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Breaking through the silence in antenatal care: Fetal movement and stillbirth education

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ABSTRACT

Background: Fetal movements are a key indicator of fetal health. Research has established significant correlations between altered fetal activity and stillbirth. However, women are generally unaware of this relationship. Providing pregnant women with information about the importance of fetal movements could improve stillbirth rates. However, there are no consistent fetal movements awareness messages globally for pregnant women.

Aims: This study aimed to explore the antenatal care experiences of Australian mothers who had recently had a live birth to determine their knowledge of fetal movements, the nature and source of that information.

Methods: An online survey method was used for 428 women who had a live birth and received antenatal care in Australia. Women's knowledge of fetal movements, stillbirth risk, and the sources of this knowledge was explored.

Findings: A large proportion of participants (84.6%; n = 362) stated they had been informed by health care professionals of the importance of fetal movements during pregnancy. Open-ended responses indicate that fetal movements messages are often myth based. Awareness that stillbirth occurs was high (95.2%; n = 398), although, 65% (n = 272) were unable to identify the current incidence of stillbirth in Australia. **Conclusion:** Women who received antenatal care have high-awareness of fetal movements, but the information they received was inconsistent. Participants knew stillbirth occurred but did not generally indicate they had obtained that knowledge from health care professionals. We recommend a consistent approach to fetal movements messaging throughout pregnancy which focuses on stillbirth prevention.

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Statement of significance

Problem or issue

Women are not receiving consistent FM messages or educated about stillbirth during antenatal care.

What is already known

Altered fetal activity and stillbirth are significantly correlated. Providing pregnant women with information about FM and stillbirth could reduce poor outcomes.

What this paper adds

FM messaging remains inconsistent and could lead to the perpetuation of long-held dangerous myths such as, 'babies slow down at the end of pregnancy.' Women were not being informed about the possibility of stillbirth within their antenatal care. Discussion of stillbirth and FM would not necessarily create anxiety for women. Therefore HCP should discuss it within antenatal care.

1. Introduction

Stillbirth remains a largely ignored global health issue on a community, policy and public health level.¹ However, there are nearly three million stillbirths over 28 weeks gestation per year worldwide.¹ While low-income countries shoulder the bulk of this burden, women living in high-income countries are not immune. For example, in

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Australia, one in one-hundred and thirty-five births result in a stillbirth.² Stillbirth in Australia is defined as the in-utero death of a fetus from 20 weeks gestation and a gestational weight of 400 g.²

In recent years there has been the identification of modifiable health behaviours, namely monitoring fetal movements,^{3–5} and settling to sleep on the side during pregnancy^{3,6–8} which may reduce stillbirth. Fetal activity is an indicator of fetal health; it is hypothesised that when a fetus reduces the frequency of their movements (DFM) that this may be due to placental insufficiency.⁹ Initially, stillbirth was only associated with decreased fetal movements.^{3,4,10} However, recent research has established reported that any change in fetal activity, i.e., changes in strength, frequency or daily pattern of activity, increases the risk of stillbirth.^{3,4,10,11} Therefore, women should be informed about the potential significance of any alteration in fetal movements and urged to report these changes by their HCPs. This is important because an online international case-control study found that those who had a live baby were more likely to indicate that they had received information about fetal movements from their care provider than women who experienced a stillbirth (aOR 0.55, 95% CI 0.36–0.86, $p=0.008$).¹⁰ Saastad et al.^{12,13} demonstrated an apparent link between a delay in reporting DFM and stillbirth, and also between low maternal awareness of fetal movements and other poor pregnancy outcomes such as fetal growth restriction. Together this research indicates that there is a need for mothers to be informed about the importance of fetal movements throughout their pregnancy, as well as the importance of immediately reporting any changes they notice.

While the maternal perception of any alteration in fetal movements can be used as a screening tool to assess fetal well-being, there is little guidance as to what message should be given to women and when. For example, the recent Australian antenatal guidelines only mention that FMs should be ‘discussed’ but do not outline the recommended content of the discussion. This means there is no consistency and consensus over fetal movements messaging¹⁴ and this, in turn, may lead to HCPs refraining from discussing the importance of fetal movements with women altogether.¹⁵

Women cannot know to present to their maternity care provider if they are not aware of the significance of changes in their baby’s movements. Health care providers play an important role in providing information and empowering women through their antenatal care, and this includes when to act if they perceive a change in their baby’s activity.¹⁶ Unfortunately, there is much myth-based information being given to pregnant women, for example, two Australian studies both reported pregnant women being given outdated information about trying to stimulate the fetus to move by drinking a cold glass of water/sugary drink.^{14,15} Linde et al.¹⁶ a Swedish study of 215 women who had a stillbirth, also found that women were still being informed by their health care provider that a reduction in the frequency of movements at the end of pregnancy was normal. Such information is not based on evidence nor is it physiologically sound and more, giving this information may provide false reassurance and delay help-seeking in women who are genuinely concerned about their unborn baby’s wellbeing.¹⁴ This situation is further complicated because some reports have shown that when women present with concerns that they are not always appropriately managed or that their concerns are not heard.⁴ Also, research to date has typically only explored knowledge of fetal movements late in the third trimester, and not usually in connection the importance of monitoring fetal movements to reduce the risk of stillbirth. However, a delay in presenting (>24 h from the maternal perception of a reduction in the frequency of fetal movements) is associated with increased risk of stillbirth,¹⁷ but women do delay seeking care especially because they consider their concerns may not be treated seriously.¹⁸ Providing pregnant women with consistent information on fetal movements may be one way to reduce delayed

reporting and subsequently, stillbirth. For example, Saasted et al.¹³ were able to observe this relationship in a randomised control trial (RCT) of primiparous women in Norway. They also reported that discussing fetal movements did not increase maternal concerns; neither did it increase the number of times a woman presented to assessment units due to concerns about fetal movements.¹³

Further evidence which supports the value of a more explicit messaging can be seen in Scotland. The Maternity and Children Quality Collaborative (MCQC) introduced a requirement that all HCPs should have a documented discussion about the importance of fetal movements between 18–24 weeks with pregnant women.¹⁹ Since the introduction of this initiative in 2012, stillbirth in Scotland had reduced by more than 19.5% in 2015.²⁰ While there may be other reasons for this reduction, it is plausible to attribute at least some of this reduction to the implementation of this policy change. This reduction is a particularly significant change when interpreted in light of the stillbirth rates from other high-income countries being relatively stable for more than two decades.²¹

