and whether a cause was identified. All participants were asked about their beliefs regarding the causes of miscarriage.

Personal reactions to a miscarriage were acquired on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). Emotional effect of a miscarriage ranged from 1 (extremely upsetting, like

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Table 1. — *Women Wanting to Know the Cause of Miscarriage, n (%)*

	Entire Cohort		Never Pregnant		Pregnant without Miscarriage		Pregnant with Miscarriage	
	Useful	**Not Useful**	**Useful**	**Not Useful**	**Useful**	**Not Useful**	**Useful**	**Not Useful**
4	52 (18)	50 (17)	10 (20)	12 (24)	35 (21)	29 (18)	7 (9)	9 (11)
5	209 (71)	186 (63)	37 (76)	33 (67)	110 (66)	98 (59)	62 (77)	55 (69)
T	**261 (88)**	**236 (80)**	**47 (96)**	**45 (92)**	**145 (87)**	**127 (77)**	**69 (85)**	**64 (80)**

4 = would like to know cause; 5 = would strongly like to know cause; useful – knowing cause could help prevent future miscarriage; not useful – cause not beneficial to prevent future miscarriage; T – total 4+5

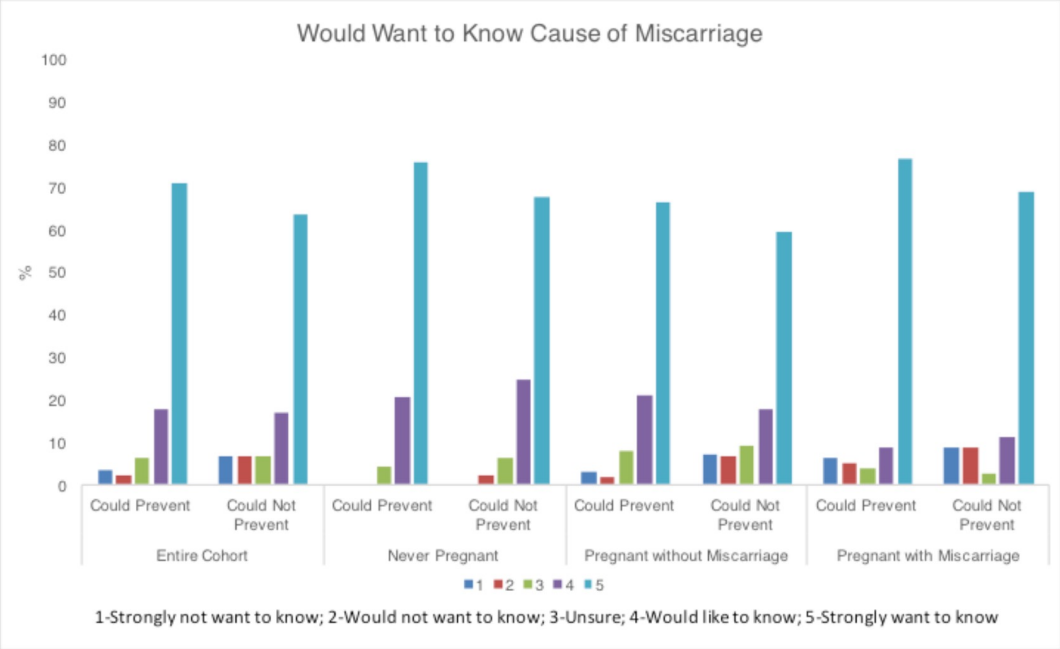

Figure 1. — Women wanting to know the cause of miscarriage.

the loss of a child) to 3 (moderately upsetting), and 5 (not upsetting; only an inconvenience). Desire to know the cause of a miscarriage if there was or was not something that could be done to prevent a subsequent miscarriage was captured on a 1 (strongly not like to know) to 5 (strongly like to know) scale, with 3 being "unsure." Belief in potential causes of miscarriage were acquired as agree, disagree, or unsure. Study team members administered a pilot survey to 20 eligible and consenting women, which results were used to make minor data management revisions prior to open recruitment for the remainder of the sample. Selected clinic staff were trained by study team members to recruit eligible and agreeing women, administer the questionnaire in the waiting area, answer any questions, and submit the completed surveys to team members for data entry.

