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Are gender attitudes and gender division of housework and childcare related to fertility intentions in Kazakhstan?

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Abstract

Previous research has found evidence of positive associations between gender-egalitarian attitudes or more equal division of housework/childcare and short-term fertility intentions in developed countries of Europe and East Asia. This study extends the literature to the context of a developing country in the post-communist region—Kazakhstan, which has progressed well in public gender equality but may not have developed private gender equality to the same extent as more developed countries. The study explores how (1) gender attitudes, (2) gender behaviour (housework and childcare division), and (3) consistency between gender attitudes and gender behaviour are associated with fertility intentions in this country. Kazakhstan's Generations and Gender Survey of 2020 was used for the analyses. The dependent variable was treated as an interval measure, where intentions move along a continuum of certainty. Linear regressions were employed to test the hypotheses. The results show that gender-egalitarian attitudes were negatively associated with short-term fertility intentions for women with two and more children. Likewise, a more equal division of housework was negatively associated with short-term fertility intentions for both women and men, whereas more equal sharing of childcare was negatively associated with men's fertility intentions. Also, in contrast to studies in more developed contexts, an egalitarian match of gender attitudes and behaviour (either housework or childcare) was negatively associated with short-term childbearing intentions for both women and men. Overall, greater gender equality in the family has a negative relationship with short-term fertility intentions in Kazakhstan. The study provides new and compelling evidence about the relationship between gender equality and fertility in a context that has not previously been studied.

Keywords: Gender equality, Gender attitudes, Housework, Childcare, Kazakhstan

Introduction

Existing theories suggest that there may be a positive effect on fertility rates in the developed world when increased gender equality in the public sphere is accompanied by greater gender equality in the private sphere (Esping-Andersen & Billari, 2015; Goldscheider et al., 2015; McDonald, 2000a, 2000b). Gender equality in the public sphere is characterized by higher levels of women's educational attainment and labour force

participation, while gender equality in the private sphere involves men's increased involvement in household tasks and childcare. However, current fertility rates do not consistently align with these expected outcomes. A systematic review of empirical evidence on the topic showed mixed results (Raybould & Sear, 2021). Furthermore, a more recent elaboration of the relationship points out how the specific gender context matters and that large disparities between public and private gender equality may lead to a negative relationship between gender egalitarianism and fertility intentions (Lappegård et al., 2021).

This article focuses on Kazakhstan—a developing post-communist country that presents a unique case study characterized by intriguing dynamics. On the one hand, it showcases a remarkable level of gender equality in the public sphere, akin to more egalitarian societies. On the other hand, when examining gender equality within private settings, a different picture is revealed, resembling the traditional norms commonly found in more conservative societies (Dugarova, 2019; Durrani et al., 2022; Kuzhabekova et al., 2018; Snajdr, 2005). What adds further complexity to the situation is the unexpectedly high aggregate fertility rates observed in the country. This contradicts prominent theories of gender equality, which typically suggest a decline in fertility when there is a lack of increased male involvement in household chores and childcare. Kazakhstan's distinct combination of factors challenges conventional assumptions and invites deeper exploration into the interplay between gender dynamics, societal norms, and fertility patterns.

Another contribution of the study is its expansion of the growing body of literature examining the effect of discrepancies between gender attitudes and gender behaviour on fertility (Aassve et al., 2015; Goldscheider et al., 2013). Gender attitudes and gender behaviour, specifically the division of housework and childcare, may have different effects on fertility intentions due to the complex interplay between societal norms, individual preferences, and practical constraints. While gender attitudes reflect individuals' values and beliefs about gender roles, gender behaviour represents the actual practices and behaviours exhibited in daily life. The misalignment between gender attitudes and behaviour can arise from various factors such as cultural expectations, economic constraints, or power dynamics within relationships. For example, individuals may hold egalitarian gender attitudes but still engage in traditional gender roles due to social pressures or limited resources.

The differences between gender attitudes and behaviour are crucial because they can shape individuals' fertility decision-making processes. When there is a discrepancy between egalitarian gender attitudes and traditional gender behaviour, it can create tension and conflict within relationships and households. This misalignment can influence family dynamics, the division of responsibilities, and the perceived fairness of the partnership. Such discordance can impact fertility intentions, as individuals may hesitate to have children if they perceive that their gender role expectations or the division of labour within the family might hinder their personal and professional aspirations.

The study uses Kazakhstan's Generations and Gender Survey of 2020, which has information on gender indicators at the time of the interview. Thus, it offers a snapshot of gender attitudes and gender behaviour (housework and childcare) and how these are related to fertility intentions. Fertility intentions are seen as a predictor of fertility behaviour and can be determined by normative beliefs such as gender values and attitudes

(Ajzen & Klobas, 2013). In comparison to lifetime fertility intentions, short-term fertility intentions (planning to have children in the next 2–3 years) are seen as more likely to be acted on (Philipov & Bernardi, 2012). Furthermore, it is an important alternative measure to actual childbearing because it is not biased by the effect of unplanned births (Morgan, 2003).

Thus, I specifically analyse whether (1) gender attitudes, (2) division of domestic work (housework and childcare), and (3) the match between gender attitudes and division of domestic work and childcare are associated with women's and men's parity-specific fertility intentions in Kazakhstan.

Theoretical background

Gender equality and fertility

Gender equality and its relationship with fertility have been examined through various theoretical frameworks, one of which is the gender revolution framework (Goldscheider et al., 2015). According to this framework, the association between gender equality and fertility is contingent upon the stages of the gender revolution, and findings in this regard are often conflicting. The link between gender equality and fertility varies not only across countries at different stages of the gender revolution, but also within countries presumed to be more egalitarian.

In the initial stages of the gender revolution, when gender equality is low and fertility rates are high, an increase in gender equality in the public sphere, such as women's employment, is associated with a decline in fertility rates (Goldscheider et al., 2015). However, it is anticipated that fertility rates will rebound during the second half of the gender revolution, which pertains to gender equality in the private sphere, involving men's participation in household work and childcare. The gender revolution framework and other fertility reversal frameworks describe macro-level relationships and their evolution across societies over time (Esping-Andersen & Billari, 2015; McDonald, 2000a, 2000b). Therefore, when examining the macro-level relationship at a particular point in time, the nature of the relationship will depend on the stage of the gender revolution a country has reached in its progress towards gender egalitarianism. A country that is in the early stages of the gender revolution, or one that has not made significant progress towards the later stages, would not be expected to exhibit a positive relationship between gender egalitarianism and fertility.

Furthermore, Esping-Andersen and Billari (2015) highlight that societies in the process of transitioning towards becoming more egalitarian will exhibit a high variation of gender roles, with some individuals adhering to traditional gender roles while others adopt more egalitarian ones. This wide variation in gender roles during the transition is believed to contribute to a decline in fertility rates. Conversely, when a society reaches a stage with lower variation in gender roles and a higher societal consensus, be it around traditional or egalitarian values, it is likely to experience higher fertility rates. Empirical research across 38 countries on different continents supports this notion, revealing that individuals are more likely to remain childless in societies with greater diversity in gender role attitudes (Hudde, 2018); whereas Brini (2020) highlights that the probability of being childless is lower the higher the level of gender egalitarianism, as evidenced in the study of 20 European countries.

