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## ARTICLE

# Increasing fertility knowledge and awareness by tailored education: a randomized controlled trial




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**Abstract** Women of reproductive age have insufficient fertility knowledge and awareness. Reproductive lifespan and assisted reproduction are the primary areas in which awareness is lacking. Relatively simple interventions can be used to increase knowledge among university students; however, no intervention has been tested to date in a population with more varied education levels. The aim of this study was to evaluate which intervention most improved fertility knowledge in women attending a fertility centre for oocyte donation. A randomized controlled trial was conducted with three intervention groups: tailored, untailored and control. A questionnaire was administered on the day of the first consultation, and again at the oocyte retrieval. Two hundred and one women were enrolled and completed the pre-test, 109 started the cycle and 90 completed the post-test. The effect of the intervention was measured as the difference between the groups in their score from the pre-test to the post test. Only the tailored group showed a significant increase (+2.5; 95% CI [1.8, 3.3];  $P = 0.001$ ). Information relating to a woman's most fertile age and limits for childbearing were the most useful. Tailored oral education, therefore, increases fertility knowledge in young women, particularly in relation to their fertility lifespan. 

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**KEYWORDS:** age-related infertility, counselling, fertility awareness, fertility knowledge, reproductive life planning

## Introduction

Fertility knowledge and awareness of infertility risk factors are modest to low in people of reproductive age in countries with different scores on the Human Development Index (Bunting et al., 2013; Chan et al., 2015; Hammarberg et al., 2013; Maeda et al., 2015; Peterson et al., 2012). What information, however, do people of reproductive age receive about fertility? Sex education programmes in schools have been initiated at varied times in European countries; compulsory sex education classes were introduced into schools in Sweden, Germany and France in 1956, 1970 and 1973, respectively, whereas, in other countries, such as Italy, they are not obligatory. In Spain, a recently enacted law regulates the incorporation of this area of knowledge into the curriculum of high school and medical science students (Law 2/2010), but it is not widely applied. Sex education has traditionally focused on the prevention of unintended pregnancies and sexually transmitted diseases, and it is neither optimal nor systematic. Hence, multiple calls to action can be found have been published (Chapman et al., 2006; Everywoman, 2013; Mazza et al., 2012; Moos et al., 2008), and further recommendations aimed at improving reproductive health are being introduced in clinical settings (Dunlop et al., 2007; Johnson et al., 2006; Johnson et al., 2012; Stern et al., 2015). These actions, however, are far from universal or compulsory. To date, young men and women are not properly informed about either contraception or preconception (Liu et al., 2015; Moos, 2003). In particular, young people are seldom, if ever, told about the risk factors for future infertility, such as ageing (Dunson et al., 2004). Accurate information about age-related infertility and the limitations of assisted reproductive techniques would be particularly valuable (Dunson et al., 2004; Leridon, 2004; Liu and Case, 2011) because possibilities with assisted reproduction techniques are commonly thought to be considerable, if not unlimited (Daniluk et al., 2012; Maheshwari et al., 2008; Sabarre et al., 2013).

Three randomized controlled trials (RCT) were conducted to evaluate the efficacy of educational interventions aimed at increasing fertility knowledge in young people through different evaluation tests. The distribution of educational online brochures about fertility to a population of psychology students at a university in Australia resulted in a significant increase in knowledge about fertility and the effectiveness of assisted reproduction techniques, and a reported lower desired age for childbearing (Wojcieszek and Thompson, 2013). The authors, however, could not evaluate the long-term effects of the intervention, as the evaluation test and the intervention were conducted on the same day. In another study (Williamson et al., 2014), a presentation on fertility was given to a population of female university psychology students in Canada, resulting in a twofold increase in the number of correct answers to the test. Again, the intervention and the test were carried out on the same day (Williamson et al., 2014). Finally, Stern et al. (2013), in the context of a university health centre in Sweden, provided participants with tailored oral and written information about family planning based on their reproductive life plans, and administered the evaluation test two months after the intervention. The tailored oral and written information provided in this study was found to have a positive effect on participants' knowledge of reproduction, even two months

after the intervention. Overall, these studies showed the effectiveness of relatively simple interventions, which were also greatly appreciated by most participants. All three tests, however, were carried out among a population of university students, who might be more receptive to the intervention than less educated people.

Oocyte donors seem to be a suitable target population for fertility information and reproductive health advice. On the one hand, they are women in their twenties, on average, which is an optimal time to provide information about the risks and benefits of delaying childbearing, as perceived by the participants of previous research (Maheshwari et al., 2008). On the other hand, oocyte donors are usually childless but are expecting to have a family in the future (Garcia et al., 2014). Finally, different educational levels are represented in this population (primary school, high school and university), such that the effect of an intervention can be assessed without restricting the interpretation to the educated population, which has been the focus of most published research.

The primary objective of this study was to evaluate the benefit of two educational interventions (tailored and untailored) on fertility knowledge in oocyte donors. Furthermore, the aim was to assess whether these interventions have an effect on the reported ideal age for giving birth to the first and the last child.

## Materials and methods

### Study population

Inclusion criteria for participation in the study were as follows: women between 18 and 35 years of age, who were candidates for oocyte donation, and who had made their first visit to a large private fertility centre between April and November 2014. The CONSORT diagram, represented in Figure 1, shows the flow of participants from the 214 women selected for the study to the 90 women who finally completed the oocyte donation cycle, and the two questionnaires required to evaluate the effect of the educational interventions. The participation rate was 93.9%.

### Sample size

A sample size estimation was made (Faul et al., 2007) to detect an effect size  $f$  of 0.3 (moderate effect; critical  $F = 3.07$ ) between three groups and setting error I and II at 0.05 and 0.1, respectively, resulting in a total number of 126 individuals (at a 1:1:1 scheme resulting in 32 per group). To enable a 50% response (the proportion of candidate donors that are not accepted in the donation programme after the first consultation for reasons unrelated to the study), the intention was to include 67 women per group. The estimated power of the study for the actual group's size is 89.6% accepting an alpha risk of 0.05.

### Study setting and procedure

The study has a randomized controlled trial design with three groups, to which participants were randomly allocated on their

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