Summary data were prepared as proportions or means with standard deviations. However, pregnancies that were < 20 weeks at the time of the survey were not included in pregnancy summaries, as their miscarriage status was unknown at that time. Chi-square analysis explored differences between relevant proportions, with $p < 0.05$ indicating statistical significant. When appropriate, groups were collapsed for comparison (e.g., university education versus less than university education, and Likert strongly agree / agree and strongly disagree / disagree).

Results

Enrolment was undertaken between June 1, 2015, and August 30, 2016. A convenience sample of 310 women attending the clinics was approached regarding participation in the study, of which 296 (95.5%) consented. Participants were aged 18 to 57 years at the time of the survey, and most had a university (69.6%) or high school (22.0%) education. Of these 296 women, 247 (83.4%) had never been pregnant, which included women who were in a first pregnancy > 20 weeks and did not include two women whose first pregnancy was < 20 weeks at the time of the survey. A history of miscarriage was reported by 81 (32.8%) of these ever-pregnant women. Most women had one (69.9%), or two (12.0%) miscarriages and one woman had 13 of 15 pregnancies ending in miscarriage.

In the entire cohort, 59 (19.9%) reported a consanguineous marriage to a cousin. Each had at least one pregnancy; accordingly, 23.9% of never-pregnant women had a consanguineous marriage. Among these 59 women, 23 (39.0%) had a history of miscarriage, compared with 58 of 188 (30.9%) women who were in non-consanguineous marriages ($p = 0.245$). In the group of women in non-consanguineous marriages, miscarriages were experienced by a numerically smaller proportion of younger (< 35 years; 35/123; 28.5%) compared with older (≥ 35 years; 23/65; 35.4%; $p = 0.417$) women, and were experienced by significantly more older (14/24; 58.3%) compared with younger (9/35; 25.7%; $p = 0.024$) women who were in con-

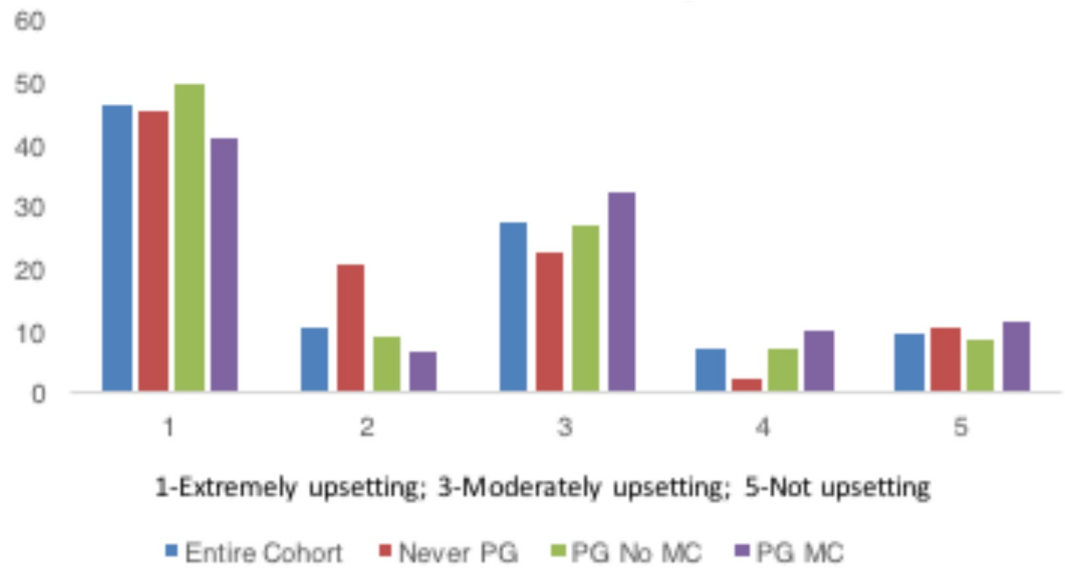

Figure 2. — What would a miscarriage mean?

sanguineous marriages.