On the other hand, another study (Kolk, 2019) reveals that in developed countries with high gender equality, there is no straightforward correlation between fertility and gender equality, particularly when assessed through female political empowerment. The absence of a clear relationship at the aggregated level suggests that the population's heterogeneity based on relative gender equality may lead to various patterns. Despite witnessing increasing gender equality over the past few decades, these societies have not experienced a significant rise in fertility. The study proposes that future research should delve into whether these theories depend on specific threshold levels of total fertility rate.

The empirical evidence on the association between gender equality and fertility is mixed. Quantitative studies examining the relationship between private gender equality and fertility reveal that there is no universal association between greater egalitarianism and fertility rates, as countries are at different stages of the gender revolution and exhibit varying progress in different aspects of gender equality, such as men's involvement in household chores. For instance, Neyer and colleagues (2013) found no universal relationship between different types of gender equality and fertility intentions in 11 Eastern and Western European countries, emphasizing that the effects may vary depending on factors such as gender, parity, and the measurement of gender equality. Recent research by Lappegård and colleagues (2021) emphasizes the contextual nature of the relationship, indicating that even countries presumed to be more egalitarian and modernized may be at different stages of development, leading to variations in the relationship between gender equality and fertility intentions, particularly when there are disparities between public and private gender equality.

Notably, studies examining the association between gender equality and fertility outcomes yield conflicting findings depending on the measures used to assess gender equality, such as whether attitudes or actual behaviour are measured, and also considering different parities and genders. In European contexts, men's egalitarian attitudes (Puur et al., 2008) and a modernized division of household work (Riederer et al., 2019) have been positively associated with men's fertility intentions. Suero (2023) highlights that one-child mothers' in Spain are less likely to intend to have a second child when the distribution of housework is highly unbalanced between mothers and fathers within a couple. Similarly, in East Asian contexts, studies by Kan and Hertog (2017), Yoon (2017), and Kan and colleagues (2019) found a positive association between husbands' greater involvement in housework and both their own and their partners' fertility preferences and actual fertility behaviour. On the other hand, Mills and colleagues (2008) found that the negative impact of an unequal division of household work on women's fertility intentions in Italy and the Netherlands was conditional upon existing heavy workloads and the number of children. Cooke (2009) discovered that men's involvement in housework had a positive effect on second births in Italy but only up to a certain threshold (one-quarter to one-third of total housework), beyond which the probability of a second birth sharply declined.

Moreover, studies by Cooke (2004) on Germany, Cooke (2009) on Spain, Craig and Siminski (2011) on Australia, Miettinen and colleagues (2015) on Finland, and Yang (2017) on China did not find a significant influence of a more equal division of housework on fertility outcomes. However, both Torr and Short (2004) and Miettinen and

colleagues (2011) found that both egalitarian and traditional attitudes were associated with a higher progression to second births in the USA or men's fertility intentions in Finland.

The contextual dependence of the association between gender equality and fertility intentions is also evident in qualitative research. Contrary to the expectations of theoretical frameworks assuming a gender equality-related reversal of fertility, Brinton and colleagues (2018) found that references to existing or anticipated work–family conflict were not prominent in gender-unequal Japan. The authors argued that unequal division of household work is more commonly taken for granted in this context. Similarly, a study conducted in Turkey (Kavas, 2019), a country which shares cultural similarities with the context of interest in this article, examined the association between housework, childcare division, and fertility intentions. The study revealed significant variation in the associations within the country, highlighting the presence of different stages of the gender revolution within Turkish society (Kavas, 2019).

Consistency between gender attitudes and actual behaviour

Another angle on the relationship between gender equality and fertility is to look at the consistency between gender attitudes and the actual division of housework/childcare. This is an important question because attitudes may not lead to an actual gender-equal division of housework and childcare. In addition, the discrepancy between them may affect fertility. Empirically, very few studies have focused on the matching between gender attitudes and the division of labour at home in relation to fertility. Goldscheider and colleagues (2013) found that a mismatch between gender attitudes declared before parenthood and actual household behaviour afterwards was negatively associated with the transition to second births among women in Sweden, while no impact was found for first and later births.

Aassve and colleagues (2015) found that an inconsistency between gender attitudes and partners' actual gender division of household chores had a negative impact on progressions to a second birth among women in Bulgaria, the Czech Republic, France, Hungary, and Lithuania. The same negative impact was found for a match between gender-unequal attitudes and gender-unequal housework sharing. A positive effect was found only for the couples where both attitudes and behaviour were more egalitarian.

These findings show the importance of not looking only at either attitudes or the actual division of labour but rather looking at the combined effect. It can be especially relevant for countries with large discrepancies between public and private gender equality and which thus are at transitional stages of progression towards the gender revolution.

In sum, we can see that there is no universal relationship between gender equality and fertility intentions, and that mixed results can be driven by differentials by parity, gender, or measurements of gender equality. It can also be driven by the progress of different stages of the gender revolution in a particular country, and by combinations of public and private gender equality that might not have the same effect on fertility intentions as in more developed countries. Thus, a developing country context with long-lasting achievements in public gender equality, but with a more traditional family context may extend the existing literature on the association between gender equality and fertility

intentions. Next, the context of Kazakhstan will be presented further with a focus on the points described above.

The context of Kazakhstan

Public gender equality

The global gender indices rank Kazakhstan relatively high. According to the Gender Inequality Index (United Nations Development Programme, 2019), the country is ranked 44 out of 162 countries (the higher, the more gender-equal); it ranks above the Russian Federation and Ukraine, as well as the combined average for Europe and Central Asia. This is largely driven by high scores in women's education and participation in the labour market. For example, there is a very high proportion of women aged 25 and older who have at least some secondary education (99.3%), which is higher than in countries such as Turkey (50.2%), Spain (75.4%) or Italy (75.9%). Moreover, at the tertiary level, women outnumber men in Kazakhstan, and the female-to-male enrolment ratio has even increased in recent years (Khitarishvili, 2016).

Despite some policy initiatives directed at promoting women to leadership positions in civil service, women remain underrepresented in key decision-making posts, with female politicians often involved in social sectors and having less political experience than male politicians (Kuzhabekova et al., 2018). Additionally, women are still concentrated in less profitable sectors such as healthcare, education, and social services, while being underrepresented in investment-attractive areas such as infrastructure development (Buribayev & Khamzina, 2019). Gender stereotypes and occupational and sectoral segregation limit women's bargaining power in the labour market and within the family, leading to persistent wage inequality and reluctance from prospective employers to hire younger women due to their maternal roles (Dugarova, 2019). These labour market realities can lead to lower bargaining power of women within a family and an increase in unpaid work of women in a household. Despite the facts that the labour force participation rate among women is 62.7% (United Nations Development Programme, 2019) and the gender gap in employment is around 10 percentage points, the wage gap between women and men remains significant at 31.4% in 2016 (Dugarova, 2019) and is rooted in occupational and sectoral segregation (Buribayev & Khamzina, 2019; Dugarova, 2019; Khitarishvili, 2016). Additionally, the gender wage gap further increases when women enter prime child-bearing years (Khitarishvili, 2016).

