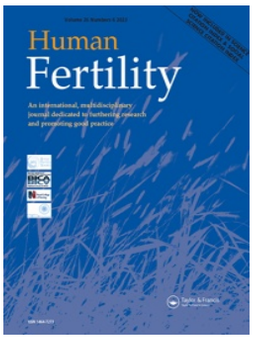

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RESEARCH ARTICLE

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Young adult's views on using a poster to learn about fertility: redesigning the fertility education poster

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ABSTRACT

Fertility awareness should be taught to everyone. The International Reproductive Health Education Collaboration (IRHEC) designed a fertility poster in 2019 but did not have a specific target group in mind. Studies have been conducted in Denmark and Sweden to determine how the poster can be redesigned. In this study, we carried out focus groups with young adults in the UK to ask their views of the poster, with the aim of redesigning it. Six focus groups were undertaken with twenty seven, 18–25 year olds. Five questions were asked: 1. What are your thoughts, feelings, and reactions to the poster? 2. Did you learn anything from the poster? 3. How has reading the poster impacted your opinions or thoughts about having children? 4. What are your opinions about using a poster format to inform and start reflections regarding family building? 5. Reading through each point are there any changes to be made? Content analysis was performed. Themes identified revealed the information on the poster gave the participants some anxiety and apprehension, especially regarding the effect of age on fertility, perceptions of IVF, and gaps in knowledge. The fertility education poster is a good resource for education, but other resources should be developed.

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Education; fertility; fertility awareness; reproductive health; fertility education

Introduction

Fertility awareness is defined as an individual's understanding of reproduction, family planning, and individual factors contributing to the success of conception. The World Health Organisation (WHO) (2023) define fertility awareness as 'the understanding of reproduction, fecundity, fecundability, and related individual risk factors (e.g. advanced age, sexual health factors such as sexually transmitted infections (STIs), and lifestyle factors such as smoking, obesity) and non-individual risk factors (e.g. environmental and workplace factors); including the awareness of societal and cultural factors affecting options to meet reproductive family planning, as well as family building needs' (Zegers-Hochschild et al., 2017). Having fertility awareness allows people to make informed decisions about their reproductive options and family planning (Simmons & Jennings, 2020). Unfortunately, studies have shown that people of reproductive age have low fertility awareness (Almeida-Santos et al., 2017; Bunting et al., 2013; Daniluk & Koert, 2013, 2015; Hammarberg et al., 2013; Pedro et al., 2018; Vassard et al., 2016).

Lack of fertility awareness may be responsible for some of the changes we are seeing in the maternal age at first birth and the fertility rates globally. In the UK, the average age for first-time parenthood is 30.9 years for women and 33.7 years for men (Office for National Statistics, 2022). Over 10 years, this has steadily increased with the trend of parenthood being delayed until older ages in all EU countries (UNECE, 2024). In the UK, the fertility rate (average number of children a woman has) has decreased from 2.93 in 1964 to 1.56 in 2020 (World Bank, 2020). There may be many factors that have influenced these statistics, such as the cost of childcare, career prospects, house prices, lack of suitable relationships, and a decrease in the desire to have children. But our studies have shown that adults (Harper & Botero-Meneses, 2022; Harper, Hammarberg, et al., 2021) and teenagers (Biswakarma et al., 2024) still wish to become parents by age 30 and desire 2–3 children. This has prompted an increase in efforts from educators and healthcare professionals to improve

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fertility awareness (Grace et al., 2023; Harper, Hammarberg, et al., 2021; Office for National Statistics, 2022, 2023) by creating educational resources.

Creating educational resources

Fertility awareness is omitted from key USA guidelines (Bakkensen & Goldman, 2022; Practice Committee of the American Society for Reproductive Medicine and the Practice Committee of the Society for Reproductive Endocrinology and Infertility, 2022). We have examined the sex and reproductive health education curricula in England (Maslowski et al., 2022) and compared the curricula in the four nations of the UK (Maslowski et al., 2023) and found that sex education includes how not to get pregnant and not get a sexually transmitted infection (STI), but little about reproductive health or fertility. This should change as in 2019, the UK became one of the first countries in the world to include the need to teach 'the facts about reproductive health, including fertility, and the potential impact of lifestyle on fertility for men and women and menopause' (Department for Education, 2019).

A range of educational resources need to be developed to educate people about reproductive health. Methods that have been explored include theatrical and still art (Harper, Hepburn, et al., 2021), a fertility status awareness tool (FertiSTAT) (Bunting & Boivin, 2010), a chatbot (Maeda et al., 2020), a web site (Hammarberg, Norman, et al., 2017) and educational videos (Pedro et al., 2022).

When making educational resources, ideally they should be co-created with the target group and evaluated for impact (Martins et al., 2024; Mertes et al., 2023). Also to consider is that fertility education should vary across the lifecourse. For example, young people need to know about their reproductive health, menstruation, contraception, STIs, whereas adults need to be aware of issues relating to fertility, infertility, fertility treatments (Martins et al., 2024), menopause and reproductive cancers. Education in these topics should empower people to be able to make informed choices about their reproductive health.

In 2019 an International group was established to improve fertility awareness, initially called the International Fertility Education Initiative (IFEI) (Harper, Hammarberg, et al., 2021) and in 2023 renamed the International Reproductive Health Education Collaboration (IRHEC). This collaboration aims to reduce the prevalence of infertility and improve the health of future generations by improving reproductive health education. This includes the production of a suite of free educational resources for teachers, health professionals and the public and to be a repository for resources produced by others (www.eshre.eu/IRHEC).

The IRHEC have recently published recommendations for developing and implementing tools to improve fertility literacy (Martins et al., 2024). They defined fertility education as 'the use of communication strategies and materials to inform and influence decisions and actions to improve fertility literacy or awareness' (Martins et al., 2024). When developing resources there needs to be a comprehensive understanding of the target populations; the incorporation of theories of behavioural change; the inclusion of the users' perspectives and the use of participatory research; and the use of specific guidelines for increasing engagement.

In 2019 the IRHEC team produced a fertility awareness poster detailing '9 things people should know if they want kids in the future' (Figure 1). The poster has been translated into 26 languages. The IRHEC team decided on the key messages that should be included in the poster, from gametogenesis to preconception health, ensuring that issues affecting men were included. The poster was aimed at the general public, with no specific age group in mind. The evidence for these messages are summarised in Table 1.

The IRHEC want to be sure that educational resources are evidence based, appropriate and co-created with the target group (Martins et al., 2024; Mertes et al., 2023). Unfortunately, the original fertility education poster was not co-created with the target group. Studies are now underway to improve this educational resource. A group in Denmark (Larsen et al., 2023) and Sweden have looked at how it can be redesigned aiming the poster at young adults. This is essential as the poster aims to be a major educational resource globally.

The Danish group ran focus groups with 13 childless men aged between 25–35 years old to determine their attitudes and perceptions of two fertility awareness methods: a podcast and the IRHEC fertility education poster (Larsen et al., 2023). The men wanted education to be factual, as in the poster, and felt that the personal stories in the podcast raised conversations. Data from Sweden are not published yet.