Stillbirth can be a silent and taboo topic, and maternal care providers may feel awkward and unwilling to discuss stillbirth with well-women at low risk of stillbirth.²² However, the example from Scotland emphasises the value of appropriately situating education about the importance of monitoring the baby’s movements with an open conversation regarding the association between alterations in fetal movements and the risk of stillbirth. Discussing stillbirth may create an element of risk perception which can help in the uptake of health behaviours.²³ Despite the success of initiatives in both Scotland and Norway, there is still no consensus on the message or resources that health care practitioners should provide to women concerning fetal movements and stillbirth. However, both approaches used in Scotland and Norway indicate that a clear message and ongoing dialogue could empower women to act to advocate for their unborn baby and may also influence political and institutional structural changes. The lack of guidance over the nature of the discussion to have with pregnant women is reflected in the most recent Australian national antenatal guidelines, which guide health care providers to inform women about what to expect and is normal for fetal movements during pregnancy.²⁴ However, these are guidelines only, and there is no requirement to enact them,²⁴ even though taking such an approach appears to have been an essential part of the stillbirth reduction in Scotland.

Given the well-established association between stillbirth and altered fetal movements, evidence to suggest that messaging about fetal movements is inconsistent, and reports from Scotland regarding the benefits of fetal movements education for expecting mothers. This study sought to explore the antenatal care experiences of Australian mothers to determine to their knowledge of fetal movements, the nature, and source of information provided, and whether the connections between changes in their baby’s activity and risk of stillbirth were made clear to them during pregnancy. Specifically, this study investigated:

1. Where and how Australian pregnant women received information regarding monitoring fetal movements
2. What type of information women received about fetal movements
3. If women were informed about the possibility of stillbirth occurring in their pregnancy, and;
4. Whether women thought the discussion of fetal movements and stillbirth was anxiety inducing.

2. Methods

Women were asked to share their knowledge and the information they received about fetal movements and stillbirth

during their antenatal care. An anonymous web-based survey was developed. The survey is based on one developed for bereaved parents of stillbirth as part of the primary author's PhD study and includes quantitative and qualitative questions. The survey included demographic questions about the woman and her pregnancy, e.g. if women were currently pregnant and how long ago their pregnancy was. Questions regarding their antenatal care were also asked, for example, how many appointments they attended and their overall satisfaction with their care. Questions about the woman's knowledge of fetal movements and stillbirth, the sources from which they gained that knowledge, as well as the information given to them by their health care professionals, were also asked. The survey had a combination of open-ended responses and 5-point Likert scales. Several midwives, one obstetrician and two consumers were asked to view the survey to determine the clarity of the questions and to explore if any questions needed to be added.

2.1. Inclusion criteria

Women who were over the age of 18, had given birth to a live baby within the last ten years (2007–2017), and self-identified as receiving most of their antenatal care in Australia were invited to take part in the survey.

2.2. Exclusion criteria

Women whose last pregnancy ended in loss or who did not receive the majority of their antenatal care in Australia were excluded from this study.

3. Recruitment

Fliers about the study were distributed at the Pregnancy, Mothers and Babies expo in Sydney (19–21st of May 2017). However, participants were mainly recruited to this study through mother's support pages on Facebook.com during May–October 2017. Permissions were sought from the administrators of the relevant Facebook mothers' pages; a post was then published with a direct link to the online survey. Participants who followed the link were given further information about the purpose of the study, clicking a "next" link was taken as evidence of informed consent.

4. Data analysis

The analysis of this study involved descriptive statistics for the quantitative questions. The comment data were analysed using the summative content analysis (SCA) procedure of Hsieh and Shannon.²⁵ The SCA procedure firstly quantifies the times a word of significance is used through the calculation of frequency, to identify patterns in the data and develop codes (p. 1285). This allows for the research to then explore the potential meaning behind those words. DP initially explored the frequency of the keywords used within the open-text responses through excel. DP and JW subsequently confirmed the coding of that frequency and identified exemplar quotes.

4.1. Ethical approval

This study was approved on the 5/12/2016 by the University of South Australia Human Research Ethics Committee. Protocol number 0000036017. A summary of the content within the survey, the benefits and disadvantages to participation and consent information was provided to the participants at the start of the survey. Participants were informed through the information page that consent was voluntary, and they were able to withdraw at any

time. Participants were asked to click 'next' if they agreed to the information sheet which was taken as an assumption of consent. No identifying information from participants was collected. As knowledge about risks of stillbirth was asked about within the survey, participants were directed at the start and end of the survey to Beyond Blue and Perinatal Anxiety and Depression Australia (PANDA), which are free counselling services in Australia.

5. Findings

Five-hundred and thirty responses were collected, however, after the initial data analysis, only those who completed most of the survey were included within the current study. Subsequently, 428 participant responses were analysed. Participants were mainly Caucasian, between the ages of 26–35, chiefly residing in South Australia and mostly had had their baby in the past five years, full demographic characteristics are presented in Table 1.

Most participants indicated that they currently only had one child (52.6%, n = 225), with a further 32.9% (n = 141) stating that they had two children and 11.9% (n = 51) had three children. Only 2.5% (n = 106) had four or more children. There were 15.4% (n = 66) of participants who were currently pregnant again during the time of undertaking this study (note: they were informed to discuss their antenatal care experiences from their most recent pregnancy). Participants were also asked if they had a prior pregnancy loss (miscarriage, stillbirth or termination), 35.7% (n = 153) responded with 'yes.'

Information regarding the participant's antenatal care was also collected. Participants indicated that the type of antenatal care was mainly private (n = 265, 61.9%) and delivered by an obstetrician

Table 1
Demographic characteristics of participants.

Respondent characteristics	Response category	Results (n = 428)	
		N	%
Age	18–25	38	8.9
	26–31	159	37.1
	32–35	125	29.2
	36–40	79	18.5
	41–45	20	4.7
	45+	6	1.4
Year of baby's birth	2013–2017	399	93.2
	2008–2012	29	6.8
Residing state/territory	South Australia	182	42.5
	Western Australia	16	3.7
	Queensland	23	5.4
	New South Wales	89	20.8
	Victoria	102	23.8
	Tasmania	7	1.6
	Australian capital territory	7	1.6
	Northern Territory	2	0.5
Cultural background	Caucasian	402	93.9
	Australian Aboriginal	6	1.4
	Asian	9	2.1
	African	4	0.9
	Other	7	1.6
Highest level of educational attainment	Less than High school certificate	22	5.1
	High school certificate	80	18.5
	Some university, but not completed	79	18.5
	Associates degree	5	1.2
	Bachelor's degree	107	25
Marital status	Honours	33	7.7
	Postgraduate degree	96	22.4
	Doctorate	6	1.4
	Single	30	7
	Married	304	71
	Defacto	93	21.7
	Widowed	1	0.2

Table 2
Participant information of their antenatal care.

