Journal of Population Research (2023) 40:18
https://doi.org/10.1007/s12546-023-09311-0

ORIGINAL RESEARCH

Choice of desired family size among young women in Zambia: what matters?

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Accepted: 24 May 2023 / Published online: 30 July 2023
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Abstract

In many developing countries, population expansion and high fertility rates have been of concern to individuals, society, and governments. Zambia is one of the countries in sub-Saharan Africa, which has been experiencing high fertility for more than four decades since it attained independence. Understanding of factors associated with desired family size, especially amongst young women, is important because their future reproductive behaviour has the potential to influence the country's course of fertility. Therefore, this study was conducted to examine the determinants of family size choice among young women in Zambia. The study analysed data extracted from repeated cross-sectional surveys conducted in 2007, 2013 and 2018. The analysis was done on a pooled weighted sample of 15,528 young women aged 15–24 years. Multivariate logistic regression was used to examine factors associated with the desired family size of young women. All analyses were conducted using Stata software version 17 and considered complex survey design. The prevalence of young women who had the desire of at least 4 children has been considerably high in Zambia, at 63.2%. Young women in the age group 20–24 were found to have higher odds (AOR = 1.31; 95% CI: 1.03, 1.66) of desiring at least 4 children compared to those aged 15–19. Women living in the rural areas were (AOR = 1.41; 95% CI: 1.10, 1.79) more likely to desire at least 4 children compared to their counterparts living in urban areas. Age of a young woman, place of residence, level of education, household wealth status, number of living children, and exposure to mass-media family planning messages were significantly associated with desire of at least 4 children. The desire for a large family size remains a social concern for reducing fertility in Zambia. This is because the proportion of young women who desire a large family size has been consistently high. Increasing access to education and sexual reproductive health information to young women especially to those in rural areas is key to changing their reproductive behaviour.

Keywords Ideal family size · Young women · Fertility preference · Zambia

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Introduction

The link between demographic change and economic consequences has long been a topic of discussion among economists, demographers, and other social scientists. Yet, a consensus has developed to support the idea that declining birth rates are typically a result of improving personal economic conditions. The idea that slower population growth rates promote economic progress and assist people and families in escaping poverty, however, is considerably less widely concluded (Bucci, et al., 2018; Mberu & Ezeh, 2017; Sinding, 2009). Increasing evidence from studies support the idea that countries which have incorporated population policies and family planning programmes in their overall economic development strategies have higher chance to achieve sustained rates of economic growth which in turn can improve the welfare of their population (Bucci, et al., 2018; Bucci & Prettner, 2020; Sinding, 2009). Although, fertility reduction is by no means an economic development panacea and is certainly not a sufficient condition for economic growth in developing countries, but it may well be a necessary condition in which governments can invest more per capita in education and health, thus creating the human capital for sustained economic growth (Bucci, et al., 2018; Bucci & Prettner, 2020; Sinding, 2009).

In many developing countries, population expansion and high fertility rates have been of concern for both society and individuals (Ezeh, et al., 2020). In terms of socio-economic progress, environmental sustainability, and resource supply, a growing population could impact on the population's well-being (Canning & Schultz, 2012; Ezeh, et al., 2020; Mberu & Ezeh, 2017). With a growing population and many other developmental challenges such energy crises, weak public reseource management, low levels of industrialisation and export marginalisation (Bawole & Adjei-Bamfo, 2020; Morris & Fessehaie, 2014; Njike, 2021; Okereke, et al., 2019). Most developing countries, especially in sub-Saharan Africa, face the challenge of creating jobs for a growing workforce while their governments lack the resources to meet the rising demand for services and infrastructure (Bawole & Adjei-Bamfo, 2020; Greene, 2005).

Individuals and households are faced with socio-economic difficulties as a result of the high fertility level prevailing in many parts of sub-Saharan Africa (Bongaarts & Casterline, 2013; Kebede, et al., 2019; Simona, et al., 2022). When a mother has many children, her home may be burdened financially, and her family is likely to fall into poverty (Aassve, et al., 2005). Children, particularly girls, may be compelled to drop out of school and get married at a young age in families with insufficient means for education, food, and health care (Greene, 2005; Mberu and Ezeh, 2017). High fertility can also raise the chances of infant mortality due to inadequate care from the mother. High fertility can also be associated with maternal health risks among women of reproductive ages because of short birth intervals (Kravdal & Kodzi, 2011).