In this study we used focus groups with young adults aged 18–25 years in the UK to determine their views on using the fertility education poster to learn

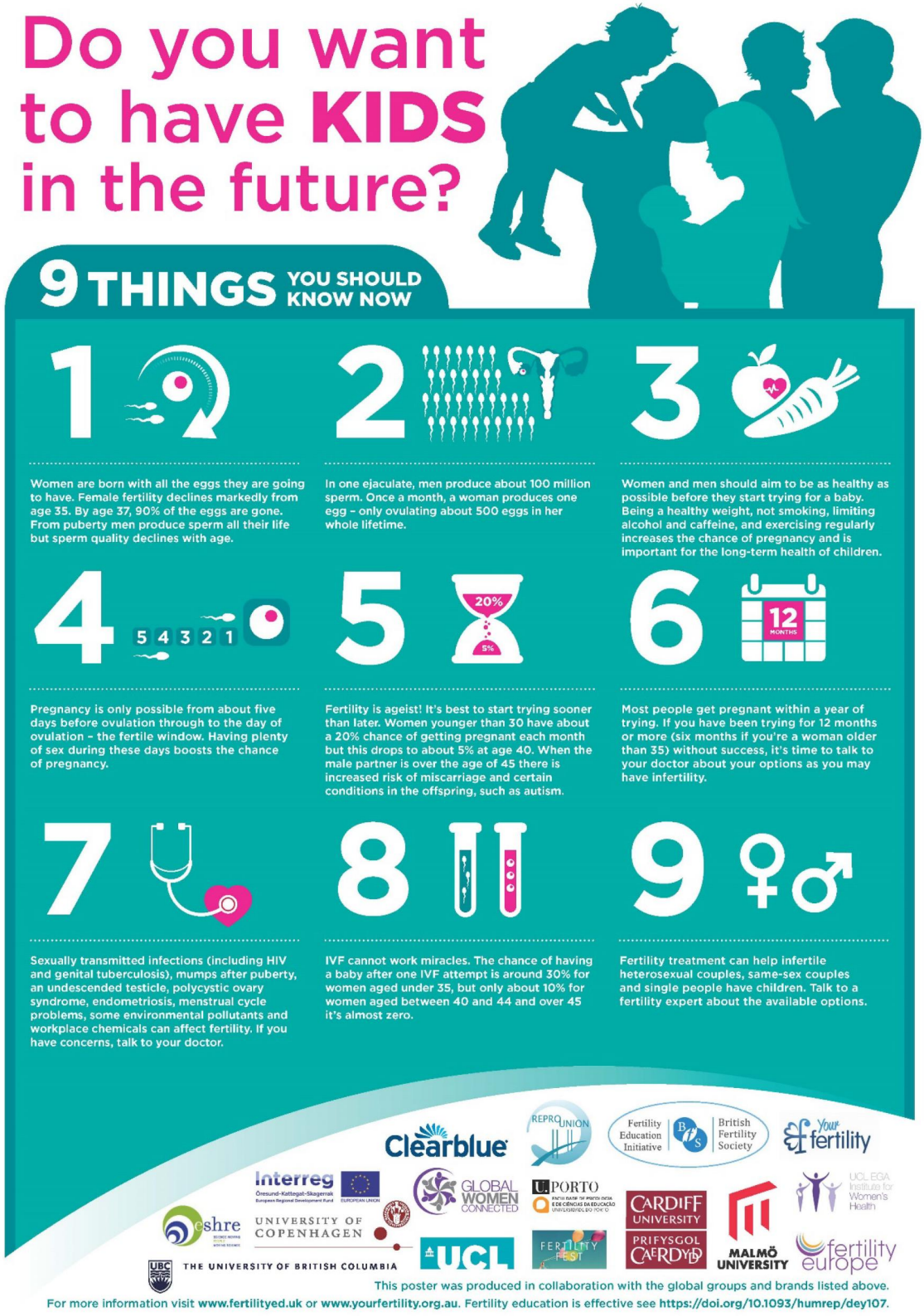

Figure 1. The original fertility education poster.

about fertility, to see if the poster taught them anything and if this impacted their thoughts about having children. The data from this study will be discussed with the teams from Denmark and Sweden, and with the IRHEC steering committee, to redesign the poster, aiming it at young adults

Table 1. The evidence behind the 9 points on the original poster.

Facts 1 and 2	Human female fetuses are born with around 1–2 million primordial germ follicles (Faddy et al., 1992). By the time they reach menarche, this has reduced to about 400,000. During their fertile years, women ovulate approximately one oocyte per month, over about 500 menstrual cycles. By age 37, about 90% of eggs are gone and by menopause, all viable oocytes have gone, because hundreds of oocytes die during each menstrual cycle (American College of Obstetricians and Gynecologists Committee on Gynecologic Practice and Practice Committee, 2014). As well as the number of oocytes decreasing with age, oocyte quality also declines due to an increase in meiotic non-disjunction leading to chromosomal aneuploidy and miscarriage (Te Velde & Pearson, 2002; Vollenhoven & Hunt, 2018). Spermatogenesis is a continuous process meaning sperm can be produced throughout the male reproductive lifetime (Marcon & Boissonneault, 2004). A normal ejaculate contains about 100 million sperm (Sultan Sheriff, 1983).
Fact 3	Lifestyle factors play a major role in fertility. Obesity in males and females decreases fertility (Amiri & Ramezani Tehrani, 2020; Katib, 2015). For women, obesity affects endocrine and ovarian functions leading to reduced ovarian cycles and fertility rates (Amiri & Ramezani Tehrani, 2020). The effects of male obesity on fertility are less documented however obesity affects semen parameters and concentration, which is associated with poorer-quality sperm (Katib, 2015). In both men and women, there has been a beneficial effect on weight loss and natural conception after lifestyle intervention (Hoek et al., 2022). There is also evidence that obesity in parents can have adverse effects on the health of future children (Hieronimus & Ensenauer, 2021). For many couples weight loss is the main preconception advice alongside reducing alcohol intake and stopping smoking. There is no standardized guideline about what preconception advice should be offered (Boedt et al., 2021).
Fact 4	The menstrual cycle is made up of four phases: menstruation, the follicular phase, ovulation and the luteal phase (Reed & Carr, 2018). This cycle on average occurs over a 28 day cycle but can vary in length for each person (Bull et al., 2019). It can also be affected by different methods of contraception or reproductive disorders. The chances of natural conception are greatest over the fertile window which is a 6 day period ending with the day of ovulation (Wilcox et al., 1995). However, chances are highest if intercourse happens closer to ovulation (Wilcox et al., 1995). Every woman's menstrual cycle is different (Reed & Carr, 2018) and understanding when ovulation happens may be important if trying to get pregnant. There are different ways of doing this, such as measuring basal body temperature or using an ovulation test to detect the LH surge in urine (Su et al., 2017). Unfortunately, many period tracker apps tell women the day they are ovulating, but if this information is obtained only from cycle dates, it may be unreliable (Ali et al., 2020).
Fact 5	Women younger than 30 have about a 20% chance of getting pregnant each month (Cooke & Nelson, 2011). For most women, this decrease in fertility becomes most important around the age 35 (Crawford & Steiner, 2015) which makes it more difficult to get pregnant, especially over the age of 40. By age 45, the majority of women will be infertile (American College of Obstetricians and Gynecologists Committee on Gynecologic Practice and Practice Committee, 2014). Men are also affected by fertility decline as the quality of sperm decreases from 40 years of age (Kaltsas et al., 2023). This affects the sperm count and percentage of viable sperm within an ejaculate. After age 40, less semen is produced and motility becomes reduced (Kaltsas et al., 2023). There is also an increased risk of some genetic defects and conditions such as schizophrenia and autism (Kaltsas et al., 2023). A longer time to conception has also been observed (Kaltsas et al., 2023) and an increase in miscarriage (Du Fossé et al., 2020).
Fact 6	For women under age 35 who are trying to get pregnant, the majority will be pregnant with 6–12 months (Favaro et al., 2021) but the time it takes to get pregnant increases with age. At the age of 40, the probability of becoming pregnant within 12 months is only about 30% (Vollenhoven & Hunt, 2018). Infertility 'is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse' (Zegers-Hochschild et al., 2017).
Fact 7	Sexually transmitted infections (STIs) such as gonorrhoeae, chlamydia and syphilis are the most common infections (World Health Organisation, 2023). In women, untreated infections can spread to the womb and ovaries which causes pelvic inflammatory disease (PID) which can damage the Fallopian tubes causing infertility (Smolarczyk et al., 2021). STIs in pregnancy can also lead to adverse outcomes. In men these infections can cause epididymitis (Westrom, 1996). Having an understanding of the symptoms of STIs, where to go for testing and treatment as well as being aware of methods of prevention is important to reduce the rate of infertility as a result of STIs.
Fact 8	Unfortunately in modern society, the media have perpetuated the message that it may be easy for women to get pregnant later in life and that if they have problems, IVF is an easy option (Hammarberg, Zosel, et al., 2017). The most recent data from the Human Fertilisation and Embryology Authority (HFEA) states the average IVF pregnancy rates using fresh embryo transfers for patients aged between 18–34 were 33% per transfer in contrast to 4% for patients aged 43–50 years old (Human Fertilisation and Embryology Authority, 2023). These low success rates highlight how difficult it is to achieve a pregnancy with IVF, exacerbated by age.
Fact 9	Fertility treatment can help single people, same-sex couples and trans, non-binary and gender diverse people have families. The recent HFEA data represents the shift in family types and how fertility treatment allows them to achieve their reproductive goals (Human Fertilisation and Embryology Authority, 2023). The majority of IVF cycles represent families with a male partner but there was an increase in female same-sex relationships (Human Fertilisation and Embryology Authority, 2023).

