Human Reproduction, Vol.37, No.5, pp. 988–996, 2022
Advance Access Publication on March 3, 2022 https://doi.org/10.1093/humrep/deac036

human reproduction

ORIGINAL ARTICLE ***Psychology and counselling***

The ABC of reproductive intentions: a mixed-methods study exploring the spectrum of attitudes towards family building

B. Grace [1,*], J. Shawe[2,3], S. Johnson [4], N.O. Usman[5], and J. Stephenson[1]

[1]Department of Sexual and Reproductive Health, UCL Institute for Women's Health, Faculty of Population Health Sciences, University College London, London, UK [2]Faculty of Health, University of Plymouth, Devon, UK [3]SW Clinical School, Royal Cornwall Hospital, Truro, UK [4]QIAGEN Manchester Ltd, Manchester, UK [5]Department of Community Medicine, Kaduna State University, Kaduna, Nigeria

*Correspondence address. UCL EGA Institute for Women's Health, Faculty of Population Health Sciences, Room 236 Medical School Building, University College London, 74 Huntley Street, London WC1E 6AU, UK. E-mail: bola.grace@ucl.ac.uk https://orcid.org/0000-0001-5943-1700

Submitted on November 10, 2021; resubmitted on February 02, 2022; editorial decision on February 09, 2022

STUDY QUESTION: What are the intentions of men and women of reproductive age in the UK regarding reproduction and family building?

SUMMARY ANSWER: We identified six main categories of people; Avoiders, Betweeners, Completers, Desirers, Expectants and Flexers, for whom reproduction education strategies should be tailored differently to suit intentions.

WHAT IS KNOWN ALREADY: Several studies have highlighted poor fertility awareness across men and women of reproductive age. As the average age of first-time parents continues to rise, there has been a concerted effort from educators, healthcare professionals, charities, reproductive health groups and government policymakers, to improve fertility awareness. In order to ensure that these messages are effective and to deploy the best strategies, it is important to understand people's reproductive health needs. This study therefore aimed to explore different reproductive intentions to aid tailoring of information to help individuals and couples achieve their family building desires.

STUDY DESIGN, SIZE, DURATION: We conducted a mixed-method study via a UK-wide cross-sectional survey with 1082 participants and semi-structured interviews of 20 women and 15 men who agreed to follow-up interviews. Interviews lasted an hour on average. Ethics approval from UCL Research Ethics Committee.

PARTICIPANTS/MATERIALS, SETTING, METHODS: Survey participants were recruited nationwide via online newspaper and social media adverts. Interviewees were purposely sampled to include men and women from the reproductive age range (18–45 years), varying ethnicity and education background. Survey data were analysed using the Minitab statistical software package. Interview data were transcribed and analysed using the framework method.

MAIN RESULTS AND THE ROLE OF CHANCE: From the survey and interviews, we identified six key categories of people, grouped alphabetically, in a user-friendly manner to highlight a spectrum of reproductive intentions: Avoiders describes respondents who have no children and do not want to have children in the future; Betweeners describes those who already have child(ren) and want more in the future but are not actively trying to conceive; Completers describes those who have child(ren) but do not want more; Desirers describes those who are actively trying to conceive or plan to have child(ren) in the future; Expectants describes those who were pregnant at the time of the study; and Flexers describes those who may or may not already have and are unsure but or open to having child(ren) in the future. Analysis of survey data identified the following proportions in our study: Avoiders, 4.7%; Betweeners, 11.3%; Completers, 13.6%; Desirers, 36.9%; Expectants, 4.1%; and Flexers 28.4% and 2.4% preferring not to answer. There was one 'other' group from qualitative analysis, who would like to have children in the future but were unsure whether they could or had changing views. We recommend classifying as 'Desirers' or 'Flexers' for the purposes of fertility education. A majority of the survey population were trying to get pregnant; were pregnant; or planning to have a child in the future—whether actively, passively or simply open to the idea, with interviews providing deep insights into their family building decision-making.

LIMITATIONS, REASONS FOR CAUTION: Due to the online recruitment method, there may be a bias towards more educated respondents.

WIDER IMPLICATIONS OF THE FINDINGS: We developed a user-friendly, alphabetical categorization of reproductive intentions, which may be used by individuals, healthcare professionals, educators, special interest groups, charities and policymakers to support and enable individuals and couples in making informed choices to achieve their desired intentions, if and when they choose to start a family.

STUDY FUNDING/COMPETING INTEREST(S): There was no external funding for this study. The authors report no competing interests.

TRIAL REGISTRATION NUMBER: N/A.