Responses to items about wanting to know the cause of a miscarriage when the cause may or may not be beneficial to preventing future miscarriages followed similar trends between questions and among groups according to pregnancy and miscarriage history status (Figure 1). In the entire cohort, most respondents wanted to know the cause of a miscarriage whether it could be useful to preventing additional miscarriages (88%) or would not be beneficial (80%). Among subgroups, more never pregnant women wanted to know if the cause was or was not beneficial (96%, 92%), compared with women who had been pregnant without a miscarriage (87%, 77%) and those who had experienced a miscarriage (85%, 80%) (Table 1).

In the entire cohort, 137 (46.3%) believed that a miscarriage would be extremely upsetting, similar to the loss of a child. Proportions with this belief were similar among subgroups with miscarriage (41%), pregnant without miscarriage (49%), and those who were never pregnant (45%). In the entire cohort, 9% believed a miscarriage would simply be an inconvenience, comprised of 8% to 11% of subgroups by pregnancy and miscarriage status with this view (Figure 2).

All 81 respondents who had experienced a miscarriage revealed their loss to someone. Most told their husbands (97.5%), followed by their doctor or healthcare professional (91.4%), mother (79.0%), sister (51.9%), friend (49.4%), and father (45.7%). Most of these women agreed (21.3%) or strongly agreed (62.5%) that they received adequate emotional support from their husbands after their miscarriage. Other persons who were told of the miscarriage were considered to be similarly supportive (30.0% agreed, 56.3% strongly agreed). All but four (4.9%) participants received medical care for their miscarriage; however, the medical establishment was perceived as providing lesser emotional support (31.6% agreed, 34.2% strongly agreed) than others who were aware of the miscarriage.

Among women with a history of miscarriage, at least one negative feeling was reported by 45.7% of participants including guilt (35.4%), shame (13.6%), and being alone (22.2%) after their miscarriage. Eight (9.9%) participants experienced all three negative feelings, while 46.9% reported they disagreed or strongly disagreed to having any of the three negative feelings. Guilt, shame, and being alone were denied by 51.9%, 72.8%, and 64.2% of participants. However, ten of 28 (35.7%) participants who agreed or strongly agreed to having guilt feelings associated with their miscarriages did not agree that they did something wrong that caused the miscarriage, and 14 of 34 (41.2%) women who agreed or strongly agreed that they did something wrong to cause the miscarriage did not agree or strongly agree to have resultant feelings of guilt. In participants with a miscarriage history, 34 (42.0%) agreed or strongly agreed that they did something wrong that resulted in the miscarriage, and 29 (35.8%) believed they could have done something to prevent the miscarriage. Overall, 40 (49.4%) either believed they did something wrong that caused the miscarriage or that they could have prevented it from happening. The small group of 14 (17.3%) women who reported that a medical cause was provided for their miscarriage, five (35.7%) believed they had done something wrong that caused the miscarriage or that they could have done something to prevent it; which was numerically, but not significantly, less than the 35 of 67 (52.2%) women with this belief who did not report a reason for their miscarriage ($p = 0.260$).