Methods

Ethics and confidentiality

Ethical approval was obtained from University College London's (UCL) ethics committee (reference number 9831/006). The names and contact information of the participants were managed solely by the first author. No additional identifiable information was collected. Written consent was obtained by each participant in advance of the focus group and participants were given a pseudonym to use throughout the Zoom meeting. These names were given so everyone in group A had a name beginning with A, everyone in group B was given a name beginning with B, etc. At the beginning of each focus group, the participants were informed of their right to withdraw from the study without consequence.

Study design

This research was part of a collaboration with the IRHEC steering committee and others, where similar studies have been and are taking place in different countries to re-design the fertility education poster aiming it at young adults. The projects in Denmark, UK and Sweden were independent but discussions regarding methods and results were undertaken. For example, the questions for the focus groups in this study were based on those used by the Danish study (Larsen et al., 2023) with some variation which included asking about different formats being used to deliver education, such as social media.

Participants were considered eligible if they were aged between 18–25 years old and from the UK. The focus groups were undertaken online.

Recruitment

Participants were recruited through a poster shared on the Instagram and Facebook of the first author who is the same demographic as those required for this study. Thirty-nine people were sent the poster, participant information leaflet, and consent form and 32 consented. This informed them of the ethical approval, structure, rationale, and responsibilities as a participant. They were given the questions for the focus group in advance and advised to think about how they would answer the questions. Included in the consent form was a request for information about the demographics of the participants including their age, employment status, ethnicity, and if they had any children. They were informed about a selection of dates and timings for the focus groups upon completion of the consent form. The participants were allocated to focus groups to ensure gender balance. A Zoom link and pseudonym were allocated to them to ensure confidentiality was maintained. After attending the focus group each participant was given a £25 love-to-shop voucher.

Focus group format

Six focus groups were completed between the 6th June and 3rd July 2023 and 27 participants took part. Five who were consented did not take part as they could not make the focus group dates or withdrew. The focus groups were led by JH and assisted by KM. The largest number of participants in one focus group was seven participants and the smallest was two participants. The longest focus group lasted for 61 minutes and the shortest lasted 52 minutes. The focus groups were recorded with the participants' consent and a Zoom transcript was created. The visual recording was deleted at the end of the focus group. The audio file was used to check the transcripts for accuracy and deleted. The anonymous transcripts were saved and uploaded to a password-secure computer until analysis was complete and then stored on the UCL safe haven.

Content analysis

Both researchers carried out the analysis using a variation of conventional content analysis with coding categories being derived directly from the text data (Hsieh & Shannon, 2005; Kleinheksel et al., 2020). After each focus group, the researchers discussed the focus groups, and a summary was made of each focus group. When the sixth focus group was completed, each question was taken in turn, looking at the summary of each focus group and then delving deeper into the transcript for a particular question for each focus group. The transcripts for individual questions were read and re-read until themes were identified. The themes were organized for questions 1–4 which were discussed between the researchers to ensure sufficient detail was described for each question. The identified themes were justified with quotes from the transcript. The results from the last question directly informed the editing of the fertility poster along with discussions with the Danish and Swedish groups and the IRHEC steering committee.

Results

Demographics

Table 2 shows the demographics of the participants. The majority of participants were women (82%). Over half were employed (56%) and 37% were full time students.

Question 1 – what are your thoughts, feelings, and reactions to the poster?

The discussion following the first question was generally positive. Participants recognized the importance of having a resource to share this information and three themes were found: anxiety and apprehension, the importance of visual impact, and target the information for young adults.

Anxiety and apprehension

The participants described the poster creating a sense of apprehension. Generally, the data about age

Table 2. The demographics of the participants.

Location	Number of women	Number of men
Gender	21	6
Age		
20	0	1
21	5	1
22	0	0
23	4	3
24	10	1
25	2	0
Relationship status		
Single	10	4
In a relationship	10	1
Married	1	1
Employment status		
Full time work	11	3
Part time work	1	0
Full time student	9	1
Part time student/part time work	1	0
Unemployed	0	2
Number of children		
0	20	6
1	1	0
Ethnicity		
White-English/Welsh/Scottish/Northern Irish/British	15	3
Any other white	3	0
Black/Black British-African	2	1
Any other Asian background	2	0
Mixed ethnic background	1	0

created anxiety. The participants recognized people would digest the information differently depending on their views of parenthood. The reactions were mixed between people feeling pressure to conceive sooner than originally planned and some felt apprehensive to plan and make changes to their lifestyle before family planning.

> *'It does create like a sense of urgency.' – Daniella*

> *'So you know if I had this information when I was younger in school, it would maybe put my mind at ease a bit more so. I think it's because I lack the information. Maybe that's why it's heightening my anxiety about some of the figures that are on there.' – Flora*

Importance of visual impact

The majority responded by positively commenting on the presentation of the poster. They described the general colour scheme and layout of the poster as informative and clear. Some people felt the colour scheme was relevant as it connotes themes of having children and fertility. A few people did not like it as they felt it fed into a heteronormative narrative and some thought it would not attract a wide audience.

> *'I really liked the overall like layout of the poster. I thought it was really clear with the numbers and the little symbols by each number. I really liked that. It was very eye catching. Made you look at each bit and like the title is really clear. Yeah, I liked it and the colour scheme as well.' – Davina*

Generally, the participants liked the use of pink and blue being used for the graphics as it was visually pleasing and consistent with each fact. Some reported the colour of the text easy to read and accessible for audiences with dyslexia.