Participant characteristics	Response category	Results	
		N	%
Type of antenatal care	Public care	160	37.4
	Private care	265	61.9
	Independent midwifery care	3	0.7
Which HCP did you have most of your antenatal appointments with?	Obstetrician	220	51.4
	Midwife	165	38.6
	Independent midwife	4	0.9
	GP	39	9.1
Where did you have the majority of your antenatal care appointments?	Hospital clinic	168	39.3
	Hospital MFM unit	12	2.8
	Home	29	6.8
	Birth centre	11	2.6
	GP practice—shared care	48	11.2
How many antenatal appointments did you attend?	Obstetricians office	157	36.7
	<5	44	10.7
	6+	382	89.3

(n=220, 51.4%); most participants had attended at least six antenatal appointments (n=382, 89.3%, further descriptive data regarding antenatal care can be seen in Table 2.

5.1. Being comfortable in discussing concerns (n=428)

On a 5-point Likert scale ranging from 'very comfortable' to 'very uncomfortable', 87% (n=373) participants stated that they were 'very comfortable' to 'comfortable' in discussing their concerns with their health care provider. Only 81 mothers provided comment data on this question. Six categories were identified from these responses; they included: Happy with care/communication, not heard, inconsistency between health care providers, labelling, rushed, and lack of continuity. Please refer to Table 3 for examples of quotes which characterise each category found.

5.2. Satisfaction with antenatal care (n=428)

Participants stated that they had high satisfaction with the antenatal care they received from their health care providers. On a 5-point Likert scale ranging from 'I was very satisfied,' to 'I was very unsatisfied.' A vast majority (82.4%, n=353) stated were 'very satisfied to satisfied' with their antenatal care. Only, 7.5% (n=31) stated that they were 'unsatisfied to very unsatisfied' with the care they received.

5.3. Knowledge of fetal movements (n=391)

Three hundred and ninety-one participants answered an open-ended question: "Please tell us what you know about what to

expect regarding your unborn baby's movements in pregnancy?" These 391 responses were analysed using summative content analysis, and seven categories and several sub-categories were identified from the responses of this question: *When movements starts, and a pattern develops, what is 'normal fetal movements?'* *Methods of movements tracking, when to seek action, myths or misunderstandings and evidence in messaging.* Responses could have been included two or more coded areas, i.e. the quote could have discussed what a normal pattern of movements was, and then when to seek action. The most common responses are detailed in Table 4 however due to a large number of responses, to see all coded responses please see the supplementary file 1, for a complete and detailed breakdown of the responses. Most participants (n=63) believed that the baby's movements start between 12–19 weeks. With a further 40 participants stating that movements are felt at 20 weeks. Mothers explained what 'normal' fetal movements meant to them. The most common response was 'regular movements' (n=86), participants did not detail what this meant though. Most attempted to quantify movements with the most common being 'ten movements.' However, there was inconsistency in the time period in which the ten movements should occur. Only 28 participants provided comment data on methods of movements tracking. These mothers reported a range of methods which they used to track movements, however, detail on how to establish or realise when something was not normal was rarely identified. Mothers stated that babies should "develop their pattern," and they should "get to know" their baby's movements. Counting the baby's kicks was also a recurring approach. Participants comments about when they might seek assistance were broad and ranged from when there was any change in baby's pattern, to when there was decreased or even no movements. A small number (78.8%; n=26) of participants who responded to this question stated that a decrease in movements or no movements was not 'normal,' also, that a baby's movements should be stronger at the end of pregnancy. Participants who provided comment expressed the prominent myth that baby's run out of room (n=13) and they will slow down (n=8) near the end of the pregnancy. Furthermore, 11 participants suggested that there were ways to encourage movements. However, they did not specify that they should seek action if the baby's movements do not return to normal. Please refer to Table 4 for identified categories and exemplar quotes on what women knew to expect regarding a baby's movements during pregnancy.

Despite this range of responses, when asked: 'Were you aware that a change in fetal movements could be a possible indicator that your baby could be unwell?' 97.2% (n=416) responded with 'yes,' with only, 2.6% (n=11), responding with 'no.' The participants were then asked to rate the importance of monitoring their baby's movements in pregnancy, and 97.7% (n=418) answered 'very important' and 'important.'

Table 3
Participant responses to 'how comfortable did you feel talking to your care provider about any concerns you had about your baby?.'

Categories	n	%	Exemplar quotes (year of baby's birth)
Happy with care/communication	32	39.5%	"Care I received both before and after becoming high risk was fantastic; felt all precautions were taken to ensure the safety of my baby and me." (2017)
Not heard	15	18.4%	"I felt comfortable raising concerns but also felt a lot of my concerns were dismissed flippantly." (2016)
Inconsistency between health care providers	12	14.8%	"Depends on which midwife I saw . . . one was rude and made me feel like I was an inconvenience." (2014)
Labelling	8	9.8%	"I felt like I was looked at a 'hysterical' woman when I was concerned about my baby. I was made to feel uneducated and overly anxious, and at times I agonised whether to take my concerns to the professionals or just 'Dr. Google' from the laptop at home to save face and stress associated with being upfront." (2009)
Rushed	8	9.8%	"I felt very rushed during clinic appointments. I feel that if I had been given the opportunity to have midwife consultations in addition to OB consults. I would have been more comfortable discussing concerns." (2017)
Lack of continuity	6	7.4%	"Didn't connect well as had different midwife every appointment." (2015)
Total	81	100.0	

Table 4

Categories identified regarding what women knew to expect about an unborn baby's movements in pregnancy.