Zambia is one of the countries in sub-Saharan Africa which has been experiencing high fertility for over four decades now (Central Statistical Office, 2012; Bakibinga, et al., 2019; Zambia Statistics Agency, et al., 2019) since independence. The total fertility rate has declined from 6.5 children in 1992 to 4.7 children in 2018 (Phiri, et al., 2020; Zambia Statistics Agency, et al., 2019). Demographic evidence shows that there is a relationship between fertility levels and desired family size such that

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an increase in the proportion of women desiring large family sizes would lead to an increased fertility rate in a country (Adilo & Wordofa, 2017; Feyisetan B & Casterline JB, 2000). Therefore, efforts to reduce fertility in sub-Saharan African countries and Zambia, in particular, should target reproductive behaviour change of young women. Our review of the literature shows that fewer studies in Zambia have made efforts to examine trends in desired family size and well understand a holistic influence of factors that determine desired family size among young women (Cook, et al., 2014; Mulenga, et al., 2018; Phiri, et al., 2023).

Although the prevalence of young women who desire a large family size appears to be falling over time globally, it remains unacceptably high in sub-Saharan African countries (Feyisetan B & Casterline JB, 2000; Indrastuti and Salim, 2021; Mback, 2017). In Zambia total wanted fertility among women reduced from 5.4 children in 1992 to 4.0 children in 2018 (Mapoma, et al., 2018; Zambia Statistics Agency, et al., 2019). However, actual fertility rate is still higher than wanted fertility (Zambia Statistics Agency, Ministry of Health (MOH) Zambia, and ICF, 2019). This discrepancy could be attributed to high unmet need for family planning among women of childbearing age (Namukoko, et al., 2022a; Phiri, et al., 2023). The high fertility preferences among women of childbearing age signify the fact that more needs to be done to stimulate a further reduction in fertility in the region at the health policy level. Doing so requires a holistic understanding of factors associated with the desire for ideal family size, especially among young women, because their desired reproductive behaviour has the potential to influence the country's future course of fertility. Similar studies conducted in other settings in sub-Saharan Africa and elsewhere reported that, age of a woman; education; wealth status; religion; age at first marriage; and exposure to mass-media were among key determinants influencing ideal family size among women of childbearing age (Ambrosetti, et al., 2019; Asadi Sarvestani, et al., 2017; Indrastuti & Salim, 2021; Molla & Muluneh, 2019). However, these studies ignored other important factors such as age at first sex; age at first birth; and exposure to family planning messages through community health worker visits that might influence the future reproductive behaviour of young women.

Many national-level family planning efforts have been implemented in Zambia since the early 1980s with the view of spearheading fertility control. In 1979, the country launched its first National Population Policy, which has since been recently updated (Ministry of National Development Planning, 2019). The policy highlights key strategies that are aimed at reducing fertility further. The health sector has also seen enomous investments in sexual reproductive health interventions targeting adolescents and young people. The government through the Ministry of Health (MoH) also launched the Adolescent Health Strategy in 2017 aimed at increasing the provision of reproductive health information and family planning youth-friendly services, especially to the marginalised populations (Ministry of Health (MOH), 2017). Despite these interventions, the country's total fertility rate is still among the highest in the region, coupled with low contraceptive prevalence rate (Lasong, et al., 2020; Mutombo & Bakibinga, 2014; Bakibinga, et al., 2019).

This study investigated factors associated with desired family size among young women in Zambia. To achieve this, cross-sectional data from the Zambia Demographic Health Survey (ZDHS) was used to perform a weighted analysis. The study

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has identified important factors that influence young women's fertility desire in Zambia. The study has provided an opportunity by generating information useful for shaping and redesigning existing Sexual Reproductive Health (SRH) policies and interventions aimed at influencing the future fertility course of the country. Study findings have the potential to inform fertility policies and programming in other parts of sub-Saharan Africa.

Methods and data

Data source

This study based on secondary data from the Zambia Demographic Health Surveys (ZDHS) of 2007, 2013-14, and 2018. A thorough description of the ZDHS technique can be found elsewhere (Zambia Statistics Agency, et al., 2019). To be concise, the ZDHS utilised a two-stage cluster sampling procedure, in which clusters were randomly picked from the sample frames (the 2000 and 2010 Zambia Population and Housing Censuses) and household listing in the first step. Stage two involved a systematic selection of households from the clusters that had been chosen. The DHS is usually conducted to provide data on fertility trends, as well as the usage of family planning methods (DHS program, 2021). The ZDHS data were collected using three questionnaires: Household, Women's, and Men's. This study's sample was limited to 15,528 young women aged 15 to 24, including 3,003, 6,726, and 5,799 young women in 2007, 2013, and 2018, respectively (Fig. 1).