> *'I think the colours are quite engaging. And yeah, once again, the pictures are good and the descriptions are quite brief, and easy to understand, even if you're not scientists.' – Bobby*

> *'I think accessibility and the sizing is really important. Like accessibility of the poster in terms of like learning disabilities. And there's this site that you can check colour contrast against. It's really helpful. I don't know if this actually does pass colour contrast guidelines.' – Bella*

The majority of participants reported a good mixture of text and graphics, feeling the information flowed well and was relevant. The majority felt the graphics made a big impact on the accessibility of the poster, despite mixed views on the actual graphics themselves. They felt the graphic for each point should reflect the information within the text. Visually some felt the layout and positioning for the graphics with fact numbers 1 and 5 were particularly controversial and some participants wanted these removed or updated to be more clear.

> *'The fact that there's a timer right in the centre of it is slightly off putting … you could use an icon that is less intimidating.' – Amelia*

> *'Of all the logos there are a few I do not understand at all, I can see the idea they're meant to be like but some of them could be better.' – Frankie*

Generally, participants felt the language used was colloquial and non-clinical. Many felt there was too much text and the font size was too small to make someone stop and read the poster; some reported the amount of information was intimidating and that would put them off reading it.

> *'So the facts are a little bit too small. I don't know if it's just because I was reading it on my phone majority of the time. But I also thought that the facts were so beneficial to have. Because some of the stuff on it I was reading to my partner. I don't think you could take any out.' – Daisy*

> *'I feel like I'd have to spend a lot of time in front of it to understand it all.' – Caroline*

Some people suggested the important data should be emphasized with a larger font or a bolder typeface to make more of an impact and increase readability from a glance so the audience can learn something without having to read the whole poster. The key figures were highlighted in a different colour to add emphasis.

'Using like a bold type face, for those key facts would be really helpful, just because it's easy to… it's easy to lose the numbers with all the text that's there.' – Freddie

Target the information for young adults

Many of the participants felt some of the information on the poster was too broad and the statistics were not relevant for 18–25-year-olds. The participants recognised the importance of including key information but felt some could be signposted rather than being included on the poster.

'If it's tailored to a smaller age range, it might be more effective, because it's things to keep in mind now, it's more relevant, more action based and more implementable rather than oh I need to remember that when I am 45, which is way down the line.' – Emily

Question 2 – did you learn anything from the poster? If so, what?

All participants reported they learned new information from the poster. They provided a variety of viewpoints on the content of the poster which created four themes of key learning points: effect of age on fertility, natural conception, perceptions of IVF, and gaps in knowledge.

Effect of age on fertility

The majority of people did not know how much age affected their fertility. Some did not realise women were born with all of their eggs or that sperm quality decreased with age. Many did not realize how drastic the drop off in fertility was for women over the age of 35.

'I was a bit taken back when I read it but that's because I haven't been exposed to some of that information, but equally, I think it's good information to be exposed to.' – Flora

'I thought, gosh, that's why it's surprising, because that's a lot sooner than you think.' – Chloe

The male participants reported feelings of anxiety surrounding their age affecting fertility and the quality of the sperm they would be producing. Many did not know there are links between raised paternal age and miscarriage and different disorders and conditions in children. They also discussed understanding the pressure put on women and how these facts could induce anxiety for their partners. They did recognise the importance of being aware as their partner is likely to be of a similar age to them and so would affect them when planning family building.

'I thought having kids in my 30s would be easy.' – Andrew

'And the one that really shocked me was the fact that women are born with all their sort of eggs which is a terrifying thought to me. I think it's important that guys know what women have to face that can help the relationship build.' – Dan

Natural conception

Many of the participants did not know how long it normally takes to naturally conceive, and if they did, they were not aware of the change in length of time to expect to conceive after the age of 35. This was explained by defining infertility, which was new information for a lot of participants as many did not know when it is recommended to access fertility treatment after failure to conceive.

'I didn't know that infertility was defined differently for women over 35. I didn't know that was after 6 months of trying that they were then eligible for infertility treatment or measures.' – Alexis

There was confusion surrounding ovulation and when in the month a woman is most fertile. The majority of the participants did not know a woman could only fall pregnant when she was ovulating. The majority did not know how to reliably track ovulation and thought a mobile period tracking application (app) was a good tool. There were discussions about accurate methods to use for ovulation tracking. It was recommended by the participants that this information should be added to the poster to help prevent unwanted pregnancies and also help those who are trying to conceive.

'I have no idea when my fertile window is.' – Eden

'I think one of the most important things on there is that you can only get pregnant for a certain period of time in the month and I wish I'd known that as a student.' – Amelia

Some people did not realize the importance of both male and female health relating to higher chances of natural conception but also the impact this has on the future health of children. A few people understood the effect on maternal health but were shocked BMI and smoking status for men could affect conception. A few people said the information about becoming healthy before conceiving was not specific enough and they felt this was really important information to include as it is relevant for the target audience.

'It's definitely made me think that when I want to start trying, I am going to encourage a healthier lifestyle for me and my partner, I didn't realise the importance of

taking steps beforehand to make sure that you're healthy.' – Ava

'It reaffirmed the importance of male health as well as female health which is something I did not know.' – Eden

Perceptions of IVF

Only a few people knew how unsuccessful IVF is for women over the age of 35 and reported assuming the high costs of fertility treatment meant a high success rate. The participants were shocked at the reality of how small the likelihood is of achieving a pregnancy after only 1 cycle of IVF and reported their knowledge from the media gave them false hope.

'I always thought, IVF is 100% guaranteed that you can have children.' – Caryn

'I was quite surprised in terms of the IVF statistics. And I think it's interesting to have that out there because actually having it portrayed in the media with kind of a higher number of successful cycles, it really doesn't give that true perspective of the reality.' – Bonnie

Some participants reported little confidence in relying on IVF as an option if they could not naturally conceive. Some of these said the statistics against IVF being successful made them anxious as they had assumed if they focused on building a career later in life, they would have the funds to pay for IVF but realized this was an unrealistic expectation.

'It kind of put me off a little bit of the option of IVF just because it said on the poster about how slim the rates are, particularly when you're getting older.' – Amanda

'I just assume that because it was so expensive it was effective and it always worked.' – Frankie

Gaps in knowledge

Both male and female participants admitted the majority of the content of the poster was new information and not something they had been exposed to.

'I basically knew none of this, and it's not something I've been exposed to.' – Dan

'I knew health and general fitness can affect fertility. I knew that, but otherwise everything else would have been new to me.' – Eden

A few participants recognised a lack of understanding about male factor infertility. They reported assuming it was a female problem as this is what they had previously learned or experienced through talking about fertility with their friends and family. They also reported confusion about who to go to or where to access fertility services if they thought they were suffering from infertility.

'Whenever I've heard about fertility, it's always about the women's age. It's never about the men's age.' – Courtney

'I like the fact that it gives you some directions on where to go if you are struggling with fertility, I didn't know this.' – Flo

Question 3 – how has reading the poster impacted your opinions or thoughts about having children?

There were two clear themes: The pressure to conceive and supporting family planning. All the participants said it gave them a better understanding of the key components of conception and general fertility.

The pressure to conceive

Half of the participants felt reading the poster made them feel pressure to start family planning sooner than they had originally thought due to their anxiety about having difficulties with conceiving naturally.

'Made me think that I need to have kids a lot sooner than I thought I would, I never envisioned having kids in my 20s but now I would.' – Alexis

'It makes me a bit apprehensive, I think more just like, oh like the biological clock is ticking.' – Freya

Many said the poster impacted their decision to initially focus on developing their career before starting a family and thought they needed to change their focus to family planning rather than planning their career or carelessly dating. Many of the participants reported this fed into the societal pressures women may have surrounding having children later in life.