Gender roles in the family

The position of women in the family in Kazakhstan has been labelled a "gender paradox", where high levels of women's education and labour force participation co-exist with highly traditional gender roles in the family (Durrani et al., 2022). There is high societal pressure for marriage and childbearing, especially for women. It has been argued that the superiority of men over women is established in Kazakh norms (Durrani et al., 2022) and that women mainly acquire status and power through marriage and motherhood (Werner, 2022).

During the Soviet era, a norm emerged where working mothers played a dual role as breadwinners and primary caretakers, indicating a significant level of gender equality in the public sphere. However, traditional gender roles persisted in private settings, despite

the promotion of women's increased participation in the labour market by the state. As a result, mothers predominantly shouldered the responsibility for unpaid work, including housework and childcare, highlighting the continuation of traditional gender norms within households (Uskembayeva et al., 2016).

Despite the potential for societal transformation, little progress has been made in advancing gender equality within private spheres. Women continue to bear the primary burden of household chores and childcare, evident from the ongoing dominance of men and the prevailing gender disparities. These inequalities are rooted in societal norms and expectations that relegate women to traditional roles, limiting their opportunities and decision-making power within families and communities. The emphasis on traditional family values further reinforces these gender imbalances, making it difficult for women to achieve more equitable roles in their daily lives (Kuzhabekova et al., 2018). This division of labour remains even among highly educated women and those in leadership positions, who receive minimal support from men (Kuzhabekova et al., 2018; Snajdr, 2005). The participation of men in domestic work continues to be significantly lower compared to women, with a nearly 3- to 4-fold discrepancy (Dugarova, 2019; Statistics Committee, 2019).

To summarize, the Soviet era witnessed a norm of working mothers as the primary caretakers, along with state support for traditional gender roles. These dynamics persisted following independence, as the preservation of self-identification, increased religiosity, and ethnic heritage have upheld traditional gender roles. Consequently, little progress has been made towards achieving gender equality within the private sphere, leaving women to continue shouldering the primary burden of housework and childcare.

Family policies

Family policies include paid and job-secure maternity leave (one year), a possibility of unpaid job-secure maternity leave (up to 3 years), and almost no paternity-related policies (Dugarova, 2019). According to Grunow and colleagues (2018), such policy designs “strengthen gendered traits through promotion of separate spheres” (p. 49), and traditional ideologies will prevail in countries with such policies.

The provision of public childcare improved in the 2000s after a dramatic decline in the 1990s. Ninety-five per cent of 3- to 6-year-old children attended preschools in 2018. However, only 32% of 1- to 3-year-olds were in childcare facilities due to insufficient provisions and places available for children of these ages (Information & Analytical Centre, 2019; Litjens et al., 2017). Thereby, a shortage of preschools and high prices of private childcare facilities have the capacity to impact domestic work and compel mothers of small children to stay at home longer than they otherwise would (Dugarova, 2019).

In summary, Kazakhstan exhibits a relatively high level of gender equality in public institutions, such as in education and employment. However, family policies still tend to support a traditional division of household work and childcare. Moreover, there is a high cultural acceptance of women as main caretakers of household work and children.

Expectations

In this study, individual fertility intentions are studied, as the data do not allow for the analysis of the fertility intentions of both partners. Because Kazakhstan is a context

with relatively high public gender equality and relatively low private gender equality, the following relationships will be expected:

1. It is expected that gender-egalitarian attitudes will be negatively associated with fertility intentions among both women and men.
2. Considering the above-mentioned low levels of gender equality in private settings and family policies that promote separate spheres, it is assumed that gender-equal sharing of domestic work (either housework or childcare) is not prevalent in the country. Thus, I assume that people who share domestic work in a gender-equal way may be forerunners of changes in the gender roles in line with the second demographic transition and may not want more children. Thus, gender-equal sharing of domestic work (housework or childcare) will be negatively associated with fertility intentions among both women and men.
3. Following previous research on the consistency between gender-egalitarian attitudes and a gender-egalitarian division of labour in the household/in childcare (Aassve et al., 2015; Goldscheider et al., 2013), it is expected that a mismatch between attitudes and behaviour will also be negatively associated with fertility intentions among both women and men. However, contrary to the findings in more developed countries (Aassve et al., 2015), it is not expected that a match between unequal gender attitudes and unequal housework sharing would be negatively associated with fertility intentions. This is based on the arguments of prevailing low levels of private gender equality in Kazakhstan and its relatively high aggregate fertility levels.

I will analyse the above-mentioned relationships of fertility intentions for men and women separately, because family building has strongly gendered effects in terms of household and childcare work (Neyer et al., 2013; Sanchez & Thomson, 1997). The analyses of the intentions to have a first, second or three or more children will also be done separately, because gender values as well as the division of housework and childcare may have different effects at different parities (Neyer & Rieck, 2009; Neyer et al., 2013; Sanchez & Thomson, 1997).

Data and methods

Data

The data used are the first wave of the Generations and Gender Survey (GGS) in Kazakhstan. The fieldwork was completed in 2018 and the data were released in 2020. It has a sample of 16,000 respondents aged 18–79 (response rate 93%, $N=14,857$), which includes both women and men. The GGS survey in Kazakhstan utilized the 2009 census as a sampling frame. The selection process entailed choosing units based on population size, resulting in a total of 840 primary sampling units (PSUs), with an average of approximately 20 units per PSU. Final unit selection was determined using simple random sampling. To select a respondent within a household, the “next birthday” principle was applied. Data collection involved personal face-to-face interviews using computer-assisted methods. Respondents were offered a small gift valued at no more than US\$3 on behalf of the United Nations Population Fund (UNFPA). Contact

attempts were made on different days and times until a successful interview was conducted, with a minimum of three contacts required and no maximum limit (Dossanova et al., 2020).

I compared Kazakhstan's GGS descriptive statistics with the 2009 census. Women were overrepresented (60.9% vs. 51.7% in the census), and 18- to 34-year-olds were underrepresented (32.2% vs. 44.5% in the census). The sample overrepresents both those with lower secondary and tertiary education, and working women and men. Additional file 1: Appendix Table A1 displays the comparison of relevant proportions. The disproportionate representation of women in the survey data can result in a gender bias in the findings. Also, our understanding of the perspectives of younger generations could potentially be limited if older individuals are overrepresented. Younger individuals may have significantly different experiences and attitudes, particularly concerning gender roles and fertility intentions. Additionally, an educational bias can be introduced when individuals with lower or higher levels of education are overrepresented. Educational attainment has been known to influence gender attitudes and decision-making processes, including fertility intentions. Therefore, if the sample predominantly consists of individuals with different educational backgrounds, it may not accurately represent the perspectives and experiences of those with secondary-level education. Furthermore, the overrepresentation of employed individuals can introduce a bias related to work-related factors. Factors such as employment nature, work-life balance, and workplace policies can strongly influence gender attitudes, the division of household responsibilities, and fertility intentions. However, by primarily focusing on employed individuals, the survey data may overlook the experiences and attitudes of unemployed individuals or those who are not actively seeking employment. To address the implications of overrepresentation in survey data, analytical weights are employed as a useful tool. By assigning appropriate weights to different groups, researchers can adjust the data to better reflect the demographic composition of the population, ensuring that the findings are representative.