Key words: fertility awareness / psychosocial / mixed methods / qualitative research / fertility intentions / family building / preconception health / reproductive health / childbearing / childfree

Introduction

The demographic shift towards delayed childbearing and family building is of increasing public health and clinical concern due to involuntary childlessness as well as elevated risks of poor outcomes for mother and baby. In the UK, the latest data from the UK Office for National Statistics showed that fertility rates have decreased across all age groups. The total fertility rate for England and Wales in 2020 fell to 1.58 children per woman, which is significantly below the replacement rate of 2 and is the lowest since records began in 1938. A similar trend is observed in many high-income countries, with the coronavirus disease-19 pandemic being an exacerbating factor. In response, there has been a concerted effort from educators, healthcare professionals, charities, reproductive health groups and government policymakers, to improve fertility education. There is a lack of understanding regarding fertility, even in men and women seeking to conceive (Soumpasis *et al.*, 2020). In some cases, potentially modifiable factors can reduce the chances of getting pregnant, with the lack of quality education and awareness being key contributing factors (Harper *et al.*, 2017). Studies have reported low fertility knowledge among men and women of reproductive age (Hammarberg *et al.*, 2017; Pedro *et al.*, 2018). Although many remain childless by choice and most women will be able to conceive naturally, provided they start trying before the age of 35 (RCOG, 2011), poor outcomes increase rapidly for those with difficulty conceiving, reemphasizing the need for better fertility education.

Many factors, both sociocultural and biological influence decisions about whether, when and how to have children (Bodin *et al.*, 2021). Studies (Hodes-Wertz *et al.*, 2013; Schytt, 2014) have reported the lack of a suitable partner, and the partner's suitability to parent, as key reasons for delaying childbearing. Economic reasons such as education, employment, career progression and financial stability are also cited as motivators for delaying family building (Brand and Davis, 2011; Mills *et al.*, 2011). Nevertheless, evidence shows some benefits to having children at an older age. It has been suggested that social advantage could reduce some effects of advanced maternal age, with a higher happiness score reported in children of mature parents, as well as a higher level of satisfaction and less stress (Carolan and Frankowska, 2011; Myrskylä and Margolis, 2014; Barclay and Myrskylä, 2016), highlighting the continuous need for public health initiatives to educate about fertility, while supporting the range of reproductive intentions. Although the classification of pregnancies into intended and unintended remains quite common, research shows that this basic dichotomy does not reflect the reality of women's lived experiences, with studies of reproductive motivations and/or intentions describing retrospective accounts of intendedness as 'pregnancy intentions' and prospective accounts as 'fertility intentions' (McQuillan *et al.*, 2011). Furthermore, there is an important need to engage men in discussion about reproductive intentions (Grace *et al.*, 2019). In many low-income country settings, with high unintended pregnancies, maternal and neonatal deaths, resources often focus on these issues rather than the spectrum of reproductive intentions. However, evidence (Hall *et al.*, 2017) shows a reduction in the risk of postnatal depression and stillbirth where pregnancy intentions are measured and are clear.

The improvement of fertility knowledge and awareness continues to be a crucial component of public health initiatives for preventing involuntary childlessness and achieving desired family building intention and despite positive intent, many public fertility education initiatives are met with resistance by the public and negative coverage by the media (Focus on Reproduction, 2018). Recently, a group of experts have founded the International Fertility Education Initiative (IFEI) in collaboration with European Society of Human Reproduction and Embryology (ESHRE), in response to poor fertility awareness, with a 'mission is to improve fertility and reproductive health awareness through education' (Harper *et al.*, 2021), a crucial element of this, is how the message is delivered.

In order to understand fertility knowledge in the UK, we conducted a mixed-method study which showed that men and women in the UK had low fertility knowledge. The findings of this study, which has been reported elsewhere (Grace *et al.*, 2020) suggested that different people have different fertility education needs. In this article, we address some of these issues by using mixed methods to explore the different reproductive intentions of men and women of reproductive age.

Materials and methods

The findings presented in this article are from a mixed-method study undertaken to explore fertility knowledge across UK population groups (Grace *et al.*, 2020) with further analysis to extrapolate reproductive intentions. In summary, the survey test instrument questionnaire was adapted from previous studies (Lampic *et al.*, 2006; Lundsberg *et al.*, 2014), using The UK Office for National Statistics format for demographic characteristics for direct comparison with general population. Three pilot studies were conducted to test the survey instrument's validity and reliability, with revisions after each pilot study before the final version (see Supplementary Table SI) was administered

online using the SurveyMonkey® survey software and questionnaire platform.

