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The general populations' understanding of first trimester miscarriage: a cross sectional survey

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Objectives

Miscarriage is a common, yet for many, devastating adverse pregnancy outcome. However, despite this the level of public knowledge on the topic is sub-optimal. We aimed to examine the general public's knowledge of miscarriage as well as their health information seeking behaviours associated with this topic.

Study Design

We commissioned a national cross-sectional telephone survey of adults in the Republic of Ireland. 967 members of the general public consented to participate to this anonymised telephone survey. Sampling procedures ensured proportionality as per national standards. We examined respondents' definitions of miscarriage, its incidence and clinical findings, as well as the information seeking behaviours of the general population surrounding miscarriage.

Results

699 (72%) of respondents provided an estimate of miscarriage frequency, with 28% of respondents correctly estimating that miscarriage occurs in 21-30% of pregnancies, with 61% under-estimating the incidence. Men were three times more likely than women to under-estimate (aOR 3.5; 95% CI 2.4-4.9), as were those without children (aOR 1.7; 95% CI 1.2-2.6), or those living in urban areas (aOR 1.6; 95% CI 1.0-2.4). One third of respondents (33%) believed that the risk of miscarriage was higher following only one miscarriage. While 83% of respondents knew someone who had experienced a miscarriage, just over one third had discussed the topic of miscarriage with a family member/friend.

Conclusions

The general populations' knowledge of miscarriage, its incidence and associated factors is concerning, as are their health information seeking behaviours. Improving the level of knowledge of the general public could be achieved by adopting the topic into existing public health and education strategies. This will allow those experiencing miscarriage to frame their experience and expectations.

Keywords: Public health, miscarriage, maternity, knowledge, obstetrics

1. Introduction

First trimester miscarriage is a common adverse pregnancy outcome,¹ yet can be a devastating and distressing event in the reproductive lives of women and their families.² Retrospective studies indicate one in five pregnancies will end in first trimester miscarriage, while prospective studies have reported miscarriage to occur as frequently as one in two pregnancies in women of advanced maternal age and with other risk factors.⁴ The variation in miscarriage rates could potentially be attributed to the manner in which they are calculated as many studies record the outcome from clinically recognised pregnancies within the first trimester.⁵ The aetiology of miscarriage is largely unknown, with 50-85% of first trimester miscarriages presumed due to chromosomal abnormalities.⁶

Despite miscarriage being a common pregnancy complication, there remains “a vast silence” around this topic.⁷ The loss of a baby, no matter what the gestation, is an emotional time for women and those who experience the loss with them,⁸ and can negatively impact psychological wellbeing both in the short and long term.⁹ Emotional and physical support has been shown to be beneficial both during and after miscarriage,¹⁰ yet a lack of awareness that miscarriage can occur and the support that is available can limit the utilisation of these services.

The trauma of miscarriage, and indeed later pregnancy loss is an area that is infrequently acknowledged amongst the general public.¹⁰ It is often not until miscarriage is personally experienced that people become aware of the high rates of miscarriage.¹¹ Consequent to this, studies have highlighted the need for improved information provision in relation to

miscarriage to allow individuals better prepare for the possibility that their pregnancy could end in miscarriage.¹²

Methods of health knowledge acquisition vary, but there has been a rapid increase in patients utilising the internet as a primary source.¹³ It has been demonstrated that women seek out information in relation to pregnancy and the services that are available to them, and are encouraged to be active participants in their care and the decision-making process.¹⁴ In order to develop and implement successful health education strategies, it is important to determine what information is needed by the target population. Thus, in this study, we sought to investigate the level of current knowledge among the general public in relation to miscarriage in addition to exploring their health information seeking behaviours.

1. Materials and Methods

Over a two-week period, Ipsos Market Research Board Ireland (MRBI) was commissioned to carry out a cross-sectional survey to ascertain public knowledge of miscarriage in the Republic of Ireland. Ipsos MRBI used Omnipoll, their telephone omnibus service which collects a representative national sample, of Irish adults aged 18 years and older, by applying census derived quota controls. Sampling procedures ensured proportionality in terms of the age, gender, social class and region of respondents with the population provided by the Central Statistics Office.¹⁵ Participants were sampled using random digit dialling. Random Digit Dialling allows for participants that have, listed and unlisted, landline numbers and mobile phone numbers contacted.

