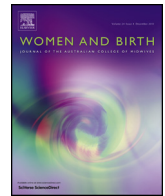




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Knowing your audience: Investigating stillbirth knowledge and perceptions in the general population to inform future public health campaigns

D. Pollock^{a,*}, C.C.J. Shepherd^{b,c,d}, A.A. Adane^d, C. Foord^e, B.M. Farrant^c, J. Warland^{b,f}

^a JBI, School of Public Health, Faculty of Health and Medical Science, University of Adelaide, Australia

^b Curtin Medical School, Curtin University, Bentley, WA, Australia

^c Telethon Kids Institute, The University of Western Australia, Nedlands, WA, Australia

^d Ngangk Yira Research Centre for Aboriginal Health & Social Equity, Murdoch University, Murdoch, WA, Australia

^e Still Aware, South Australia, Australia

^f UniSA Clinical and Health Sciences, University of South Australia, Adelaide, South Australia, Australia

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ABSTRACT

Background: The prevalence of stillbirth in many high income countries like Australia has remained unchanged for over 30 years. The 2018 Australian government Senate Select Committee on Stillbirth Research and Education highlighted the need for a public health campaign to encourage public conversations and increase awareness. However, there is little evidence about the community's knowledge and perceptions towards pregnancy and stillbirth, nor their aspirations for a public health campaign.

Aims: To assess the general knowledge, perceptions, myths and attitudes towards stillbirth to inform future public health campaigns.

Methods: Australian participants (n = 344; predominately women n = 294 (85.5%)) were recruited via Facebook.com. They completed a cross-sectional online survey designed to assess their knowledge of pregnancy and stillbirth, with additional questions on socio-demographic characteristics.

Results: Stillbirth knowledge and awareness of incidence was low in this sample. Prominent myths, such as baby runs out of room in the uterus (n = 112, 33%) and baby slows down when preparing for labour (n = 24, 27%) were endorsed. Only 25% (n = 85) knew the prevalence of stillbirth in Australia (six per day). Almost two-thirds (n = 205; 62%) agreed that there needs to be a public health campaign, however one in five (n = 65; 20%) were concerned that talking about stillbirth with pregnant women may cause them to worry.

Discussion and conclusion: Our findings reinforce the need for a targeted campaign, which educates the general population about the definition and prevalence of stillbirth, stillbirth risks and modifiable health behaviours. Appropriate messaging should target pregnant women during antenatal care as well as their support and care systems (family, friends, and care providers).

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Statement of significance

Problem

Stillbirth is a significant public health issues that requires attention. Currently, there is a growing push to create awareness of stillbirth among pregnant families, clinicians and the general population in high income countries across the globe.

What is already known

Public health campaigns have primarily focused on pregnant families and clinicians without considering the general population of Australia.

What this paper adds

Evidence of low knowledge and awareness of stillbirth and perpetuation of myths that could harm, and there is a need and desire for a public health campaign in the general Australian population.

* Corresponding author at: 55 King William Road, North Adelaide 5006, Australia.
E-mail address: danielle.pollock@adelaide.edu.au (D. Pollock).

Stillbirth is a significant public health issue, which has received relatively little attention and yet remains the primary cause of infant mortality not only in Australia [1] but across the globe. There are six stillbirths (death of a baby from 20 weeks gestation and/or 400 g) in Australia every day, on average—with little change in rates in over 30 years [1]. Recently, there has been a shift towards creating awareness about stillbirth [2]. In 2018 the Australian government formed a Senate Select Committee to formally inquire on stillbirth research and education, with the goal of making recommendations on how these areas can be improved [3]. The Inquiry made numerous recommendations, based on 269 submissions and six days of witness statements from public hearings, including a call for the development of a national stillbirth public awareness campaign. The goal of this campaign would be to demystify stillbirth, educate parents and the public about the risk of stillbirth and thereby encourage public conversations about stillbirth as a public health issue [3].

Creating awareness and knowledge about stillbirth presents a unique challenge given the taboo and stigma associated with it [4] and the multifaceted nature of related behavioural change

required to keep the unborn baby safe [5]. There are prominent examples of other early life mortality prevention campaigns—for example, the SIDS ‘back-to-sleep’ public health campaigns that demonstrated high success delivering a targeted message about safe infant sleeping practices [6]. In order to reduce the risk of stillbirth, multiple messages will need to be delivered to expectant people and their families [5]. These messages include: understanding fetal movement and when to seek assessment by a health care provider [7]; trusting their intuition [8]; settling to sleep on their side from the 28th week of pregnancy; smoking cessation during pregnancy; and avoiding drinking alcohol in pregnancy [7]. Furthermore, research evidence highlights that all these messages need to be connected to why (to reduce stillbirth) in order to elicit behaviour change [5]. Therefore, those charged with development of a stillbirth public awareness campaign face a number of complex challenges.

