


An online survey of UK women's attitudes to having children, the age they want children and the effect of the COVID-19 pandemic

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STUDY QUESTION: What are women's views on having children, including the age they want to have them and other influences such as the coronavirus disease 2019 (COVID-19) pandemic?

SUMMARY ANSWER: Women's views on having children, at their preferred age of 30 years, included their maternal urge and concerns about their biological clock and stability, while 19% said COVID-19 had affected their views.

WHAT IS KNOWN ALREADY: Women globally are delaying the birth of their first child, with the average age of first birth approaching 32 years in some countries. The average age women have their first child in the UK is 30.7 years and over 50% of women aged 30 years are childless. The fertility rate stands at 1.3 in several European Union countries. Some people are not having their desired family size or are childless by circumstance. It is essential to understand people's attitudes to having children in different countries to identify trends so we can develop educational resources in an age-appropriate manner.

STUDY DESIGN, SIZE, DURATION: We conducted an anonymous, online survey of multiple choice and open-ended questions. The survey was live for 32 days from 15 May 2020 to 16 June 2020 and was promoted using social media.

PARTICIPANTS/MATERIALS, SETTING, METHODS: A total of 887 women from 44 countries participated in the survey. After filtering out women who did not consent, gave blank or incomplete responses, and those not in the UK, 411 responses remained. From the data, three areas of questioning were analysed: their views on having children, the ideal age they want to have children and the effects of the COVID-19 pandemic. Qualitative data were analysed by thematic analysis.

MAIN RESULTS AND THE ROLE OF CHANCE: The average age (\pm SD) of the women who completed the survey was 32.2 years (\pm 5.9), and they were mainly heterosexual (90.8%) and 84.8% had a university education. One-third of women were married/in a civil partnership (37.7%) and 36.0% were cohabitating. In relation to their views on having children, the main themes identified were: the maternal urge, the ticking of the biological clock, why did no one teach us this?, the need for stability and balance in their life, pressure to start a family and considering other ways to have a family. When asked 'In an ideal world, at what age approximately would you like to have had or have children?' a normal distribution was observed with a mean age of 29.9 (\pm 3.3) years. When asked 'What factors have led you to decide on that particular age?' the most frequent choice was 'I am developing my career'. Three themes emerged from the qualitative question on why they chose that age: the need for stability and balance in their life, the importance of finding the right time and life experiences. The majority of women felt that the COVID-19 pandemic had not affected their decision to have children (72.3%), but 19.1% said it had. The qualitative comments showed they had concerns about instability in their life, such as finances and careers, and delays in fertility treatment.

LIMITATIONS, REASONS FOR CAUTION: The survey was promoted on social media only and the women who answered the survey were highly educated.

WIDER IMPLICATIONS OF THE FINDINGS: The women surveyed ideally want children at age 30 years but there are obstacles in their way, such as the need to develop their career. Global tailored fertility education is essential to ensure people make informed

reproductive choices. In addition, it is essential for supportive working environments and affordable childcare to be in place in every country.

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Introduction

Through decades of research, it is well established that female fertility starts to decline in a woman's 30s and the majority of women will be infertile by their early to mid-40s because the quantity and quality of eggs decreases (American College of Obstetrics and Gynecology (ACOG), 2014; Practice Committee of the American Society for Reproductive Medicine in collaboration with the Society for Reproductive Endocrinology and Infertility, 2017). Women younger than 30 years old have a 20% chance of getting pregnant every month (Broekmans *et al.*, 2006, 2007; Cooke and Nelson, 2011). By age 35 years, there is a significant decrease in the chances of getting pregnant, as well as a lower chance of carrying a pregnancy to term (Stoop *et al.*, 2014; Crawford and Steiner, 2015; Harper *et al.*, 2021).

Global data show that in almost all countries there has been an increase in the average age a woman has her first birth. In many countries, including Ireland, Italy, Japan, Luxembourg, Portugal, Singapore, South Korea, Spain and Switzerland, this is now over 30 years of age (Organization for Economic Co-operation and Development (OECD)) (OECD, 2019a,b).

The total fertility rate has decreased globally from 5.0 in 1960 to 2.4 in 2019 (Worldbank, 2022). In the European Union it is currently 1.5, with several countries having rates as low as 1.3 or below, including Italy, Cyprus, Greece and Spain (Statistical Office of the European Communities, 2020).

Taking into account these statistics, it is important that we provide accurate fertility education so that if people want children, they can make informed decisions about their reproductive options (Lampic *et al.*, 2006; Bunting and Boivin, 2010; Bunting *et al.*, 2013; Maeda *et al.*, 2015, 2016). In 2020, the International Fertility Education Initiative was established to improve fertility and reproductive health awareness through education so that people can make informed decisions and hopefully reduce infertility (Harper *et al.*, 2021) and improve pregnancy and child health outcomes through understanding preconception health (Barker *et al.*, 2018; Fleming *et al.*, 2018; Stephenson *et al.*, 2018). The Initiative aims to ensure that there are effective educational resources for different audiences.

To determine the most effective way to deliver fertility education, it is important to know current knowledge and attitudes, both of which will most likely differ between countries. Regarding knowledge, a recent systematic review of 71 studies has shown that people of reproductive age have low to moderate awareness (Pedro *et al.*, 2018). They found that highly educated people, those who had fertility issues and those who had planned their pregnancies had higher levels of fertility awareness.

Various studies have been conducted on attitudes to parenthood in people of various backgrounds such as academics (Lampic *et al.*, 2006)

and university students (Virtala *et al.*, 2011; Sørensen *et al.*, 2016). While some women choose to remain childfree, for those who want children, studies have shown that women are waiting until their late 20s or early 30s to start having children (Hammarberg *et al.*, 2017b; Delbaere *et al.*, 2021), which is in agreement with the OECD data. Vassard *et al.* (2016) conducted a survey on fertility intentions and awareness in Denmark and the UK and found that the majority of people wanted their first child at around age 30 years. The average age of mothers in the UK is 30.7 years (Office for National Statistics (ONS), 2020).