For each telephone call the interviewer (employee of Ipsos MRBI) introduced themselves, informed respondents that their telephone number was randomly selected for research

purposes. The respondent was informed of the purpose and length of the interview (approx. 10 minutes), and that responses were confidential. Upon receipt of verbal consent, the interviewer proceeded with the structured questionnaire. This questionnaire (Appendix A) had three sections:

- Section A: General Knowledge of Miscarriage (3 questions)
- Section B: Miscarriage Investigations (5 questions)
- Section C: Miscarriage as a Discussion Topic (3 questions)

Socioeconomic status was measured by employment grade,¹⁶ and for the purposes of this study, employment grade was categorised as either manual (eg skilled and unskilled construction worker) or professional (eg managerial or administrative roles).

1.1 Statistical Analyses

Descriptive statistics were undertaken for all of the demographic variables reported here. Associations were then assessed using chi-square tests. Multinomial logistic regression was calculated to estimate the probability of underestimation or overestimation of the rate of miscarriage compared to respondents who reported the correct rate. In order to estimate the rate of miscarriages, respondents were asked to report any percentage between 0 and 100%. Respondents were categorised into three groups for analysis: underestimates (i.e. 0 - 20%), correct estimates (i.e. 21 - 30%) or overestimated estimates (i.e. 31 -100%). For this study, the rate of first trimester miscarriage in Ireland was estimated to be between 20% and 30%.^{3,17} Analyses were adjusted by sex, age, location of residence, employment grade and status and whether the respondent had dependent children. Analyses were performed with IBM SPSS Statistics version 26.0.

2.2 Ethical Approval

Ethical approval for this study was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals(Ref. No: ECM 4(ee) 19/01/2016).

2. Results

Over the two week study period, 967 respondents aged 18 years and older were interviewed. The demographic data of the respondents are demonstrated in Table 1 according to gender and employment grade. Of the 967 respondents, similar numbers of men(55.7%; n=539) and women(44.3%; n=428) were interviewed. One third of respondents were between 25 and 44 years of age(32.7%; n=316) and over half of respondents were manual grades(54.1%; n=523).

3.1 Incidence, definition and perceived timeframe of miscarriage

Of the 967 respondents, 699(72.2%) were able to provide an estimate of miscarriage, with the remainder(27.7%; n=268) responding that they were unable to estimate a rate. Of those who provided an estimate, 28.2%(n=197) correctly estimated that miscarriage occurs in 21-30% of pregnancies. Almost one third of respondents 29.5%; n=206 of 699) believed miscarriage occurs in 0 to 5% of pregnancies, with 60.8%(n=425 Of 699) believing the incidence of miscarriage was less than 20%.

However, after adjusting for covariates, the odds of underestimating the rate of miscarriage were three times higher for men than women(aOR3.5; 95% CI 2.4-4.9; Table 2).

Respondents who did not have dependent children or those living in an urban area were more likely to underestimate the percentage compared to those with dependent children(aOR 1.7; 95% CI 1.2-2.6) or those residing in rural areas(aOR 1.6; 95%CI 1.0-2.4; Table 2).

When questioned on the perceived timeframe for miscarriage to take place, 43.8%(n=424) believed that a miscarriage can occur in the first week of pregnancy, with 39.7%(n=384) believing a miscarriage can occur following 24 weeks gestation. Of the 967 respondents, one fifth did not know when a successful pregnancy can be seen on ultrasound(22.3%; n=216) and a third reported that it can be seen between six and ten weeks gestation(36.0%; n=348). One in six respondents(17.3%; n=167) believed that a scan can be conducted at less than five weeks gestation; those aged 18-24 and 25-44 years were more likely to believe this to be the case compared to those aged 45 years or older(OR 2.4, 95% CI 1.3-4.0 and OR 2.1, 95% CI 1.2-3.9).

The majority of respondents were aware of someone who had experienced a miscarriage(82.7%; n=800), typically a family member or a friend, with 9.3% n=90) of respondents and 6.3%(n=61) of partners experiencing a miscarriage themselves. Manual grades were significantly more likely to experience a miscarriage themselves than those in professional grades(OR 1.6; 95% CI 1.0-2.5).

3.2 Perception about fertility, miscarriage investigations and recurrent miscarriages

The majority of people(64.8%, n=627) did not believe that investigations always occur following miscarriage, but nearly one fifth of respondents did not know if investigations occurred at all(20.5%, n=198). Half of respondents did not believe that a miscarriage affected fertility(54.2%; n=524). As illustrated in Figure 1, one third of respondents(32.9%, n=318) believed that women are at an increased risk of miscarriage after one miscarriage. Men were less likely to know if experiencing a miscarriage would have on the risk of experiencing another(OR 2.1; 95% CI 1.3-3.2).