Study setting

Zambia is one of the countries located in Southern Africa and had a population of approximately 18.4 million people in 2021 (Central Statistical Office, 2013). Specifically, there has been a 28.0% population growth rate since the last census was conducted in 2010, with the population expected to double by 2034 (based on the current annual growth rate of 2.8) (Central Statistical Office, 2013). As of 2010, a majority (60.5%) of Zambians were living in rural areas (Central Statistical Office, 2012). Modern contraceptive methods among married women of reproductive age in Zambia increased from 33 to 2007 to 48% in 2018 (Zambia Statistics Agency, et al., 2019). Zambia has created an enabling policy environment to reduce fertility by increasing access and utilization of FP services focusing specifically on adolescent women. So far, the following achievements have been made regarding fertility control in Zambia: the establishment of the National Population Policy (Ministry of National Development Planning, 2019); National Reproductive Health Policy (Ministry of Health, 2000); Family Planning Guidelines; and Protocols (Ministry of Health, World Health Organization, United Nations Population Fund, United Nations Child Fund, Health System Support Program, 2006). Some other achievements include: Reproductive; Maternal; Newborn; Child; and Adolescent Health and Nutrition Communication and Advocacy Strategy 2018–2021 (Ministry of Health (MOH), 2019); National Adolescent Health Strategic Plan (Ministry of Health (MOH), 2017);

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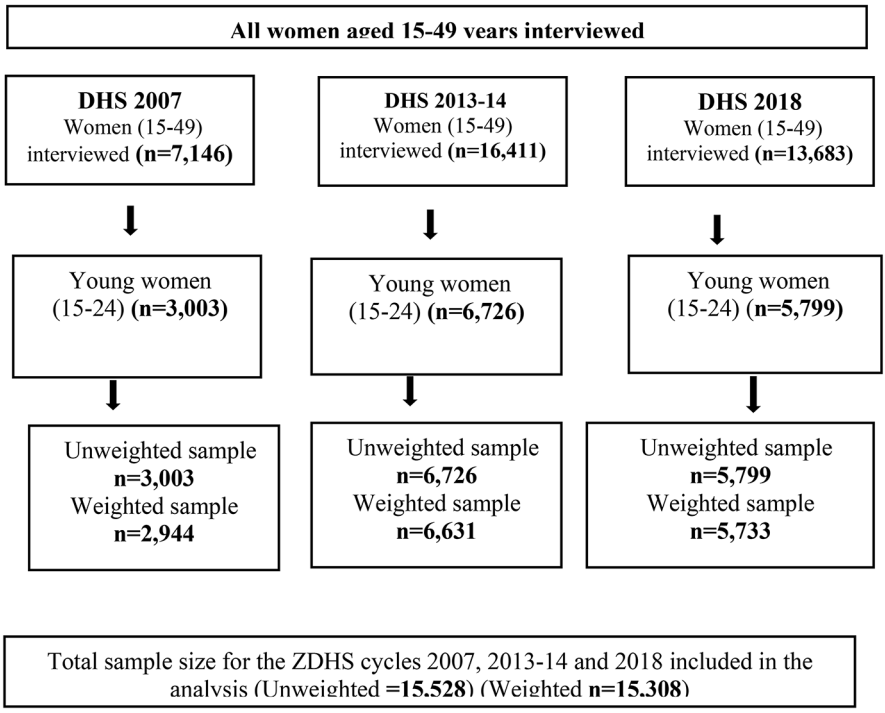

Fig. 1 Sample selection and inclusion criteria

and the Health Sector Strategic Plan (Ministry of Health, 2018). All these health policies and guidelines were created to address the contextual and individual barriers that inhibit availability and access to information and reproductive health services among adolescent and women, especially those in marginalized communities.