Survey participants were recruited nationwide via online newspapers, social media adverts and word-of-mouth, additionally, healthcare professionals were recruited from healthcare professional bodies. A study weblink was provided in the online recruitment advert. Interested participants were provided with the study information and preliminary screening questionnaire to confirm eligibility. Those who met the screening requirements were then provided with access to the survey via a unique link connected to the email address provided. The survey was administered online using the SurveyMonkey® questionnaire platform and completed in 2017. Survey questions covered socio-demographic background, whether participants had child(ren) or were pregnant at the time of the study, how many child(ren) they had, whether they would like any or more child(ren) in the future, and their attitude towards unplanned pregnancy. For the fertility knowledge questions, the Minitab Statistical software package was used to calculate the percentages and 95% CIs questions answered correctly by each group. Of the 1082 survey respondents, 1029 agreed to be contacted for follow-up studies.

For the semi-structured interviews, criteria-based purposive sampling was applied to ensure the socio-demographic diversity including gender, age, ethnicity and education of the survey participants who had agreed to a follow-up interview. Interviews were conducted face-to-face (3) and remotely (32) by a single trained interviewer (B.G.). During interviews, probing continued until a full understanding of the perspectives of each participant was obtained on their circumstances, intentions, feelings and personal situation. Interviews averaged 1 h and were digitally recorded, transcribed verbatim and coded electronically using the NVIVO Pro software (version 11, QSR International). Data analysis was conducted using the Framework methodology (Gale *et al.*, 2013). This covered familiarization; identification of a thematic framework; indexing; charting; and finally, mapping and interpretation. The coded framework matrix was exported from the NVIVO 11 software into a Microsoft Excel file which was used for further examination. Reflexive journaling (Dodgson, 2019) was used to minimize personal bias. A qualitative review workshop was held with five attendees (co-authors B.G., J.Sh. and J.St. and two qualitative research experts within the university department) where the interview transcripts were reviewed, coding and interpretation of results were discussed, feedback on analysis was provided. Feedback from the workshop resulted in additional line by line review of codes, re-categorization and incorporation of memo and reflective notes from NVIVO.

Favourable ethical approval was obtained from UCL Research Ethics committee (Reference 8421/001). All participants in this study participated voluntarily and gave informed consent.

Results

Survey

Demographics

The socio-demographic characteristics of participants are outlined in Table I.

Table I Socio-demographic characteristics of study participants.

SOCIO-DEMOGRAPHIC CHARACTERISTICS	N	%
Gender identification		
Men	451	41.7
Women	628	58.0
Other	1	0.1
I prefer not to answer	2	0.2
Ethnicity		
White	827	76.4
Mixed/multiple ethnicity	112	10.2
Asian	87	8.0
Black	45	4.20
Other ethnic groups	11	1.1
Education		
Degree or equivalent and above	756	69.9
A levels, vocational level 3 and equivalent or above	252	23.3
GCSE (Grade A*-C), vocational level 2 and equivalent	61	5.6
No qualifications	6	0.6
Other	7	0.6
Occupation		
Higher managerial, administrative or professional	128	11.8
Intermediate managerial, administrative or professional	198	18.3
Supervisory or clerical, junior, managerial, administrative or professional	326	30.1
Skilled manual workers	237	21.9
Semi and unskilled manual workers	70	6.5
Not earning, state pensioners, student, casual workers	123	11.4
Age		
18–27 years	234	21.6
28–36 years	461	42.6
37–45 years	356	32.9
≥46 years	31	2.9
Sexual orientation		
Heterosexual/straight	1014	93.7
Gay/Lesbian	29	2.7
Bisexual	28	2.6
I prefer not to answer	11	1.0
Other	3	0.3
Religion		
No religion	416	38.4
Christianity	356	32.9
Islam	57	5.3
Hinduism	23	2.1
Judaism	11	1.0
Buddhism	9	0.8
Sikhism	9	0.8
I prefer not to answer	204	18.9

Attitudes towards family building

Participants were asked specific questions to elucidate their reproductive intentions and attitudes towards family building. Responses to questions on intentions are outlined in Table II.

Fertility knowledge

Analysis of survey questions on fertility knowledge according to the different intentions is presented in Table III. Reproductive intention did not appear to affect fertility knowledge. Completers had the highest proportion of respondents correctly answering the nine questions, with an average of 52.8% (95% CI = 44.4, 61.1); compared to the other categories: Avoiders 39.5% (95% CI = 25.4, 54.9); Betweeners 46.0% (95% CI = 39.1, 52.9); Desirers 40.9% (95% CI = 36.9, 44.9); and Expectants 39.4% (24.8, 55.4). However, the large differences in the sample sizes for the different categories as shown in must be taken into account when considering these proportions; we did not recruit specifically for these categories, which have been extrapolated, categorized and applied retrospectively to the survey results.

Attitude towards unplanned pregnancy

Additional questions were asked to better understand attitude towards unplanned pregnancy. As shown in Fig. 1, nearly two-thirds of the survey respondents (57.8%) were open to getting pregnant in the future.