'I'd say that it does kind of feel a bit stressful to think about. You know as a woman, I want a career, how do you balance that with wanting children.' – Fiona

Supporting family planning

The other half of the participants stated the poster had no impact on their opinions surrounding family planning whether they wanted children or not and felt empowered by the information on the poster. Some participants said the statistics were far enough in the future for them to be able to retain the information and use it when it is more applicable to their situation.

'I think I realise I'm not like it hasn't made me that like apprehensive or anxious. It's just made me realize I need to do a lot more planning about it.' – Freddie

'I found it almost empowering to have the knowledge.' – Frankie

Question 4 – What are your opinions about using a poster format to inform and start reflections regarding family building? What about other media/social media?

Participants liked the idea of a poster as an educational resource but felt it could be more interactive. The themes highlighted from these discussions were: different audiences need different educational sources and reliable resources on social media.

Different audiences need different educational sources

The majority of participants thought the poster was a helpful tool to educate people about fertility, as it allows people to decide to read the poster over an algorithm automatically fed into social media.

> *'A poster allows people to choose whether they want to read it or not rather than it coming up due to an algorithm on social media platforms.' – Eden*

A few people felt the poster format should be more interactive. Those who did not like a poster as an educational resource voiced the importance of location as a factor for how interactive an audience would be with the resource, recognising in a health care setting such as a GP surgery, the poster would have better interaction. Many participants suggested QR codes to make the poster more interactive and readable.

> *'Print posters do have their place still.' – Eden*

> *'I think it will probably draw more attention if you only had like 9 bullet points and then had a QR code. I think that would draw my attention more than if something had loads of text. Because if it's too much text you tend to sort of skip past it.' – Chloe*

The majority of people agreed that tailoring the poster's content to cater specifically for young adults would enhance its clarity, given that readers of varying ages process and comprehend content differently. They emphasised the necessity of utilizing various media types to educate diverse demographic groups about family building. Some people thought the poster format would not be engaging for the desired audience concerning the topic of family building as there is no proactive discussion. The responses from participants suggested, if the poster was shared in schools proactively such as alongside a discussion, there would be greater transfer of information.

> *'I think the only real way for people to engage with it is going to be actively talking about the poster.' – Barnaby*

> *'Posters need formatting differently for social media, which is a lot of effort. But it would work better than trying to use the same thing in each different type of media.' – Freya*

Reliable resources on social media

The majority of people said for young adults, social media would be a better platform. Some felt concerned about using social media due to the potential lack of reliability of the source of information. Ensuring the influencer is reliable is key.

> *'So I think maybe on social media using Instagram or TikTok, or whatever social media is around, I think that would be a better way of reaching younger individuals than the poster.' – Davina*

> *'Likewise on social media as well. I would have a look if it came up on social media. But wouldn't look at it elsewhere.' – Amanda*

Since young adults might not be directly looking for fertility information, some people suggested using less direct methods on social media would reach a wider audience. For example, working with influencers who are talking about other topics, such as lifestyle, and adding in fertility education. Influencers such as Vicky Pattinson, The Body Coach, Dr Alex & Dr Khan were suggested which would reach a wider audience.

> *'Yeah I would agree with the influencer aspect of it. I think it's something that a lot more people would want to kind of look into. And a lot of them will also have Instagram and Facebook as a social media platform which it can be more widely spread more widely.' – Bonnie*

> *'People who go on to their pages. They're not looking for fertility information. People who are looking for fertility information probably needed this about 5 years ago, whereas people who we like you want to be reading this are people who need to stumble upon it because they're not thinking about it at the moment.' – Frankie*

The participants suggested splitting up the facts into separate posts to make the information easier to be retained. This fits into the format on different social media platforms with these functions allowing for it to be transferable between platforms.

> *'I would agree with that because for aiming at younger people, probably social media is like a better way to go, maybe even like Instagram. Like when you can, or like an Instagram advertisement, even so that kind of thing rather than like a video. Because like you said it's a lot of information for a video that maybe it would attract people who were scrolling, maybe they might stop and see it.' – Courtney*

> *'Formatting it differently for social media, which is a lot of effort. But it would work better than trying to use the same thing on everything else because even if I saw this*

online they even have the swiping format on tiktok now. So like one by one, I would probably read it if the first thing grabbed my attention, I would continue reading it wheras if it was presented like this I probably wouldn't.' – Freya

Question 5 – reading through each of the 9 points on the poster are there any changes to be made? Is there anything that stands out?

Many participants suggested using bold fonts for the key statistics and facts to make them stand out more. The participants suggested consistent labelling of men and women to male and female throughout the poster. This was to prevent conflating gender with sex. To improve signposting QR codes could be added to each fact on the poster once the information fact sheets have been created. These adaptations were used in the discussions to redesign the poster (Figure 2).

The title, text, and graphics

The majority of participants liked the title as having a question grabbed their attention. Some participants felt it was generic when the contents of the poster is about fertility and suggested including this in the title. Many of the participants felt this may not draw in a wide audience due to the more serious connotations of the word fertility or the assumption fertility is a female issue.

'I quite like posters. I will look at them if I'm out and about, and especially when they have catchy titles like this one does.' – Amelia

'I think this is a good title which everyone would understand, and everyone would want to read more than including like fertility, which might, people might see it like big words or you know, a bit scary compared to that.' – Caroline

The graphic at the top of the poster was liked by all participants as it shows a mixture of versions of families and is inclusive of different parenting examples.

'I'd say I really like the images used, it is very friendly with the big images. I think it's good to have many types of parents in the top graphic. That is something I went back to after reading the fact, I was thinking about women and then I realised there was a father figure in this too.' – Eden

For each fact on the poster – the participants saw the original poster and the text was updated from the focus group discussions. The updated text appears on the redesigned poster.

Fact 1

Original text – Women are born with all the eggs they are going to have. Female fertility declines markedly from age 35. By age 37, 90% of the eggs are gone. From puberty men produce sperm all their life but sperm quality declines with age.

Updated text – Both male and female fertility declines with age, especially after age 35 for females and age 40 for males. Females are born with all their eggs whereas males produce sperm from puberty for the rest of their lives.

The majority of the participants stated major edits were needed for fact 1. They did not like the use of the word 'markedly' as they felt the language added unnecessary pressure on women in comparison to the male decline of sperm quality.

A few people suggested changing the statistic for female fertility decline to a more relevant percentage for the target audience and adding in a statistic to represent male fertility decline to balance the discussion to represent how age affects both sexes.

'In the text it said, like fertility reduces by 35. But then you give us stats for age 37. So that didn't really make sense. To me it was like where's that 2 years gone? Is there a big difference between 35 and 37 or what is the stat for 35? That's something that I thought didn't really match up.' – Chloe

'I would just say, when it comes to the men, maybe there was a statistic that you could add there because there's one for the woman.' – Fiona

The participants disliked the graphic as they felt it was unclear in what it was trying to represent and suggested changing it to be more like a timeline representing the life span of fertility for both men and women.

'I just didn't really understand the graphic. But the other graphics are centred quite well with what the message was saying, I just didn't really understand that one.' – Amanda

Fact 2

Original text – In one ejaculate, men produce about 100 million sperm. Once a month, a woman produces one egg – only ovulating about 500 eggs in her whole lifetime.

Updated text – Males produce about 100 million sperm in one ejaculation. Females produce one egg, once a month, ovulating about 500 eggs in their lifetime.