There are many social and economic factors that will influence the decision of when to have children, including education, career, finances, not having a partner or not having a willing partner, whether employers have family inclusive policies and affordable childcare. As women experience age-related fertility decline, leaving conception until later ages may cause some to not reach their desired family size or lead to childlessness by circumstance (Chauhan *et al.*, 2021). In the UK, 18% of women are childless at the end of their reproductive lives and 50% of 30-year-old women are childless (Office for National Statistics (ONS), 2020).

Several studies have examined how the coronavirus disease 2019 (COVID-19) pandemic has affected attitudes to having children. An Italian study reported that for those who were planning to have a child before the pandemic, over one-third abandoned the intention and, conversely, over 10% of those who did not want to have a child before the pandemic had changed their mind (Micelli *et al.*, 2020). A Polish study found that one-fifth of people had changed their reproductive intentions (Sienicka *et al.*, 2022) and a Shanghai study found one-third of people changed their intention (Zhu *et al.*, 2020). Owing to the COVID lockdown, some people found themselves in situations where their work or finances were negatively affected, which made them feel unable to start a family. However, others found they had more time at home, and this encouraged them to try for a family earlier. We have shown that since many fertility clinics closed during the pandemic, some patients faced delays in fertility treatment, which left patients feeling 'powerless/helpless', 'frustrated' and 'anxious' (Gürtin *et al.*, 2022).

The aim of this study was to evaluate women's views on having children, what would be their ideal age to have children and if the COVID-19 pandemic had affected their decision to have children. Similar surveys have been repeated in 2021/2022 for UK men, Greek men and women, and English, Greek and Belgium teenagers aged 16–18 years; data which are being written up separately. Preliminary data on the English curriculum and English teenagers have been published (Maslowski *et al.*, 2022). It is hoped that this information will help develop tailored and age-appropriate fertility education resources and interventions (Harper *et al.*, 2017, 2021).

Materials and methods

This research has been approved by the UCL Research Ethics Committee ID Number: 9831/001. All participants provided informed consent.

A 36-item survey addressed the respondent's demographics, obstetric history, fertility and attitudes to childbearing and was designed and hosted on Qualtrics XM[®] (Seattle, Washington and Provo, Utah). To develop the questions for the survey, the original plan was to hold focus groups with women who fitted the inclusion criteria but because of the COVID-19 pandemic, this was not possible. Therefore, questions were developed through the first author's experience of fertility education in discussions with key people in the field, including Dr Zeynep Gürtin (Social Scientist at University College London) and Professor Jacky Boivin (Health Psychologist at Cardiff University) and the data obtained from our childless survey (Chauhan *et al.*, 2021). The survey was tested using a series of pilot responses with women who fitted the inclusion criteria and it was validated using cognitive interviewing of eight women, which resulted in minor edits. The survey was live online for 32 days, from 15 May 2020 to 16 June 2020 (during which ART clinics and services were temporarily suspended in the UK).

The survey was in English and targeted at all childless women aged 25–45 years who wanted to have children and could understand written English. Exclusion criteria were those who already had children or were below or above the age range.

Owing to the quantity of the data obtained, in this article we have only analysed a subset of the 36 questions, which come under three headings: their views on having children; what would be their ideal age to have children; and if the COVID-19 pandemic had affected their decision to have children.

Their views on having children were asked with a qualitative question 'In your own words, is there anything you would like to tell us about your views on wanting to have children?'

Their ideal age to have children was asked in three questions; two quantitative questions 'In an ideal world, at what age approximately would you like to have had or have children? This may be an age in the past or future'. The women were able to choose an age from 20 to 45 years using a pull-down menu. And 'What factors have led you to decide on that particular age?' They could pick up to three responses and the data were analysed as a percentage of participants. There was also a free text question which was analysed qualitatively.

To determine if the COVID-19 pandemic had affected their decision to have children, women were asked a quantitative question 'Has the recent COVID-19 pandemic affected your present or future decision to have children?', with the options yes, no, not sure, and a qualitative question 'In your own words, would you like to say any more about how the COVID-19 pandemic may have affected your views on having children?'

Analysis of the demographics and quantitative questions was conducted using descriptive statistics, means, percentages and SDs.

The qualitative responses were analysed by inductive thematic analysis (Braun and Clarke, 2006) to determine themes. This was an iterative process of reading and re-reading the responses so they could be organized into codes and then themes. First, the responses were read to familiarize the authors with the data and to recognize similar words and patterns that were common throughout the responses. The responses were re-read to highlight repeated patterns to form the

initial codes. Next, the responses were re-read so they could be assigned to specific codes. Finally, the responses and codes were re-read to develop themes.

Results

A total of 887 women started the survey. After filtering out those not in the UK (314), those who did not consent (10), those who did not want to have children (75) and those who did not press submit (77), a total of 411 responses were analysed.

Demographics

The mean age of the respondents was 32.2 years. The majority identified as heterosexual (373/411, 90.8%) and female (410/411, 99.8%). The majority were married or in a civil partnership (155/411, 37.7%). A total of 333 (333/393, 84.7%) had a university education (Table I).

Women's views on having children

We asked the participants 'In your own words, is there anything you would like to tell us about your views on wanting to have children?' The following themes were identified: the maternal urge, the ticking of the biological clock, why did no one teach us this?, the need for stability and balance in their life, pressure to start a family and considering other ways to have a family.