It is also important to note that while the GGS data have advantages in providing information on gender attitudes and behaviours not captured in population censuses, cross-sectional data have several limitations. These include the difficulty in establishing temporal causality relationships between variables, the possible influence of conjunctural effects specific to the time and place of data collection, the inability to analyse changes over time, and response bias due to factors such as social desirability bias.

I restrict the sample to women (aged 18–45) and men (aged 18–49) with a co-residential partner of the opposite sex at the time of the interview who are not pregnant or sterilized and whose partner is not pregnant or sterilized. Thus, the restricted sample size is 3,933 people. The selection flow and final population are provided in Additional file 1: Appendix Fig. A1. Also, descriptive statistics of the restricted sample are presented in Additional file 1: Appendix Table A2. The dataset allows differentiating between biological, step, and adopted children of current and past partnerships. Parity is specified based on the number of biological children a respondent has ever had and is defined as parity 0 (individuals with no biological children), parity 1 (individuals with one biological child), and parity 2+ (individuals who had two or more biological children).

Dependent variable The dependent variable was based on the following question: "Do you have the intention to have a child within the next three years?" The survey allows for

five possible answers: (a) “definitely not”, (b) “probably not”, (c) “unsure”, (d) “probably yes”, and (e) “definitely yes”.

Independent variables The three main independent variables are Gender division of housework, Gender division of childcare, and Gender attitudes. They reflect gender equality (actual sharing of responsibilities) and gender attitudes and beliefs. The composite variables were created as arithmetic means of the respective set of questions.

Gender division of housework is a composite variable based on the questions about “preparing meals”, “vacuuming”, and “doing laundry”. Respondents’ answers include “always me”, “usually me”, “equally me and partner”, “usually partner”, “always partner”, “always or usually someone else”. Based on the gender of respondents, they were further transformed into the answers “always woman”, “usually woman”, “woman and man about equally”, “usually man”, “always man”. Thereby, the score assigned to each single item varies from 1 (more traditional) to 5 (more egalitarian). “Always or usually someone else” was treated as non-applicable in constructing the composite variable, and thereby does not contribute to the mean score (this answer only represents 3–6% of answers to the specific questions). The Cronbach’s alpha, a measure of internal consistency of a composite variable that assesses whether separate items produce similar scores, for the scale of housework division is 0.869. A criterion of 0.7 and above is universally considered high internal consistency according to Nunnally and Bernstein (1994).

Gender division of childcare is a composite variable constructed using five questions: “dressing children”, “staying with ill children”, “playing with children”, “doing homework with children”, and “putting children to bed”. The questions were asked to people with co-residential children. Based on the respondent’s gender, initial answers were further redefined into the answers “always woman”, “usually woman”, “woman and man about equally”, “usually man”, “always man”. Thereby, the score assigned to each single item varies from 1 (more traditional) to 5 (more egalitarian). “Always or usually someone else” was treated as non-applicable in constructing the index and does not contribute to the mean score (this answer only represents 1–2% of answers to the specific questions). Cronbach’s alpha for the scale is 0.812. The sample size for the analysis to study the effect of the gender division of childcare on fertility intentions is different from the models for housework division and gender attitudes, because only parents with co-residential children aged 10 years and younger were included due to the specificity of the questions related to childcare.

In both *Gender division of housework* and *Gender division of childcare* variables, a greater contribution by men (usually man/always man) was very uncommon (2–4% for single items for housework and 1–2% for childcare) and was considered as more egalitarian in line with previous studies (Aassve et al., 2015; Goldscheider et al., 2013). The composite variables based on mean scores were created without taking into account any missing values. For instance, if three variables are specified, and in some observations, one of those variables is missing, the composite variable for mean scores will be calculated using the mean of the two variables that do exist. The higher the score of the composite variable, the more gender-egalitarian responsibilities within the couple. The composite variables were treated as continuous measures.

Gender attitudes is a composite variable measured by a set of five Likert scales on gender values: “for whom having a job is more important”, “for whom looking after

children is more important”, “whose task is it to look after home and children”, “whose task is it to earn money for the family”, and “better at caring for children”. Respondents’ answers include “men definitely”, “men slightly”, “both sexes equally”, “women slightly”, and “women definitely”. Following the definitions of gender division of housework and childcare in the literature, the score assigned to each single item varies from 1 (more traditional) to 5 (more egalitarian). For the questions “for whom looking after children is more important”, “whose task is it to look after home and children”, and “better at caring for children”, reverse-score items were created to make all items moving from more traditional to more egalitarian. The variable is constructed as a mean score of single items. The construction of the composite variable using is based on mean scores ignoring missing values. If some individual items out of the five used for constructing the composite variable have missing values, then the mean score of the combined variable would be calculated by utilizing only the available variables with non-missing values. The Cronbach’s alpha for the scale is 0.681 (close to the conventional criterion of 0.7). The higher the index the more gender-egalitarian views a respondent has. The composite variable was treated as a continuous measure, treating gender attitudes as unidimensionally moving along the continuum from more traditional to more egalitarian. The construction of the composite variable using is based on mean scores ignoring missing values. If only single item has non-missing values out of five single items used for the composite variable, then the combined variable’s mean score would be computed by utilizing only the available variable.

Categorical indices and matching variables

To assess the expectation related to consistency in attitudes and behaviour, pairwise matches were made between the attitudes variable and the two behavioural variables. The continuous composite variables (housework division, childcare division) were divided into two categories. A score of 2 or less indicated that the work was typically or always done by women, which was classified as reflecting more traditional gender roles (0). On the other hand, a score higher than 2, indicating a more equal division of work or even greater involvement by men, was classified as reflecting more egalitarian gender roles (1). Then, a gender attitudes dummy constructed with a similar logic was matched separately with the housework division dummy and childcare division dummy, producing two matching variables that include traditional match, egalitarian match, and two mismatch categories (egalitarian attitudes–traditional behaviour, and traditional attitudes–egalitarian behaviour). The two mismatch categories were combined into one category due to the small number of those who have traditional attitudes but behave more equally. Treating this mismatch category separately was problematic, especially due to further disaggregation by gender and parity.