Please tell us what you know about what to expect regarding your unborn baby's movements in pregnancy? (n = 391)			
Categories	N	% ^a	Exemplar quotes (year of baby's birth)
When it starts	114		
Before 20 weeks	66	57.1	"Will start happening at about week 18." (2017)
20 weeks (halfway)	40	35.1	"Movements from 20 weeks." (2016)
After 20 weeks	8	7.0	"Kicking around the 22 weeks." (2017)
What is normal movements	181		
Regular movements	47	25.9	"Expect movements during your pregnancy that are consistent and regular for your baby." (2016)
Babies movements are individual	29	16.0	"There should be a pattern of movement but it's quite individual." (2017)
Some movements every day	29	16.0	"Should feel something a few times at least every day." (2016)
Quantifying movements	64	35.4	
10 per day	10	5.2	"To be at least ten movements a day." (2016)
10 per 2 h	18	9.9	"It should move ten times in 2 hours." (2016)
1–5 per hour	11	6.1	"I believe its 4 per hour on average, maybe? (2014)
6–10 per hour	25	13.8	"At least ten movements in an hour is what you should expect at a minimum." (2017)
Methods of movements tracking	28		
Count your baby's kick	18	64.3	". . . take 15 minutes at same time of day each and count kicks." (2016)
Babies develop a pattern, you need to learn them	10	35.7	"Its important to gain an understanding over time of what is 'normal' for you and your baby." (2016)
When to act	161		
Report if baby doesn't move or movements have decreased	68	42.2	". . . that any slowing of movements should be seen about in hospital." (2016)
Report if any change in movements	53	32.9	". . . I was informed if baby's movements changed significantly (increased/decreased) to go to the birth unit to be monitored." (2016)
Report after encouraging movements (eating or drinking something 'sugary,' poking baby, or standing up and moving around) and still not feeling baby movements	17	9.4	"After two hours if felt no movements try to encourage movements, stand up move around, have sugar, citrus drink. If still no movements/reduced movements go to hospital." (2016)
Evidence in messaging	33		
Your baby's movements should not decrease	26	78.8	"Movements should NOT slow down towards the end of pregnancy even the baby has less room to move." (2016)
Myths and misunderstanding	36		
Babies run out of room in the late pregnancy	13	36.1	"Close to birth when baby moves into position for birth, movements will lessen a bit, also because there is less room." (2017)
There are ways you can encourage your baby to move	11	30.5	"That you should expect at least 10 strong movements every couple of hours. If not have a glass of ice-cold water and lay on your side, of your still concerned go to the clinic for monitoring" (2016)
Babies slow down at the end of pregnancy	8	22.2	"Should be fairly active up until a few weeks before birth were movement slows down." (2012)
The position of the placental and where the baby is positioned can affect the perception of movements	4	11.1	"Position of placenta can affect feeling movements of your baby." (2013)

^a Summary table of top responses for each category with exemplar quotes does not include all responses, therefore, percentages will not add to one hundred.

When asked to determine where they obtained their information about the importance of fetal movements, a range of responses were obtained, as seen in Table 5. The maternity care provider was the main source of information with 54.7% obtaining their information from Obstetricians (n = 104, 24.3%) and midwives (n = 130, 30.4%), and a further 3.3% (n = 14) from General Practitioners (GPs). Other popular sources were internet web pages (n = 69, 16.1%), friends (n = 18, 4.2%) and family (n = 15, 3.5%). There were 24 (5.6%) of those participants who self-identified as having professional knowledge about the importance of fetal movements.

5.4. Health care providers and fetal movements (n = 426)

Participants were asked: "Were you informed to be aware of fetal movements by your health care provider?" The majority 84.6% (n = 362) stated that they were informed by their health care provider to be aware of fetal movements. Those who answered 'yes' to being informed by their HCPs were asked at what gestation they were informed, n = 358 responded to this question. The most common response was 17–20 weeks (33%, n = 118), with 24.3% (n = 87)

Table 5

Sources of fetal movements knowledge.

Sources	Quantity (n)	Percentage
Midwife	130	30.9%
Obstetrician	104	24.7%
Internet web pages	69	16.4%
Own professional knowledge	24	5.7%
Friends	18	4.3%
Facebook pregnancy loss pages	18	4.3%
Family	15	3.6%
GP	14	3.3%
Multiple sources	12	2.8%
Pregnancy books, apps, and expos	6	1.4%
Other	11	2.6%
Total	428	100.00

informed before 17 weeks. A further 18.4% (n = 66) participants were informed between 21–24 weeks gestation; 16.8% (n = 60) between 25–30 weeks gestation; 6.7% (n = 24) between 31–36 weeks and 0.8% (n = 3) between 36–40 weeks gestation.

Participants were asked an open-ended question: “Do you think health care providers should provide more information about monitoring fetal movements?” Four hundred three participants responded and 11 categories were found as seen in Table 6. The majority of those who responded agreed that there was a need for more information (65%, n = 262).

5.5. Knowledge of stillbirth

A clear majority of respondents (95.2%, n = 398) had prior awareness of stillbirth before their pregnancy. Despite this knowledge most (66% n = 277) were unable to correctly identify the current prevalence of stillbirth in Australia ie 6 per day. Full responses to this question can be seen in Table 7.

5.6. Health care provider's education of stillbirth

Participants were asked: ‘Were you informed about the possibility of stillbirth in your pregnancy by your health care providers?’ 64.9% (n = 272) stated that they were not informed. Furthermore, when asked: “Do you feel you were given enough information by your health care provider for warning signs to help you prevent stillbirth?’ 56.3% (n = 234) felt they were not given enough information, whilst 43.8% (n = 182) felt they did receive enough information.

5.7. A common misconception (n = 414)

Participants were asked: ‘Please rate how you would feel if your health care provider discussed with you about stillbirth alongside with some tools (fetal movements monitoring) to possibly detect that your baby was unwell. The 5-point Likert responses ranged from: “I would feel very anxious;” to ‘I would feel very calm.’ A large proportion of the participants (44.5%; n = 184) stated they ‘would feel slightly calmer’ to ‘very calm.’ Furthermore, 23.9% (n = 99) stated that this conversation would make them feel ‘neither anxious nor calmer.’ Some participants (27.1%, n = 112) did indicate that this conversation would make them feel ‘slightly anxious’, but only 4.6% (n = 19) indicated that this conversation would make them ‘very anxious.’

Table 6
Coded responses to the question ‘do you think HCPs should provide more information about monitoring fetal movements?’.

	N	%	Exemplar quote (year of baby's birth)
Yes	221	54.8	“Yes, because I had a decrease in movements late in pregnancy and called my HCP where I was told it was likely normal.” (2016)
Yes, and more in-depth	20	5	“Yes, particularly what to do if we are concerned. First steps before seeking medical advice. Found this out from other sources.” (2012)
Yes, and more resources as well	9	2.2	“Absolutely! A compulsory pamphlet, on antenatal card after every visit. Reassurance even if at maternity frequently.” (2016)
Yes, and to feel heard when we contact HCPs	6	1.5	“Yes, I feel people are sometimes not taken seriously if they go to the hospital saying they haven't felt movements for a while.” (2016)
Yes, but be conscious of anxiety	6	1.5	“Yes. However, also, being aware of alarming women too.” (2017)
I was provided with enough information, but others may not have been	14	3.5	“I suppose? I guess it's something I've always known so for me I'd say no, but other people may not be as aware as I am” (2016)
Unsure	17	4.2	“Unsure, I spent a lot of time researching online including mum groups so knew a lot about what to expect” (2017)
I received good information	45	11.2	“For me, my providers gave good information about it, they handed out leaflets and also explained them.” (2017)
No	35	8.7	“No – only when there is to be a concern!”(2016)
No, I was provided with enough information	22	5.5	“No, I had enough information and felt comfortable with this aspect of care” (2016)
No, as we should make women anxious	8	2.0	“No, general information should be given so as not to distress or cause too much anxiety with mum's” (2015)
Total	403	100.00	

Table 7

Participants responses to prevalence of stillbirth in Australia.