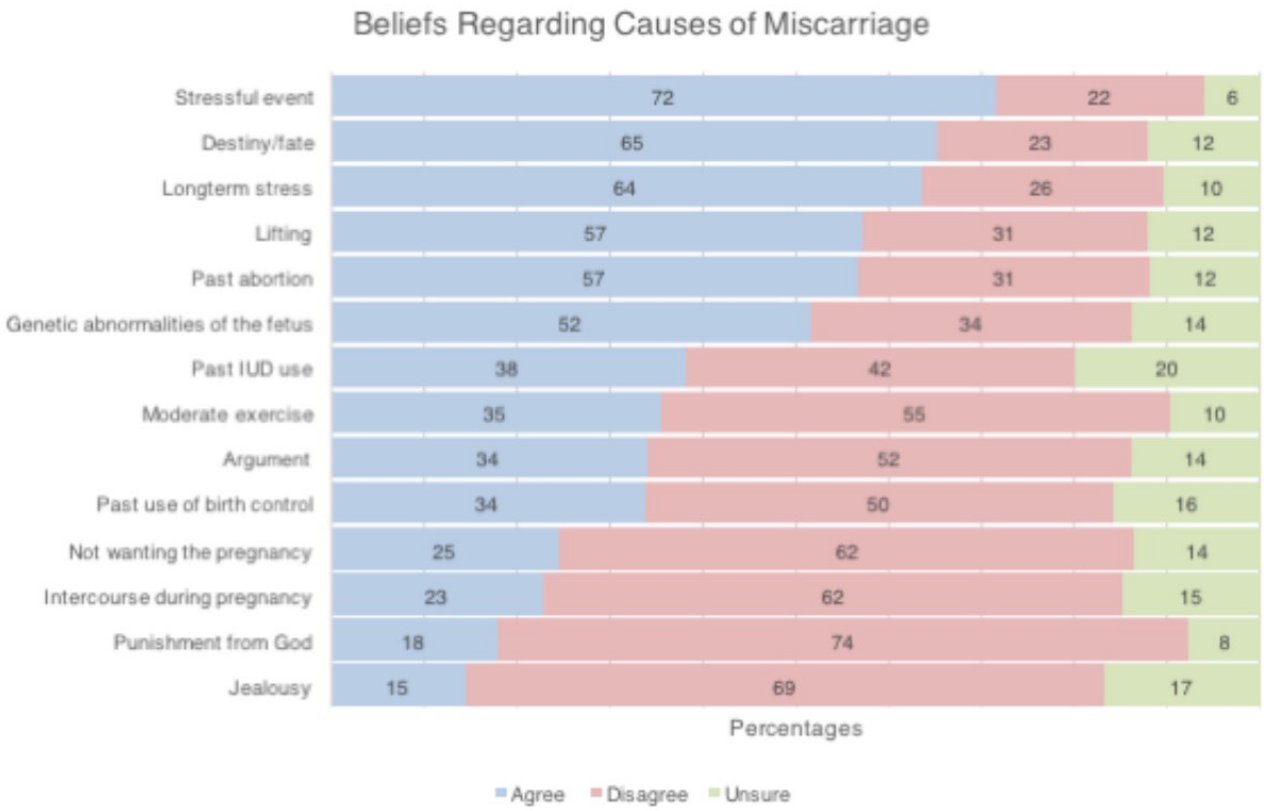

Figure 3. — Beliefs re-garding causes of miscarriage.

Among the offered causes of miscarriage (Figure 3), a stressful event was the most accepted cause (72%), followed by destiny/fate (65%), long-term stress (64%), lifting (57%), and past abortion (57%). Approximately one-half (52%) agreed that fetal genetic abnormalities can result in a miscarriage, and this belief was the same in consanguineous marriages (57.6% agree) and non-consanguineous marriages (50.2% agree; $p = 0.51$). Past use of an intrauterine device (IUD) (38%) or birth control (34%) were believed to be able to cause a miscarriage by slightly over one-third of participants in the entire cohort. Thirty-five percent believed that moderate exercise was a cause of miscarriage.