Control variables

The following demographic control variables were included in the models, depending on the parity. The parity 0 models included controls for respondent’s age group (18–24, 25–29, 30–34, 35–39, 40+). The parity 1 and 2+ models included controls for respondent’s or female partner’s (in case of male respondent) age at last birth (18–24, 25–29, 30–34, 35–39, 40+) and age group of the youngest child (0–2,

3–5, 6–8, 9 years and older). All the models include variables that account for the respondent's socio-economic status, such as the level of education attained by the respondent (lower secondary or less, upper and post-secondary, and tertiary), the labour force status of the respondent (employed, unemployed, homemaker, on maternal/parental leave, or other, such as in education, senior/retired but of reproductive age, permanently sick/disabled but self-reportedly able to conceive [a very small proportion of the "other" category, about 13%], etc.), the partner's labour force status (with similar categories), and a household affordability index. The household affordability index is a composite measure ranging from 0 to 10. It is calculated by summing equally weighted scores of various items, including the ability to afford heating, vacations, furniture, clothes, meat, entertainment, and meeting financial obligations. Missing values are treated as 0 in the calculation. The index provides an overall assessment of the household's affordability, with higher scores indicating better financial capacity. The reliability of this index, as measured by Cronbach's alpha, is 0.65.

The inclusion of respondent's age at first birth as a control variable is important to account for the potential influence of early or late parenthood experiences on subsequent fertility intentions. By controlling for this variable, the analysis aims to isolate the specific associations between gender attitudes, housework division, and childcare division with fertility intentions for subsequent births. Additionally, including the respondent's or female partner's age at last birth for subsequent parities helps capture the impact of recent fertility experiences on current fertility intentions, considering factors like recency of childbirth. The justifications for incorporating socio-economic controls, such as education, labour market situation, and household affordability, lie in their potential influence on fertility intentions beyond gender attitudes and domestic responsibilities. Education is associated with decision-making processes and values, while the labour market situation reflects economic resources and stability. The index of household affordability considers economic constraints or facilitators in supporting additional children. By including these controls, the analysis aims to disentangle the effects of gender attitudes and domestic division from the broader socio-economic factors that may shape fertility intentions.

Method

The dependent variable, fertility intentions, was treated as a continuous variable following the approach of Thomson and Brandreth (1995). This approach considers responses to fall on a continuum of certainty, ranging from "definitely not" to "definitely planning to have a child". Consequently, the measure was treated as an interval variable, and linear models were estimated using ordinary least squares (OLS) regression. Separate OLS models were conducted to examine the association between the dependent variable and (1) gender attitudes, (2) housework division, (3) childcare division, (4) a matching variable of gender attitudes and housework division, and (5) a matching variable of gender attitudes and childcare division. Control variables were included based on improvements in model fit. Sensitivity analyses were performed using various model specifications.

Sensitivity analysis

Sensitivity analyses were performed to ensure the robustness of the results. The gender attitudes variable included both public (employment-related) and private (housework and childcare) gender equality measures. Separate composite variables for public and private gender equality were used in the analyses to assess their impact. While the internal consistency of the separate variables was lower than the combined variable, the results remained consistent in terms of direction of relationships and statistical power.

Another sensitivity analysis examined the categorization of the “always or usually someone else” response in the housework and childcare division questions. By considering it as reflecting more traditional or more egalitarian patterns instead of treating it as non-applicable, the analysis confirmed that the relationship direction and statistical power remained unchanged.

Additionally, another sensitivity analysis was conducted to examine the consistency of the findings specifically related to the division of housework. The main models were applied to both the full sample and a restricted sample, which included only respondents with co-residential children under 10 years old (refer to Additional file 2: Table S16). The results support the reliability and consistency of the findings.

Interactions between the main independent variables and labour force status were also examined, but they did not significantly improve the model fit for any parities or gender. Additionally, a sensitivity analysis with adjustment for religion showed a decrease in the effect size of the main independent variables, but the direction of relationships and statistical power remained unchanged.

Furthermore, sensitivity analyses using logistic regressions, linear probability models, and multinomial logistic regressions. Logistic regression and linear probability models were tested with a binary dependent variable. Fertility intentions were transformed into a dummy variable, grouping “probably yes” and “definitely yes” as intending (1) and combining “definitely no”, “probably no”, and “unsure” as not intending (0). Additionally, multinomial logistic regressions were employed, treating the dependent variable as a nominal categorical variable to assess the probability of being in each category. Various model specifications yielded consistent relationship directions with the main analysis using OLS regressions (see Additional file 2). This further supports the reliability and consistency of the findings.

Results

Descriptive results

Table 1 presents descriptive sample statistics of gender attitudes, housework division, and childcare division by gender, parity, age group, and educational level (for means scores of the respective indices disaggregated by these groups with standard errors and confidence intervals see Additional file 1: Appendix Tables A3–A7). Proportion wise, more women hold more egalitarian gender attitudes than men across all parities. A small proportion of both women and men report more egalitarian housework division (20% and lower) across all parities. A bigger proportion of both women and men report having a more egalitarian childcare division. It is worth noting that gender

Table 1 Descriptive statistics, by gender, parity, educational level and age group

| | Gender attitudes | | | Housework division | | | Childcare division | | |
|-------------------------|------------------|-----------|-------|--------------------|-----------|-------|--------------------|-----------|-------|
| | More trad | More egal | Total | More trad | More egal | Total | More trad | More egal | Total |
| | N (%) | N (%) | N | N (%) | N (%) | N | N (%) | N (%) | N |
| <i>Women</i> | | | | | | | | | |
| Parity 0 | 63(39) | 99(61) | 162 | 129(80) | 33(20) | 162 | | | |
| Parity 1 | 197(38) | 318(62) | 515 | 434(84) | 81(16) | 515 | 151(29) | 364(71) | 515 |
| Parity 2 | 790(48) | 853(52) | 1643 | 1445(88) | 198(12) | 1643 | 547(33) | 1096(67) | 1643 |
| Below tertiary educated | 664(50) | 669(50) | 1333 | 1157(87) | 176(13) | 1333 | 425(34) | 823(66) | 1248 |
| Tertiary educated | 386(39) | 601(61) | 987 | 851(86) | 136(14) | 987 | 273(30) | 637(70) | 910 |
| 30 and younger | 352(45) | 430(55) | 782 | 695(89) | 87(11) | 782 | 283(41) | 399(59) | 682 |
| 31 and older | 698(45) | 840(55) | 1538 | 1313(85) | 225(15) | 1538 | 415(28) | 1061(72) | 1476 |
| <i>Men</i> | | | | | | | | | |
| Parity 0 | 72(45) | 88(55) | 160 | 127(79) | 33(21) | 160 | | | |
| Parity 1 | 226(55) | 182(45) | 408 | 334(82) | 74(18) | 408 | 140(34) | 268(66) | 408 |
| Parity 2 | 596(57) | 449(43) | 1045 | 903(86) | 142(14) | 1045 | 382(37) | 663(63) | 1045 |
| Below tertiary educated | 616(57) | 470(43) | 1086 | 922(85) | 164(15) | 1086 | 342(35) | 646(65) | 988 |
| Tertiary educated | 278(53) | 249(47) | 527 | 442(84) | 85(16) | 527 | 180(39) | 285(61) | 465 |
| 30 and younger | 252(58) | 180(42) | 432 | 362(84) | 70(16) | 432 | 163(46) | 188(54) | 351 |
| 31 and older | 642(54) | 539(46) | 1181 | 1002(85) | 179(15) | 1181 | 359(33) | 743(67) | 1102 |

More traditional—scores 2 and lower for the respective indices. More egalitarian—scores higher than 2 for the respective indices

Source: Kazakhstan’s Generations and Gender Survey of 2020, author’s calculations

attitudes and housework division show a negative correlation with parity. These indices tend to be higher among childless individuals and lower among those with two or more children.