The maternal urge

Many women said that they had an ache to be pregnant, having children was always on their mind and they had always wanted them. They felt that having a baby was a blessing, would bring them personal happiness, was their sole purpose in life, and they were always meant to be a mother.

'But for me it is a physical need. It feels like I've been unbearably hungry for 4.5 years and everyone around me is eating a delicious meal'.

'It's the deepest desire I have ever experienced'.

'It is a physical longing, my arms feel empty'.

The ticking of the biological clock

Women had many concerns about their fertility declining and their health. Even though most knew about female fertility decline, they had concerns about the timing of motherhood never being the right time. There were often other factors that made them delay becoming a mother, including not being emotionally and physically ready. They worried they would regret not trying earlier, they worried about their health, and they worried about their age and weight.

'Feeling that my biological clock is ticking'.

'I am desperate to have a child, however my age is now a factor and I fear this may never happen'.

Why did no one teach us this?

Some women said they did not know about female fertility decline until it was too late. Many felt that it needs to be taught at school, which should include education on infertility, what infertility treatment is, egg freezing, how traumatic infertility is, and to dispel the impression that they can 'just do IVF'.

Table 1 Socio-demographic characteristics of the 411 women who completed the survey.

Demographics	Mean
Age	32.2 (± 5.9)
Sexual orientation n = 411	
Heterosexual	373 (90.8%)
Homosexual	7 (1.7%)
Bisexual	23 (5.6%)
Pansexual	4 (1.0%)
Asexual	2 (0.5%)
Prefer not to say	2 (0.5%)
Gender identity n = 411	
Female	410 (99.8%)
Non-binary	0
Prefer not to say	1 (0.2%)
Relationship status n = 411	
Married/civil partnership	155 (37.7%)
In a relationship cohabiting	148 (36.0%)
Single never married	73 (17.8%)
In a relationship not cohabiting	32 (7.8%)
Separated/divorced	2 (5.0%)
Prefer not to say	1 (0.2%)
Educational level—n = 393	
Secondary school	12 (3.1%)
A-Level/college Level	35 (8.9%)
University undergraduate	128 (32.6%)
University postgraduate	205 (52.2%)
Other	11 (2.8%)
Prefer not to say	2 (0.5%)
Ethnicity n = 398	
(they could pick more than one option)	
White-English/Welsh/Scottish/Northern Irish/British	297 (74.6%)
White—Irish	8 (2.0%)
Any other White background	34 (8.5%)
Black/Black-British—African	9 (2.3%)
Mixed ethnic background	8 (2.0%)
Black/Black-British—Caribbean	3 (0.8%)
Any other Black/African/Caribbean	2 (0.5%)
Asian/Asian-British—Indian	12 (3.0%)
Any other Asian background	9 (2.3%)
Latino	5 (1.3%)
Arab	4 (1.1%)
Mixed ethnic background	8 (2.0%)
Prefer not to say	4 (0.1%)

'I wished I was taught at school not to leave it so late to try for a family. We're always told how NOT to get pregnant when we're young but we're not told the detriments of waiting till our late 30s and 40s to try. This guilt will stay with me forever'.

'I think there should be more fertility-based education in schools you are only ever told how not to get pregnant'.

The need for stability and balance in their life

This theme had also been identified for the question about why women chose a particular age to have a family. The need for stability included education and career, financial and their partner/relationship.

Women were concerned about their education and career, wanting to be established in their career. They felt that it took a long time to reach the right point in their career, which they sometimes felt was not compatible with being a mother. Some had childcare issues.

'I want to balance both myself and my husband being at a good point in our careers, with the steep fertility decline I anticipate around my mid 30s'.

'Prioritizing a successful career is delaying the decision of having children'.

The need to be financially stable was important to many. This included having the finances to get married, buy a house and pay for childcare. For some maternity cover was a problem or there was a lack of family support.

'Mostly driven by lack of financial security/not owning our own home'.

'Finance is the main issue stopping me from having children yet'.

Some women had partners but did not feel their partner was stable, or may not help with childcare, or their partner was not ready, or was unsupportive. And some women could not find a partner, with some making decisions around solo motherhood.

'It has taken a long time for my partner to feel ready- I am two years or so behind where I wanted to be by now. I feel worried about whether I will be able to have the children I want in the time I have without putting too much pressure on my career'.

'I have always wanted children. I have always known that I am good with children. It was a complete shock to the system when 4 years ago I met the man of my dreams and found out he didn't want kids. Arguments and miscommunication almost made us break up. After many painful years, he has now accepted that he does want children with me. It annoys me when people assume women are putting it off because of their careers/social life. . .for so many it is due to not finding the right man or waiting for the man to be ready'.

Pressure to start a family

Some women reported that they had pressure from society, from family and friends, from their partner and from themselves to have children.

'I think that there is still a lot of societal pressure on women to have children. I feel the pressure and it's incredibly difficult having fertility issues since no one teaches you as a young adult that not everyone can get pregnant. It's like a huge shock when you find out there's something wrong, leading to feelings of inadequacy'.

'I really resent other people bringing up the topic with me, and putting pressure on me - and never on my partner, who is the main reason we don't have children'.

Considering other ways to have a family

Several women said that they would consider adopting or fostering, especially if they could not conceive naturally.

'If we cannot do it naturally we will explore foster or adoption, or simply not have children. I feel IVF is too widely accessed'.

'Pregnancy and labour scared me. If I am unable to get pregnant me and my husband are willing to adopt. We are also willing to adopt if we have a child too and it's something we will definitely look in to'.