Discussion

Results of the present survey increases the understanding of miscarriage perceptions in women and provide insight into experience with and knowledge about misncarriage, including beliefs about the causes of miscarriage, from Saudi women attending obstetrics and gynaecology clinics in a single hospital in Saudi Arabia. This study was based on a 2013 U.S. national online survey to assess participant beliefs about the causes of miscarriage, and to explore emotional experiences of persons who claimed a history of miscarriage [5]. In addition to the online source for participants, the Bardos *et al.* study differed from the present by including both men and women, and participants who were never married. Also there was a higher level of some form of university education (89%) in the Bardos *et al.* study [5]. Miscarriage experience in that study was collected on a partner basis; that is, a man completing the survey could answer questions about a miscarriage that his wife had experienced. Despite similarities between the survey instruments, valid comparisons between the present study and that of Bardos *et al.* [5] are hampered by the major differences in the populations sampled. In addition, the continuing debate concerning the quality of data acquired through the commercial Amazon Mechanical Turk

platform used in that study suggests caution is warranted when comparing observations among similar participant groups. [11] However the present study used questionnaires administered by study staff.

A relationship between consanguinity and miscarriage may be expected, considering the prevalence of genetic causes of miscarriage, where over half of fetal losses are due to genetic disorders.[5] A case control study of 452 women in Saudi Arabia reported significantly more cases hospitalized for spontaneous abortion (< 25 weeks) were in consanguineous marriages (47.8%), compared with controls without a spontaneous abortion history who were hospitalized for a normal delivery (31.0%; $p = 0.0001$) [12]. High consanguinity rates are common in Saudi Arabia and other Arabic countries; a nation-wide diabetes prevalence study in Saudi Arabia found high consanguinity prevalence of 57.7% (28.4% first cousin, 14.6% second cousin, 15.2% distant relative) [13], while a study on pregnant women coming for a second- trimester ultrasound in Jordan found a consanguinity rate of 21% [14]. In general, however, most studies report that fetal loss is not associated with consanguinity [15, 16], which was reflected in the present study, where proportions of the respondents with miscarriage experience were similar whether they were in consanguineous (39.0%) or non-consanguineous (30.9%) marriages. Studies in Saudi Arabia on recurrent miscarriages have shown significant relations between consanguinity and chromosomal abnormalities [17, 18].

In the Bardos *et al.* survey, most participants would want to know the cause of a miscarriage if the knowledge could (88%) or could not (78%) help prevent a recurrent miscarriage [5]. Similar proportions of the present sample expressed the same opinion (88%, 80%). Bardos *et al.* reported that fewer persons who knew the cause of the miscarriage believed they had done something wrong that resulted in the fetal loss; however, negative feelings and belief that something could have been done to prevent the miscarriage were not different in this participant subgroup [5]. In the present sample, only 17% of women were given a reason for their miscarriage. These women were less likely to believe they caused or could have prevented the miscarriage (35.7%), compared with women who were not given a reason for their miscarriage (52.2%; $p = 0.260$). Causes of first and second miscarriages are often not known, partially because they are not investigated [19]. Studies in the United Kingdom have shown that not knowing the miscarriage cause can sustain initial anxiety levels, while information about the cause can assist in lowering them [20, 21].

The majority of earlier studies on negative feelings cannot be compared with our study due to different social cultural contexts and different study designs, for example qualitative research or use of special scoring scales specifically adapted for the context and topic (anxiety, depression, grief etc,). It is however clear that negative feelings like grief, sadness, depression, guilt, self-blame, loss of baby, isolation, and devastating events are common after miscarriages and can last for months.[19, 22-25]. For example, 96% of Irish women referred to a miscarriage clinic for support and counselling had a grief reaction, of which 21% was not resolved after one month [26]. After a missed abortion at 10-14 weeks of pregnancy anxiety and depression were found in 45% and 15% of English women, respectively, while they had a mean grieving score of 2.52 which is slightly higher than the score (2.23 on a scale of 1 to 5) found in death of a close relative [20]. This is similar with findings in the present study where 46.3% of participants indicated that a miscarriage would be extremely upsetting, similar to the loss of a child.