Table 1 also suggests that the older generations tend to report a slightly more equal division of housework and childcare. However, this is a simplistic measure of change over time. These correlations are crude, and it should be borne in mind that this observation might be influenced by the fact that individuals in the older age group are likely to have older children who may require less involvement in household tasks and especially childcare compared to respondents with younger children.

In terms of educational level, Table 1 shows that proportion wise more individuals with tertiary education report more egalitarian gender attitudes than individuals with below tertiary education. There is only a very small difference in terms of proportions reporting more egalitarian division of housework and childcare among the educational groups among both women and men.

Table 2 provides descriptive sample statistics on the matching variables between gender attitudes and housework/childcare division, organized by gender and parity. These tables reflect situations where the gender attitudes and housework/childcare division match, either traditionally or in a more egalitarian way, as well as situations

Table 2 Descriptive statistics, a matching variable between gender attitudes and housework/childcare division, by gender and parity

| | Gender attitudes and housework | | | | | | Gender attitudes and childcare | | | | | |
|-------------------|--------------------------------|-------------------|---------------------|-------------------|-------------------|---------------------|--------------------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
| | Women | | | Men | | | Women | | | Men | | |
| | Parity 0 N (%) | Parity 1 N (%) | Parity 2 + N (%) | Parity 0 N (%) | Parity 1 N (%) | Parity 2 + N (%) | Parity 1 N (%) | Parity 2 + N (%) | Parity 1 N (%) | Parity 2 + N (%) | Parity 1 N (%) | Parity 2 + N (%) |
| Traditional match | 51(32) | 176(34) | 716(44) | 60(38) | 194(48) | 530(51) | 68(18) | 315(23) | 92(28) | 244(27) | 92(28) | 244(27) |
| Mismatch | 88(55) | 279(54) | 794(49) | 79(49) | 171(42) | 437(42) | 161(43) | 586(46) | 145(44) | 414(46) | 145(44) | 414(46) |
| Egalitarian match | 21(13) | 60(12) | 124(8) | 21(13) | 40(10) | 76(7) | 146(39) | 455(34) | 90(28) | 237(26) | 90(28) | 237(26) |
| Total | 160 | 515 | 1,634 | 160 | 405 | 1,043 | 375 | 1356 | 327 | 895 | 327 | 895 |

Traditional match—traditional attitudes and traditional behaviour; egalitarian match—egalitarian attitudes and egalitarian behaviour; mismatch—traditional attitudes and egalitarian behaviour or egalitarian attitudes and traditional behaviour

Source: Kazakhstan's Generations and Gender Survey of 2020, author's calculations

where they do not match. We can see that except for fathers in relation to housework, the biggest proportion is occupied by a mismatch between gender attitudes and housework/childcare division. We can also notice a bigger proportion of respondents having an egalitarian match between gender attitudes and behaviour for the division of childcare than for housework. This may indicate that men are more eager to be involved in childcare than other household chores. Also, it is worth noting that the number of both women and men who fit into the egalitarian match category is particularly low for the matching between gender attitudes and housework. This may also influence the statistical power in the analyses, leading to insignificant results for this category.

Results of regression models

Table 3 presents linear regression results of intending to have a child, or another child, for both women and men at different parities from models where the focus is on gender attitudes. The models show that, net of control variables, having more gender-egalitarian attitudes is not statistically related to childbearing intentions for either women or men. The only exception is for women with two or more children, who had lower intentions to have another child when attitudes were more gender egalitarian. A relationship between women’s employment and their intention to have children was only found among mothers who have one child. The complete tables are presented in Additional file 1: Appendix. The data also show that women who have received tertiary education and have one or two and more children are more likely to have intentions of having another child soon, compared to those with upper secondary education. The data also reveal that as the self-reported affordability level of a household increases, the intentions of mothers of one or more children and one-child fathers to have another child soon also increase. Interestingly, it was found that men’s unemployment was positively associated with the intentions of women who already have two or more children and men who have one or two and more children to have another child soon.

Table 4 presents linear regression results of intending to have a child, or another child, for women at different parities from models where the focus is on housework division, measured with a composite variable. The models show that, net of control variables, having a more equal division of housework was negatively related to

Table 3 Adjusted OLS models of women’s and men’s fertility intentions, by gender attitudes and parity

| | Women | | | Men | | |
|------------------|----------|----------|------------|----------|----------|------------|
| | Parity 0 | Parity 1 | Parity 2 + | Parity 0 | Parity 1 | Parity 2 + |
| Gender attitudes | – 0.003 | 0.099 | – 0.170*** | – 0.224 | – 0.144 | – 0.040 |
| Constant | 4.594*** | 3.213*** | 3.277*** | 4.390*** | 3.682*** | 3.567*** |
| N | 161 | 511 | 1623 | 159 | 402 | 1037 |
| Adj. R-squared | 0.11 | 0.20 | 0.15 | 0.11 | 0.17 | 0.14 |

Source: Kazakhstan’s Generations and Gender Survey of 2020, author’s calculations

p* < 0.05, *p* < 0.01, ****p* < 0.001

Models adjusted for women’s/female partner’s age (in parity 0 models) or age at previous birth (in parity 1 and 2 + models), age of the youngest child (in parity 1 and 2 + models), respondent’s education, affordability index, partner’s education, and partner’s employment. Post-stratification weights were applied.

Table 4 Adjusted OLS models of women’s and men’s fertility intentions, by housework division and parity

| | Women | | | Men | | |
|------------------------|----------|------------|------------|----------|----------|------------|
| | Parity 0 | Parity 1 | Parity 2 + | Parity 0 | Parity 1 | Parity 2 + |
| Housework division | − 0.124 | − 0.269*** | − 0.123* | − 0.259* | − 0.153* | − 0.176*** |
| Constant | 4.786*** | 3.846*** | 3.111*** | 4.513*** | 3.645*** | 3.771*** |
| <i>N</i> | 161 | 511 | 1632 | 159 | 405 | 1039 |
| Adj. <i>R</i> -squared | 0.12 | 0.21 | 0.15 | 0.13 | 0.18 | 0.15 |

Source: Kazakhstan’s Generations and Gender Survey of 2020, author’s calculations

p* < 0.05, *p* < 0.01, ****p* < 0.001

Models adjusted for women’s/female partner’s age (in parity 0 models) or age at previous birth (in parity 1 and 2 + models), age of the youngest child (in parity 1 and 2 + models), respondent’s education, affordability index, partner’s education, and partner’s employment. Post-stratification weights were applied