The ideal age to have children

When asked 'In an ideal world, at what age approximately would you like to have had or have children? This may be an age in the past or future.', a normal distribution was observed with a mean age of 29.9 (± 3.3) years (Fig. 1). For women ≤ 35 years old their mean ideal age to have children was 29.5 (± 2.9) (n = 303) and those ≥ 36 years old the mean age was 31.1 (± 3.8) years (n = 108). The majority of women chose age 30 (27%, 111/411), followed by age 28 (13.8%, 57/411), and age 32 years (10.7% 44/411). Outlier values for the youngest and oldest options were found with 21 years being the youngest and 45 years the oldest.

When asked 'What factors have led you to decide on that particular age?', the women were given 11 choices and were able to choose the three top answers that applied to them (Fig. 2). The most frequent choice was 'I am developing my career', followed by 'I am ready to have children'.

We asked women: 'What factors have led you to decide on that particular ideal age to have children?' and they could reply by free text. Thematic analysis of this data gave three themes: the need for stability and balance in their life, the importance of finding the right time and life experiences.

The need for stability and balance in their life

This was a theme we also found when we asked their views on having children. Many women said that they chose a particular age because they wanted to have their career, finances and emotions stable before they wanted to start a family.

'Solid enough in my career to be able to access maternity leave, will have bought a house and be in a stable relationship with someone I want to have kids with'.

The importance of finding the right time

This theme covered a range of responses including having time to experience life, not wanting to be too old to be an active mother and to avoid fertility issues. Some stated they wanted to be mentally and physically young. Some women were aware of their biological clock ticking. Several said that they wanted to have more than one child, so they did not want to leave it too late.

'Before I'm 30 - I want to be a young mother and able to conceive relatively easily. I don't want to leave it too late so that I am stressed about not having much time left to conceive'.

'In an ideal world I could birth 4 humans not that much apart by the time I'm 32 years old so they can grow up surrounded by siblings and young parents so we can take care of and enjoy our family for as much time as possible'.

A common response was that the women wanted to have enough energy to play with their children.

'Having a lot of energy to care for the baby'.

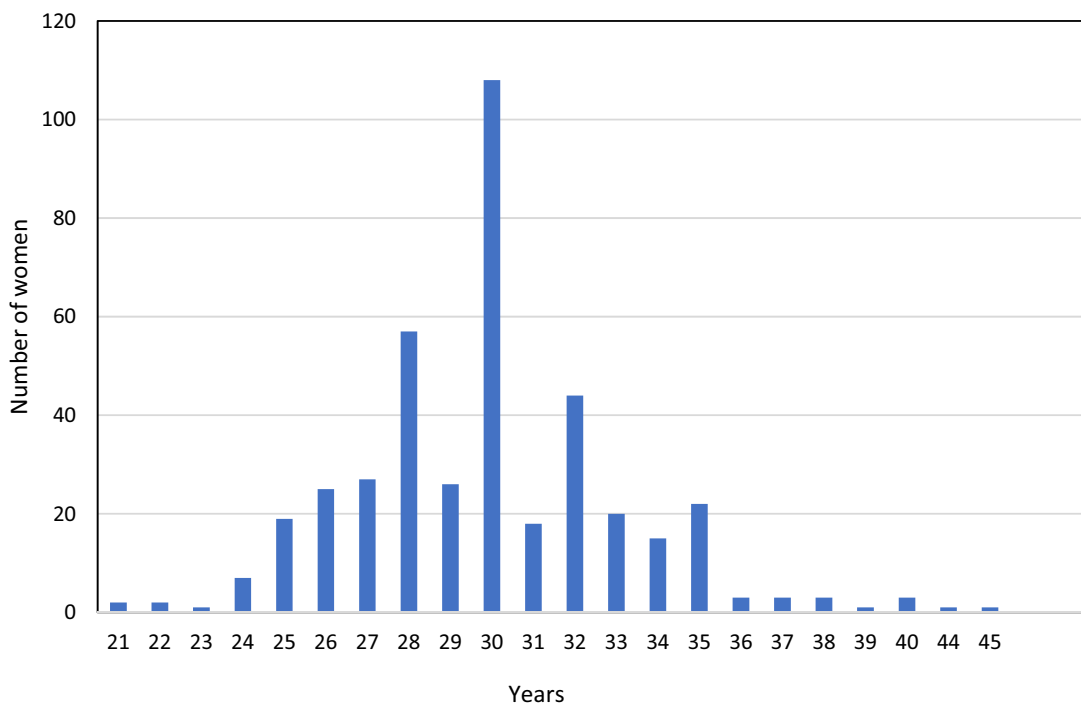
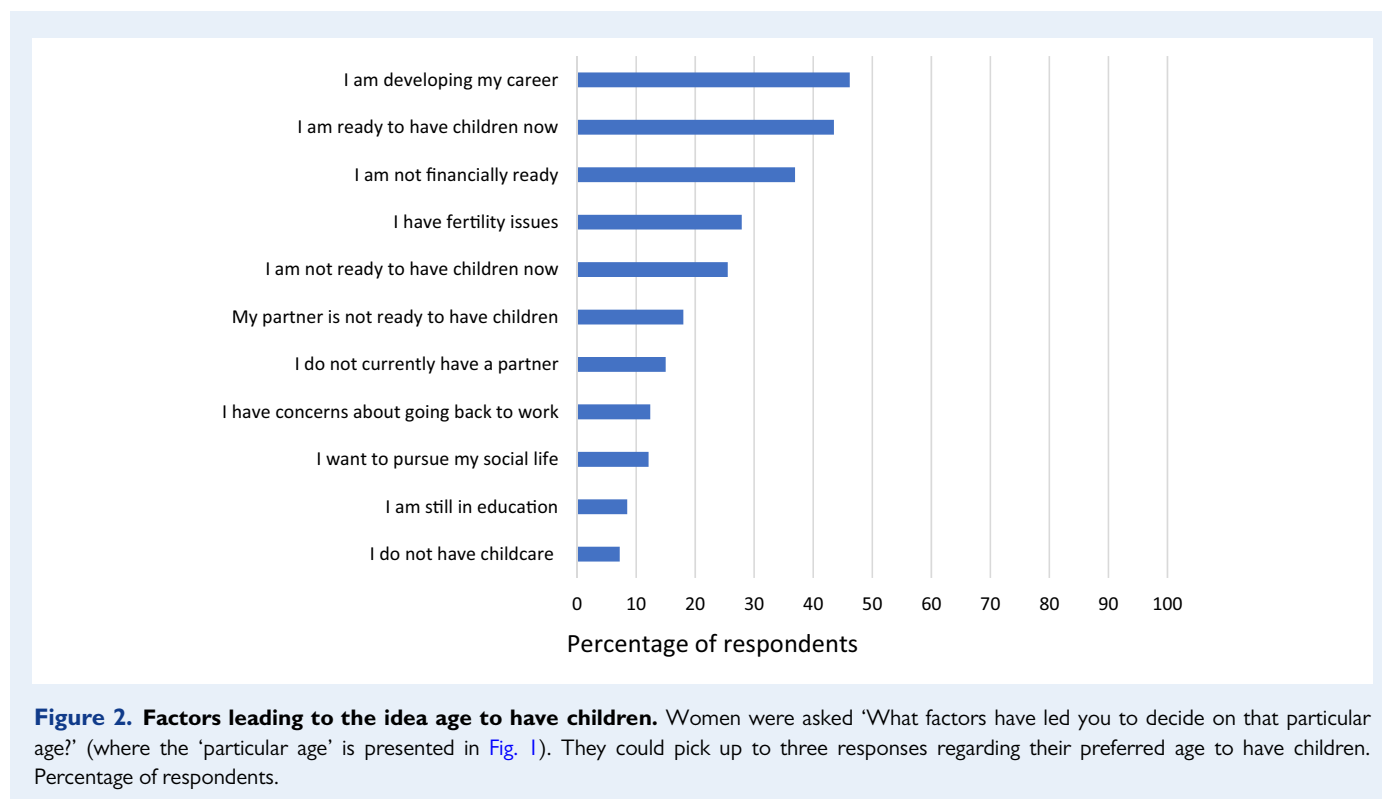