Interviews

From our analysis of interview data, we categorized individuals into six broad groups to cover the spectrum of reproductive intentions as illustrated in Fig. 2. Avoiders describes respondents who have no children and do not want to have children in the future; Betweeners describes those who already have child(ren) and want more in the future but are not actively trying to conceive; Completers describes those who have child(ren) but do not want more; Desirers describes those who are actively trying to conceive or plan to have child(ren) in the future; Expectants describes those who were pregnant at the time of the study; and Flexers describes those who may or may not already have and are unsure but open to having child(ren) in the future.

Avoiders

The 'Avoiders' group comprised three men and two women who were all of White ethnicity and had a minimum of degree level education. Their reasons for not wanting children include eco-anxiety about the climate, their environment, global warming, wars, global political situation, autonomy and simply never having the desire. Of all the categories presented, avoiders, the voluntarily childfree, were the most certain of their choices.

> '*I don't have children and I have never wanted children*'. MP1—Male, Age 45, White, Degree qualification, no child, no desire for children.

> '*Okay, I have never, ever, ever wanted children. You know? I just never ever wanted children of my own. . .. No, I just never ever thought, oh, I would love to have a child someday. I just never had that maternal instinct*'. FP8—Female, Age 28, White, Degree qualification, has no child, no desire for children.

> '*Having children is environmentally irresponsible, you know; the world is really overpopulated already and stuff and I don't think most people are aware of that or that it governs people's choices*'. FP9—Female, Age 33, White, Degree qualification, no child, no desire for children.

Betweeners

The 'Betweeners' group comprised one man and four women who were a mix of White and Asian ethnicity and with a mix of graduates and non-graduates. In terms of family building, decision-making, financial stability, (lack of a) support system, paternity and maternity leave access were discussed, as were other reasons such as wanting a sibling for their child(ren), coming from a large family themselves or cultural and religious reasons.

> '*We always knew we'd have more than one child; we have two now and would like a third one, perhaps within the next two years*'. MP11—Male, Age 36, White, no degree, has two children, would like more.

Table II Reproductive intentions survey responses.

Response	n	%	Category
I have no child(ren) and do not want any child(ren) in the future	47	4.7%	**Avoiders**
I have one/more child(ren) and would like one/some more in the future	122	11.30%	**Betweeners**
I have one/more child(ren) and I do not want any more children	147	13.60%	**Completers**
I/my partner am/is currently trying to get pregnant	98	9.10%	**Desirers**
I intend to have a child or children at some time in the future	291	26.90%	
I/my partner am/is currently pregnant	44	4.10%	**Expectants**
I do not want any children now	58	5.40%	**Flexers**
I am not sure if I want any child(ren) in the future	107	9.90%	
I don't know	52	4.80%	
I am not sure whether I will have any more children	90	8.30%	
I prefer not to answer	26	2.40%	

Table III Proportion correctly answering fertility knowledge questions with 95% CI.

	Avoiders	Betweeners	Completers	Desirers and Flexers	Expectants	Chi-square test
What is ovulation?	72.34 (56.54, 84.01)	97.17 (93.9, 98.9)	97.28 (93.18, 99.25)	93.23 (90.92, 95.09)	83.72 (69.30, 93.19)	$P < 0.001$
How long can the man's sperm survive in a woman's body after sex?	36.17 (21.35, 50.25)	28.77 (22.78, 35.37)	39.46 (31.50, 47.84)	24.42 (21.09, 28.09)	16.28 (6.81, 30.70)	$P < 0.001$
Which of the following best describes the NORMAL menstrual cycle?	44.68 (30.90, 60.99)	36.32 (29.84, 43.18)	57.14 (48.73, 65.26)	33.99 (30.12, 37.81)	34.88 (21.01, 50.93)	$P < 0.001$
How long is a NORMAL menstrual cycle length?	56.52, (41.11, 71.07)	81.6 (75.72, 86.58)	85.71 (79.00,90.93)	68.98 (65.24,72.76)	74.42 (58.83, 86.48)	$P < 0.001$
When during her cycle is a woman MOST fertile and MOST likely to become pregnant after unprotected sex?	31.91 (19.53,48.02)	49.06 (42.14, 55.99)	59.86 (51.47, 67.85)	36.63 (32.84, 40.67)	41.86 (27.12, 56.61)	$P < 0.001$
Around what age does the male fertility start to decline?	6.38 (1.37, 17.90)	5.19 (2.62, 9.09)	4.76 (1.94, 9.57)	3.3 (2.03, 5.06)	4.65 (0.57,15.81)	$P = 0.474$
Around what age does the female fertility start to decline?	12.77 (4.94, 26.26)	20.28 (15.08, 26.33)	31.29 (23.91, 39.45)	16.17 (13.35, 19.38)	13.95 (3.60, 24.31)	Insufficient sample for chi-square test
How long do you think it normally takes most healthy individuals or couples of peak reproductive age to get pregnant?	41.3 (27.00, 56.77)	33.96 (27.61, 40.76)	37.41 (29.58, 45.77)	31.68 (28.04, 35.61)	27.91 (15.33, 43.67)	$P = 0.424$
Average score per group for all questions	39.45 (25.36, 54.94)	45.95 (39.10, 52.91)	52.78 (44.39, 61.06)	40.87 (36.93, 44.91)	39.36 (24.82, 55.41)	