A necessary first step in the development of a public health campaign is knowing your target audience [9]. This is especially needed in mass media campaigns, where there are many messages and advertisements which can impact on exposure. Wakefield et al. [9]

Table 1
Socio-demographic and other characteristics of respondents.

Characteristics	n	%
Sex		
Male	25	7.3
Female	294	85.5
Not stated	25	7.3
Age group (years)		
18–24	18	5.2
25–34	146	42.4
35–44	105	30.5
>44	50	14.5
Not stated	25	7.3
Ethnicity		
Non-Aboriginal Australian	248	72.1
European	57	16.6
Other	31	9.0
Not stated	8	2.3
State/Territory		
Western Australia	157	45.6
South Australia	100	29.1
Other	62	18.0
Not stated	25	7.3
Education level		
Year 12 or below	44	12.8
Certificate/Trade/Diploma	74	21.5
Bachelor or higher degree	202	58.7
Not stated	24	7.0
Occupation		
Medical doctor or nurse	32	9.3
Manager	13	3.8
Professional	95	27.6
Technician and trade workers	4	1.2
Clerical/sales/admin worker	44	12.8
Machinery operator/labourer/driver	6	1.8
Other (unspecified)	122	35.5
Not stated	28	8.1
Number of children		
None	72	20.9
1	93	27.0
2	91	26.5
≥3	64	18.6
Not stated	24	7.0
If all of a sudden you had to get \$2000 for something important, could the money be obtained within a week?		
No	237	68.9
Yes	51	14.8
Do not know	30	8.7
Not stated	26	7.6
Current pregnancy status (respondent or partner)		
No	258	75.0
Yes	60	17.4
Not stated	26	7.6

state that health messages should be developed based on extensive research of the target group. In the case of stillbirth, there are three primary target groups: expectant people, maternity care providers, and the general population. Currently, pregnant women are not routinely informed about stillbirth during pregnancy, with one retrospective survey of 428 women reporting that 65% of women who had been pregnant and received antenatal care in Australia were not adequately informed about stillbirth [5]. Furthermore, over half (56%, $n = 234$) of the participants who received information indicated that they were not given enough information about stillbirth. Additionally, while many recalled receiving some education about stillbirth (65% $n = 272$), the messages they received to support keeping their baby safe, such as monitoring fetal movement ($n = 362$; 85%), and their knowledge about the prevalence, and risk factors, was poor. For example, only 33% ($n = 140/417$) were able to correctly identify that there are six stillbirths every day in Australia [5].

Health care professionals' knowledge about stillbirth has also been found to be lacking [10,11]. Furthermore there may also be levels of stigma and taboo even among health care professionals. For example, in the 2011 Frøen et al. [10] international survey of 2490 health care providers (HCPs), 21% considered stillbirth to be the fault of the mother, and 13% thought a mother who had experienced stillbirth was impure or taboo. Furthermore, they identified that 62% of HCPs globally believed that there was no clear understanding of what stillbirth is and 71% felt that stillbirths are seen as a public concern in media or public arenas [10]. While this study is old it has not been repeated and therefore it is not known if these views persist or not. Certainly in countries such as Australia, undergraduate midwifery education about identifying and managing the risk of stillbirth and stillbirth prevention has been lacking [12]. Many registered midwives have indicated that they were not educated about stillbirth in their undergraduate

Table 2
Participants' knowledge about pregnancy and stillbirth.

Characteristics	n	%
Average pregnancy duration		
35 weeks (8 months)	17	4.9
40 weeks (9 months)	327	95.1
Amount of alcohol safe to consume during pregnancy		
None	329	95.6
1 standard drink a day	<5	0.6
1 standard drink a week	13	3.8
It is normal for a baby to run out of room towards the end of pregnancy		
True	112	32.6
False	154	44.8
Unsure	76	22.1
When preparing for labour and birth, a baby's movements slow down		
True	94	27.3
False	178	51.7
Unsure	71	20.6
If a pregnant woman is concerned about her baby's movements, she should first . . . ?		
Lay down quietly and note how long it takes for her baby to move 10 times	88	25.6
Stimulate the baby to move by e.g. having a cold glass of water or eating something sugary	101	29.4
Immediately contact her health care professionals	144	41.9
Its normal, do nothing	5	1.5
Other	5	1.5
How common do you think stillbirth (death of a baby in mum's belly) might be in Australia?		
6 per day	85	24.7
6 per week	67	19.5
60 per month	26	7.6
600 per year	41	11.9
None of the above	<5	0.6
Unsure	122	35.5
When do you think a stillbirth occurs?		
At any stage in the pregnancy	98	28.5
Before 20 weeks	<5	0.9
After 20 weeks	140	40.7
After 24 weeks	46	13.4
After 28 weeks	35	10.2
During Labour	21	6.1
A pregnant woman is more likely to have a stillbirth if she ^a :		
Lifts her hands above her head	5	1.5
Eats cold meat and soft cheeses	75	21.8
Lifts/moves a heavy item	64	18.6
Worked too much	27	7.9
Was highly stressed	96	27.9
Slept on her back	66	19.2
Dyed her hair	9	2.6
Exercised too hard	40	11.6
Drank alcohol	192	55.8
Smoked cigarettes	212	61.6
Smoked/took illicit drugs	225	65.4
Was overweight	109	31.7
Had a prior stillbirth	145	42.2
None of the above	71	20.6
Other	17	5.0