Figure 1. Ideal age to have children. Women were asked 'In an ideal world, at what age approximately would you like to have had or have children? This may be an age in the past or future'.



‘I’d like to be a young mum and keep up with my kids. I also feel like it’s a good age in terms of ageing fertility to have children’.

And some did not want to be too old because they were concerned about their body coping with pregnancy and delivery, and how their body would recover from being pregnant. They wanted to be physically ready and have children whilst they still felt young. They wanted to be in good health to reduce fertility and obstetrics risks.

‘Best age to recover my body’.

‘I’d rather have children at an age where there is less risk to me and the baby. And I feel as though I am who I want to be as a mother now’.

Some commented that they wanted to have children at an age that was the same as their parents had them, or earlier or later than their parents. And for some it was the age their friends were having children.

‘Parents had kids at around that age’.

‘I was ready at that age in regard to maturity, employment and so on. My mom was 21 when she had me, I loved having a young mom’.

Some women had planned out the timing of their lives very precisely.

‘At the age of 26 I expect myself to get engaged, then at the age of 27 I get married and conceive a baby, at the age of 28 I would be in my third year of graduate school (phd) which is suitable to have a baby’.

‘I wanted to be under 30. I have been with my husband since 17, but we wanted to be married, have a house and done some travelling. I assumed this would be achieved by our late 20s’.

For some, the age they chose as their ideal age to have children was an age in the past and they had regret that life had not happened as they had planned.

‘My dream has always been to have three children before I turn 35 as this is when most women’s egg quality falls off the cliff. Sadly, it didn’t happen’.

‘I thought I would have it together by then’.

‘20s are the best age to have children. I always wanted 3 - planned to have them when I was 23, 25, and 27 respectively, but life had other plans for me’.

Life experiences

Some women said they wanted to experience life before they settled down. Travel was commonly mentioned.

‘It’s 1.5 years after we got married, we have been on some amazing adventures since around the world and now want to start a family’.

‘Married in 2018, trying put on hold for a trip to Australia so trying now age 29’.

And many women had personal experiences that they wanted to do before they had children. Phrases such as ‘enjoy life’, ‘have a charmed life’, ‘life experiences’, ‘freedom’ and ‘carefree’ were commonly used.

‘I feel like I still have a lot to do with my life before I have children’.

‘I’d like to enjoy my thirties without that kind of responsibility first’.

Did the COVID-19 pandemic affect their views on having children?

Women were asked if the COVID-19 pandemic had affected their decision to have children. The majority said no (77.1%, 283/367), with 20.7% saying yes (76/367), and 10.4% were not sure (38/367).

The women were asked 'In your own words, would you like to say any more about how the COVID-19 pandemic may have affected your views on having children?' The following themes were identified: instability in their life, delays to fertility treatment, changes in timing (i.e. having children sooner or later) and worries about the future.

Instability in their life

For some people, COVID-19 had a profoundly negative effect causing instability in their life and future plans. This included upsets in finances, career worries, including those who lost their jobs, lack of promotion, etc. and their relationships. This instability made some women rethink starting a family.

'The COVID-19 pandemic has had a negative financial impact on us. My job is secure but my husband is furloughed and likely to lose his job in the summer. We still want children but the financial setback is likely to put these plans on hold for a while longer, until we feel more financially secure again.'

'It's made things harder for us financially. Now scared about both of losing our jobs and the security we've worked so hard to achieve.'

Instability also related to problems with their relationships, such as delaying marriage or difficulties finding a partner, under lockdown.

'Would like to be married first, this potentially may delay plans in future.'

