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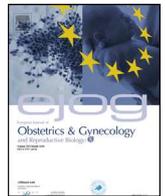


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Stillbirth: Perceptions among hospital staff in the Middle East and the UK



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ABSTRACT

Objectives Stillbirth is an important and yet relatively unacknowledged public health concern in many parts of the world. Public awareness of stillbirth and its potentially modifiable risk factors is a prerequisite to planning prevention measures. Cultural and regional differences may play an important role in awareness and attitudes to stillbirth prevention. The objective of this study was to evaluate and compare the awareness of stillbirth among hospital staff in Qatar and the UK, representing two culturally different regions.

Study design An online population survey for anonymous completion was sent to the hospital email accounts of all grades of staff (clinical and non-clinical) at two hospitals in Qatar and one tertiary hospital Trust in the UK. The survey was used to gather information on the participants' demographic background, the experience of stillbirth, knowledge of stillbirth, awareness of information and support sources, as well as attitude towards investigation and litigation. Data were analysed using descriptive and comparative statistics (Chi-Square test and Fisher's exact test).

Results 1002 respondents completed the survey, including 349 in the Qatar group and 653 in the UK group. There were significant differences in group demographics in terms of language, religion, gender, nationality and experience of stillbirth. The groups also differed significantly in the knowledge of stillbirth, its incidence and risk factors. The two groups took different views on apportioning blame on healthcare services in cases of stillbirth. The Qatar group showed significantly less awareness of available support organisations and relied significantly more on online sources of information for stillbirths ($p < 0.001$).

Conclusions This comparative study demonstrated significant differences between the two culturally distinct regions in the awareness, knowledge and attitudes towards stillbirths. The complex cultural and other factors that may be contributory should be further studied. The results highlight the need for increasing public awareness around stillbirth as part of effective prevention strategies.

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Introduction

Stillbirth, defined as a baby delivered with no signs of life known to have died after 24 completed weeks of pregnancy, remains a taboo subject despite an estimated 2.6 million occurring annually worldwide [1]. Despite the profound emotional, social and economic impact a stillbirth can have on individuals and families; initiatives to reduce stillbirth have until recently largely

been ignored [2]. The incidence of stillbirth is often considered as a surrogate measure of the performance of a country's public health system [2–4]. In high-income settings, stillbirth rates have stabilised over recent years but have risen in lower income parts of the world [5]. Therefore, there is a need for acknowledgment and discussion of stillbirth on a wider scale than is currently the case, so that healthcare and health-education resources can be appropriately targeted to reduce stillbirth rates.

An awareness of the risk factors of stillbirth is an essential prerequisite to inform healthcare planning. There is evidence associating stillbirth with maternal obesity, smoking, gestational diabetes and fetal growth restriction [6]. However, there is also

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evidence that poor public knowledge of stillbirth is imposing barriers to effective education and patient care, with 20% of bereaved parents expressing the need for greater public awareness of stillbirth [7].

Research has shown that in high-income countries stillbirth is perceived as a rare event [8], which perhaps goes some way to explaining the results of a recent study of public awareness of stillbirth in The Republic of Ireland [9]. Nuzum et al (2018) highlighted a general lack of knowledge of the incidence, risk factors and causes of stillbirth amongst a sample of the general population.

There is little known about the extent of public knowledge of this condition in Qatar and how cultural differences in this part of the world may play a role in perceptions and attitudes towards stillbirth. Qatar has witnessed rapid socioeconomic progress over the last few years with a large influx of migrant workers to support this development. The population of Qatar is approximately 2.6 million, of which the majority are expatriate workers and less than 15% are Qataris [10].

In addition, while there has been media interest and campaigning for the prevention of stillbirth in the UK [11], there has been no major health campaign on stillbirth in Qatar.

This objective of this study was to explore the extent of knowledge about stillbirth among hospital staff in Qatar and in the UK and to compare the findings, to evaluate any differences which could inform the approach required to increase awareness and modify risk factors, ultimately to achieve a reduction in stillbirth numbers.