Measurement of variables Outcome variable

The outcome variable for this study was ideal family size which was measured in two categories: small family size, and large family size. This variable was calculated based on DHS data collected from women aged 15 to 49 who were asked how many children they would like to have during their reproductive cycle if they could choose the precise number at the time they were childless. Although this question is based on a hypothetical event, it offers two options. For starters, the data provides an estimate of future fertility for women who have not yet started a family. Second, the excess of historical fertility over desired family size gives a measure of unwanted fertility for older and high-parity women. The variable was classified by two categorical groups: the first one being 0–3 children representing a small family size and coded as "0" and 4 or more children was classified as a large family size and was coded as "1". The choice of this categorization was based on information from the Zambia's Population Policy description of the current fertility rate in the country (Ministry of National

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Development Planning, 2019) and was also informed by existing literature on the determination of low or high fertility (van Dalen & Henkens, 2021).

Independent variables

The independent variables included age; residence; education level; employment status; and household wealth index. These variables were classified as individual and household level determinants. Individual-level factors included the age of women categorized as (15–19, 20–24 years); age at first marriage (below 15 years, 15–19 years, and 20–24 years); and age at first sex (below 15 years, 15–19 years and 20–24 years). Other individual variables included education level (no education, primary, secondary, and tertiary); marital status (never married, married, formally married); working status (unemployed, employed); literacy (illiterate, literate); Contraceptive use (not using, using); exposure to mass-media family planning message (no, yes). Household-level factors included; residence (rural/urban); wealth index (poor, moderate, rich), and household size (1–3, 4–6, 7+).

Data analysis

Chi-square analysis was used to analyse differences between the dependent and independent variables. Univariate and multivariate logistic regression models were used to investigate the association between optimal family size, each individual and household-level factors. Stata/SE version 17.0 was used for all analyses, and the significance threshold was set at $p<0.05$. The "svy" command was used to account for the Demographic and Health Survey's sampling weights and clustering effects. To examine the determinants of desired family size among young women, a multivariate logistic regression model was conducted on a pooled dataset. The adjusted odds ratio (AOR) with 95% confidence intervals (CIs) was used to report results.

Ethical approval and consent to participate

The data analysed is available in the public domain on the DHS program website (www.dhsprogram.com). Data does not contain any identifying information. The study did not require formal ethical approval because we used secondary data sources. The DHS program granted permission to use the Zambia DHS datasets. There are no personal identifiers for survey participants in the DHS datasets The original Zambia DHS 2018 Biomarker and survey protocols were approved by Tropical Disease and Research Center (TDRC) and the Research Ethics Review Board of the Center for Disease Control and Prevention (CDC) Atlanta. The ZDHS data collection process required consent from participants aged 18 and older. Before seeking assent from the legal minors, the DHS protocol required consent from parents/guardians of all participants aged 15–17 years.

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Results

Trends in desired family size among young women in Zambia, 2007–2018

The overall patterns in the trends show that over the period 2007 to 2018, the desire for large family size had slightly increased from 61.6 to 63.2% among young women in Zambia. Bivariate analysis reveals that many socio-economic and demographic variables were consistently associated with young women's desired family size ($p<0.001$) (Table 1). The percentage of young women who desired at least 4 children was high among those aged 20 to 24 years in all the survey years. The percentage of young women who desired at least 4 children remained high throughout all the survey years and was highest in 2013 (64.6%).

Throughout the survey years, the desire of at least 4 children has been consistently high in rural areas and among those with primary or no formal education ($p<0.001$). Ideal family size has been generally high across all the survey years in the two education level categories (no education and primary). A desire of at least 4 children among young women with no education has reduced from 82.3 to 64.0% in the period 2007 to 2018. The desire of at least 4 children has however remained constant throughout the survey period for young women with a primary level of education.

Further, age at first marriage and age at first sexual encounter was significantly associated with a young woman's desire of at least 4 children throughout all the survey years. Such that those who experienced early marriage and those who experience sexual debut early were more likely to desire at least 4 children compared to their counterparts who delayed marriage and sexual debut.

Similarly, study results show variations in the prevalence of desire for at least 4 children among young women depending on their occupation and household wealth status ($p<0.001$). Young women from poor households and those who were unemployed preferred at least 4 children compared to those who were employed and those from rich households. In 2018, 57.0% of young women who belonged to rich households compared to 69.7% from poor households desired at least 4 children. The number of living children a young woman had, was found to be significantly associated with her desire at least 4 children across the three DHS's ($p<0.001$). Women with two and more living children were more likely to have a desire of at least 4 children compared with those who had either one or no child.