'It hasn't affected my views on having children but being single it means that meeting new people will not be a possibility for the foreseeable future.'

Delays to fertility treatment

A large number of women said that they needed to access fertility tests or treatments, which had been delayed as the fertility clinics had been closed and included travel restrictions delaying treatment abroad.

'Fertility treatments were cancelled due to COVID-19 and our NHS clinic did not apply to reopen when able. We are now considering going to a private clinic.'

'Treatment that we were planning to start overseas is now delayed indefinitely due to travel restrictions.'

Changes in timing—having children sooner or later

Some women felt that COVID-19 had made them want to have children sooner, and that spending time at home had given them time to reflect on being a mother as they had more time on their hands.

'Has made me realise having children would make life more fun'

'It seems to have increased my desire to have children, I guess I have had more time to think about it.'

But for some women, reflection had made them decide they wanted to have children later.

'Was considering trying for a baby this year or next but due to the pandemic and economy we will probably put it off.'

'It has contributed to instability which means that my partner is feeling even less ready to have children so that is likely to push back the time when we can start trying.'

Worries about the future

The COVID-19 pandemic had led many women to worry about the future. Some women questioned the future health of the planet and what sort of world we would be living in, which included economic insecurity, uncertainty and they wanted to have a more certain future. Some worried how the health system would look after a pregnant woman.

'I worry a lot about the future of the planet, possible further pandemics and the climate crisis - is it moral to bring a child into a world like that?'

'Quite glad I haven't brought children into this apocalyptic nightmare!'

Some women were worried about getting ill with COVID-19 before getting pregnant, getting ill during a pregnancy, how this could affect her baby, and some were worried about burdening the National Health Service.

'I still want to have them but I have decided to stop trying for the next few months as there is still so much unknown about COVID-19- and I wouldn't want to put a baby at risk.'

'I wouldn't want to become pregnant now if I had been planning to get pregnant as I would worry about the effects of the virus on the developing foetus in the first and second trimester.'

Several women reported worries about being alone; through a pregnancy, fertility treatment, miscarriage, delivery or bring up a baby alone.

'Worried about suffering another miscarriage alone.'

'fear of giving birth alone.'

Discussion

This is the first mixed-methods study that has asked UK women who want to have children their views on having children, what age they want children and if the COVID-19 pandemic affected their views on motherhood. Using both quantitative and qualitative questions made it possible to determine the obstacles women are facing in today's society and how we can deliver fertility education.

Women's views on having children

From this qualitative question, the themes we found included the maternal urge, the ticking of the biological clock, why did no one teach us this?, the need for stability and balance in their life, pressure to start a family, and considering other ways to have a family. These themes agree with data from previous studies, which have shown women have concerns about their biological clock (Pedro *et al.*, 2018) and they want stability in their lives (Bongaarts *et al.*, 2017; Martin, 2017; Molina-García *et al.*, 2019; Bodin *et al.*, 2021a). It is not surprising that they called for fertility education (Harper *et al.*, 2021).

Studies have shown that it is common for women (Boivin *et al.*, 2018a) and men (Hammarberg *et al.*, 2017a; Bodin *et al.*, 2019) to want to be parents. People who do not have children are often required to justify themselves (Chauhan *et al.*, 2021). In the UK, 18% of women past childbearing age are childless (Office for National Statistics (ONS), 2020) and in the USA, it is one-fifth of women (Craig

et al., 2014). Some of these women will be childless by choice and some by circumstance but we are not sure how many fall into each category. *Grace et al.* (2022) explored UK men and women's intentions regarding family building. They identified six main categories: Avoiders (those who do not want to have children), Betweeners (those who already have children, want more children, but are not currently trying), Completers (those who have completed their family), Desirers (those actively trying to conceive or planning to), Expectants (currently pregnant) and Flexers (undecided). *Vassard et al.* (2016) studied men and women in Denmark and the UK and found that 6% of respondents said they did not want children and 9% said they were not sure.

A criterion for this survey was that women needed to want to have children in the future so it is not surprising that many women used very strong language around the maternal or biological urge to have children, such as it being a physical need and longing and a deep desire.

Many women were concerned about the ticking of their biological clock. As shown in several studies, most women, especially those who are highly educated or experiencing infertility, are aware that their biological clock is ticking but there are sometimes difficulties in deciding on the right time to get pregnant (*Pedro et al.*, 2018). In our survey, some women specifically asked for more fertility education as few had received any education at all; and those who had may still not be as aware about their own fertility as they think they are (*Hammarberg et al.*, 2017b).

We found that many women wanted stability in their lives before entering motherhood. Our data agrees with several studies that have reported that women want stability in their career, finances and relationships before trying to get pregnant (*Bongaarts et al.*, 2017; *Martin*, 2017; *Molina-García et al.*, 2019; *Bodin et al.*, 2021a).

When considering the financial costs of becoming a parent, any maternity and paternity pay and childcare costs have to be considered. In the UK, Statutory Maternity Pay is paid for up to 39 weeks but this includes only 6 weeks at 90% of the average weekly earnings and then 33 weeks at £156.66 or 90% of average weekly earnings (whichever is lower) (*UK Government*, 2022a). Paternity leave is only 1–2 weeks, which must be taken together and cannot start before the birth (*UK Government*, 2022b). It is also possible to have Shared Parental Leave and Statutory Shared Parental Pay where the couple share up to 50 weeks of leave and up to 37 weeks of pay between them (*UK Government*, 2022c). Sweden offers a better deal. Swedish parents are entitled to a combined total of 480 days of statutory parental leave per child, with the first 390 days paid at 80% of their salary (*European Commission*, 2022).