Prevalence rates	N	%
Six times a day	140	33.6
Six times per week	136	32.6
Two-hundred times per year	72	17.3
Ten times per month	69	16.5
Total	417	100.0

6. Discussion

The current study has provided insight into the information that women receive regarding fetal movements and stillbirth in Australia. Furthermore, it identifies what fetal movements messages pregnant women are receiving and the sources of this information. It has also challenged the commonly held beliefs by health care professionals that discussion about stillbirth and ways to reduce risk will create more ‘anxious’ mothers.²² The current study contributes much needed evidence regarding the current shortfalls in the information provided to women around their baby's wellbeing during pregnancy. The results reflect that women would value more education and information concerning fetal movements and stillbirth, within antenatal care to not only empower them to seek assistance when concerned but to break the well-established silence about stillbirth.²⁶

6.1. Fetal movements

Australian mothers within this study were strongly aware of the importance of monitoring fetal movements, with 95.6% (n = 461) stating that they understood that a change of fetal movements was an indicator that their baby could be unwell. However, when asked to describe what is normal movements for an unborn baby, responses focused on quantifying movements, often by counting kicks (35%; n = 64), which indicates that this message is still being presented to pregnant women, either by their HCPs, or other sources (friends, family, internet). Where women obtained the information to count kicks was not captured in this survey.

However, Peat et al.'s²⁸ study of 100 currently pregnant women found evidence, that 19% of their participants were encouraged to use kick counting by their HCP as a tool to monitor their baby's movements. However, kick counting, specifically the 'count to 10' approach has been challenged against its efficacy particularly as a Cochrane review in 2015 found that it did not lead to improved pregnancy outcomes such as reduced caesarean sections, fewer lower birth weight babies and stillbirths.²⁷ In part, this may be due to a lack of consensus surrounding kick counting, what the alarm limit should be, and what should be counted as one movement.²⁸ Warland and Glover¹⁴ also found inconsistencies regarding kick counting in their study of 72 Australian midwives with the number 'ten' messaging being the most prominent number but with variety about the alarm limit, for examples ten per day (5.5%, n = 10), ten per two hours (9.9%, n = 18) and six–ten per hour (13.8%, n = 25). The current study also found some vagueness over the ideal amount of movements for example responses included 'some movements every day' (16%, n = 29), or 'hour' (3.9%; n = 7) and 'every couple of hours' (1.1%; n = 2). This confusion could indicate that a 'counting' message may be too ambiguous and may lead to women misunderstanding when to present to their HCP.

One strategy that could be used instead of counting kicks is 'mindfetalness'.²⁹ Mindfetalness was developed by a Swedish midwife and can be used as a self-assessment tool which asks women to focus on the character, frequency and intensity of their baby's movements for 15 minutes each day.²⁸ It has been demonstrated to strengthen the mothers understanding of her baby's movements to empower her to get to know and advocate for her baby.³⁰ Akselsson et al.³⁹ pilot study of 104 Swedish women reported a high uptake and continual use of this method (75%), and participants felt that the technique was relaxing and helped create a relationship with their unborn baby.

Peats et al.²⁸ suggest that women do not always know when to act on changes noted with their baby's movements and argue that this is because they have not been given enough information. Furthermore, Saastad et al.¹³ found that inconsistent messaging concerning fetal movements could delay a mother reporting decreased fetal movements. Their RCT found that primiparous women who received consistent information about fetal movements were more likely to present earlier. Saastad et al.'s¹³ study also saw a reduction in stillbirth rates in the intervention group. This is not surprising given that many studies suggest that a delay of over 24 h in presenting to a maternity unit after a perceived decrease in fetal movements can lead to increased rates of stillbirth.^{13,31} The current study also found several different responses as to when women thought they should present to a maternity unit for assessment when fetal movements had changed with some women saying they would wait for "no movements" before presenting to the hospital. This is potentially dangerous information, as waiting until there are no movements, could result in missed opportunities for intervention and the worst case, stillbirth. However, this current study did find some 32.9% (n = 53) of participants stated they would inform their HCP if their baby's movements changed. This reflects the emerging evidence which indicates that health care providers and pregnant women need to investigate that any change in fetal movements including an altered pattern of daily movements, reduced strength^{10,11} or a single episode of frantic fetal movements.^{3,4,11} This study highlights the need to educate health professionals about the importance of investigating when women report ANY change in their baby's movements.

Alongside inconsistent information about fetal movements are myths that could act as barriers to women seeking help if they are concerned about their baby. The most concerning myth reported in this study was that babies slow down or run out of room at the end of pregnancy (n = 21). Therefore a 'reduction' of movements was

thought to be 'normal' and perhaps even ignored. Farrant and Heazell³² online analysis of 30 pregnancy forums and websites also found that pregnant women can normalise a reduction of baby's movements at the end of pregnancy. Furthermore, they found examples of women being informed ways to encourage movements.³² In this study, participants stated that drinking a cold glass of water/sugary drink and laying down would encourage fetal movements, and a few of our participants 10.6% (n = 17) would delay in help-seeking until they undertook this exercise. Warland and Glover¹⁴ study also reported that 37% of the 69 midwives would suggest fluids/food to women before asking them to present to the maternity unit for assessment. Despite research repeatedly finding no evidence for this practice,^{40,41} which could highlight that health care professionals may not always be giving information based on evidence and instead be perpetuating the myths surrounding fetal movements and appropriate actions women should take if they alter.