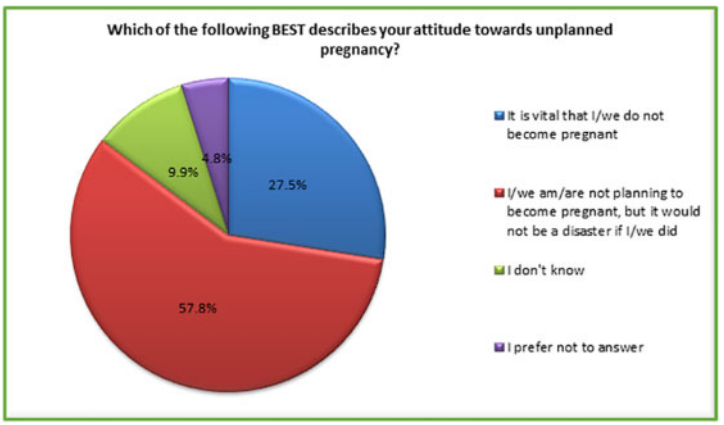

Figure 1. Attitude towards unplanned pregnancy.

Completers

The 'Completers' group comprised three men and four women who were a mix of White, Asian and other ethnicity, and a mix of graduates and non-graduates. Their reasons for not wanting more children are mainly age, life stage, economic reasons and being able to provide for their family. Others provided reasons relating to their current family size, for example, trying for a specific sex of baby.

'*But then for the third child, and we only had three, we were hoping for a girl and so there was quite a lot of research around how you maximise the chances of getting a girl and what that might require around pregnancy planning. And I'm sure you'll tell me that's all bollocks [but] we got a girl, so, you know? I dread to think what would have happened if the third one hadn't been a girl*'. MP9—Male, Age 43, White, degree, three children, does not want more.

'*I have two teenage children; I don't want more, I'm too old for that*'. MP5—Male, Age 38, White, no degree, has two children, does not want more.

Desirers

The 'Desirers' group comprised three men and five women who were a mix of White, Asian, Black and other ethnicity, with a mix of

Figure 2. The ABC of reproductive intentions.

graduates and non-graduates. They felt that the timing was important in order to try for a baby. In order to plan for pregnancy, they were talking to their healthcare professionals, taking the right vitamins, taking care of their health, and timing conception to maximize chances.

> '*Yes, I'm actually very interested in starting a family. I'm hoping we will have children sometime soon… We have both been taking these vitamins and she has been taking folic acids and other stuff and other vitamins and I have been taking the right vitamins and conception tablets. So, we have both been taking these for months and months now, it's just to make sure that our health is up to scratch*'. MP2—Male, Age 27, Asian, Degree qualification, no child, trying for a baby.

Expectants

The 'Expectants' group comprised two women of White ethnicity with a degree or above. A respondent discussed their trying-to-conceive journey extensively, highlighting how emotional and difficult the process was.

> '*Actually, I just found out that I am pregnant so I'm over the moon. Yeah so I'm very happy but I mean IVF was very intense. I found it quite difficult, I had endless gynae problems. I had four or five operations in the last 18 months. I then had to have IVF. I had a complication with IVF and got admitted in December, but I have ovarian hyperstimulation syndrome. So, I was in hospital for that and the doctor said I'm not sure it doesn't look like the IVF is going to work and then I found out that it worked. So, I'm really, really lucky and I feel very happy, but I am in a position where I feel completely ready, you know, we've been trying for a long time*'. HCP6, Female, Age 31, no child, pregnant.

Flexers

The 'Flexers' group comprised three men and four women who were a mix of White, Asian, Black and other ethnicity and with a mix of graduates and non-graduates. Their reasons for being unsure include about whether or not to have children include age, health, financial stability, timing as well as echoing some of the reasons cited by avoiders.

> '*We're going through the conversations now of whether we have a third child*'. MP11—Male, Age 36, White, A levels, two children, unsure about having more children.

Finally, we have one 'other' group who would like to have children in the future but were unsure whether they could or had changing views. For the purposes of fertility education, we recommend treating these

individuals as if they are in the 'Desirers' or 'Flexers' category but recognizing their differences.