The majority of the participants thought fact 2 was informative. Many did not like the use of the phrasing

Figure 2. The updated fertility education poster produced in 2024.

'only ovulating … her whole life' when describing ovulation as it added unnecessary pressure to women when they cannot control how many eggs they ovulate.

'The only problem I have is the word only ovulating 500 eggs. There's a sort of like blame culture around fertility. It's a female problem. And that obviously women can't help with their eggs.' – Bella

'I think the only thing that I would be a bit picky about is the only producing 500, like only still, the word only is like we only do this but men could produce this much in every single time.' – Daisy

A few people suggested changing the word ejaculate to ejaculation to make the phrasing more colloquial for the target audience.

'I think like maybe using words like ejaculation which is still scientifically accurate but doesn't sound so technical would work better.' – Freddie

The participants liked the graphic as it showed the contrast between the sexes and represented the information in the text. Some participants suggested removing the image of the uterus and leaving the egg as the same graphic is used throughout the poster so it is clear what it is representing.

'I feel like the image is pretty clear.' – Caroline

'I think that you can get rid of the uterus. Because since you used the same egg picture in the rest of the diagrams. To me it would be clear that that is what you're speaking about.' – Eden

Fact 3

Original text – Woman and men should aim to be as healthy as possible before they start trying for a baby. Being a healthy weight, not smoking, limiting alcohol and caffeine, and exercising regularly increases the chance of pregnancy and is important for the long-term health of children.

Updated text – Aim to be as healthy as possible before trying for a baby. Eat healthy food, exercise regularly and sleep well. You can increase the chance of pregnancy by stopping smoking and vaping and reducing alcohol intake.

Many of the participants thought this fact was too long and could be condensed down using more specific language to include BMI ranges, advice for how much exercise to partake in each week and include information about vaping as this is relevant for the target audience. Some participants were concerned about this comment being triggering and therefore suggested using QR codes to further signpost information about maintaining a healthy lifestyle.

'I think it can be quite triggering as well for some people. So I think that this one is just too subjective. It doesn't have any sort of indication of what. What does a healthy weight mean?' – Eden

'I know a lot of people my age and they vape rather than smoke, so that might be something to consider.' – Emily

The majority of the participants suggested editing the wording of this to include everyone to be more inclusive.

'It is 2023 men and women. I feel like everyone would be a good word to use. Everyone should aim to be healthy, instead of men and women.' – Daisy

'Maybe if that whole wording was different it would be more inclusive.' – Frankie

The majority of the participants liked the graphic. A few participants suggested including an image for exercising.

'I like the logo, I think it just shows healthy lifestyle.' – Bobby

'I was gonna say that I think you could put like a picture of exercise in there with the vegetables and things to show its healthy food and exercise.' – Bella

Fact 4

Original text – Pregnancy is only possible from about five days before ovulation through to the day of ovulation – the fertile window. Having plenty of sex during these days boosts the chance of pregnancy.

Updated text – The fertile window is the 5 days before the egg is released and the day of ovulation. Having sex during this time gives the best chance of getting pregnant. Do not rely on a period tracking app to know when you are ovulating as they are not always reliable

Many of the participants were positive about fact 4 describing it as very informative. Some suggested editing the sentence structure so the word pregnancy is not repeated multiple times. Many of the participants suggested including information about how to reliably track ovulation using ovulation sticks. Some suggest mentioning period tracking apps should not be used alone to know when a female is ovulating.

'I think we should add a comment about the period trackers that it's not a reliable source because I must admit that is something I wasn't aware of and you're encouraged to use these period trackers.' – Flora

'Instead of saying what you shouldn't use proactively saying this can be tested through ovulation strips that all that needs to be said I think to help people understand.' – Frankie

Generally, participants liked the graphic as it represents the information in the fact. A few people said the graphic was confusing but changing it to fact 5 would make it clearer with the number of days in the fertile window. This suggestion was not changed as

the researchers thought the flow of information was better suited in the original order.

'I didn't know that one but I thought it was interesting though it's kind of straight to the point. The graphic goes quite nicely alongside it.' – Amanda

'I didn't really understand why it started at 5 when you're telling me that it's a 6 day window. I thought that could have been made clearer.'-Chloe

Fact 5

Original Text – Fertility is ageist! It's best to start trying sooner than later. Women younger than 30 have about a 20% chance of getting pregnant each month but this drops to about 5% at age 40/When the male partner is over the age of 45 there is increased risk of miscarriage and certain conditions in the offspring, such as autism.

Updated Text – Fertility is ageist. Females younger than 30 have a 25% chance of getting pregnant each month. This drops to 5% at 40. When the male partner is over the age of 40, it takes longer to get pregnant, and the risk of miscarriage is higher.

The participants had split opinions on the phrasing of this fact. Many did not like the phrase 'Fertility is ageist!' as they found the tone was aggressive in comparison to the rest of the poster. But many participants said this fact was the most important on the poster and they wanted it to be kept as it had a lasting effect on them. A few suggested removing the exclamation mark to reduce the impact of the phrase and make it less aggressive.

'Yeah, I think the fertility is ageist bit I actually quite liked because it is the thing that I remembered the most.' – Courtney

'I don't know whether it needs taking out completely or whether it's the exclamation point that does throw me off the most. I think it's quite snappy.' – Emily

Many of the participants did not like the mention of autism alone as a condition affected by sperm from men over the age of 45, suggesting either changing the wording to not include an example or including more than one example to not offend. Many of the participants suggested including a QR code to signpost the audience to find further information about the different conditions associated with raised parental age.

'Highlighting autism … I think you can just say certain conditions and not have to name what they are, because you can't get every bit of information in the poster anyway.' – Barnaby

A few participants suggested removing the statistics referring to the fertility rate for women over 40 as this is outside of the ages for the poster's target audience. However, some felt this was relevant to include as the male statistics are significantly higher and it shows a clear comparison between male and female age affected fertility.

'I liked the fact that it was like age 30, that felt more relevant to me as that's only a few years away really so that feels much more relevant than putting stats in for like 37 and 40 as that feels like a long time away. But then I suppose you could go the reverse and question relevance of the men's one being age over 45. If you're targeting someone that's 18 years old. That's a really long time away.' – Chloe

A few participants suggested changing the word offspring to kids to remain consistent with the title.

'I'm not too sure about the word offspring. Maybe it would be better to be like children or kids.' – Flo

Some of the participants liked the graphic, stating it represents the information in the fact but they did not like that it was positioned right in the middle of the poster. Some participants did not like the numbers in the graphic as this was a repetition from what was in the text.

'So when I first saw the hour glass, I didn't really understand what it was and then when I read the text I didn't like it, it should be changed.' – Caryn

'I got the logo once I'd read the text so on first glance it doesn't really make sense.' – Chloe

Fact 6

Original text – Most people get pregnant within a year of trying. If you have been trying for 12 months or more (six months if you're a woman older than 35) without success, it's time to talk to your doctor about your options as you may have infertility.

Updated text – Most women with regular periods get pregnant within a year of trying. If you have been trying for 12 months or more without success, you may have a fertility problem and it might be time to talk to your doctor.

The majority of participants suggested removing the information inside the brackets as it is not relevant to the target audience. Many suggested rewording the last sentence as the tone is very direct and they did not like the idea of being diagnosed without accessing a doctor.

'I just feel like the 6 months and older than 35 kind of doesn't need to be there.' – Caroline

'I'm not sure that I like this straight to you may have infertility. Like some people actually just take over a year to get pregnant. Some people don't, I feel like it's quite a specific.' – Daisy

Some participants liked that it was actionable and encouraged the reader to get more information if they had not been able to conceive within the time frames.