Table 5 Adjusted OLS models of women’s and men’s fertility intentions, by childcare division and parity

| | Women | | Men | |
|------------------------|----------|------------|------------|------------|
| | Parity 1 | Parity 2 + | Parity 1 | Parity 2 + |
| Childcare division | 0.126 | − 0.044 | − 0.380*** | − 0.178** |
| Constant | 3.351*** | 3.091*** | 4.278*** | 3.867*** |
| <i>N</i> | 374 | 1356 | 329 | 893 |
| Adj. <i>R</i> -squared | 0.07 | 0.09 | 0.11 | 0.12 |

Source: Kazakhstan’s Generations and Gender Survey of 2020, author’s calculations

p* < 0.05, *p* < 0.01, ****p* < 0.001

Models adjusted for women’s/female partner’s age at previous birth, age of the youngest child, women’s employment, partner’s employment, affordability index, respondent’s education, and partner’s education. Post-stratification weights were applied

childbearing intentions at all parities among both women and men, with the exception of childless women. The analysis did not find any relationship between women’s employment and their fertility intentions when examining housework division models. Detailed tables are available in Additional file 1: Appendix. The coefficients for other control variables remained consistent with the previous models.

Table 5 presents linear regression results of intending to have another child for mothers and fathers at different parities from models where the focus is on childcare division, measured with a childcare division composite variable. The models show that, net of control variables, having a more equal division of childcare was not statistically related to childbearing intentions for mothers, but it was negatively related to fathers’ fertility intentions. One-child mothers who were employed had lower fertility intentions (with quite a strong effect size) than homemakers. The analysis found women’s employment to be negatively related to fertility intentions in childcare division models for both mothers of one child and mothers of two or more children. The complete tables are included in Additional file 1: Appendix. The coefficients for other control variables were similar to those in previous models.

To assess whether the consistency between gender-egalitarian attitudes and gender-egalitarian division of labour in the household (either housework or childcare)

Table 6 Adjusted OLS models of women’s and men’s fertility intentions, gender attitudes and housework, by parity

| | Women | | | Men | | |
|----------------|----------|----------|------------|-----------|-----------|------------|
| | Parity 0 | Parity 1 | Parity 2 + | Parity 0 | Parity 1 | Parity 2 + |
| Traditional | (ref.) | (ref.) | (ref.) | (ref.) | (ref.) | (ref.) |
| Mismatch | − 0.230 | 0.117 | − 0.207** | − 0.212 | − 0.355** | − 0.094 |
| Egalitarian | − 0.280 | − 0.204 | − 0.552*** | − 0.997** | − 0.390 | − 0.652*** |
| Constant | 4.689*** | 3.393*** | 3.065*** | 4.046*** | 3.559*** | 3.638*** |
| N | 160 | 511 | 1623 | 159 | 402 | 1037 |
| Adj. R-squared | 0.11 | 0.20 | 0.16 | 0.15 | 0.18 | 0.15 |

Source: Kazakhstan’s Generations and Gender Survey of 2020, author’s calculations

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Models adjusted for women’s/female partner’s age (in parity 0 models) or age at previous birth (in parity 1 and 2 + models), age of the youngest child (in parity 1 and 2 + models), women’s employment, partner’s employment, affordability index, respondent’s education, and partner’s education. Post-stratification weights were applied

Table 7 Adjusted OLS models of women’s and men’s fertility intentions, gender attitudes and childcare, by parity

| | Women | | Men | |
|----------------|----------|------------|------------|------------|
| | Parity 1 | Parity 2 + | Parity 1 | Parity 2 + |
| Traditional | (ref.) | (ref.) | (ref.) | (ref.) |
| Mismatch | − 0.093 | − 0.237** | − 0.531*** | − 0.164 |
| Egalitarian | 0.222 | − 0.273** | − 0.642*** | − 0.362** |
| Constant | 3.584*** | 3.140*** | 3.770*** | 3.668*** |
| N | 374 | 1349 | 326 | 892 |
| Adj. R-squared | 0.08 | 0.1 | 0.11 | 0.12 |

Source: Kazakhstan’s Generations and Gender Survey of 2020, author’s calculations

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Models adjusted for women’s/female partner’s age at previous birth, age of the youngest child, women’s employment, partner’s employment, affordability index, respondent’s education, and partner’s education. Post-stratification weights were applied

is associated with fertility intentions among women and men, the next measure is a match between gender attitudes and housework (Table 6). Net of control variables, having an egalitarian match between gender values and housework division was negatively associated with childbearing intentions for both women and men with two and more children and for childless men. Compared to a traditional match, having a mismatch between gender attitudes and division of housework was negatively associated with fertility intentions for mothers of two and more children and for fathers of one child.

Table 7 presents linear regression results of intending to have another child for women and men at different parities from models where the focus is on a match between gender attitudes and childcare division. Net of control variables, having an egalitarian match was negatively related to childbearing intentions for both women and men with two and more children and for men with one child. Having a mismatch between gender attitudes and division of childcare was negatively associated with fertility intentions for mothers of two and more children and for fathers of one child.

Discussion

This study aimed to investigate the association between gender attitudes, domestic work division (including housework and childcare), consistency between gender attitudes and behaviour, and fertility intentions in Kazakhstan. The assessment sought to determine the fertility intentions of both men and women regarding first, second, and third or higher-order births. Kazakhstan is an intriguing case due to its prolonged period of women's high educational attainment and participation in the labour force. However, traditional gender roles in terms of unpaid work have remained unchallenged despite progress in public gender equality. This uniqueness, coupled with relatively high fertility rates, distinguishes Kazakhstan from previous contexts in which the relationship between gender equality and fertility has primarily been studied. The findings of this case study can be extrapolated to other societies with more traditional values that have pursued gender equality only through public institutions. Additionally, it raises questions about the contextual nature of studying the relationship between gender equality and fertility.

At certain stages of the gender revolution, one might anticipate a negative impact of increased gender equality on fertility. This could be attributed to women's increased labour force participation during the first half of the gender revolution or men's limited involvement in domestic responsibilities, indicating a slow progress towards the second half. The case of Kazakhstan presents new and compelling evidence regarding these dynamics. Despite women's extensive participation in the labour market and men's low involvement in housework and childcare, the divergence between public and private gender equality does not lead to decreased fertility. Aggregate fertility measures in Kazakhstan have consistently exceeded replacement levels, suggesting that more traditional gender attitudes and division of housework and childcare support fertility intentions in this context.