^a Participants could select more than one answer.

Table 3
Participants, perceptions, and public health messaging about stillbirth.

Experience and perception	n	%	Public health messaging	n	%
Stillbirth is just nature's way			Talking about stillbirth with pregnant women will cause them to worry unnecessarily?		
Agree	40	12.7	Agree	65	19.8
Neutral	100	31.7	Neutral	97	29.5
Disagree	176	55.7	Disagree	167	50.8
Stillbirths can be prevented			There needs to be a health campaign (television/posters) to promote awareness about stillbirth?		
Agree	163	51.6	Agree	205	62.3
Neutral	110	34.8	Neutral	93	28.3
Disagree	43	13.6	Disagree	31	9.4
Babies are stillborn because there is something wrong with them.			Seeing a picture of a stillborn baby would make me feel uncomfortable.		
Agree	61	19.3	Agree	162	49.4
Neutral	135	42.7	Neutral	56	17.1
Disagree	120	38.0	Disagree	110	33.5
Having a stillbirth is the same as the death of a child			Seeing bereaved parents talk about stillbirth on TV/Poster or in public would make me feel uncomfortable.		
Agree	283	89.6	Agree	70	21.3
Neutral	19	6.0	Neutral	44	13.4
Disagree			Disagree	214	65.2
I would not know what to say if someone told me that they had a stillbirth			Seeing stillbirth discussed on TV or Poster in public would make me feel uncomfortable.		
Agree	83	26.4	Agree	53	16.1
Neutral	68	21.7	Neutral	47	14.3
Disagree	163	51.9	Disagree	229	69.6
Miscarriage and stillbirth are the same thing			I would be comfortable talking about stillbirth with a family member who had a stillborn baby		
Agree	41	13.0	Agree	242	73.6
Neutral	47	14.9	Neutral	49	14.9
Disagree	228	72.2	Disagree	38	11.6
Do you personally know someone who has had a stillbirth?			I would be comfortable talking about stillbirth with a friend who had a stillborn baby		
Yes	213	61.9	Agree	238	72.6
No	105	30.5	Neutral	47	14.3
If yes, what is your relationship to the person who had stillbirth			Disagree	43	13.1
My partner/I had a stillbirth	19	8.7	I would be comfortable talking about stillbirth with an acquaintance who had a stillborn baby		
Close family/relative	24	11.0	Agree	161	48.9
Friend	108	49.5	Neutral	78	23.7
Work Colleague	31	14.2	Disagree	90	27.4
Do not wish to answer	10	4.6	I would be comfortable talking about stillbirth with a stranger who had a stillborn baby		
Other	26	11.9	Agree	141	43.0
			Neutral	80	24.4
			Disagree	107	32.6

education and that access to professional development activities related to stillbirth was sparse [11].

Despite this increasing awareness of the need to better educate pregnant people and families, as well as health care providers, there has been little research in high income countries into the general population's level of knowledge, attitudes, and perceptions of stillbirth. A recent Irish study reported low community awareness of stillbirth among 999 participants [13]. For example, around half the participants (47%) over-estimated the prevalence of stillbirth; and there appeared to be a confusion over the differences between miscarriage and stillbirth. Only 10% of the participants believed that stillbirths could be prevented, and this coincided with very limited knowledge of risk factors [13]. It is not known if these results would be similar in other high-income countries. Accordingly, the objective of the current study was to assess the general knowledge, perceptions, and attitudes of the Australian population towards stillbirth to inform future public health campaigns.

1. Methods

1.1. Study design and period

This cross-sectional study was conducted from January to February 2019.

1.2. Recruitment

The study used a convenience sampling strategy, with Australians over the age of 18 recruited via social media in January and February 2019. Targeted advertisements were developed and placed on the Facebook page of various community organisations, generic mothers' groups (with permission from administration) and the Telethon Kids Institute (a broad-based child-health research institute in Western Australia). In order to achieve a broadly representative sample of Australian adults and avoid an over-sampling of participants with a higher level of knowledge

Table 4

Unadjusted and adjusted odds ratios and 95% confidence intervals for selected stillbirth risk factor awareness.