Surprisingly, we also found that throughout the survey years, young women who were using contraceptives had a higher chance of desiring at least 4 children compared to those not using contraceptives. Trends showed consistently higher percentages of young women desiring at least 4 children among those using contraceptives (67.3% in 2017, 69.8 in 2013, and 69.6% in 2018). The earlier demographic and health surveys showed that exposure to family planning messages was associated with a lower chance of desiring at least 4 children for young women. However, the recent DHS show that exposure to family planning messages and as well as being visited by a community health worker in the last 12 months did not influence desire for at least 4 children among young women in Zambia.

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Table 1 Percent distribution of young women's desired family size by socio-demographic factors in Zambia, DHS 2007, 2014 and 2018

Background Characteristics	DHS 2007 (N=2,770)		DHS 2014 (N=6,444)		DHS 2018 (N=5,601)	
	Less than 4 children	4+Children	Less than 4 Children	4+Children	Less than 4 children	4+Children
Age	***		***		***	
15–19	43.4	56.6	39.0	61.0	41.1	58.9
20–24	32.6	67.4	30.9	69.1	32.1	67.9
Residence	***		***		***	
Urban	53.7	46.3	42.5	57.5	45.9	54.1
Rural	24.5	75.5	28.3	71.7	28.8	71.2
Province	***		***		***	
Central	39.5	60.5	30.6	69.4	32.6	67.4
Copperbelt	46.4	53.6	38.3	61.7	41.3	58.7
Eastern	35.3	64.7	35.1	64.9	40.2	59.8
Luapula	19.8	80.2	25.6	74.4	23.3	76.7
Lusaka	54.8	45.2	43.0	57.0	49.7	50.3
Muchinga	-	-	32.5	67.5	28.8	71.2
Northern	26.6	73.4	30.5	69.5	24.6	75.4
North-Western	17.2	82.8	23.6	76.4	25.1	74.9
Southern	41.5	58.5	31.5	68.5	34.2	65.8
Western	30.1	69.9	41.6	58.4	39.7	60.3
Household Size	***		***		*	
1–3	41.8	58.2	47.7	52.3	38.2	61.8
4–6	33.4	66.6	32.2	67.8	35.2	64.8
7+	44.3	55.7	37.4	62.6	38.4	61.6
Education level	***		***		***	
None	17.7	82.3	20.9	79.1	36	64
Primary	27.4	72.6	27.4	72.6	29.2	70.8
Secondary	50.7	49.3	40	60	40.8	59.2
Tertiary	78.5	21.5	63.8	36.2	61.2	38.8
Wealth Status	***		***		***	
Poor	21.8	78.2	25.4	74.6	30.3	69.7
Middle	24.5	75.5	33.9	66.1	36.4	63.6
Rich	52.6	47.4	42.6	57.4	43	57.0
Employment status	***		***		***	
Unemployed	42.6	57.4	37.7	62.3	38.6	61.4
Employed	29.3	70.7	29.9	70.1	31.6	68.4
Age at First Marriage	***		**		***	
Below 15	17.7	82.3	17.2	82.8	22.8	77.2
15–19	25.0	75.0	25.4	74.6	36.5	63.5
20–24	42.6	57.4	32.9	67.1	25.5	74.5
Age at First Sex	**		**		**	
Below 15	29.2	70.8	32.2	67.8	26.7	73.3
15–19	37.4	62.6	34.2	65.8	33.5	66.5
20–24	51.0	49.0	47.4	52.6	47.9	52.1
Contraceptive use	**		***		***	
Not using	39.9	60.1	36.9	63.1	38.8	61.2

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Table 1 (continued)

Background Characteristics	DHS 2007 (N=2,770)		DHS 2014 (N=6,444)		DHS 2018 (N=5,601)	
	Less than 4 children	4+Children	Less than 4 Children	4+Children	Less than 4 children	4+Children
Using	32.7	67.3	30.2	69.8	30.4	69.6
Visited by community health worker in last 12 months	**Ns**		Ns		Ns	
No	38.3	61.7	35.5	64.5	36.9	63.1
Yes	40.1	59.9	34.3	65.7	35.8	64.2
Number of living children	***		***		***	
Zero	46.4	53.6	41.1	58.9	43.0	57.0
One	39.3	60.7	37.2	62.8	35.2	64.8
Two and above	17.2	82.8	16.6	83.4	20.4	79.6
Exposure to FP Messages	***		*		Ns	
No	35.2	64.8	33.9	66.1	37.4	62.6
Yes	43.9	56.1	38.1	61.9	35.6	64.4
Total	**38.4**	**61.6**	**35.4**	**64.6**	**36.8**	**63.2**