Most of the present participants with miscarriage reported receiving adequate support from husbands (83.8%) and others who were told of the miscarriage (86.3%), which is higher than the 74% reported for online US survey [5]. Fewer of the present participants reported receiving adequate support from the medical establishment (65.8%); however, the proportion is considerably greater than that reported in the U.S. study (45%) [5].

There were several similarities and differences between perceptions of the causes of miscarriage between our sample and that of Bardos *et al.* In the Bardos *et al.* study, genetic abnormalities of the fetus were agreed to by 95% of participants as a cause of miscarriage, while barely half (52%) of the present subjects agreed that genetic abnormalities was a cause, despite over two-thirds having a university education [5]. Approximately three-fourths of participants in the survey reported by Bardos *et al.* believed stress is a cause of miscarriage, which ranked second (stressful event) and third (long-standing stress) most commonly agreed causes [5]. The authors designated a stressful event as an erroneous belief. However, several studies have not supported this assumption, reporting significantly increased rates of pregnancy failure in women who had experienced a negative life event [27, 28]. A recent study of two-time-limited cohorts of US service women included 1,045 women who had experienced a miscarriage [29]. Life stressors were assessed in one cohort of 1,511 women, with 473 reporting miscarriage experience. Multivariate analysis comparing women with moderate/major life stressors with those reporting low/mild life stressors revealed a borderline association with miscarriage [adjusted OR (AOR) 1.67; 95% CI 0.99, 2.80]. Expanding the model to control for prior medical conditions and smoking status, life stressors had a marginally significant association with miscarriage (AOR 1.75; 95% CI, 1.04, 2.94). In the present entire cohort, a stressful event was the most commonly reported cause of abortion, agreed to by 72% of participants. Women with a miscarriage history were less likely to agree (56%), compared with those never pregnant (80%) and those who had a pregnancy without a miscarriage

(77%). University educated women in the present sample were also less likely to accept a stressful event as a cause of miscarriage (67.0% *vs.* 82.2%; $p = 0.019$). Although lifting heavy objects has not been shown to be associated with miscarriage, 64% of the subjects in the Bardos *et al.* study and 57% in the present study believed heavy lifting could cause miscarriage. Moderate exercise was considered a potential cause of miscarriage by 36% of teh present participants, compared with 7% of the Bardos *et al.* participants [5]. Destiny or fate was agreed to as a cause of miscarriage by 8% of the Bardos *et al.* participants [5], compared with 65% of the present participants, ranking it second among miscarriage causes. This difference can be explained by the differences in culture and religion.

Although prior induced abortion has not been associated with a risk of miscarriage [30], 31% and 57% of Bardos *et al.* and the present participants believed past abortion was a cause of miscarriage [5]. Other past reproductive events that have not been associated with miscarriage were more commonly agreed to in the present study compared with the Bardos *et al.* study. For example, past IUD use was agreed as a cause by 38% of the present and 28% of Bardos *et al.* participants, and past use of birth control by 34% and 22%.

The results of the present study reveal that Saudi women have insufficient knowledge about the causes of miscarriage. Most women with a miscarriage history were satisfied with the support provided by their husbands, while only two-thirds believed they received adequate support form the medical community. Although few women were given a reason for their miscarriage, numerical trends suggest that having this knowledge may decrease feelings of responsibility for the miscarriage. The information from this study can be used to devise education and support policies for Saudi women regarding miscarriage, particularly with regards to behaviors that need not be avoided for fear of miscarriage and more support to enabling dealing with negative feelings. In conclusion, most Saudi women with miscarriages report receiving adequate support; however, in general, Saudi women have inadequate knowledge of the causes of miscarriage. New education and support policies are warranted, particularly with regard to behaviours that need not be avoided for fear of miscarriage and more support to enabling dealing with negative feelings.

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Corresponding Author:
A.A. ROUZI, M.B., ChB
PO Box 80215
Jeddah, 21589 (Saudi Arabia)
e-mail: aarouzi@gmail.com