Characteristics	Smoking		Alcohol		Illicit drugs		Previous stillbirth	
	cOR (95% CI)	aOR (95% CI)	cOR (95% CI)	aOR (95% CI)	cOR (95% CI)	aOR (95% CI)	cOR (95% CI)	aOR (95% CI)
Gender								
Male	1.00		1.00		1.00	1.00	1.00	1.00
Female	0.79 (0.33, 1.90)	0.46 (0.17, 1.22)	0.60 (0.25, 1.44)	0.49 (0.19, 1.26)	0.63 (0.24, 1.62)	0.40 (0.14, 1.14)	0.70 (0.31, 1.59)	0.53 (0.21, 1.34)
Age								
<35	3.05 (1.57, 5.92)	3.55 (1.63, 7.70)	2.45 (1.27, 4.76)	2.92 (1.37, 6.19)	3.05 (1.56, 5.95)	3.70 (1.71, 8.02)	2.43 (1.21, 4.86)	2.91 (1.32, 6.40)
35–44	2.01 (1.00, 4.01)	1.87 (0.89, 3.96)	2.12 (1.05, 4.25)	2.26 (1.08, 4.74)	1.69 (0.85, 3.38)	1.76 (0.84, 3.66)	1.68 (0.81, 3.51)	1.69 (0.78, 3.69)
>44	1.00		1.00		1.00	1.00	1.00	1.00
Education level								
Year 12 or less	0.62 (0.32, 1.21)	0.63 (0.30, 1.34)	0.73 (0.38, 1.42)	0.75 (0.36, 1.57)	0.82 (0.41, 1.62)	0.62 (0.29, 1.34)	0.49 (0.24, 1.00)	0.35 (0.16, 0.77)
Cert/Trade/Diploma	0.98 (0.56, 1.72)	1.04 (0.56, 1.93)	0.90 (0.52, 1.54)	0.95 (0.53, 1.70)	1.12 (0.63, 2.01)	1.00 (0.53, 1.88)	0.89 (0.52, 1.53)	0.72 (0.40, 1.30)
Bachelor/higher degree	1.00		1.00		1.00	1.00	1.00	1.00

Abbreviations: cOR, crude (unadjusted) odds ratio; aOR, adjusted odds ratio – mutually adjusted for listed factors and, State/Territory, number of children and financial difficulty.

about stillbirth, study recruitment posts were not directly placed on social media pages/sites of stillbirth advocacy organisations, e.g. Still Aware (CF is Founder). To avoid bias, advertisement of the study was not placed on the personal pages of study investigators DP, CF, JW or BF who are prominent figures within the broader stillbirth community.

Participants were able to access the online study survey by clicking on web links within the various social media posts and advertisements. The survey was hosted by [surveymonkey.com](https://www.surveymonkey.com). The first page provided information about the purpose of the study. Specifically, participants were informed that the survey aimed to identify their knowledge of pregnancy and stillbirth. Furthermore, participants were informed that they would be asked about their pregnancy loss history.

1.3. Survey

The survey was designed to assess the general population's knowledge of pregnancy and stillbirth risk factors and causes, with additional questions on the socio-demographic characteristics of participants. Demographic information is included in [Table 1](#) and responses to all survey questions are included in [Tables 2–4](#). The average time taken to complete the survey was 13 minutes.

1.4. Ethical issues and approval

The survey included an acknowledgment that survey questions on stillbirth may be distressing for bereaved parents, with the option to skip the set of questions pertaining to perceptions of stillbirth. A list of counselling services was presented at the start and end of the survey. By clicking 'next' button participants indicated they had read and understood the participant information and were willing to take part in the survey. This survey was approved by the University of South Australia Human Research Ethics Committee protocol #0000036071.

1.5. Analysis

Descriptive statistics, including frequency counts and proportions were used to summarise the participants' socio-demographic characteristics, knowledge, awareness, and perceptions about pregnancy health and stillbirth. Chi-squared tests were used to compare selected characteristics of participants by age, education level, and stillbirth awareness. Binary and multivariable logistic regression (complete case) were employed to calculate odds ratios (ORs) and 95% confidence intervals (CIs) for the likelihood of

identifying selected risk factors for stillbirth. Sensitivity analysis was performed to assess the impact of an over-representation of medical professionals in the sample; whereby participants that reported their occupation as 'doctor' or 'nurse' were excluded from models examining participant awareness of stillbirth risk factors. All the statistical analyses were conducted using STATA 15 (StataCorp, College Station).