In the UK, childcare costs are one of the highest in the world. All 3- and 4-year-olds in England are eligible for 570 h of free early education/childcare a year (*UK Government*, 2022d). This usually equates to 15 h a week for 38 weeks. Some 2-year-olds are also eligible. In contrast, Sweden has the highest public spending on early childhood education and care, as a percentage of GDP (*OECD*, 2019a,b). But interestingly, the UK and Sweden have almost identical total fertility rates (1.7).

Employers also need to ensure they have flexible and parent friendly work environments (*Beck*, 2020). In the UK higher education institutions, the Athena Swan charter 'recognises and celebrates good practices in higher education and research institutions towards the advancement of gender equality: representation, progression and success' (*Advance-HE*, 2022). It is essential for employers to ensure that

they have a family friendly workplace and guarantee that they do not discriminate against employees who take parental leave (*Rimalt*, 2017).

Pay gaps are a frequent barrier for women, which limits their job opportunities and income (*Brescoll et al.*, 2010). Women's labour force participation and its link with delaying of motherhood has been studied and an inverse relationship between the ability to care for children and labour force participation for women was found (*Mills et al.*, 2011). According to United Nations Educational, Scientific and Cultural Organization (*UNESCO Institute for Statistics (UIS)*, 2022) data for 2016, 57.2% of people in the UK in tertiary education were women (*UNESCO Institute for Statistics (UIS)*, 2022), and still, women remain underrepresented in STEM (Science, technology, engineering and mathematics) fields (*Penner*, 2015), in spite of a rise in the number of women who attain graduate education.

In the survey, the women said that stability in their relationship was key. The influence that partners have on fertility awareness, perceptions, and education is relevant. For instance, in opposite-sex couples, men tend to have the notion that fertility and fertility information seeking are woman's domains and that they need not be concerned with it (*Pearson et al.*, 2021).

The age women want to have children

In this survey, the average age women wanted children was 30 years and this age was the same for women under 35 as it was for women over 35 years. This meant that the older women in the survey had recorded an ideal age that was in the past. Since prior studies have reported that women have increasingly postponed childbearing to their late 20s or early 30s in the past decades (*Mills et al.*, 2011; *Schmidt et al.*, 2012; *Vassard et al.*, 2016; *Hammarberg et al.*, 2017b; *Delbaere et al.*, 2021), and the age women are having their first child is increasing, we had predicted that women would ideally want children older than age 30 years.

The mean age of a mother in the UK has been increasing since the mid-1970s and has reached a record high of 30.7 years (*Office for National Statistics (ONS)*, 2020). While this data may indicate that women are mostly having children at the age they desire as reported in our survey, many may still be delaying motherhood either deliberately or owing to circumstance (*Chauhan et al.*, 2021; *Bodin et al.*, 2021b).

The shift to older motherhood has been linked to women's greater participation in higher education, careers, enjoying the social aspects of life, such as travelling and friendships that motherhood may hamper, and becoming financially stable, but some women are ready but unable to find a partner with whom to start a family (*Mills et al.*, 2011; *Daniluk and Koert*, 2017). There has been an increase in the number of women who have a family without a partner, either through adoption or sperm donation (*Mills et al.*, 2011). Some women choose to preserve their fertility through egg freezing and many of these are ready to start a family but do not have a willing partner (*Baldwin*, 2019). Also, some women will need to use medically assisted reproduction, mainly IVF. Globally the number of IVF cycles is increasing. In 2019, in the UK, 53 000 patients had close to 69 000 fresh or frozen IVF cycles and there has been an increase in the use of sperm donation, which has been attributed to an increase in single women and same-sex couples having treatment (*Human Fertilisation & Embryology Authority (HFEA)*, 2021).

According to the [Office for National Statistics \(ONS\) \(2020\)](#), there is a clear trend towards childlessness in younger generations of UK women. For the first time, over 50% of women born in 1990 have no children by the time they turned 30 years old. This trend has steadily risen since the 1940s and will most likely continue to do so. Women today have better, albeit not equal to men, chances to achieve higher education and develop successful careers. There is a clear relation between women choosing to develop their careers before considering motherhood as an option in their lives ([Mills et al., 2011](#); [Schmidt et al., 2012](#); [Office for National Statistics \(ONS\), 2020](#)).

In the qualitative data, we found three themes relating to why women chose a particular ideal age to have a child. Our results agree with previous studies that show women wanted stability and balance in their life, to find the right time and have life experiences ([Mills et al., 2011](#); [Waldenström, 2016](#)). We found that the main obstacles for a woman to have children were career development and finances. They wanted to develop their education and careers, have a job which would enable them to take maternity leave, have economic stability to meet their basic needs such as buying a house, and be in a stable relationship.

Women who have concerns about their fertility consider infertility as a strong barrier to the age they want to have children ([Pedro et al., 2021b](#)). Women will be most likely to take reproductive action early if they have knowledge about their own fertility and their reproductive choices, including fertility preservation through egg freezing ([Baldwin, 2019](#)) and IVF. Moreover, women who have planned pregnancies are more likely to have received fertility education and have higher fertility awareness ([Pedro et al., 2021a](#)). A lack of knowledge and awareness of the factors that influence fertility, including age, among people of reproductive age might contribute to later childbearing ([Hammarberg et al., 2013, 2017b](#); [Pedro et al., 2018](#)). [Hammarberg et al. \(2017b\)](#) reported on the scepticism about female fertility decline data as women see older female celebrities having children and there is a false idea that IVF may overcome female fertility decline.

In 2014, Denmark opened the world's first Fertility Assessment and Counselling Clinic to provide individual fertility assessment and guidance to women and men with no known reproductive problems ([Hvidman et al., 2015](#); [Birch Petersen et al., 2017](#)). This scheme has the advantage that it can identify issues with fertility as well as being an opportunity to deliver fertility education.