*** $p<0.001$; ** $=p<0.01$; * $=p<0.05$; Ns=non-significant

Desired family size and associated factors

Results in Table 2 from the univariate binary logistic regression model showed that all the independent factors, that is, age of a young woman; residence; education; household wealth status; household size; employment status; age at first marriage; number of living children; contraceptive use; exposure to media family planning messages except visit by a community health worker in the last 12 were associated with desire of at least 4 children among young women in Zambia. Study results suggest that increasing the education level of women, improvement in household wealth status, as well as increasing age at first marriage, have the potential to reduce women's fertility behavior.

Determinants of desired family size among young women

Table 3 presents multivariate logistic regression results showing the odds ratios and 95% for each variable while controlling for each of the others in the study. Results reveal that age of a young woman; residence; level of education; household wealth status; number of living children; and exposure to mass-media family planning messages were significantly associated with a desire of at least 4 children. Young women in the age group 20–24 were found to have higher odds of desiring at least 4 children (AOR=1.31; 95% CI: 1.03, 1.66; $p<0.05$). Women living in the rural areas were more likely to desire at least 4 children compared to their counterparts living in urban areas (AOR=1.41; 95% CI: 1.10, 1.79; $p<0.01$). The increasing level of education and household wealth is associated with reduced odds of desiring at least 4 children among young women. Young women with higher education (AOR=0.32;

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Table 2 Univariate logistic regression analysis examining variations of desire of at least 4 children **among young women 15–24 in Zambia, DHS 2007–2018**

Background Characteristics	Desire of at least 4 children		
	Unadjusted odds Ratio	p-values	[95% CI]
Age			
15–19	1		
20–24	1.47	0.000	(1.35 1.60)***
Residence			
Urban	1		
Rural	2.20	0.000	(2.0 2.41)***
Education level			
No education	1		
Primary	0.85	0.137	(0.68 1.05)
Secondary	0.46	0.000	(0.37 0.57)***
Tertiary	0.17	0.000	(0.13 0.24)***
Household Wealth index			
Poor	1		
Medium	0.69	0.000	(0.61 0.78)***
Rich	0.39	0.000	(0.35 0.43)***
Household Size			
1–3	1		
4–6	1.11	0.080	(0.99 1.25)
7+	0.88	0.033	(0.79 0.99)***
Employment status			
No	1		
Yes	1.46	0.000	(1.33 1.60)***
Age at first marriage			
Below 15	1		
15–19	0.77	0.000	(0.60 0.99)***
20–24	0.43	0.000	(0.33 0.58)***
Age at first sex			
Below 15	1		
15–19	0.78	0.000	(0.68 0.90)***
20–24	0.44	0.000	(0.35 0.56)***
Number of living children			
Zero	1		
One	1.66	0.000	(1.52 1.80)***
Two and above	5.44	0.000	(4.10 7.22)***
Contraceptive use			
Not using	1		
Using	1.38	0.000	(1.25 1.54)
Visited by community health worker in last 12 months			
No	1		
Yes	1.04	0.632	(0.89 1.21)
Exposure to media FP messages			
No	1		
Yes	0.71	0.000	(0.66 0.78)***

*** $p<0.001$; ** $=p<0.01$; * $=p<0.05$

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Table 3 Multivariate logistic regression analysis examining variations in desire of at least 4 children among young women 15–24 in Zambia, DHS 2007–2018

Background Characteristics	Desire for at least 4 children		
	Adjusted odds ratio (AOR)	p-values	[95% CI]
Age			
15–19	1		
20–24	1.31	0.023	(1.03 - 1.66)***
Residence			
Urban	1		
Rural	1.41	0.006	(1.10 - 1.79)***
Education level			
No education	1		
Primary	0.92	0.674	(0.62 – 1.36)
Secondary	0.69	0.074	(0.46 - 0.04)***
Tertiary	0.32	0.011	(0.13 - 0.77)***
Household Wealth index			
Poor	1		
Medium	0.80	0.076	(0.63 - 1.02)
Rich	0.69	0.008	(0.52–0.91)**
Household Size			
1–3	1		
4–6	0.99	0.907	(0.79 – 1.23)
7+	0.85	0.168	(0.68 – 1.07)
Employment status			
No	1		
Yes	1.19	0.080	(0.98 – 1.43)
Age at first marriage			
Below 15	1		
15–19	1.14	0.447	(0.81–1.61)
20–24	0.83	0.379	(0.55–1.26)
Age at first sex			
Below 15	1		
15–19	0.94	0.603	(0.73 - 1.20)
20–24	0.93	0.773	(0.57 - 1.52)
Number of living children			
Zero	1		
One	1.00	0.995	(0.77–1.29)
Two and above	1.94	0.000	(1.40–2.69)***
Contraceptive use			
Not using	1		
Using	0.95	0.623	(0.77–1.17)
Visited by community health worker in last 12 months			
No	1		
Yes	0.87	0.301	(0.67–1.13)