2. Results

2.1. Participant characteristics

A total of 344 participants responded to the survey, including 294 (86%) women. Nearly half were between 25 and 34 years of age. Three-quarters (n = 257, 75%) of participants were either from Western Australia (n = 157, 46%) or South Australia (n = 100, 29%), with the majority holding a bachelor or higher degree qualification (n = 202, 59%). Most participants (n = 248, 72%) had at least one child. [Table 1](#) provides more detailed characteristics of the participants.

2.2. General pregnancy knowledge

[Table 2](#) illustrates the participants' general knowledge about pregnancy and stillbirth. Almost all (n = 327, 95%) selected the correct duration of pregnancy as 40 weeks or 9 months, and 96% (n = 329) of them knew that there is no safe level of alcohol consumption during pregnancy. About a third (n = 112, 33%) indicated that it is normal for a baby to run out of a room towards the end of a pregnancy, and 27% (n = 94) believed that a baby's movements slow down before labour and birth. More than two in five (42%, n = 144) indicated that a pregnant woman who had concerns about her baby's movements should immediately seek assessment.

2.3. Knowledge of incidence and timing of stillbirth

A quarter (n = 85, 24.7%) of participants knew how common stillbirth was in Australia (i.e. six per day), while only 41% (n = 140) knew that stillbirth occurs after 20 weeks gestation. Participants were given a list of common risk factors as well as some myths often thought to be associated with stillbirth. Most identified smoking (n = 212, 62%), alcohol (n = 192, 59%) and illicit drug (n = 225; 65%) use as risks to stillbirth, while 'moving heavy items' (n = 64; 19%) and 'exercising too hard' (n = 40, 12%) were incorrectly identified as risks by many ([Table 2](#)).

2.4. Perceptions about stillbirth causes and prevention

Table 3 presents the participants' perceptions of stillbirth and associated public health messaging. About 56% ($n = 176$) disagreed with the statement "stillbirth is just nature's way". Over half (52%, $n = 163$) of respondents indicated that stillbirths can be prevented. Almost two in five (38%, $n = 120$) disagreed with the statement that "babies are stillborn because there was something wrong with them", while many ($n = 135$, 43%) chose "neutral" for this question.

Approximately two-thirds ($n = 213$, 62%) of participants indicated they knew someone who has had a stillbirth and 50% ($n = 108$) of these indicated it was a "friend". Over a quarter ($n = 83$, 26%) of participants indicated they would not know what to say if someone told them that they had a stillbirth, although this was more common among younger (<35 years) respondents (Table S1) and those who did not know someone who has had a stillbirth (Table S2).

2.5. Factors associated with stillbirth risk awareness

Age but not gender was significantly and consistently associated with awareness of these risk factors. For instance, in the adjusted model (adjusted for sex, education level, state/territory, number of children and financial difficulty), younger (<35 years) participants were significantly more likely to identify smoking ($OR = 3.55$, 95% CI: 1.63, 7.70), use of alcohol ($OR = 2.92$, 95% CI: 1.37, 6.19) and illicit drugs ($OR = 3.70$, 95% CI: 1.71, 8.02), and previous stillbirth ($OR = 2.91$, 95% CI: 1.32, 6.40) as a risk factor for stillbirth, compared with older (>44 years) participants. Respondents with a bachelor/higher degree educational qualification were more likely to identify the previous stillbirth ($OR = 2.84$, 95% CI: 1.29, 6.21) as a risk factor for stillbirth, compared with those with a Year 12 or less qualification (Table 4). We found similar results in the sensitivity analysis that excluded doctors and nurses with some exceptions, although the results were less precise. The association with the gender of participants became statistically significant; in the sample exclusive of doctors and nurses, female participants were 60%–80% less likely to identify the aforementioned factors as risks to stillbirth than males (Table S3).

2.6. Public health messaging about stillbirth

One in five ($n = 65$, 20%) participants agreed with a statement that talking about stillbirth with pregnant women would cause them to worry unnecessarily, and another 30% ($n = 97$) were neutral about this matter. However, nearly two-thirds ($n = 205$, 62%) agreed there was a need for a health campaign (television/posters) to promote awareness about stillbirth. Participants identified that they would be comfortable seeing a bereaved parent talk about stillbirth via TV or poster ($n = 214$; 65%). Seeing stillbirth discussed generally on TV or poster would also not make them uncomfortable ($n = 229$; 70%). Although half ($n = 162$, 49%) indicated that seeing a picture of a stillborn baby would make them feel uncomfortable—particularly those who did not know someone who had had a stillbirth (Table S2). About three-quarters of participants agreed that they would be comfortable talking about stillbirth with a family member ($n = 242$, 74%) or a friend ($n = 238$, 73%) who had a stillborn baby, but only 43% ($n = 141$) stated that they would be comfortable discussing this with a stranger who had a stillborn baby (Table 3).