This study also explored the sources of information women accessed regarding fetal movements. McArdle et al.'s study⁴² reported that women received education about fetal movements from midwives (n = 420, 79.8%), Obstetricians (n = 206, 39.1%), and GPs (n = 290, 55.1%). Half of their participants accessed further information through the internet. This study also suggests that the internet is often used. However, HCPs (midwives 30.9%, n = 130 and obstetricians 24.7%, n = 104) remain the most common source of information. The internet (16.4%, n = 69) and Facebook pregnancy loss pages (4.3%, n = 18) were also influential in providing information about fetal movements to pregnant women but may be of poor quality.³² In an online international case-control study, reported significantly more of those who gave birth to live baby's received information about fetal movements from their care provider than the stillborn cases (aOR 0.55, 95% CI 0.36–0.86, $p = 0.008$).¹⁰ The current study which only included livebirths did indicate a higher percentage (84.6%, n = 362) of women saying they were informed about fetal movements by their HCPs. This is consistent with Raynes-Greenow et al.¹⁵ study of 156 women who were at least 28 weeks pregnant and found 83% had been asked to assess their baby's movements by their HCP. It is higher than McArdle et al.'s⁴² study of 562 pregnant women of 34 weeks gestation or later, where 62.2% (n = 327) stated they were informed about fetal movements. Possible reasons as to why not all women are saying they were informed about fetal movements cannot be deduced from this study and require further research. However, it could be due to different practice in different settings and the lack of consensus of the fetal movement's message.

McArdle et al.'s⁴² study suggests that women would like to be informed about fetal movements from their first appointment and would like more specific information about what to expect. They also found that women would like more specific questioning about their baby's movements by their HCP. This was reflected in the current study, with 65% (n = 262) women stating they wanted more detailed information. This aligns with Australian guidelines for antenatal care which also indicate that a discussion about the importance of fetal movements should occur at the first antenatal visit and again from 20 weeks and then at each antenatal visit.²⁴ Warland and Glover¹⁴ suggest the query about fetal movements should be changed from a closed-ended one "is your baby moving" to an open-ended one such as "tell me about your baby's movements?"

This study found that women did not always receive evidenced-based care when presenting to maternity units when they had noticed a change in their baby's movements. Mothers in this study felt that they were not taken seriously or felt they were labelled as 'anxious' when presenting. These findings support a Swedish study of 362 pregnant women who had presented for assessment due to reduced fetal movements.¹⁸ Their study found that women were

made to feel like they were unnecessarily worrying about their baby or were irritating their health care professional by attending,¹⁸ which was also supported by the findings within this study. Furthermore, O'Leary et al.³³ suggest that when a pregnant woman is not listened to, it could cause her to question her developing motherly intuition, and thereby be putting her baby at undue risk.

The evidence from this study and other research suggests that two changes could occur clinically to improve the antenatal education of pregnant women. Firstly, HCPs could ask an open-ended question regarding fetal movements such as: 'Tell me about your baby's movements,' allowing for the mother to provide detail about their baby's movements regarding strength, frequency and pattern. Secondly, as seen with the success within Scotland a consensus over the fetal movement's message in Australia needs to occur. This message should also connect the fetal movement's message with its association in the reduction of stillbirth as it establishes risk perception which could encourage Australian women to seek help when they feel a change in their baby's movements.

6.2. Stillbirth-knowledge, sources, and anxiety

Knowledge of stillbirth is higher in this study than in many comparable studies from HICs. For example, a study conducted in Ireland on 999 participants of the general Irish population, only 17% knew the Irish incidence rate of stillbirth.³⁴ Whereas the current study found that 33.6% (n = 140) were able to identify the correct rate of six stillbirths a day. The difference may be because our research focused on women who had recently had antenatal care and presumably had some education.

Furthermore, within the current study, 35.7% of the participants had experienced a pregnancy loss, and these women may, therefore, be more likely to be aware in preparation for their next pregnancy, which could contribute to the higher knowledge rate. Nuzum et al.'s³⁴ study also focused on the general Irish population. However, this lack of awareness suggests that there is a silence surrounding the discussion of stillbirth. As seen in similar taboo subjects such as mental health³⁵ and suicide³⁶ research, silence perpetuates potentially stigmatising attitudes towards those experiencing those conditions. This research did not explore ways to break the silence, and further research should identify strategies and interventions which could assist in breaking to silence to better educate pregnant women about the possibility of stillbirth occurring within their pregnancy.

Studies that have specifically explored stillbirth education in antenatal care settings are limited. Health care professionals may feel that a discussion of stillbirth with pregnant women might create unnecessary anxiety for her.²² Although no research has explored if discussing stillbirth with pregnant women would cause anxiety, fetal movements counting has been explored as a possible antecedent to maternal anxiety.²⁷ However, this evidence contradicts others who found no increase of maternal anxiety when women were informed about fetal movements.^{27,37} In the current study, most women (44.5%, n = 184) reported that they would feel calm when discussing stillbirth and fetal movements together, with a further, 23.9% (n = 99) stating that they would be 'neither anxious or calmer.' However, 27.1% (n = 112) did state that the discussion of stillbirth and fetal movements could create anxiety.

Further research needs to be undertaken to establish what is causing this anxiety, for example, is it the discussion of stillbirth per se, or, are these women already naturally anxious? Given the background prevalence of anxiety in pregnancy is very common it could be expected that 32% may be already anxious.³⁸ Additionally, the current study only presented a common scenario for comment and self-reported feelings rather than a measured scale of anxiety in a real-world setting.

7. Strengths and limitations

This study incorporated both quantitative and qualitative data to allow women to have a voice within this research. However, the open-ended responses were typically brief and did not allow for a rich or complex response that might emerge from more detailed qualitative data collection such as an interview. This study was retrospective, and therefore, some responses could be influenced by recall bias,⁴³ especially those who had their antenatal care longer ago from 2007 to 2012. There was also a high distribution of women from South Australia participating in this survey, which may mean the results are not generalisable to other settings. Snowball methodology was utilised, and the researchers reside in South Australia, despite the national Facebook groups which this study was advertised on could be a possible explanation for this occurrence. Furthermore, one-third of the respondents had experienced some type of pregnancy loss, based of these experiences, especially those who endured a stillbirth, may have either received or personally sought more information about fetal movements in their subsequent pregnancy. Therefore, they may be more informed, which could skew the information within the current study.

The current study sample distribution was also skewed towards highly educated European Caucasian women, with a high rate of women giving birth in private hospitals, 61.9%, compared to the national average of 25%.⁴⁴ Therefore, we may not have truly captured the experiences of women who identify as Aboriginal or Torres Strait Islander, live in low socio-economic areas, or who are from culturally and linguistically diverse (CALD) backgrounds, thus a generalisation of results may be limited. Current statistics suggest that Aboriginal and Torres Strait Islander women are at least one and a half times more likely to have a stillbirth in Australia.⁴⁵ Therefore, it is further imperative research which targets the antenatal care experience of the discussion of stillbirth and fetal movements in Aboriginal and Torres Strait Islander women needs to be undertaken.