> *'It wasn't really a decision as such. I always think that when I'm old enough I'd like to have kids, I'm still thinking that; I'm 45 and I still think that I might like to have kids when I grow up, which is ridiculous because obviously I'm not going to now… I think I always imagined that I'd perhaps get married in my 20s and have kids but that never happened. I didn't meet the right man until I was 36, didn't have sex for the first time until I was about that age or 37. And my partner who I am still with, he said almost from the start he wasn't that bothered about having kids and I was thinking "oh that suits me fine I'm not that bothered either"'*. HCP3—Female, White, Postgraduate Qualifications, Age 45, no child, would like in future.

Discussion

This mixed methods study applied criteria-based purposive sampling to ensure socio-demographic diversity including age, ethnicity and education, representative of the UK population of reproductive age. From our analysis, we identified six broad groups of people, whom we categorized to describe a spectrum of reproductive intentions. We further refined these categories alphabetically for user-friendliness. The distribution of reproductive intentions from our analyses provided interesting perspectives; especially when accounting for 'Avoiders' whom we had not initially anticipated would be represented in our study, and the proportion of 'Flexers', which was the biggest group. Notably, the inclusion of men's perspectives, for which there is a dearth of evidence in this area, provides rich insights.

Our survey data highlighted poor fertility knowledge, although a majority of the survey respondents (79.7%) were trying or planning to get pregnant—whether actively or passively (Desirers); pregnant (Expectants); hoping to have a child in the future or simply open to the idea (Betweeners, Flexers). A total of 13.6% did not want to have any more children (Completers) and only 4.7% did not have children and did not want children (Avoiders). It could be argued that those in the 'Avoider' group might not necessarily need to demonstrate good fertility knowledge for family building; however, since a high proportion of the survey respondents would like children in the future, the poor levels of fertility knowledge across population groups is concerning, especially in terms of the knowledge of age-related fertility decline.

These findings are consistent with other studies where people of reproductive age hope to have children in the future but have poor awareness of age-related fertility decline (Pedro *et al.*, 2018). For 'Betweeners', 'Desirers' and' Expectants', current evidence suggests that there may be a relationship between pregnancy intention and pregnancy outcome. A better understanding of the way in which reproductive intention influences pregnancy outcome will enable effective tailoring of pre-conception, antenatal, delivery and postnatal services to meet men and women's needs and mitigate risk of adverse outcomes (Hall *et al.*, 2017; Stephenson *et al.*, 2018).

During the inception of this study, we did not anticipate that the 'Avoiders' group would have an interest in a fertility awareness study. However, some respondent who felt strongly that it was 'socially irresponsible to have children'—in the context of climate change, wars, the global economy and over-population—also wanted good fertility awareness as part of their overall health education or so that they can share this information with others in order to help them achieve their desired reproductive intentions. It is worthy to note that of all the categories presented in this study, 'Avoiders' were the most certain of their reproductive intentions; this finding is consistent with other research, especially among younger generations, for example Gen-Zer's, who are increasingly choosing to be voluntarily childfree for various reasons, including eco-anxiety—the chronic fear of environmental disaster (Blackstone, 2019; Bodin *et al.*, 2021; Tocchioni *et al.*, 2021). For this group, fertility awareness is still important, to help prevent unintended pregnancy.

Furthermore, as views continued to emerge during our study, the importance of segmentation of reproductive intentions and tailoring fertility awareness information to suit different groups became more evident. This information would need to be delivered sensitively and with support. For example, describing their experience with involuntary childlessness, a respondent showed the struggle reconciling their desire to have children with the reality of their life circumstances. Cooke *et al.* (2012) found that women perceived a lack of choice in the timing of when to start a family. In their study, women suggested that although they may have reached a juncture in their lives at which they felt ready to start family building, the circumstances in which they found themselves may not support a plan. Factors such as financial stability, relationship, health and fertility were not necessarily within their control.

The categories we have presented reflect people's current situation, rather than their entire fertility journey and are designed to be mutually exclusive at a given point in time. Although 'Avoiders' in our study were the most certain of their choices, it is inevitable that many people will move between the categories that we have identified over time, as their circumstances change, and their reproductive intentions evolve. For example, 'Expectants' will, by definition, move into another group after pregnancy. It is also likely that many 'Flexers', whose uncertainty marks their categorization, will move to another group; for example, if they decide to actively try to become pregnant, a move to 'Desirers' and achieve it, a move to 'Expectants'. Those who would like to have children in the future but are unsure whether they can or had changing views can be classified as 'Desirers' or 'Flexers' for the purposes of fertility education. While those without children and are not voluntarily childfree, no longer trying to get pregnant and have accepted involuntary childlessness, can be classified as 'Completers'.