3. Discussion

Our online survey of adults explored the knowledge, attitudes, and perceptions towards stillbirth among Australian adults, highlighting that general knowledge about causes and prevention

messages for stillbirth may be relatively poor, however there is a desire for further information through a public health campaign. Our results are consistent with previous international studies of the general population [13,14]. They are also consistent with those studies that targeted knowledge and awareness of stillbirth in a population who had been previously pregnant [5] as well as health care providers [11,15].

3.1. Knowledge of stillbirth

A quarter of the participants were able to correctly identify the daily prevalence of stillbirth. This is slightly lower than a previous study which solely focused on women who have received antenatal care in Australia, where a third of were able to correctly identify the prevalence of stillbirth. While 41% of participants in the current study correctly identified 20 weeks as the gestation from which stillbirth occurs in Australia, nearly a quarter indicated that stillbirth occurs from 24 weeks (a UK definition) or 28 weeks (the WHO definition). Nevertheless, this finding suggests higher rates of knowledge, from that of Nuzum et al. [13] study where participants (58%) reported that stillbirth could occur at any stage in a pregnancy.

3.2. Causes and prevention awareness

There was a lower amount of participants (19%) of the participants agreed that a stillbirth occurred due to something wrong with the baby compared to the Irish cohort in Nuzum et al. [13] research, which found over half of their population supported that sentiment.

Over half of the participants in the current study indicated that stillbirth could be prevented, this starkly contrasts with Nuzum et al. [13] who reported that only 10% agreed that stillbirth was preventable. However, a small number (13%) of participants in the current study agreed that stillbirth was "just nature's way" and this highlights the need for public education in this area. However, this contrasts with the results of the Frøen et al. [10] survey, where 63% of Australians felt that stillbirth is natural selection. The attitude that stillbirth cannot be prevented represents a small proportion of the sample in the current study and when compared to Frøen et al. [10] study it is much lower. The findings in the current study could reflect the increasing advocacy and awareness that has occurred in Australia since the Australian Stillbirth Senate Inquiry. However, it could also highlight a need, for any future campaign to address that while many babies are stillborn due to congenital abnormalities that are incompatible with life (30%), up to 60% of stillbirths are potentially preventable [16].

Some common myths about a baby's movement were held by participants in the current study, namely that it is normal for a baby to "run out of room" and to "move less" towards the end of the pregnancy. These kinds of views were also reported by Pollock et al.'s [5] survey of recently pregnant women in Australia. Of concern, the majority of participants selected a 'first response' of either "stimulating the baby to move by, for example, having a cold glass of water or eating something sugary" (29%), "lay down quietly and note how long it takes for her baby to move 10 times" (26%) or "its normal, do nothing," (2%). Only 41% correctly responded that if a woman is concerned about her fetal movements, she should contact her health care provider. It will be important for a public awareness campaign to dispel these kinds of myths as well as reinforce correct messages.

It is noteworthy that younger participants had more knowledge of factors associated with stillbirth risk, such as alcohol consumption, illicit drug taking, smoking and a history of previous stillbirth factors than older participants. This was also seen in the Nuzum et al. (2017) study, who reported that those over 45 years were

more likely to say they did not know the incidence or risk factors of stillbirth (31% versus 18%). Australian studies have reported that pregnant women receive perinatal information such as fetal movements and stillbirth from a variety of sources not just their health care provider [5,17]. These include their family, friends, and own mother [5,17]. These results reflect the need for future public health messages to target not only pregnant people, but also older individuals within our community.

3.3. Anxiety and stillbirth messaging

There is a common concern that the discussion of stillbirth creates unnecessary anxiety for pregnant women [5], with potential consequences for fetal development. One in five of the participants in the current study agreed that such a discussion would cause “unnecessary worry”. This is consistent with a recent Australian study of 428 women who had a live birth and received antenatal care. They reported a little over a quarter of the participants (27% $n = 112$) indicated that if they were told about stillbirth and the importance of monitoring fetal movements during their antenatal care that this would “create anxiety” [5]. However, studies of pregnant women’s views have shown that fetal movement messaging does not appear to prompt anxiety [18–20]. On balance, the evidence suggests that a focus on supporting risk reduction may be less anxiety provoking than discussing stillbirth directly [5]. Further research is needed to establish what aspects of stillbirth messaging are anxiety provoking and how to frame stillbirth prevention messages to minimise the risk of causing anxiety.