8. Conclusion

Our findings suggest that pregnant women are generally being informed about fetal movements; however, this message is not consistent and is dependent on the source of information, including different HCPs. Furthermore, standardised antenatal care in Australia is not always providing pregnant women with the knowledge they require to keep their baby safe during pregnancy. Women reported in this study that fetal movements messages were inconsistent or outdated and not always in keeping with current empirical evidence. This information suggests a need for further education to be implemented for health care professionals and women on understanding the importance of fetal movements. Stillbirth education in routine antenatal care remains silent and taboo, with most women in this study reporting that they were not informed about the possibility of stillbirth occurring. The current belief that discussing stillbirth could lead to increased anxiety that might result in women making repeated unnecessary presentations, rather than empowering them with the knowledge they need to advocate for themselves and their baby. This study suggests that within the current antenatal guidelines in Australia that a clear fetal movements message statement and care plan needs to be created to ensure all women are receiving at least a baseline level of information during pregnancy. Furthermore, more research on why there is hesitation to discuss stillbirth with women by health care providers, and the implications of this lack of discussion needs to occur to stop the further perpetuation of silence surrounding stillbirth.

Statement of disclosure

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Ethical statement

The authors declare that the research presented in the manuscript was approved by

- This study was approved on the 5/12/2016 by the University of South Australia.
- Human Research Ethics Committee. Protocol number 0000036017.