Time is also related to being young enough to be able to keep up with their children, see them learn how to walk, talk, go to school, and grow up to have families of their own. Studies have shown women often want two or more children and, thus, are starting to try to get pregnant at an earlier age ([Blyth 2013](#); [Blyth and Lee 2013](#)). This is, however, contradictory with evidence showing that women are delaying motherhood ([Mills et al., 2011](#); [Daniluk and Koert, 2017](#); [OECD, 2017](#)). Conversely, some women also feel they want to experience and enjoy their life before having the responsibility to care for children.

The ideal age to have a child was the question to which several women spoke specifically about wanting to have life experiences, such as travel and personal experiences. The sense of freedom that comes with not having to care for anyone other than oneself is something that many women wish to experience during their 20s or 30s ([Daniluk and Koert, 2017](#)), before thinking of having a family ([Mills et al., 2011](#)).

A study looking at parental attitudes among European medical students showed that they were, overall, exposed to quality fertility education ([Delbaere et al., 2021](#)). Interestingly, most of the students in the

study suggested women should complete their family by age 35 years. Their training has most likely made them aware of age-related fertility decline and genetic risk, which is why this is a reasonable answer from a medical standpoint.

The effects of the COVID pandemic

For the first time, women in the UK were asked whether the COVID pandemic had affected their views of having children. As was reported for other countries, about one-fifth of women reported that the pandemic had changed their views ([Micelli et al., 2020](#); [Zhu et al., 2020](#); [Sienicka et al., 2022](#)).

Many responses showed a deep feeling of uncertainty and even a sense of impending catastrophe and insecurity about the future. This could happen on a small and immediate scale, concerning financial crisis following the pandemic, or in a more global sense with some women talking about a new world order or an apocalyptic scenario following the pandemic.

Some women talked about themselves or their partner losing their job or being furloughed. The negative impact that the pandemic had on their stability and their ability to provide, changed their plans and made many of them want to wait before having children. Studies have shown that reproductive health plans may include specific variables, such as the number of children desired and age at first and last children ([Pedro et al., 2021a](#)). Others said they were concerned about feeling alone and isolated if they had to carry a pregnancy and raise a child in lockdown. The absence of family members, friends and support made women very anxious about having children. Some relationships ended during lockdown, while others were rekindled. Intention to conceive as well as frequency of encounters were variable, with some women having their expectations unmet.

Some of the women had reported their concerns about the delays in fertility treatment because of the IVF clinics closing. We examined how the pandemic affected those whose fertility treatment was impacted by the closure of fertility clinics in the UK ([Gürtin et al., 2022](#)). We showed that women had increased levels of baseline anxiety and depression owing to the indefinite disruption of their fertility treatments.

Fertility education

We need to ensure that fertility education is delivered to young people, adults, parents, teachers, health professionals and institutions, so that everyone can be empowered by knowledge of their own fertility and its impact on their reproductive decisions. Fertility education should also be available across all areas of health, and actively promoted in public health and policy strategies. Likewise, active primary prevention and identification of infertility or subfertility should be reinforced ([Harper et al., 2017](#); [Boivin et al., 2018b](#); [Astle et al., 2020](#)). However, education needs to be tailored to specific demographics. How we deliver fertility education to teenagers will probably not be the same as how we educate women in their 40s who have experienced infertility. This is why studies such as these need to be conducted across different demographics. We have to ensure that the language we use is appropriate and does not cause offense. Fertility education can lead to worry, self-blame and distress ([Bodin et al., 2021b](#)) and some campaigns have not been seen as positive ([Pedro et al., 2018](#)). [Bodin et al. \(2021b\)](#) found that fertility education was best received by high school students but for older generations one of

the main sources of information will be the internet (Hammarberg *et al.*, 2017b). We therefore need to develop a multi-pronged approach, such as the 'Your Fertility' campaign in Australia (www.yourfertility.org.au).

Since 2016, a team of experts and stakeholders formed the UK Fertility Education Initiative (FEI) (Harper *et al.*, 2017). After a consultation in 2018, for the first time the UK Department of Education included fertility education in the Relationships Education, Relationships and Sex Education (RSE) and Health Education curriculum 'the facts about reproductive health, including fertility and the potential impact of lifestyle on fertility for men and women and menopause'.

The International FEI's (IFEI) mission is 'to increase fertility awareness using the life course approach, in order to improve reproductive health and facilitate decision-making in family planning among adolescents, people of reproductive age, primary healthcare, education professionals and policymakers through development, evaluation and dissemination of inclusive educational resources.' (www.eshre.eu/IFEI). It is key that we use the data from surveys, such as reported in this article, to develop inclusive and effective educational resources for different populations and health professionals (Hammarberg *et al.*, 2020; Grace *et al.*, 2022).

Limitations

All surveys have a selection bias. The survey presented here was only promoted on social media. The women who answered the survey were highly educated, which may have been due to the demographics of people who follow the work of the first author.

Conclusion

If people want to make informed decisions about their reproductive health, we need to provide tailored and effective fertility education. Through analysis of our surveys from English teenagers (Maslowski *et al.*, 2022) and adults, we can develop appropriate resources. Evaluation of these education methods is essential to confirm that they fulfil their role in delivering key messages. However, to complement this, it is essential that we have the society infrastructure to support working parents, including affordable childcare and supportive working environments.

Data availability

The data underlying this article cannot be shared publicly due to the privacy of individuals that participated in the study. The data will be shared on reasonable request to the corresponding author.

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Authors' roles

J.C.H and J.S.B.M. conceived the idea, both authors designed the survey, validated the survey, promoted the survey, analysed the data and wrote the paper.

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Conflict of interest

J.C.H. is founder of www.globalwomenconnected.com and Reproductive Health at Work and author of a book *Your Fertile Years*.

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