Material and methods

Ethical approval for this online questionnaire-based study was sought from the local ethics committee in Qatar and the study was classed as "exempt" from ethics approval requirement. The project was registered as a service evaluation at Sheffield Teaching Hospitals NHS Foundation Trust (project number 8595) and ethical approval was not required.

A 23-item online survey on stillbirth knowledge was designed and piloted in April 2018 within a group of hospital staff before a final version was produced.

The online survey of all grades of employees was carried out over a three-week period in June 2018 across two hospitals in Doha, Qatar and a hospital Trust in Sheffield, UK. The hospitals included in Doha were Sidra Medicine (a 400 bedded, maternity and children's healthcare facility employing approximately 4000 staff) and Al Wakra hospital (a 260 bedded general hospital employing approximately 3000 staff). In the UK, the Sheffield Teaching Hospitals NHS Foundation Trust with a total of approximately 2400 beds and 17,000 employees within five hospital sites participated.

The survey was disseminated via email to all staff at the participating hospitals and the responses collected, a reminder was sent each week during the study period.

The survey consisted of questions relating to the demographic data of the participant (age, sex, religion, nationality, any children, and personal experience of stillbirth, level of education and area of work) and questions testing the participants' knowledge about stillbirths. The latter included definition, incidences, causes, risk factors, prevention, investigation, support organisations, medicolegal aspects as well as exposure to information on stillbirth in the media. The same survey was used at all study sites and only complete responses were included (supplementary material- Appendix 1).

Due to the sensitive nature of stillbirth, the survey first emphasised that the content of the survey could be distressing and an option was available to exit the survey. A contact number to access local support was also provided in case distress was caused.

Data collected were transferred to SPSS (version 23.0) for analysis. Descriptive statistics were assessed and comparisons for

statistically significant differences in survey responses between the UK and Qatar groups were made with Pearson's Chi-square test and Fisher's exact test.

Results

One thousand and two hospital employees participated in the survey, with 349 participants from Qatar and 653 from the UK. Table 1 shows the demographics of each group by age, gender, educational level, religion, language, area of work within the hospital, whether the participants had children of their own and any personal experience of stillbirth.

Survey respondents were predominantly female (848 females versus 155 males). However, the proportion of females was significantly lower in the Qatar group (79.1%) compared with the UK group (87.4%) ($p < 0.05$). Qatar group participants were significantly more likely to have a university level education (77.3% in the UK group and 96.6% in the Qatar group), follow Islam (1.8% in the UK group and 35.5% in the Qatar group) and significantly less likely to speak English as a first language (96.8% in the UK group and 40.1% in the Qatar group) ($p < 0.05$). Around two-thirds of all survey respondents were clinically based with no significant difference seen between the two groups. A

Table 1
Background demographic data and experience of stillbirth of the study populations.

Question	Qatar (n = 349)	UK (n = 653)	Statistical significance using Pearson chi ² test (* denotes statistical significance)
Age (years)			
<20	1 (0.3%)	5 (0.8%)	$p = 0.015^*$
21 – 30	85 (24.4%)	119 (18.2%)	
31 – 40	145 (41.5%)	181 (27.7%)	
41 – 50	81 (23.2%)	166 (25.4%)	
>50	47 (13.5%)	182 (27.9%)	
Gender			
Female	276 (79.1%)	571 (87.4%)	$p < 0.0001^*$
Male	73 (20.9%)	82 (12.5%)	
Religion			
Islam	124 (35.5%)	12 (1.8%)	$p < 0.0001^*$
Christianity	161 (46.1%)	301 (46.1%)	
Other	40 (11.5%)	23 (3.5%)	
None	24 (6.9%)	307 (47%)	
English first language			
Yes	140 (40.1%)	632 (96.8%)	$p < 0.0001^*$
No	209 (59.9%)	21 (3.2%)	
Educational level			
School or equivalent	12 (3.4%)	148 (22.7%)	$p < 0.0001^*$
University education	337 (96.6%)	505 (77.3%)	
Area of work			
Clinical	236 (67.6%)	452 (69.2%)	$p = 0.604$
Non-clinical	113 (33.3%)	201 (30.7%)	
Having own children			
Yes	224 (64.2%)	454 (69.5%)	$p = 0.085$
No	125 (30.7%)	199 (30.4%)	
Know someone who has experienced stillbirth			
Yes	196 (56.2%)	363 (55.6%)	$p = 0.862$
No	153 (43.7%)	290 (44.3%)	
Personal experience of stillbirth			
Yes	23 (6.6%)	19 (2.9%)	$p = 0.006^*$
No	326 (93.3%)	634 (97%)	