'I think this is a really good one to include, and it's very actionable.' – Eden

'I thought it was a good point. I feel like a lot of people wouldn't know that necessarily. And obviously if you had been trying for like more than 12 months. It would kind of give you a boost to make you go to the doctor essentially. I do think that the logo sums up that pretty clearly.' – Caroline

The majority of the participants liked the graphic but wanted it to be more like a calendar to emphasize waiting a year whilst trying.

'I think I agree with the calendar actually putting it in context for it because also you most people that obviously do understand like and do track it and do know. A calendar is quite a good idea.' – Bella

Fact 7

Original text – Sexually transmitted infection (including HIV and genital tuberculosis), mumps after puberty, an undescended testicle, polycystic ovary syndrome, endometriosis, menstrual cycle problems, some environmental pollutants and workplace chemicals can affect fertility. If you have concerns, talk to your doctor.

Updated text – Your fertility can be affected by many factors including sexually transmitted infections, menstrual problems, PCOS and endometriosis. Anabolic steroids, some environmental pollutants and workplace chemicals can also affect fertility. Talk to your doctor if you have concerns.

The majority of the participants were confused by the sentence structure and felt too many topics were covered within this fact. Many participants suggested focusing on the more common disorders such as STIs, PCOS, and endometriosis as people with the more rare disorders such as an undescended testicle will probably already have contact with a health care professional.

'I think if you just say like certain things could affect your fertility. Then include STIs, pre-existing reproductive disorders and symptoms of the conditions. Because if you say stuff like workplace chemicals and people are going to be like oh my god!' – Bella

'I don't think you have to list all of them. I think it's just key to include STIs and disorders maybe the environment, can reduce your fertility and then they can go and look it up.' – Bobby

Some people recommended listing symptoms to be aware of, to know when to access support. Others suggested having a QR code for this so the audience can access this information if they think it might apply to them.

'I thought the logo matches the point quite nicely and you understand what that was for. But I don't think it's necessary to list all the conditions, doing that you're going to scare yourself or convince yourself you've got all of them.' – Chloe

The participants liked the graphic and suggested adding in someone speaking to their doctor.

'I think it would be better to just add a face to show speaking to your doctor.' – Caroline

Fact 8

Original text – IVF cannot work miracles. The chance of having a baby after one IVF attempt is around 30% for women aged under 35, but only about 10% for women aged between 40 and 44 and over 45 it's almost zero.

Updated text – Fertility treatment such as IVF is not guaranteed to work. The chance of having a baby after one attempt is around 30% for females under age 35, but less than 10% for females aged between 40 and 44 and over 45, it's almost zero.

The majority of participants liked the reality of this fact. They recalled it as one that stuck out to them. Some participants did not like the phrasing 'IVF cannot work miracles.' and suggested it was offensive to people who are currently going through IVF treatment. A few participants said this phrase should be removed as the fact has as much impact without it.

'I think it encapsulates it quite nicely, it doesn't seem too sciencey when IVF is talked about it can seem that way when, it is just another method to conception.' – Dan

'I think maybe saying something more like it's just not guaranteed to work is like better.' – Courtney

Many participants asked for the statistics for people above the age of 35 to be removed as they are not relevant to the target audience and suggested including the average number of IVF cycles people undergo to achieve a pregnancy.

'I think maybe highlighting that it's normal to have more than one IVF cycle.' – Bobby

'I think information about multiple IVF attempts is a good idea because it can be an expensive process and the people shouldn't rely on it in the way they do.' – Bella

Many of the participants found this graphic offensive due to connotations with test tube babies and suggested changing the graphic to a petri dish. Some of the participants liked the graphic as was a simple explanation of the information within the text.

'I don't know, it's like you know the whole test tube baby thing. It seems to be a little bit insensitive.' – Freya

Fact 9

Original text – Fertility treatment can help infertile heterosexual couples, same-sex couples and single people have children. Talk to a fertility expert about the available options.

Updated text – Fertility treatment can help many different people achieve their goal of having a family: heterosexual couples, same-sex couples, gender diverse and single people. A fertility expert can discuss your options with you.

The majority of participants liked the inclusivity of the text within this fact and felt it was one of the key pieces of information for the target audience. Similar to previous facts the participants were unsure who a fertility expert was and therefore asked for clearer signposting to whom they could get fertility advice from.

'I don't know if other people would know where to find a fertility expert. It's specific and you haven't said GP. Just makes it easier to know where they can access one.' – Davina

The majority of participants did not like this graphic and suggested changing it to a graphic that promotes inclusivity such as the LGBTQ+ flag. Some participants suggested changing the graphic to an image of people holding hands around the world to represent fertility for all who wish to achieve a family.

A few participants suggested changing the graphic to a shadow of a family to be consistent with the graphic at the top of the poster.

'It's ending it on a really like hopeful end note. Maybe the image could reflect that obviously. Such as a silhouette of a family it's not something that is uniform, but something that kind of reflects that hope at the end.' – Frankie

'It's very clear, I'd say it's perfect, it just sums up the whole conversation all of discussion of what the poster is saying. The logo can be improved to connect and relate to what the message is trying to say.' – Caryn

Redesigning the poster

The responses from the participants, along with discussions with the Swedish and Danish teams (Larsen et al., 2023), the IRHEC working group on poster design, the IRHEC steering committee and the ESHRE executive, led to a re-design of the poster (Figure 2). It was also decided to rearrange the order of the first 5 facts to be in a more logical order. The poster is currently being produced by ESHRE and translations are being undertaken for all EU languages and beyond.

Discussion

Educational resources, regardless of the format, should ideally be co-created with the target audience (Martins et al., 2024; Mertes et al., 2023). Since this was not done with the IRHEC fertility education poster, studies are being undertaken with young adults for them to critically review the poster so that it can be re-designed. This study involved young adults from the UK to ask their views regarding the poster.

Many reported learning new information about fertility, IVF and lifestyle factors affecting fertility. They were surprised to learn how much age impacted the chance of conception: naturally or through ART. The participants made suggestions to focus the information for younger people by updating the language and making it more interactive.

In the study in Denmark with young men, the participants appreciated the visual aspects of the poster and thought the information was appropriate for a wide target group (Larsen et al., 2023). They also reported learning new knowledge and were motivated to complete more research on certain topics. They felt the authoritative narrative could have negative connotations when encouraging parenthood from a perceived young age. A consensus was the poster had too much information and they wanted more emotive, experience-based information toward decision-making. The results from the Denmark study, although focused on men, showed different types of media should be used to inform individuals about fertility and family intentions.

What are your thoughts, feelings, and reactions to the poster?

The participants said the poster made them feel anxious due to the vast amount of new information. They also described anxiety around not knowing how or who to access for support for fertility issues. This is consistent with previous research such as a Danish-

Swedish study using focus groups involving childless women between the ages of 25–35. They looked at their reactions to fertility education posters and found they caused pressure to start a family. The Danish paper also reported the poster caused pressure due to the tone of the language it uses surrounding age (Larsen et al., 2023). This underlines how important the format and communication of information are when acknowledging how it will be received (Mertes et al., 2023).