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Table 3 (continued)

Background Characteristics	Desire for at least 4 children		
	Adjusted odds ratio (AOR)	p-values	[95% CI]
Exposure to mass-media FP messages			
No	1		
Yes	0.82	0.033	(0.68–0.98)***

*** $p<0.001$; ** $=p<0.01$; * $=p<0.05$

95% CI: 0.13, 0.77), and those who belonged to rich households (AOR = 0.69; 95% CI: 0.52, 0.91) were less likely to desire at least 4 children compared to those from poor households.

Young women with two or more living children (AOR = 1.94; 95% CI: 1.40, 2.69; $p<0.001$) were more likely to desire at least 4 children. Exposure to mass-media family planning messages has shown the potential to influence young women's fertility preferences. Our study shows that young women who had exposure to mass-media family planning messages were less likely to desire at least 4 children (AOR = 0.82; 95% CI: 0.68, 0.98; $p<0.05$). Although not significant, young women who were visited by community health workers had lower odds of desiring a at least 4 children.

Discussion

This study sought to analyse the influence of individual and household level factors on the desired family size among young women in Zambia. The study applied multivariable logistic regression model on pooled 2007, 2013, and 2018 ZDHS dataset to better understand the factors associated with fertility preferences of young women. Our study has contributed to the literature by examining additional factors, which were ignored by previous studies. Inclusion of other individual factors that may potentially influence the desired family size of young women has enhanced a holistic understanding of the factors that affect reproductive decision behaviour of young women.

Our results revealed that the proportion of young women who desired at least four children has slightly reduced to 63.2% in 2018 from 64.6% to 2013. Our study found that the age of young woman, place of residence, education level, household wealth status, number of living children, and exposure to mass-media family planning messages were significantly associated with fertility preference of young women. The findings of this study have significant implications for the design and sharping of fertility policies and programmes to address the country's future course of fertility. Conversely, the study has revealed that family size, employment status, age at first marriage, age at first sex, contraceptive use, and community health worker visits in the last 12 months before the survey did not affect desired family size among young women.

Our findings, which reveal a strong preference for many children among young women, are consistent with previous research (Atake & Gnakou Ali, 2019; Phiri, et al., 2020, 2022). This means that, despite the challenges presented by the harsh

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economic situation in developing countries, the big family size norm may not fade among the younger generation. However, other than the coming of the national population policy guidelines on the appropriate number of children, little has been done to address the persistent problem of desire for large family sizes among young women in Zambia. However, maternal and child healthcare and the use of family planning have been promoted in reproductive health programmes to prevent undesired pregnancies and their effects (Ministry of Health (MOH), 2017, 2019). The country's education policy has paid little attention to intentional full mainstreaming of sexual and reproductive health education in the country's education system. If this problem of high preference for a large family among young women is not addressed with urgent programmatic interventions, especially in rural areas, the call to reduce fertility will yield futile results.

An increase in the level of education a young woman has achieved was found to be associated with reduced odds of desiring a large family size. This reflects the empirical pattern of the relationship between educational attainment and fertility in most societies (Ajou & Kim, 2016; Bucci and Prettner, 2020; Mapoma, et al., 2018). Young women who have attained secondary education or higher are expected to spend more of their time contributing to the labour force and hence opting for a less number of children. The finding of this study propped up earlier works done in other settings (Akinyemi & Odimegwu, 2021; Ambrosetti, et al., 2019; Molla & Muluneh, 2019). This implies that investing in female education access, especially for those in marginalised areas, will further speed up the reduction of fertility in sub-Saharan Africa.