We recommend that information is tailored to each group—relevant to the needs of the group—whilst recognizing that this means that information reaching an individual may change over time as they move between groups. To support this recommendation, we propose using the reproductive life plan (American College of Obstetricians and Gynecologists, 2016; Bodin *et al.*, 2018). Practical ways of implementing this may include when men and women present for contraceptive counselling. 'Avoiders' and 'Completers' ensuring they are informed of the effectiveness of different methods when choosing contraception, as should 'Betweeners' until they are ready for a new pregnancy (Stern *et al.*, 2015). 'Desirers' and 'Flexers' could benefit from a discussion on age realized fertility decline, the fertile window of the menstrual cycle, modifiable factors influencing fertility and preconception health such as diet and nutrition, as well as impact of sexually transmitted infections (Stephenson *et al.*, 2021).

Similar to previous studies (Greil *et al.*, 2011; McQuillan *et al.*, 2014), we found notable patterns in the responses from different demographic groups. For example, working professionals discussed the impact of their career, working hours and job flexibility more than any other group. Furthermore, women tended to discuss home environment, family values and a support system, whilst men highlighted financial stability and their ability to provide for the family as being crucial. Some ethnic minorities appeared to place more emphasis on the impact of culture, upbringing and views of their family members as having an impact on their family building intentions, and those who were religious reported that this governed their reproductive health decision-making.

In terms of study strengths, we developed a new categorization for reproductive intentions which can be used by different stakeholders to improve fertility education campaigns. The inclusion of men's views provides a key strength as men's perspectives are underrepresented psychosocial studies on fertility and are largely excluded from the discourse. Finally, the mixed methods approach provided depth and richness of insights as most studies on reproductive intentions are survey based, often with a dichotomy which does not reflect the reality of people's lived experiences. In terms of study limitations, although we gathered rich data, interviewees were self-selected and results principally reflect views of those who were willing to participate. Additionally, our categorizations are in English, which may not be as easy to translate into other languages using the same alphabetical format. Due to the online recruitment method, there may be bias towards more educated participants. While in principle, the findings may be applicable in similar contexts, the representativeness of the UK population would need to be considered, especially in low-income settings, which has implications for generalizability.

Conclusions

People have different family building needs at different stages in their life; therefore, fertility awareness strategies need to be tailored differently to suit different intentions. We identified six key categories, grouped alphabetically, to highlight a spectrum of reproductive intentions: Avoiders, Betweeners, Completers, Desirers, Expectants and Flexers. Our simple categorization may be used by individuals, educators, researchers, healthcare professionals, special interest groups, charities, product manufacturers, policymakers and other stakeholders as part of fertility awareness campaigns, education schemes, resource planning, communication strategies, product design and development, policy guidelines and other initiatives to support and enable individuals and couples to make informed choices to achieve their desired reproductive intentions.

Supplementary data

Supplementary data are available at *Human Reproduction* online.

Data availability

Anonymized data underlying this article will be shared on reasonable request to the corresponding author.

Acknowledgements

The authors would like to thank the study participants for their contribution this study and Orishi Inclusive Innovation for providing the reproductive intentions illustration.

Authors' roles

Study design and concept: B.G. Study execution and analysis: B.G., J.Sh. and J.St. Manuscript draft: B.G. All authors contributed to the manuscript revision and approval.

Funding

There was no external funding for this study.

Conflict of interest

The authors report no conflict of interest.

References

American College of Obstetricians and Gynecologists. Reproductive life planning to reduce unintended pregnancy. Committee Opinion No. 654. *Obstet Gynecol* 2016;**127**:e66–e69.

Barclay K, Myrskylä M. Advanced maternal age and offspring outcomes: reproductive aging and counterbalancing period trends. *Popul Dev Rev* 2016;**42**:69–94.

Blackstone A. *Childfree by Choice: The Movement Redefining Family and Creating a New Age of Independence*. New York: Dutton, 2019, 279.

Bodin M, Holmström C, Plantin L, Schmidt L, Ziebe S, Elmerstig E. Preconditions to parenthood: changes over time and generations. *Reprod Biomed Soc Online* 2021;**13**:14–23.

Bodin M, Tydén T, Käll L, Larsson M. Can reproductive life plan-based counselling increase men's fertility awareness? *Ups J Med Sci* 2018;**123**:255–263.

Brand JE, Davis D. The impact of college education on fertility: evidence for heterogeneous effects. *Demography* 2011;**48**:863–887.

Carolan M, Frankowska D. Advanced maternal age and adverse perinatal outcome: a review of the evidence. *Midwifery* 2011;**27**:793–801.

Cooke A, Mills TA, Lavender T. Advanced maternal age: delayed childbearing is rarely a conscious choice a qualitative study of women's views and experiences. *Int J Nurs Stud* 2012;**49**:30–39.

Dodgson JE. Reflexivity in qualitative research. *J Hum Lact* 2019;**35**:220–222.

Focus on Reproduction. *Public Reaction to Fertility Awareness Campaigns*. 2018. https://www.focusonreproduction.eu/article/ESHRE-Meetings-FA (8 November 2021, date last accessed).

Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 2013;**13**:117.

Grace B, Shawe J, Johnson S, Stephenson J. You did not turn up. . . I did not realise I was invited. . .: understanding male attitudes

towards engagement in fertility and reproductive health discussions. *Hum Reprod Open* 2019;**2019**:hoz014.

Grace B, Shawe J, Johnson S, Stephenson J. I trust the healthcare professional most: exploring fertility knowledge among healthcare professional and lay population groups. *Hum Reprod* 2020;**35**: i1343–i1451.

Greil AL, Shreffler KM, Schmidt L, McQuillan J. Variation in distress among women with infertility: Evidence from a population-based sample. *Hum Reprod* 2011;**26**:2101–2112.

Hall JA, Benton L, Copas A, Stephenson J. Pregnancy intention and pregnancy outcome: systematic review and meta-analysis. *Matern Child Health J* 2017;**21**:670–704.

Hammarberg K, Collins V, Holden C, Young K, McLachlan R. Men's knowledge, attitudes and behaviours relating to fertility. *Hum Reprod Update* 2017;**23**:458–480.

Harper J, Boivin J, O'Neill HC, Brian K, Dhingra J, Dugdale G, Edwards G, Emmerson L, Grace B, Hadley A *et al.* The need to improve fertility awareness. *Reprod Biomed Soc Online* 2017;**4**:18–20.

Harper J, Hammarberg K, Simopoulou M, Koert E, Pedro J, Massin N, Fincham A, Balen A; International Fertility Education Initiative. The International Fertility Education Initiative: research and action to improve fertility awareness. *Hum Reprod Open* 2021;**2021**:hoab031.

Hodes-Wertz B, Druckenmiller S, Smith M, Noyes N. What do reproductive-age women who undergo oocyte cryopreservation think about the process as a means to preserve fertility? *Fertil Steril* 2013;**100**:1343–1349.e2.

Lampic C, Svanberg AS, Karlström P, Tydén T. Fertility awareness, intentions concerning childbearing, and attitudes towards parenthood among female and male academics. *Hum Reprod* 2006;**21**:558–564.

Lundsberg LS, Pal L, Gariepy AM, Xu X, Chu MC, Illuzzi JL. Knowledge, attitudes, and practices regarding conception and fertility: a population-based survey among reproductive-age United States women. *Fertil Steril* 2014;**101**:767–774.e2.

McQuillan J, Greil AL, Shreffler KM, Bedrous AV. The Importance of Motherhood and Fertility Intentions among U.S. Women. *Sociological Perspect* 2015;**58**:20–35.

McQuillan J, Greil AL, Shreffler KM. Pregnancy intentions among women who do not try: focusing on women who are okay either way. *Matern Child Health J* 2011;**15**:178–187.

Mills M, Rindfuss RR, McDonald P, Te Velde E; ESHRE Reproduction and Society Task Force. Why do people postpone parenthood? Reasons and social policy incentives. *Hum Reprod Update* 2011;**17**: 848–860.

Myrskylä M, Margolis R. Happiness: before and after the kids. *Demography* 2014;**51**:1843–1866.

Pedro J, Brandão T, Schmidt L, Costa ME, Martins MV. What do people know about fertility? A systematic review on fertility awareness and its associated factors. *Ups J Med Sci* 2018;**123**:71–71–81.

RCOG. Reproductive ageing. Scientific Impact Paper *No. 24*. London: Royal College of Obstetricians and Gynaecologists, 2011, 15–30.

Schytt E. Agreement in Swedish childless couples' reproductive intentions in relation to age. *Midwifery* 2014;**30**:e43–e48.

Soumpasis I, Grace B, Johnson S. Real-life insights on menstrual cycles and ovulation using big data. *Hum Reprod Open* 2020;**2020**: https://doi.org/10.1093/hropen/hoaa011.

Stephenson J, Heslehurst N, Hall J, Schoenaker DA, Hutchinson J, Cade JE, Poston L, Barrett G, Crozier SR, Barker M *et al.* Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health. *Lancet* 2018;**391**:1830–1841.

Stephenson J, Schoenaker DA, Hinton W, Poston L, Barker M, Alwan NA, Godfrey K, Hanson M, De Lusignan S; the UK Preconception Partnership. A wake-up call for preconception health: a clinical review. *Br J Gen Pract* 2021;**71**:233–236.

Stern J, Bodin M, Grandahl M, Segeblad B, Axén L, Larsson M, Tydén T. Midwives' adoption of the reproductive life plan in contraceptive counselling: a mixed methods study. *Hum Reprod* 2015; **30**:1146–1155.

Tocchioni V, Berrington A, Vignoli D, Vitali A. The changing association between homeownership and the transition to parenthood. *Demography* 2021;**58**:1843–1865.