An RCT evaluating the psychological changes in people exposed to fertility information leaflets found it increased fertility awareness however high levels of anxiety were induced in women of reproductive age (Poland, 2002). They suggested low-cost methods, such as leaflets, should be targeted to younger demographics as providing information earlier may help individuals better manage anxiety. This links to our research theme of targeting the information for young adults**.** Our study found that people want fertility information earlier in their adult life which further aligns with the Danish study where they described men only searching for fertility information when they had fertility issues. This suggests the poster should be considered as a starting point for future conversations or as a link to more information.

Did you learn anything from the poster? If so, what?

Sex education in the UK is taught in schools with a focus on the physiology of menstruation, contraception, and the prevention of STIs (Maslowski et al., 2022, 2023). Students state the current curriculum does not educate them on the topics they wish to learn about (Maslowski et al., 2024).

The responses from the participants showed the poster provided new information about natural conception and the success of IVF and much of this was new to them as they had not been taught it before. This is in line with the findings of the Danish study reporting the male participants thought it was informative and led them to do further research. Our results support the depth of research into the lack of public knowledge about fertility. One UK study found young women lacked knowledge about fertility but were open to the opportunity to learn (Boivin et al., 2019). The participants requested information tailored to their age group in various formats. This correlates with previous research showing men prefer multiple channels of resources to learn about fertility (Larsen et al., 2023).

The participants had little understanding of the age affecting natural conception which supports an Australian study on university student's knowledge about fertility (Prior et al., 2019) and our study with UK teenagers (Maslowski et al., 2024). These studies showed how a lack of understanding can impact family planning decisions (Biswakarma et al., 2024). Social media could be an extenuating factor of this as the perceptions of older mothers in the media rarely highlight the difficulties older women may face when receiving IVF (Maheshwari et al., 2008). This raises the question of how can we produce realistic information for the public before they are actively trying to conceive. Education in schools is essential (Maslowski et al., 2024).

How has reading the poster impacted your opinions or thoughts about having children?

Generally, people wish to become parents by the age of 30 and desire to have at least one child (Harper & Botero-Meneses, 2022; Harper, Hammarberg, et al., 2021). This is the same for 16–18 year olds (Biswakarma et al., 2024). Those who decide they do not want to have children often have to justify their decision (Grace et al., 2022). A UK survey on women's attitudes to having children reported that women who want to have children specifically asked for more fertility education (Harper & Botero-Meneses, 2022).

In our study many of the participants reported feeling empowered by the information in the poster. The information allowed them to feel supported in their current lifestyle choices. This contributes to the understanding that younger people want to be educated about their reproductive choices even if they do not want to have children (Grace et al., 2022). A mixed methods study in the UK found there are 5 distinct groups of people related to family planning (Grace et al., 2023). This highlights the need for targeting fertility education to meet the needs of each group. For example, some may need guidance on the effects of delaying parenthood, optimizing fertility, or managing secondary infertility.

Conversely, the poster made some participants feel pressure to conceive and more aware of lifestyle factors affecting fertility. Many were willing to give up habits to increase the chances of conception. Our participants requested more direct advice about smoking, vaping, and alcohol use when discussing lifestyle and diet changes which could positively impact fertility before trying to conceive (Sansone et al., 2018). A literature review found men knew how to improve

fertility but only a few had the intention to quit (Bodin & Käll, 2020). Plan-based counselling techniques have been shown to improve fertility awareness prior to conception. An RCT found that women who had received preconception consultations had a significant increase in awareness of health factors such as abstaining from tobacco and alcohol (Skogsdal et al., 2019). This shows how effective educational interventions can be when they are assessed to ensure long-lasting impact on awareness.

What are your opinions about using a poster format to inform and start reflections regarding family building? What about other media/social media?

The participants appreciated the information on the poster and recognized it as a helpful educational tool but felt it would be overlooked if it was not more interactive. The participants suggested a need for more accessible education interventions to reach a wider audience. A survey found that posters may not be the most effective method for health education as they result in lower changes in knowledge and attitudes (Hasanica et al., 2020). A systematic review suggested digital platforms and blended learning showed greater effectiveness in delivering sex and reproductive health education to adolescents but that further evaluation is needed into new technology (Lameiras-Fernández et al., 2021).

Frequently, social media was suggested to be a better platform for this information. A review of online social media platforms has shown Instagram and Facebook are powerful tools for quickly disseminating health information and therefore should be used by health professionals and educators to share health education as a contribution to providing accurate and reliable sources (Bodin et al., 2018). A study of fertility education on Instagram has shown that the majority of posts were from people sharing their personal stories and physicians advertising oocyte freezing (Peyser et al., 2021). And now Chat GPT is being used by the public for fertility decision making (Beilby & Hammarberg, 2024).

Redesigning the poster

The redesign of this poster will hopefully be used by teachers, health professionals and the public to improve fertility awareness of young adults. It is important to note that point 9 will be omitted in some countries as these treatments are illegal.

When comparing the data we obtained to the Danish study (Larsen et al., 2023) there are similarities. Both studies showed how important it is to understand how people want information to be communicated to them. This meant understanding how the language and tone of the resource would be perceived by the reader to prevent offence (Mertes et al., 2023). Our study found young adults wanted the information clearly presented in comparison to the Denmark study where they reported humour being the best way to convey health messaging. It is important to note the demographics of our study included a mixture of the sexes whereas only male participants were included in the Danish study. Both studies commented on the poster causing offence either by increasing the pressure to conceive or by questioning a sense of masculinity through the tone of the poster. This highlights the importance of this information being provided sensitively.

Commonly both studies concluded multiple resources were necessary for health communication as this poster alone would not fit the needs and goals of all individuals. By recognizing this it is important to provide this information at a time after mainstream education has finished but before an individual would experience fertility issues.

To better inform the audience of the poster, more in-depth information needs to be written for each of the facts on the poster so a QR code can be created. This will increase the interactivity of the poster. This work is currently underway by IRHEC who are working with the young adults to co-develop public information leaflets on the topics of the poster, which will be freely available on the IRHEC web site in 2024.

As a follow-up to this project further research is needed to determine the most effective method of intervention for increasing fertility awareness that impacts family planning. This will ensure the interventions have an impact on how much knowledge is retained after engaging with this media (Boivin et al., 2019; Harper, Hepburn, et al., 2021; Martins et al., 2024).

Another avenue for further research includes creating a poster on facts about how to conceive. This should include information about preconception care as well as how to access a fertility clinic and further information about assisted reproduction (Barker et al., 2018; Stephenson et al., 2018).

Limitations

Some of the respondents could not attend due to the time and date of the focus groups however the drop

out could be due to the nature of the research being conducted online via Zoom.

Within the methodology it was planned for each focus group to include 4–5 participants however due to late dropout or technical difficulties of the participants, this led to a variation of 2–7 participants in each focus group. Two is not an ideal number for a focus group but the authors felt the data from this group was key to include. This was out of the researcher's control but could have been prevented if more dates and times for focus groups were available.

Recruiting on social media always has a bias. It was decided to only advertise on the first author's social media as she is the demographic required for the study and this would be reflected in her followers.

Conclusion

The IRHEC want to provide a range of resources to promote reproductive health and fertility education. A poster is one way of doing this. It is important to note that resources need to be adapted to specific countries. This study aimed to give young adults the opportunity to critically discuss the IRHEC fertility education poster so it could be redesigned. Young adults are open and keen for this information to be made into resources to be shared with their peers so they can achieve their goals of parenthood feeling informed and empowered. Other methods of fertility education need to be explored.

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Disclosure statement

JH is paid to give corporate talks and collaborates with various companies which includes work on fertility and reproductive health education.

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Data availability statement

Approval needs to be sought from UCL ethics committee.

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