significantly larger proportion of Qatar respondents had personally experienced stillbirth than those in the UK group (6.6% in Qatar vs 2.9% in UK) ($p < 0.05$).

Table 2 demonstrates the responder awareness and knowledge surrounding elements of stillbirth, including risk factors and incidence. The majority of respondents in both groups were able to define stillbirth correctly although significantly more in the UK group were able to do. However, only 3.7% in the Qatar group and 19.6% in the UK group were able to correctly identify the incidence of stillbirth in their country of residence ($p < 0.001$). Around half of the UK did not know the incidence of stillbirth in the UK, compared to three quarters in the Qatar group. Significantly more in the Qatar group thought that stillbirth was always preventable (41.8% versus 17.7%, $p < 0.05$). More in the UK group considered recurrence of stillbirth to be a possibility (79.3% v 70.2%).

Overall, there were statistically significant differences between the groups in both the cause selected for stillbirth and risk factors for stillbirth ($p < 0.05$). In the UK group 65% felt that obesity was a risk factor, compared to 50% in the Qatar group; 15% in the Qatar group felt that mobile phone use was a risk factor compared to 2% in the UK group, and 9% in the Qatar group felt that exposure to screens (television, tablets, etc.) was a risk factor, compared to 1% of the UK group.

Both responder groups were aware of the importance of fetal movements in pregnancy and the association of reduction in movements with stillbirth (97.1% in Qatar group and 99.2% in UK group) and although most respondents felt that medical help should be sought urgently if movements were perceived by the

Table 2
Knowledge about stillbirth including definition, incidence, causes and risk factors.

Theme	Qatar (n = 349)	UK (n = 653)	Statistical significance using Pearson chi ² test or Fischer's exact test (* denotes statistical significance)
Correctly defined stillbirth	306 (87.7%)	624 (95.6%)	$p < 0.0001^*$
Correctly identified incidence of stillbirth	13 (3.7%)	128 (19.6%)	$p < 0.0001^*$
Stillbirth is always preventable	146 (41.8%)	116 (17.7%)	$p < 0.0001^*$
Stillbirth can recur	245 (70.2%)	518 (79.3%)	$p < 0.0001^*$
Cause of stillbirth			$p < 0.0001^*$
Maternal	250 (71.6%)	436 (66.8%)	
Fetal	246 (70.5%)	482 (73.8%)	
Medical care related	298 (85.4%)	488 (74.7%)	
Unexplained	236 (67.6%)	559 (85.6%)	
Risk factors for stillbirth			$p < 0.0001^*$
Smoking	297 (85.1%)	627 (96.0%)	
Alcohol	266 (76.2%)	509 (77.9%)	
Drugs	312 (89.4%)	632 (96.8%)	
Obesity	174 (49.9%)	425 (65.1%)	
Mother sleeping flat on back	71 (20.3%)	159 (24.4%)	
Mobile phone use in pregnancy	51 (14.6%)	15 (2.3%)	
TV/Computer screen exposure in pregnancy	33 (9.4%)	6 (0.9%)	
Hereditary	128 (36.7%)	174 (26.6%)	
Fetal movements			
Important to monitor	339 (97.1%)	648 (99.2%)	$p = 0.073$
No need for urgent review if decreased	27 (7.7%)	55 (8.4%)	$p = 0.298$

mother to decrease, around one in ten women in each group felt urgent medical attention was not required in this situation (Table 2).