Almost two thirds of those interviewed (63.6%, n=615) were aware of recurrent miscarriage, however the definition of this was varied, with the most popular beliefs being that of two consecutive miscarriages(28.1%, n= 173 of 615) or any two miscarriages(26.5%, n= 163 of 615)

3.3 Information sources of miscarriage

Over one third of respondents had engaged in a discussion on the topic of miscarriage with a family member(35.9%; n=347), with 38.6%(n=373) having gained knowledge or discussed the topic with a friend. As illustrated in Figure 2, the internet was an important source of knowledge for one third of respondents(33.7%, n=326) with 36.1%(n=349) researching the topic. Conversely, 13.7%(n=132) engaged with a General Practitioner or clinic/hospital when looking for information on the topic. Professionals were more likely to seek information about miscarriage from family(42.3% vs 30.4%; $p<0.001$) and friends(48.2% vs 30.4%; $p<0.001$) than those in manual grades(see Figure 2). In addition, professional grades were more likely to access the internet(43.2% vs 25.6%; $p<0.001$) or consult healthcare professionals(16.1% vs 10.8%; $p=0.02$) for information. Those in manual grades were more likely not to know where to access information(8.6% vs 4.1%; $p=0.01$) or would not look for any information relating to miscarriage(7.3% vs 3.6%; $p=0.02$; see Figure 2).

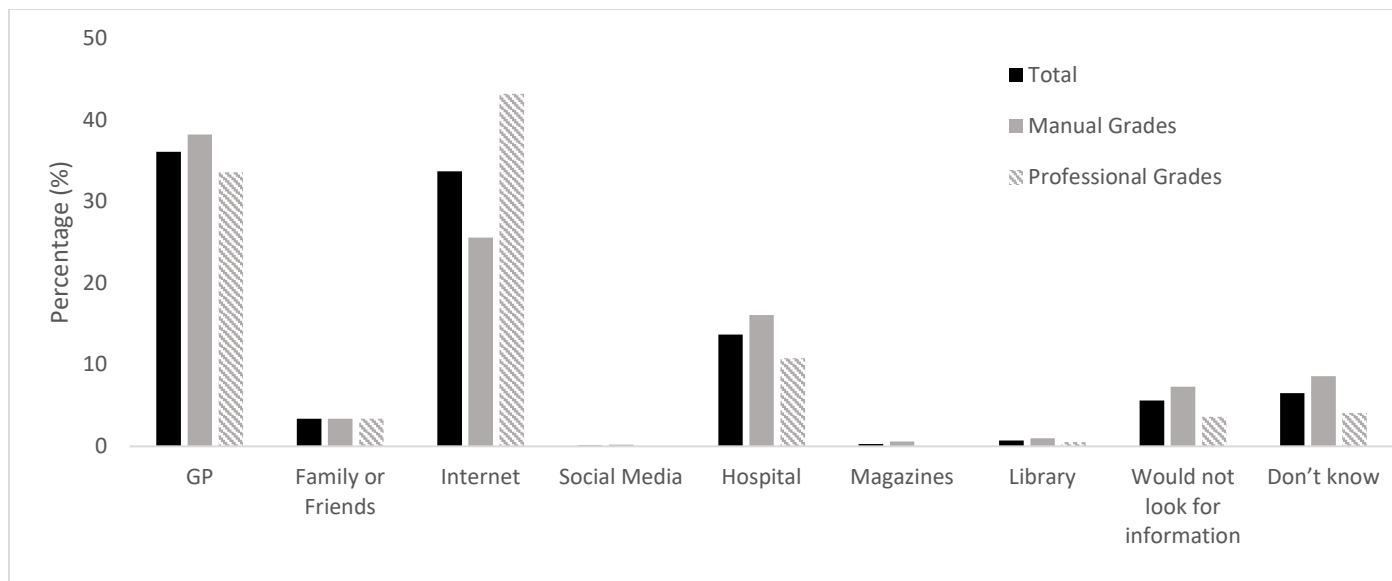


Figure 2: Sources to seek information about miscarriage by employment grade

3. Discussion

This study provides an insight into the poor understanding of the general population on the topic of miscarriage. This includes a lack of factual awareness on miscarriage including its incidence, definition and consequences. We have highlighted how women and their partners who are affected by this common adverse outcome may not be accessing credible sources of knowledge on the topic of miscarriage. This is more apparent amongst male respondents, those in a younger age range, manual grades of workers and those without children. Some of the reasons to explain these findings may include a lack of personal experience of miscarriage, not receiving education on the topic or not knowing where to find reliable information, and a preference to avoid unreliable information.