Furthermore, the study reveals that a match between gender-egalitarian attitudes and a more equal distribution of unpaid work demonstrates a negative relationship with fertility intentions. This contrasts with studies conducted in more developed countries (Aassve et al., 2015; Goldscheider et al., 2013) and highlights that in certain contexts, a combination of gender-egalitarian attitudes and an equal division of household work may not positively affect fertility. While Aassve and colleagues (2015) found a negative correlation between a match between gender-unequal attitudes and behaviour and fertility intentions in the European context, in Kazakhstan, such a match is associated with higher fertility intentions. When considering the completion of the first half of the gender revolution in Kazakhstan and the country's increasing fertility levels, it appears that Kazakhstan has adopted an alternative combination of gender relations that diverges from those observed in more developed countries. In conventional gender theories and empirical research, a unidirectional progression towards higher egalitarianism is usually predicted. However, Kazakhstan does not follow a unidirectional path towards egalitarianism and serves as an example of a country where gender relations have seemingly stabilized or even regressed, with high public gender equality and low private gender equality.

On the other hand, the study's results reveal that a disparity between gender attitudes and gender-related behaviour in housework and childcare is associated with lower

fertility intentions, consistent with previous studies (Aassve et al., 2015; Goldscheider et al., 2013). Although this may not immediately lead to a depressive effect on fertility, the long-term consequences could entail increased conflict due to the mismatch between attitudes and behaviour, ultimately resulting in declining fertility outcomes in the future.

Another potential explanation for these patterns lies in the influence of family policies that have been designed to align with specific gender roles. In this scenario, the state has supported gender-symmetric roles in the labour market, a practice that was established during the Soviet era and continued in independent Kazakhstan. Additionally, family policies have also reinforced gender-asymmetric roles within the home, offering extended maternity leave and the option of extended unpaid leave for mothers. Consequently, in accordance with the findings of Grunow and colleagues (2018), the presence of such work–family policies can reinforce prevailing ideologies that contribute to maintaining a negative association between gender egalitarianism and fertility.

In contrast to the development of gender equality in other parts of the world, post-Soviet countries have experienced a resurgence of traditional gender roles (Artsiomenka, 2019; Fodor & Balogh, 2010; Klüsener et al., 2019). Kazakhstan, like many other Asian countries, also tends to accept the unequal division of housework, but this does not necessarily result in lower fertility rates as expected based on theories and evidence from more developed countries. The high fertility rates and intentions among those with more traditional gender beliefs in Kazakhstan cannot be attributed to a mismatch in public gender equality between high education and low labour force participation, which is a common explanation in developing countries in the MENA region (Buyukkececi & Engelhardt, 2021). The “MENA paradox” does not apply to Kazakhstan, as women in this country are highly educated and participate actively in the labour market, indicating no mismatch in public gender equality. The case of Kazakhstan provides compelling new evidence that contradicts the established theoretical understanding of the relationship between gender equality and fertility in developed countries, as well as the factors driving high fertility in other developing countries. The study suggests that other contextual factors are at play in determining fertility intentions in Kazakhstan.

There are some limitations to this study, such as it being a cross-sectional one-time snapshot. In fact, there is evidence that gender attitudes are changing over time (Nitsche & Grunow, 2016). Upon better availability of longitudinal data on gender attitudes and housework and childcare division, it would be crucial to study how both attitudes and behaviour evolve over time. Another limitation is the focus on individual rather than couple characteristics that may not fully describe the situation with private gender equality. With improved availability of couple data, future research could better follow previous studies on gender attitudes and housework and childcare division (Hudde & Engelhardt, 2020; Nitsche & Grunow, 2016, 2018).

Also, the current study employed unidimensional indicators of gender attitudes, moving along the continuum from more traditional to more egalitarian patterns. There have been debates about the validity of multidimensional traits of gender attitudes (Grunow et al., 2018; Knight & Brinton, 2017). Grunow and colleagues (2018) pointed out low reliability scores of composite measures in some previous studies implied multidimensionality of gender attitudes. In this particular study, however,

reliability scores are relatively high. Further studies should assess the possible multidimensionality of gender attitudes (Knight & Brinton, 2017).

To gain a better understanding of the reasons behind why the forerunners of gender-egalitarian attitudes and behaviour in Kazakhstan do not desire to have more children, further research is necessary. It may be related to the lack of policy support for women who combine both working careers and family life as well as the lack of policy support for higher involvement of men into household work and childcare. Further implications of this study could be to assess the current family policies that support a more traditional division of unpaid work and how these policies impact on other spheres of lives, including the decision of women and men to have children.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s41118-023-00200-1>.

Additional file 1: Table A1. Descriptive statistics, GGS full sample vs 2009 population census. **Figure A1.** Selection flow and final population. **Table A2.** Descriptive statistics of the restricted sample, unweighted. **Table A3.** Descriptive statistics, main independent variables, by gender and parity. **Table A4.** Descriptive statistics, main independent variables, by generations (age 18-30 vs 31-49), by gender and parity. **Table A5.** Descriptive statistics, main independent variables, by education (tertiary vs other education), by gender and parity. **Table A6.** Adjusted OLS models of women's and men's fertility intentions, gender attitudes, by parity, weighted. **Table A7.** Adjusted OLS models of women's and men's fertility intentions, housework division, by parity, weighted. **Table A8.** Adjusted OLS models of women's and men's fertility intentions, childcare division, by parity, weighted. **Table A9.** Adjusted OLS models of women's and men's fertility intentions, gender attitudes and housework, by parity, weighted. **Table A10.** Adjusted OLS models of women's and men's fertility intentions, gender attitudes and childcare, by parity, weighted.

Additional file 2: Table S1. Adjusted logistic regression models of women's and men's fertility intentions, gender attitudes, by parity (odds ratios). **Table S2.** Adjusted logistic regression models of women's and men's fertility intentions, housework division, by parity (odds ratios). **Table S3.** Adjusted logistic regression models of women's and men's fertility intentions, childcare division, by parity (odds ratios). **Table S4.** Adjusted logistic regression models of women's and men's fertility intentions, gender attitudes and housework, by parity (odds ratios). **Table S5.** Adjusted logistic regression models of women's and men's fertility intentions, gender attitudes and childcare, by parity. **Table S6.** Adjusted linear probability models of women's and men's fertility intentions, gender attitudes, by parity. **Table S7.** Adjusted linear probability models of women's and men's fertility intentions, housework division, by parity. **Table S8.** Adjusted linear probability models of women's and men's fertility intentions, childcare division, by parity. **Table S9.** Adjusted linear probability models of women's and men's fertility intentions, gender attitudes and housework, by parity. **Table S10.** Adjusted linear probability models of women's and men's fertility intentions, gender attitudes and childcare, by parity. **Table S11.** Adjusted multinomial logistic regressions models of women's and men's fertility intentions, gender attitudes, by parity. **Table S12.** Adjusted multinomial logistic regressions models of women's and men's fertility intentions, housework division, by parity. **Table S13.** Adjusted multinomial logistic regressions models of women's and men's fertility intentions, childcare division, by parity. **Table S14.** Adjusted multinomial logistic regressions models of women's and men's fertility intentions, gender attitudes and housework, by parity. **Table S15.** Adjusted multinomial logistic regressions models of women's and men's fertility intentions, gender attitudes and childcare, by parity. **Table S16.** Linear regression models of fertility intentions, housework division, sample with co-residential children under 10.

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Solo author.

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Code availability

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Not applicable.

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