References

1. Goldenberg RL, McClure EM, Bhatta ZA, Belizán JM, Reddy UM, Rubens CE, et al. Stillbirths: the vision for 2020. *Lancet* 2011;**377**(9779):1798–805. doi: [http://dx.doi.org/10.1016/S0140-6736\(10\)62235-0](http://dx.doi.org/10.1016/S0140-6736(10)62235-0).
2. Australian Institute of Welfare and Health (AIHW). *Perinatal deaths in Australia: 2013–2014*. . p. 1–87.
3. Stacey T, Thompson JMD, Mitchell EA, Ekeroma A, Zuccollo J, McCowan LME. Maternal perception of fetal activity and late stillbirth risk: findings from the Auckland stillbirth study. *Birth* 2011;**38**(4):311–6. doi: <http://dx.doi.org/10.1111/j.1523-536X.2011.00490.x>.
4. Warland J, O'Brien L, Heazell A, Mitchell E. An international internet survey of the experiences of 1,714 mothers with a late stillbirth: the STARS cohort study. *BMC Pregnancy Childbirth* 2015;**15**.
5. Heazell AEP, Stacey T, amp, Apos, Brien LM, Mitchell EA, et al. Excessive fetal movements are a sign of fetal compromise which merits further examination. *Med Hypotheses* 2018;**111**:19–23. doi: <http://dx.doi.org/10.1016/j.mehy.2017.12.024>.
6. McCowan LME, Thompson JMD, Cronin RS, Li M, Stacey T, Stone PR, et al. Going to sleep in the supine position is a modifiable risk factor for late pregnancy stillbirth: findings from the New Zealand multicentre stillbirth case-control study. *PLoS One* 2017;**12**(6):e0179396. doi: <http://dx.doi.org/10.1371/journal.pone.0179396> PubMed PMID: PMC5469491.
7. Platts J, Mitchell E, Stacey T, Martin B, Roberts D, McCowan L, et al. The Midland and North of England Stillbirth Study (MiNESS). *BMC Pregnancy Childbirth* 2014;**14**(1):171. doi: <http://dx.doi.org/10.1186/1471-2393-14-171>.
8. 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**(2):347–55. doi: <http://dx.doi.org/10.1097/aog.0000000000000627>.
9. Warrander LK, Batra G, Bernatavicius G, Greenwood SL, Dutton P, Jones RL, et al. Maternal perception of reduced fetal movements is associated with altered placental structure and function. *PLoS One* 2012;**7**(4):e34851. doi: <http://dx.doi.org/10.1371/journal.pone.0034851>.
10. Heazell AEP, Warland J, Stacey T, Coomarasamy C, Budd J, Mitchell EA, et al. Stillbirth is associated with perceived alterations in fetal activity – findings from an international case control study (case study). *BMC Pregnancy Childbirth* 2017;**17**(1). doi: <http://dx.doi.org/10.1186/s12884-017-1555-6>.
11. Heazell AEP, Budd J, Li M, Cronin R, Bradford B, McCowan LME, et al. Alterations in maternally perceived fetal movement and their association with late stillbirth: findings from the Midland and North of England stillbirth case-control study. *BMJ Open* 2018;**8**(7). doi: <http://dx.doi.org/10.1136/bmjopen-2017-020031>.
12. Saastad E, Ahlborg T, Frøen JF. Low maternal awareness of fetal movement is associated with small for gestational age infants. *J Midwifery Women's Health* 2008;**53**(4):345–52. doi: <http://dx.doi.org/10.1016/j.jmwh.2008.03.001>.
13. Saastad E, Tveit JVH, Flenady V, Stray-Pedersen B, Fretts RC, Børdahl PE, 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* 2010;**3**:2. doi: <http://dx.doi.org/10.1186/1756-0500-3-2> PubMed PMID: 904574645; 20044943.
14. Warland J, Glover P. Fetal movements: what are we telling women? *Women Birth* 2017;**30**(1):23–8. doi: <http://dx.doi.org/10.1016/j.wombi.2016.06.001>.
15. Raynes-Greenow C, Gordon A, Li Q, Hyett J. A cross-sectional study of maternal perception of fetal movements and antenatal advice in a general pregnant population, using a qualitative framework. *BMC Pregnancy Childbirth* 2013;**13**(32):32. doi: <http://dx.doi.org/10.1186/1471-2393-13-32>.
16. Linde A, Pettersson K, Rådestad I. Women's experiences of fetal movements before the confirmation of fetal death—contractions misinterpreted as fetal movement. *Birth* 2015;**42**(2):189–94. doi: <http://dx.doi.org/10.1111/birt.12151>.
17. Frøen JF, Saastad E, Tveit JVH, Børdahl PE, Stray-Pedersen B. Clinical practice variation in reduced fetal movements. *Tidsskrift for den Norske lægeforening: tidsskrift for praktisk medicin, ny raekke* 2005;**125**(19):2631.
18. Georgsson S, Linde A, Pettersson K, Nilsson R, Rådestad I. To be taken seriously and receive rapid and adequate care – women's requests when they consult health care for reduced fetal movements. *Midwifery* 2016;**40**(C):102–8. doi: <http://dx.doi.org/10.1016/j.midw.2016.06.006>.
19. Harley D, Cunningham A, Love C, Pound C, McNally D. *Fetal movement awareness: reducing stillbirth in Scotland*. 2016.
20. The Scottish Government. In: Improvement IoH, editor. *The Scottish improvement journey: a nationwide approach to improvement*. Scottish Government; 2018. p. 1–49.
21. 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**(10019):691–702. doi: [http://dx.doi.org/10.1016/S0140-6736\(15\)01020-x](http://dx.doi.org/10.1016/S0140-6736(15)01020-x).
22. Warland J, Glover P. Talking to pregnant women about stillbirth: evaluating the effectiveness of an information workshop for midwives using pre and post intervention surveys. *Nurse Educ Today* 2015;**35**(10):e21–5. doi: <http://dx.doi.org/10.1016/j.nedt.2015.07.031>.
23. Lench H, Levine L. Effects of fear on risk and control judgements and memory: implications for health promotion messages. *Cognit Emot* 2005;**19**(7):1049–69. doi: <http://dx.doi.org/10.1080/02699930500203112>.
24. Australian Government Department of Health. *Clinical practice guidelines: pregnancy care*. . p. 1–325.
25. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;**15**(9):1277–88. doi: <http://dx.doi.org/10.1177/1049732305276687>.
26. Scott J. Stillbirths breaking the silence of a hidden grief. *Lancet (London, England)* 2011;**377**(9775):1386. doi: [http://dx.doi.org/10.1016/S0140-6736\(11\)60107-4](http://dx.doi.org/10.1016/S0140-6736(11)60107-4).
27. Mangesi L, Hofmeyr G, Smith V, Smyth R. Fetal movement counting for assessing of fetal wellbeing. *Cochrane Database Syst Rev* 2015;**2015**(10). doi: <http://dx.doi.org/10.1002/14651858.CD004909.pub3>.
28. Peat AM, Stacey T, Cronin R, McCowan LME. Maternal knowledge of fetal movements in late pregnancy. *Aust N Z J Obstet Gynaecol* 2012;**52**(5):445–9. doi: <http://dx.doi.org/10.1111/j.1479-828X.2012.01462.x>.
29. Rådestad I. Mindfetalness a method for structured observation on fetal movements. *Women Birth* 2017;**30**:34–5. doi: <http://dx.doi.org/10.1016/j.wombi.2017.08.089>.
30. Rådestad I. Strengthening mindfetalness. *Sex Reprod Healthc* 2012;**3**(2):59–60. doi: <http://dx.doi.org/10.1016/j.srhc.2012.01.002>.
31. Koshida S, Ono T, Tsuji S, Murakami T, Arima H, Takahashi K. Excessively delayed maternal reaction after their perception of decreased fetal movements in stillbirths: population-based study in Japan. *Women Birth* 2017;**30**(6). doi: <http://dx.doi.org/10.1016/j.wombi.2017.04.005>.
32. Farrant K, Heazell AEP. Online information for women and their families regarding reduced fetal movements is of variable quality, readability and accountability. *Midwifery* 2016;**34**:72–8. doi: <http://dx.doi.org/10.1016/j.midw.2015.12.013>.
33. O'Leary J, Warland J, Parker L. Prenatal parenthood. *J Perinat Educ* 2011;**20**(4):218–20. doi: <http://dx.doi.org/10.1891/1058-1243.20.4.218>.
34. Nuzum D, Meaney S, O' Donoghue K. The public awareness of stillbirth: an Irish population study. *BJOG Int J Obstet Gynaecol* 2018;**125**(2):246–52. doi: <http://dx.doi.org/10.1111/1471-0528.14939>.
35. Wynaden D, McAllister M, Tohota J, Al Omari O, Heslop K, Duggan R, et al. The silence of mental health issues within university environments: a quantitative study. *Arch Psychiatr Nurs* 2014;**28**(5):339–44. doi: <http://dx.doi.org/10.1016/j.apnu.2014.08.003>.
36. Binnix TM, Rambo C, Abrutyn S, Mueller AS. The dialectics of stigma silence, and misunderstanding in suicidality survival narratives. *Deviant Behav* 2018;**39**(8):1095–106. doi: <http://dx.doi.org/10.1080/01639625.2017.1399753>.
37. Salehi K, Salehi Z, Shaali M. The effect of education of fetal movement counting on maternal-fetal attachment in the pregnant women: a randomized controlled clinical trial. *Int J Pediatr* 2017;**5**(4):4699–706. doi: <http://dx.doi.org/10.22038/ijp.2017.21795.1820>.
38. Ross LE, McLean LM. Anxiety disorders during pregnancy and the postpartum period: a systematic review. *J Clin Psychiatry* 2006;**67**(8):1285–98.
39. Akesson A, Georgsson S, Lindgren H, Pettersson K, Rådestad I. Women's attitudes, experiences and compliance concerning the use of Mindfetalness—a method for systematic observation of fetal movements in late pregnancy. *BMC Pregnancy Childbirth* 2017;**17**(1). doi: <http://dx.doi.org/10.1186/s12884-017-1548-5>.
40. Druzin ML, Foodim J. Effect of maternal glucose ingestion compared with maternal water ingestion on the nonstress test. *Obstet Gynecol* 1986;**6**:425–6.
41. Esin S, Baser E, Cakir C, Tuncal G, Tuncay K. Chocolate or orange juice for non-reactive non-stress test (NST) patterns: a randomized prospective controlled study. *J Matern Fetal Neonatal Med* 2013;**26**(9). doi: <http://dx.doi.org/10.3109/14767058.2013.766698>.
42. McArdle A, Flenady V, Toohill J, Gamble J, Creedy D. How pregnant women learn about foetal movements: source and preference for information. *Women Birth* 2015;**28**(1):54–9.
43. Hassan E. Recall bias can be a threat to retrospective and prospective research designs. *Internet J Epidemiol* 2006;**3**(2).
44. Australian Institute of Health and Welfare. In: Welfare AloHa, editor. *Australia's mothers and babies 2015—in brief*. Canberra: Australian Institute of Health and Welfare; 2017.
45. Ibiebele I, Coory M, Smith GCS, Boyle FM, Vlack S, Middleton P, et al. Gestational age specific stillbirth risk among Indigenous and non-Indigenous women in Queensland, Australia: a population based study. *BMC Pregnancy Childbirth* 2016;**16**(1):159. doi: <http://dx.doi.org/10.1186/s12884-016-0943-7>.