There is a wide range in variation between miscarriage estimates; a previous internet-based questionnaire study revealed that over half of respondents believed that miscarriage occurred

in less than 5% of pregnancies, compared to under one third of our respondents.¹¹ This study did concur that education level and gender impacted on the understanding of this topic. University students also demonstrate variable knowledge, with 20% of respondents correctly identifying the prevalence of miscarriage, yet with high rates of under-estimation.¹⁸ When we look at public knowledge of later pregnancy losses, there is also a sparsity of information concerning the incidence, risk factors and causes of stillbirth despite over half of people knowing someone who experienced an intrauterine death.¹⁹ Indeed, we demonstrate a confusion in the terminology around definitions of pregnancy loss, with one fifth of respondents defining a pregnancy loss over 24 weeks as a miscarriage.

We also have elucidated how miscarriage remains a stigmatising topic with the minority people not seeking information from friends or family, despite a significant proportion of people knowing an individual who had previously had a miscarriage. It has been shown that women who experience miscarriage are passive information seekers, searching for causes and information to help in future pregnancies.²⁰ However, they utilise methods such as sharing stories online (often anonymously) through forums and social media to obtain psychological support, as opposed to face-to-face interactions.²⁰ In addition, partners are seen as one of the primary peer supporters, which necessitates education of both women and their partners.¹¹

These findings highlight the need for increased public health interventions to improve reproductive health education and to increase the awareness of potential adverse outcomes of pregnancy. Given an increase in pregnancy rates in women with medical co-morbidities and advanced maternal age, miscarriage rates will potentially increase into the future, and irrespective, miscarriage remains the most common complication of pregnancy. Education would also dispel myths associated with miscarriage, such as its effect on fertility, the

aetiology of miscarriage and when medical investigations should take place. Previously, studies have recommended that an improvement in information provision would be beneficial in allowing individuals to better prepare for the possibility that their pregnancy could end in miscarriage and, if it does occur, that support is available.¹² It will also ensure that there are less misconceptions surrounding the topic.²¹ Having accurate knowledge is inextricably linked to improved care perceptions and outcomes.

In spite of this, it is known that the experience of miscarriage has a considerable impact on both women and men, with studies showing significant related stress and anxiety.²² Subsequent pregnancies may also be affected by elevated anxiety and depression levels.²³ Family and social support are integral to help in the recovery following this loss,²⁴ and it has been shown that some women are hesitant to receive formal support, instead preferring it from family, friends or support groups.¹¹

Notwithstanding the general population, it is also important to ensure that healthcare practitioners who interact with women, and particularly those who would be presumed to have good knowledge about miscarriage are well informed. However, one study showed that emergency department nurses have self-reported that they believe they have the least amount of knowledge on the topic of miscarriage amongst emergency health care providers.²⁴ Similarly, a majority of Flemish midwives believe that they also have insufficient knowledge on the topic.²⁵

Our study illustrates the disparities between access and source information in relation to social class, showing consistency with previous findings.²⁶ These studies further indicate that there are substantial social disparities in health-related knowledge.²⁷ Thus, a focus needs to

be placed on providing education in an understandable and appropriate medium for all socioeconomic groups.

This could be aided by the institution of appropriate healthcare policies in order to address disparities. An ideal place for this to occur would be within the education system, which has been echoed by other studies¹⁸. This could be achieved by adapting this topic into mandatory education sessions (i.e. Relationships and Sexuality Education) at post-primary level. Current resource materials from the Irish Department of Health and Education do not mention miscarriage or pregnancy loss in resource materials.²⁸ In the United Kingdom, Relationships and Sexuality Education will become mandatory from September 2020, with one of the objectives that students know “the facts around pregnancy including miscarriage”.²⁹ Additionally, information leaflets on the topic of abortion have been provided to schools in the United Kingdom on the topic of abortion from relevant stakeholders³⁰, yet similar information has yet to be disseminated regarding miscarriage and pregnancy loss. A dedicated programme delivered in secondary or tertiary education (in conjunction with relevant professional bodies) would allow a variety of areas in reproductive health, such as contraception and safe sexual practices, to be discussed but should also equip students with information relating to pregnancy and pregnancy loss that may become relevant later.