At the household level, the wealth quintile was a significant determinant of the desired family size among young women in Zambia. As the household wealth quintile increased, the odds of desire for a large family size decreased. A negative relationship between socio-economic indices and family size aspirations has been reported in previous studies (Akinyemi & Odimegwu, 2021; Molla & Muluneh, 2019). It remains a conundrum why persons in poor/poorer households would desire larger family sizes. Furthermore, young women living in rural areas were 41% more likely to desire a large family size compared to their counterparts living in rural areas. These results suggest an urgent need to strengthen women's empowerment programmes targeting marginalised individuals and societies. In addition, our study found that young women who had two or more living children were more likely to desire a large family size than those with no living child.

Mass media has increasingly become a common channel being used worldwide to disseminate family planning and general health information. This is because of the power that media has to reach a wider population. Similar studies conducted earlier in the sub-Saharan context conclude that women who are exposed to family planning messages through radio or newspapers or television are more likely to make positive health decisions since their awareness and knowledge of the benefits of family planning services is enhanced (Muhoza, 2019; Muluneh & Moyehodie, 2021; Namukoko, et al., 2022b; Phiri, et al., 2022; Yeatman, et al., 2013). Our study found that being exposed to mass-media family planning messages among young women reduced the change of desire for a large family size by 18%. This finding supports

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earlier works, which established an association between access to mass-media family planning information and reduced fertility preference.

Differences in fertility preferences were observed according to different individual and household factors. Therefore, increasing access to education for female adolescents and young women and strengthening sexual reproductive programmes and interventions will be key to addressing the problem of high fertility in Zambia. As observed, young women with exposure to mass-media family planning messages were less likely to have the desire for a large family size suggesting that strengthening access to reproductive health information through mass media may go a long way in changing young women's reproductive behaviour. Lower fertility desires were observed among young women who belonged to rich households. This highlights the need to create opportunities that empower households' socioeconomic status to reduce fertility in Zambia further. There is a need to consider strengthening sexual reproductive programmes that are embedded in the early school curriculum and thorough community engagement approaches involving relevant stakeholders, such as civic leaders, traditional leaders, community leaders, and religious institutions.

This study has provided useful findings to inform the strengthening of existing sexual reproductive policies and programming targeting at changing the reproductive behaviour of young women. Designing appropriate interventions to effectively address the problem will require a conducting a comprehensive analysis of both individual and community factors to have a fuller understanding of the drivers of high fertility desire among young women in Zambia.

Strengths and limitations

Because the study comprised a nationally representative sample of Zambian young women, the current analysis of findings can be applied to the entire population of young women in Zambia. A wide range of factors was assessed in this study to strengthen the associations observed. However, because of the cross-sectional nature of the DHS data, causality cannot be implied from this study.

Conclusion

The study has established that the desire for large family size remains a social concern for reducing fertility further in Zambia. This is because the proportion of young women who have a desire for a large family size has been consistently high mainly in rural settings. The study has revealed that the age a young woman, place of residence, education level, household wealth status, and exposure to mass-media family planning messages influence fertility desire of young women in Zambia. Increasing access to education especially for adolescents in rural areas can contribute to changing their prospective reproductive behaviour. For sexual reproductive health programmaing, there is need to incorporate comprehensive sexuality education education into secondary education curriculum to embede the culture of family planning among adolescents while they are in school. Furthemore, community sensitisation, advocacy and campaigns on sexual reproductive health and family planning edu-

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cation should be expanded to target out of school adolescents and young women in marginalised communities like rural areas. Programmatic efforts aimed at further reducing fertility in Zambia should target at changing the future reproductive behaviour of young women. There is a need for further qualitative research in Zambia to have an in-depth understanding of how both individual and community factors may influence young women's fertility desire.

Acknowledgements We appreciate the Zambia Statistics Agency, Ministry of Health, ICF, and other partners involved in the Zambia Demographic and Health Survey program.

Authors' contributions MP and LS developed the concept for this study, extracted DHS data and wrote the methods section. ML and EM performed data analysis. MP wrote the background, interpretation text and discussion. MM and ML performed editorial checks and reviewed the manuscript for intellectual content. All authors read and approved the final version of the manuscript.

Funding No funding was received for this study.
Open access funding provided by University of the Witwatersrand.

Data Availability Data used in our study is publicly available at on the DHS programme website (https://dhsprogram.com/).

Declarations

Conflict of interest The authors declare no competing interests.

Consent for publication Not applicable.

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