Table 3 shows the results for investigations, litigation, support services and information sources regarding stillbirth. The groups differed significantly in terms of attitudes towards litigation against medical care received in such cases, with those in the Qatar group five times more likely to consider pursuing legal action against the healthcare providers compared to the UK participants (15.8% v 3.1%).

The participants were questioned on available information regarding stillbirth in the media including television, radio, print media or online sources. Around four in ten women in each group were not aware of any public media campaigns for pregnant women which highlighted measures to reduce stillbirth. The overall responses to sources of information were statistically significantly different. Patients in the Qatar group were more likely to have come across information on television and radio, compared to the UK group, but there were similar responses to social media and online sources of information for the two groups (Table 3).

Comment

The main finding of this study is that, even amongst hospital workers, knowledge about stillbirth, its incidence, etiology, risk factors and the preventable nature of the condition is suboptimal. The main secondary finding is that there are significant differences in knowledge of stillbirth between hospital workers in Qatar and the UK.

The results of this study confirmed that, while there was awareness among both the groups about what stillbirth is, there was a poor knowledge of its incidence which was more marked in the Qatar group. The stillbirth rate in Qatar is 7.81 per 1000 births [12] compared to the UK rate of 4.2 per 1000 births [13]. The results showed that apart from the minority who were aware of the correct incidence rates, there was a tendency to underestimate rates of occurrence in both groups, in keeping with the fact that stillbirth is thought to be rare by people in high-income countries [8]. This highlighted a knowledge gap in both regions.

The results showed that there was awareness among both groups around the main modifiable risk factors of smoking, alcohol

Table 3
Investigation, litigation and support in for those experiencing stillbirth.

Theme	Qatar (n = 349)	UK (n = 653)	Statistical significance using Pearson chi ² test (* denotes statistical significance)
Every case should be investigated	299 (85.7%)	569 (87.1%)	$p = 0.517$
Legal action should be considered in every case	55 (15.8%)	20 (3.1%)	$p < 0.0001^*$
Have you come across stillbirth information in the media			$p < 0.001^*$
TV	103 (29.5%)	224 (26%)	
Radio	31 (8.8%)	81 (6.7%)	
Facebook	97 (27.8%)	159 (23%)	
Instagram	26 (7.4%)	17 (6%)	
Twitter	17 (4.9%)	21 (4.9%)	
Other online sources	138 (39.5%)	121 (40%)	
Posters/ leaflets	74 (21.2%)	113 (17.6%)	
None	141 (40.4%)	286 (42.4%)	
Aware of support organisations	74 (21.2%)	239 (36.6%)	$p < 0.0001^*$

and drug abuse; however, this awareness was significantly less in the Qatar group. Both groups demonstrated poor awareness of obesity as a risk factor, the Qatar group more so than the UK group. The underestimation of obesity as a risk factor for stillbirth has been shown in previous studies [14]. Sleeping in a supine position in pregnancy is a potentially modifiable risk factor for stillbirth [15]. Only a fifth of the Qatar group and a fourth of the UK group identified this as a risk factor for stillbirth (Table 2). Interestingly, respondents in the Qatar group identified exposure to mobile phone radiation and display screens as risk factors for stillbirth. This is not supported by the literature [16]. The awareness of risk factors is critical for any reduction/prevention programs as modifiable risk factors are present in more than half of all cases of stillbirths [6]. A delay in reporting reduced fetal movements is associated with an increased risk of adverse outcomes and this is a risk factor for stillbirth [13]. Both groups showed a general awareness of the importance of fetal movements in pregnancy. However, it is still concerning that there was a proportion in both groups who did not think a decrease in fetal movements merited urgent medical review.

The majority of respondents in both groups identified maternal, fetal, unexplained and healthcare related causes as possible in stillbirths.

Stillbirth can recur [17] and in both groups, the majority of respondents were aware of this. It has been shown that half of all stillbirths occur during childbirth and 75% of these can actually be prevented [18]. However, a significant minority in both groups felt that stillbirth was inevitable and could not be prevented, which may well have influenced responses to the questions in this survey.