3.4. Future public health campaign

Our results indicate firm support (62%, $n = 205$) for a public awareness campaign about stillbirth. Particularly on what stillbirth is (death of a baby from 20 weeks gestation) and what it is not (miscarriage). Our findings indicate that participants were comfortable seeing a bereaved parent talk about stillbirth via TV or poster. However, there may need to be some consideration about showing images of stillborn babies, as nearly half of participants felt that seeing a picture of a stillborn baby may make them feel uncomfortable. Images are often used in public health campaigns to provide motivation to change behaviours. Although, these methods are effective, there is no existing research into the effectiveness, or appropriateness of using images of stillborn babies to motivate change. Furthermore, main stream media often put ‘trigger’ warnings on images of stillborn babies or follow stories about stillbirth with information about where to get help. This may inadvertently be supporting stillbirth stigma and taboo. Images of a stillborn baby are often parents only lasting memory and are therefore cherished by bereaved parents and this should be respected. Therefore, further research is needed to understand the type of images that could inform a future public health campaigns and ensure that these images are respected and that their use is not a cause of further harm to the bereaved parent nor add to existing stigma [4].

3.5. Strengths and limitations

The sample size was relatively small, with a high proportion of participants from Western Australia and South Australia—therefore these results may not be generalisable to the broader Australian population. Despite changing the recruitment advertisement to a more male-centric direction, this study was only able to recruit a limited number of men. Furthermore, the sample only represents a small portion of the Australian population, with little or no representation from culturally and linguistically diverse or

Aboriginal and Torres Strait Islander peoples. Aboriginal and Torres Strait Islander peoples are more likely to experience a stillbirth [21]. Therefore, it is imperative that future research is co-designed, addresses the culture, values, needs and wants of a stillbirth public health campaign with Aboriginal and Torres Strait Islander peoples. A strength of the current research is that it incorporated lived experience researchers from conceptualisation to completion. DP, CF, JW and BF are bereaved parents who have experienced a stillbirth.

4. Conclusions

There remains a paucity of general community knowledge about stillbirth in high income countries such as Australia. Little is known about its prevalence, risks, and prevention methods. This study provides further support for the need for public awareness campaigns. We show that a targeted campaign which educates the general population about what stillbirth is alongside the well-established modifiable health behaviours is required. Such campaigns should also recognise that pregnant women are involved in a larger community and often obtain their information from older members of the general population and not just social media, the internet, or health care professionals.

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Author contributions

DP was responsible for the conceptualization. All authors conceived the study and were responsible for the interpretation of results, drafting and editing of this project. DP, JW and CF was responsible for the conceptualization, recruitment and original draft preparation. DP, AA, CS performed the analysis and all authors have seen and approved the final version of the entire article and abstract.

Ethical statement

This survey was approved by the University of South Australia Human Research Ethics Committee protocol #0000036071.

Conflict of interest

There are no conflict of interests.

Acknowledgement of Lived Experiences

DP, BF, JW and CF are bereaved parents who have experienced a stillbirth.

References

- [1] L. Hilder, V. Flenady, D. Ellwood, N. Donnelly, G.M. Chambers, Improving, but could do better: trends in gestation-specific stillbirth in Australia, 1994–2015, *Paediatr. Perinat. Epidemiol.* 32 (6) (2018) 487–494, doi:<http://dx.doi.org/10.1111/ppe.12508>.
- [2] V. Flenady, D. Ellwood, B. Bradford, M. Coory, P. Middleton, G. Gardener, et al., Beyond the headlines: Fetal movement awareness is an important stillbirth prevention strategy, *Women Birth* 32 (1) (2019) 1–2, doi:<http://dx.doi.org/10.1016/j.wombi.2018.12.001>.
- [3] Commonwealth of Australia. The Senate Select Committee on Stillbirth Research and Education Report. ISBN 978-1-76010-7688-3 (2018). Available from: https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Stillbirth_Research_and_Education/Stillbirth/Report.