4. Conclusion

Despite miscarriage being a common, yet traumatic life event for women, their partners and families, there is still a significant amount of work to do to ensure that all affected are equipped with the right knowledge, support and information in anticipation of them experiencing this life event. Through the integration of education programmes and public health campaigns, we can continue to work towards ending the stigma associated with

miscarriage and limit the number of women who take this journey unprepared and unsupported.

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Legends to Tables and Figures

Table 1. Sample characteristics

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	Manual Grades		Professional Grades	
	Male N; %	Female N; %	Male N; %	Female N; %
Age				
18-24	23; 7.8	17; 7.4	28; 11.4	22; 11.1
25-34	32; 10.9	17; 7.4	47; 19.2	42; 21.1
35-44	42; 14.3	24; 10.5	61; 24.9	51; 25.6
45-54	40; 13.6	37; 16.2	50; 20.4	37; 18.6
55-64	76; 25.9	52; 22.7	46; 18.8	35; 17.6
65+	81; 27.6	82; 35.8	13; 5.3	12; 6.0
Dependent children	62; 21.1	55; 24.0	100; 40.8	76; 38.2
Residence				
Urban	61; 20.7	47; 20.5	91; 37.1	62; 31.2
Rural	233; 79.3	182; 79.5	154; 62.9	137; 68.8
Employment status				
Employed	139; 47.3	77; 33.6	198; 80.0	149; 74.9
Unemployed	42; 14.3	27; 11.8	6; 2.4	3; 1.5
Other	113; 38.4	125; 54.6	41; 16.7	47; 23.6
Household Status				
Chief income earner	237; 80.6	114; 49.8	168; 68.6	95; 47.7
Not chief income earner	53; 18.0	110; 48.0	73; 29.8	103; 51.8
Don't know	4; 1.3	5; 2.1	4; 1.6	1; 0.5

Table 2. Respondents estimation of the rate of miscarriage in comparison to characteristics.