Previous studies have shown that, importantly, a minority of healthcare providers consider very few stillbirths are preventable and so do not view stillbirth prevention as a high priority for healthcare intervention [19]. Therefore, the potential impact of this view in these cohorts of hospital workers is significant

A majority of participants in the study considered medical care-related factors as a possible cause of stillbirth and felt that every case of stillbirth should be investigated. This is supported by evidence in the literature [19]. However, there was variation between the groups with regard to litigation. Those from the UK group were much less likely to consider litigation against the medical team. This might be based on multiple social, cultural and healthcare system-related factors that need to be further explored.

The findings of the study showed that there was significantly less awareness of available support organisations in the Qatar group. Access to support organisations may reduce the negative effects of stillbirth and also lead to greater satisfaction with healthcare [2], which may be one of the factors contributing to higher healthcare litigation rates.

A significant proportion of respondents in both groups had not come across information on stillbirths in public media. The main source of information in both groups was online (including social media). Information available online may not have been evidence-based and reliable. Moreover, discussions on social media platforms may include apportioning blame on healthcare services in these cases and therefore diminish public trust in healthcare providers [20]. The findings highlight the need for education campaigns and the provision of access to reliable information.

The findings of this study have to be interpreted with caution. The two groups were inherently different culturally by geographical location. More participants from Qatar had received higher education and had personal experience of stillbirth. Both groups were comparable in terms of clinical workers participating in the survey. The two groups differed in that significantly more females participated in the UK groups and the two groups were significantly different in terms of religion and nationality. The knowledge and attitudes around stillbirth of the two groups

differed in several areas and the factors above may have a contributory role here. An exploration and deeper understanding of these factors are therefore required.

Bereaved parents want an increased public awareness of stillbirths and for stillbirth care to be prioritised [7]. Our study makes a case for improving health education around stillbirth in both regions and increasing acknowledgment of the importance of stillbirth so that care can be improved. Stillbirth prevention should be included in health plans and research [4]. While there are some national healthcare initiatives in this area in the UK [11], there are no dedicated stillbirth reduction initiatives nationally in Qatar.

There is very little data on perceptions and knowledge about stillbirth in Qatar in general and among hospital staff in the UK. One of the strengths of this study is that it helps to provide a baseline for knowledge among hospital staff in the two studied regions. Due to the sensitive nature of the topic the study was conducted among hospital staff in the first instance rather than the general population. The overall response rate to the study was low in both groups. In particular, in the Qatar group, participation by Qatari nationals was low and this is a limitation of this study. This may be due to the nature of the topic itself but may also raise the question of whether the online survey methodology is an acceptable tool to use in Qatar.

In conclusion, this study has shown that there is a general lack of awareness of the incidence and causes of stillbirths and a variation in access to information and knowledge of support organisations in hospital workers in both Qatar and the UK. Regional differences between Qatar and the UK in awareness and knowledge of stillbirth have been clearly demonstrated. Further research is needed to develop appropriate patient-facing strategies for prevention of stillbirth in populations which require further education on this tragic and potentially preventable pregnancy outcome.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Conflict of interest

The authors have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.eurox.2019.100019>.