- [4] D. Pollock, E. Pearson, M. Cooper, T. Ziaian, C. Foord, J. Warland, Breaking the silence: Determining prevalence and understanding stillbirth stigma, *Midwifery* 93 (February) (2021) 102884, doi:<http://dx.doi.org/10.1016/j.midw.2020.102884> Epub 2020 Nov 13. PMID: 33246144.
- [5] D. Pollock, T. Ziaian, E. Pearson, M. Cooper, J. Warland, Breaking through the silence in antenatal care: Fetal movement and stillbirth education, *Women Birth* 33 (1) (2020) 77–85.
- [6] M. Vennemann, D. Fischer, G. Jorch, T. Bajanowski, Prevention of sudden infant death syndrome (SIDS) due to an active health monitoring system 20 years prior to the public “Back to Sleep” campaigns, *Arch. Dis. Child.* 91 (4) (2006) 324–326, doi:<http://dx.doi.org/10.1136/adc.2005.082172>.
- [7] C.J. Andrews, D. Ellwood, P.F. Middleton, C.S.E. Homer, H.E. Reinebrant, N. Donnelly, et al., Survey of Australian maternity hospitals to inform development and implementation of a stillbirth prevention ‘bundle of care’, *Women Birth* 33 (3) (2020) 251–258, doi:<http://dx.doi.org/10.1016/j.wombi.2019.06.001>.
- [8] J. Warland, A.E. Heazell, T. Stacey, C. Coomarasamy, J. Budd, E.A. Mitchell, et al., “They told me all mothers have worries”, stillborn mother’s experiences of having a “gut instinct” that something is wrong in pregnancy: Findings from an international case–control study, *Midwifery* 62 (2018) 171–176.
- [9] M.A. Wakefield, B. Loken, R.C. Hornik, Use of mass media campaigns to change health behaviour, *Lancet* 376 (9748) (2010) 1261–1271, doi:[http://dx.doi.org/10.1016/S0140-6736\(10\)60809-4](http://dx.doi.org/10.1016/S0140-6736(10)60809-4).
- [10] J.F. Frøen, J. Cacciatore, E.M. McClure, O. Kuti, A.H. Johkio, M. Islam, et al., Stillbirths: why they matter, *Lancet* (London, England) 377 (9774) (2011) 1353–1366, doi:[http://dx.doi.org/10.1016/S0140-6736\(10\)62232-5](http://dx.doi.org/10.1016/S0140-6736(10)62232-5) Epub 2011/04/19. PubMed PMID: 21496915.
- [11] J. Warland, P. Glover, Talking to pregnant women about stillbirth: Evaluating the effectiveness of an information workshop for midwives using pre and post intervention surveys, *Nurse Educ Today* 35 (10) (2015) e21–e25.
- [12] J. Warland, P. Glover, Tertiary education regarding stillbirth for student midwives: The tears 4 SMS project, *Women Birth* 32 (3) (2019) e409–e412.
- [13] D. Nuzum, S. Meaney, K. O’Donoghue, The public awareness of stillbirth: an Irish population study, *BJOG Int. J. Obstet. Gynaecol.* 125 (2) (2018) 246–252, doi:<http://dx.doi.org/10.1111/1471-0528.14939>.
- [14] S.D. Golden, J.A.L. Earp, Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions, *Health Educ. Behav.* 39 (3) (2012) 364–372, doi:<http://dx.doi.org/10.1177/1090198111418634>.
- [15] S. Mohan, T. Gray, W. Li, M. Alloub, A. Farkas, S. Lindow, et al., Stillbirth: perceptions among hospital staff in the Middle East and the UK, *Eur. J. Obstet. Gynecol. Reprod. Biol.* X 4 (2019) 100019, doi:<http://dx.doi.org/10.1016/j.eurox.2019.100019> PubMed PMID: 31673684.
- [16] Welfare AloHa, Stillbirths and Neonatal Deaths in Australia, AIHW, Canberra, 2020.
- [17] A. McArdle, V. Flenady, J. Toohill, J. Gamble, D. Creedy, How pregnant women learn about foetal movements: sources and preferences for information, *Women Birth* 28 (1) (2015) 54–59, doi:<http://dx.doi.org/10.1016/j.wombi.2014.10.002> Epub 2014/12/03. PubMed PMID: 25457375.
- [18] J.V.H. Tveit, E. Saastad, B. Stray-Pedersen, P.E. Børdaahl, V. Flenady, R. Fretts, et al., Reduction of late stillbirth with the introduction of fetal movement information and guidelines — a clinical quality improvement, *BMC Pregnancy Childbirth* 9 (1) (2009) 32, doi:<http://dx.doi.org/10.1186/1471-2393-9-32>.
- [19] E. Saastad, J.V.H. Tveit, V. Flenady, B. Stray-Pedersen, R.C. Fretts, P.E. Børdaahl, et al., Implementation of uniform information on fetal movement in a Norwegian population reduced delayed reporting of decreased fetal movement and stillbirths in primiparous women — a clinical quality improvement, *BMC Res. Notes* 3 (1) (2010) 2, doi:<http://dx.doi.org/10.1186/1756-0500-3-2>.
- [20] A.T. Evans, E. Peters, A.B. Shoben, L.R. Meilleur, E.G. Klein, M.K. Tompkins, D. Romer, M. Tusler, Cigarette graphic warning labels are not created equal: they can increase or decrease smokers’ quit intentions relative to text-only warnings, *Nicotine Tobacco Res.* 19 (10) (2017) 1155–1162, doi:<http://dx.doi.org/10.1093/ntr/ntw389>.
- [21] Australian Institute of Health and Welfare (AIHW), Stillbirths and Neonatal Deaths in Australia Retrieved from Canberra, (2020) . <https://www.aihw.gov.au/getmedia/9ef3cbfed9fc-4dcf-99f8-a811f141951e/Stillbirths-and-neonatal-deaths-in-Australia.pdf.aspx?inline=true>.