See attached

Figure 1. Risk of miscarriage following a first trimester miscarriage by sex

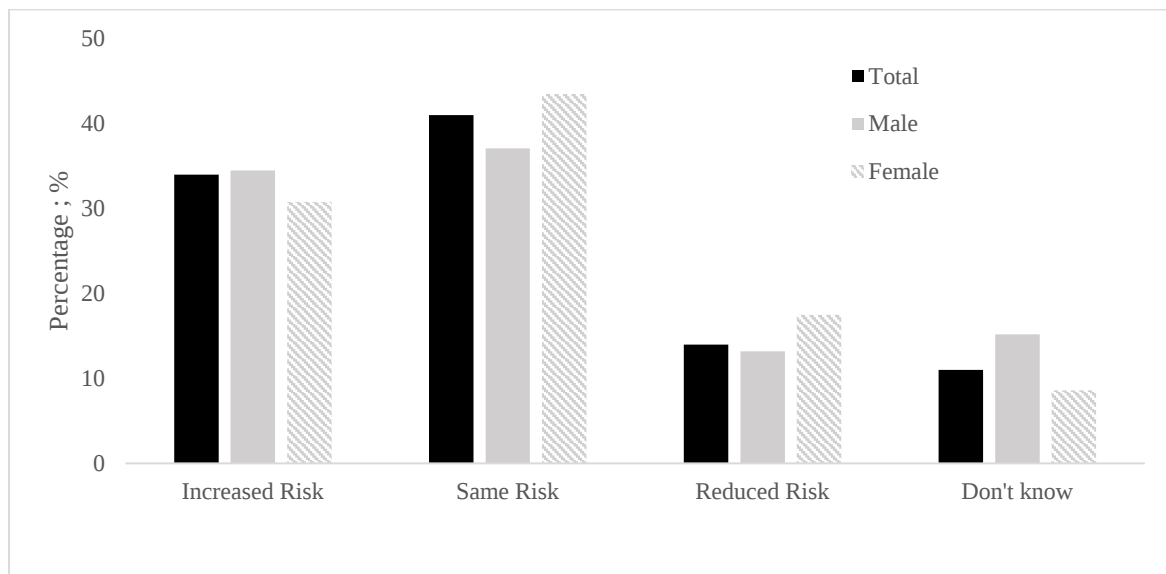


Figure 1: Risk of miscarriage following a first trimester miscarriage by sex

Figure 2. Sources to seek information about miscarriage by employment grade

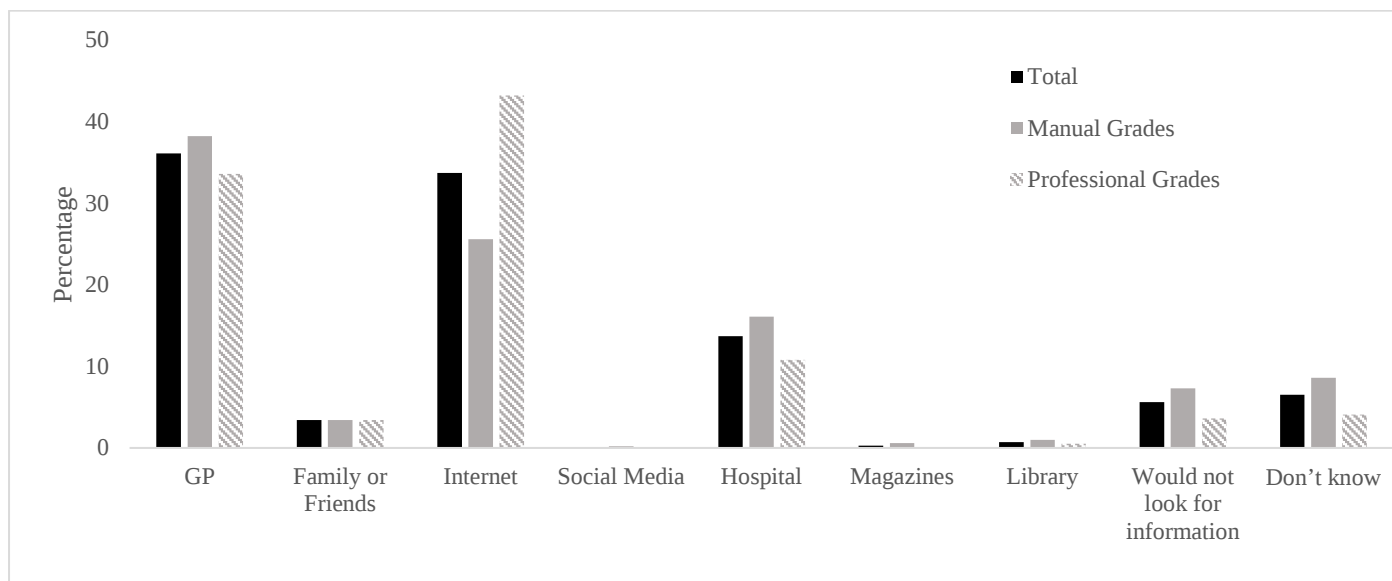


Figure 2: Sources to seek information about miscarriage by employment grade

Appendix A

Section A: General Knowledge on Miscarriage

1. How early can a pregnancy be successfully scanned on ultrasound?
Please insert number of weeks. _____
2. When can miscarriage occur?
Between week _____ to _____ week of a pregnancy.
3. In your opinion, what percentage of pregnancies in Ireland ends in a miscarriage? Please insert a number anywhere from 0 to 100%. _____

Section B: Miscarriage Investigations

1. Does everyone who experiences a miscarriage get offered investigations into the cause of the miscarriage?
Yes.....O
.....O
No.....O
.....O
Don't
know.....O
O
2. Upon investigation, how often is a cause of miscarriage identified? Please insert a value anywhere from 0-100%. _____
3. After a woman experiences a first trimester miscarriage, what is the risk she will experience another miscarriage?
Reduced risk.....O
Same
risk.....O
Increased
risk.....O
Don't
know.....O

4. Have you heard of **recurrent** miscarriages?

Yes.....
.....O

No.....
.....O

If yes

What is your understanding of it?

Experiencing two
miscarriages.....O

Experiencing two consecutive
miscarriages.....O

Experiencing three
miscarriages.....O

Experiencing three consecutive
miscarriages.....O

5. Do miscarriages affect a woman's fertility?

Yes.....
.....O

No
.....
....O

Don't
know.....O

Section C: Miscarriage as Discussion Topic

1. Do you know of anyone who has experienced a miscarriage?

Yes.....

.....O

No.....

.....O

If yes, who? Please select all that apply.

Me.....

.....O

My partner/former

partner.....O

Family

member.....O

Friend.....

.....O

Celebrity.....

.....O

Other;

-
2. Have you ever received information or engaged in a discussion on miscarriage with any of the following people/groups?

Family.....

.....O

Friend.....

.....O

Secondary school

teacher.....O

College

staff.....O

GP.....

.....O

Other healthcare professional;

-
3. Where would you look for information about miscarriage now? Please select all that apply.

GP.....
.....O
Family and/or
Friends.....O
Internet.....
.....O
Social
Media.....
O
Other;