References

- [1] Lawn JE, Blencowe H, Waiswa P, Amouzo A, Mathers C, Hogan D, et al. For the Lancet Ending Preventable Stillbirths Series study group with the Lancet Stillbirth Epidemiology investigator group. Stillbirths: rates, risk factors, and acceleration towards 2030. *Lancet* 2016;387(10018):587–603.
- [2] Heazell AE, Siassakos D, Blencowe H, Burden C, Bhutta ZA, Cacciatore J, et al. Stillbirths: economic and psychosocial consequences. *Lancet* 2016;387(Febuary10018):604–16.
- [3] de Bernis L, Kinney MV, Stones W, ten Hoop-Bender P, Vivio D, Leisher SH, et al. Ending preventable deaths by 2030. *Lancet* 2016;387(Febuary 10019):703–16.
- [4] Frøen JF, Friberg IK, Lawn JE, Bhutta ZA, Pattinson RC, Allanson ER, et al. Stillbirths: progress and unfinished business. *Lancet* 2016;387(Febuary 10018):574–86.
- [5] Joseph KS, Kinniburgh B, Hutcheon JA, Mehrabadi A, Basso M, Davies C, et al. Determinants of increases in stillbirth rates from 2000 to 2010. *Can Med Assoc J* 2013 Jan 1: cmaj-121372.
- [6] Gardosi J, Madurasinghe V, Williams M, Malik A, Francis A. Maternal and fetal risk factors for stillbirth: population based study. *Bmj* 2013;346:f108 Jan 24.
- [7] Ellis A, Chebsey C, Storey C, Bradley S, Jackson S, Flenady V, et al. Systematic review to understand and improve care after stillbirth: a review of parents'

- and healthcare professionals' experiences. *BMC Pregnancy Childbirth* 2016;16 (December1):16.
- [8] Flenady V, Middleton P, Smith GC, Duke W, Erwich JJ, Khong TY, et al. Stillbirths: the way forward in high-income countries. *Lancet* 2011;377(May 9778):1703–17.
- [9] Nuzum D, Meaney S, O'Donoghue K. The public awareness of stillbirth: an Irish population study. *Bjog Int J Obstet Gynaecol* 2018;125(January2):246–52.
- [10] Ministry of development planning and statistics. Population first section. 2016. . Accessed January 2019 https://www.mdps.gov.qa/en/statistics/Statistical%20Releases/Population/Population/2016/Population_social_1_2016_AE.pdf.
- [11] Robertson L, Knight H, Snelling EP, Petch E, Knight M, Cameron A, et al. Each baby counts: national quality improvement programme to reduce intrapartum-related deaths and brain injuries in term babies. In *Seminars in Fetal and Neonatal Medicine* 2017;22(June3)193–8 WB Saunders.
- [12] Maducolil MK, Abid H, Lobo RM, Chughtai AQ, Afzal AM, Saleh HA, et al. Risk factors and classification of stillbirth in a Middle Eastern population: a retrospective study. *J Perinat Med* 2018;46(November9):1022–7.
- [13] Heazell AE, Weir CJ, Stock SJ, Calderwood CJ, Burley SC, Froen JF, et al. Can promoting awareness of fetal movements and focusing interventions reduce fetal mortality? A stepped-wedge cluster randomized trial (AFFIRM). *BMJ Open* 2017;7(August8):e014813.
- [14] Flenady V, Wojcieszek AM, Middleton P, Ellwood D, Erwich JJ, Coory M, et al. Stillbirths: recall to action in high-income countries. *Lancet* 2016;387 (February10019):691–702.
- [15] Gordon A, Raynes-Greenow C, Bond D, Morris J, Rawlinson W, Jeffery H. Sleep position, fetal growth restriction, and late-pregnancy stillbirth: the Sydney stillbirth study. *Obstet Gynecol* 2015;125(February 2):347–55.
- [16] Triche EW, Hossain N. Environmental factors implicated in the causation of adverse pregnancy outcome. In *Seminars in perinatology* 2007;31(August 4) 240–2 WB Saunders.
- [17] Bhattacharya S, Prescott G, Black M, Shetty A. Recurrence risk of stillbirth in a second pregnancy. *BJOG* 2010;117:1243–7.
- [18] Bhutta ZA, Das JK, Bahl R, et al. What will it take to avert preventable newborn deaths and stillbirths and at what cost? *Lancet* 2014;384:347–70.
- [19] Frøen JF, Cacciatore J, McClure EM, Kuti O, Jokhio AH, Islam M, et al. Lancet's stillbirths series steering committee. stillbirths: why they matter. *Lancet* 2011;377(April9774):1353–66.
- [20] Meaney S, Cussen L, Greene RA, O'Donoghue K. Reaction on Twitter to a cluster of perinatal deaths: a mixed method study. *JMIR Public Health Surveill* 2016;2(July2).