

Original Research

Prevalence and Factors Associated with Modern Contraceptive Use among Married Women of Reproductive Age in Tanzania: Evidence from the 2022 Tanzania Demographic and Health SurveyPeter Wangwe¹, Pankras Luoga^{2*}¹Department of Obstetrics and Gynaecology, School of Clinical Medicine, College of Medicine, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania²Department of Development Studies, School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania***Corresponding author:** Pankras Luoga; Email: luoga.pankras1@gmail.com**Abstract**

Introduction: In Tanzania, there is limited evidence on the modern contraceptive use among married women. This study determined the prevalence and factors associated with modern contraceptive use among married women aged 15-49 years.

Methods: This study analyzed secondary data, including a total weighted sample of 9,252 married women from the 2022 Tanzania Demographic and Health Survey (TDHS). A dependent variable was modern contraceptive use, while independent variables were demographic and socio-economic characteristics of married women. Chi-square test and modified Poisson regression were performed. A significance threshold of p-value <0.05 was used.

Results: The prevalence of modern contraceptive use among married women was 31.1% (95% CI: 29.7-32.0). After controlling for other covariates, married women with secondary or higher education (APR=1.24; 95%CI:1.07-1.44), those from the richest households (APR=1.53; 95%CI:1.15-1.59), and those who had 5 or more parity (APR=10.13; 95%CI:5.46-18.76) had a higher prevalence of using modern contraceptives than their counterparts. Married women who were residing in the Southern zone (APR=1.66; 95%CI:1.49-1.85), those who were working (APR=1.23; 95%CI:1.12-1.35), and

those who desired to have more children after two or more years (APR=2.01; 95%CI:1.79-2.27) had a higher prevalence of using modern contraceptives than their counterparts. Equally, married women who resided in rural areas (APR=0.84; 95%CI:0.76-0.93) and those who experienced a terminated pregnancy (APR=0.89; 95%CI:0.80-0.98) had a lower prevalence of modern contraceptive use than their counterparts.

Conclusion: The use of modern contraceptive was low and associated with women's parity, education level, wealth index, working status and fertility preferences. Tailored programmes targeting women to improve their health education are crucial for increasing the use of modern contraceptives.

Keywords: *Women; Modern Contraceptive Use; Tanzania*

Introduction

Reproductive health is the cornerstone of the public health sector since it is critical to people's physical and mental well-being as well as the economic and social development of nations (1,2). To achieve optimal reproductive health, it is essential to address many aspects related to family planning and contraceptive utilization (3). This will contribute to the establishment of a robust reproductive health status for the nation. When individuals exercise their reproductive rights, they are more likely to experience positive outcomes in both reproductive health and socio-economic well-being (1,2,4,5).

The reproductive rights of women in many African societies, such as Tanzania, are sometimes underestimated due to their low socio-economic status (2) and age gap (6), resulting in men typically holding the authority to make decisions (2). This has led to an increase in HIV infection, many unwanted pregnancies and a poor socio-economic lifestyle. A study conducted in 23 sub-Saharan African (SSA) countries reported that only 28.4% of women of reproductive age used modern contraceptives (7). Limited access to family planning options, low maternal education and employment status are among the significant barriers in improving the use of modern contraceptives in SSA countries, including Tanzania (6,7).

Fertility rate in Tanzania stands at 4.8 births per woman (8), with 38% use of any contraceptive methods and 34.3% of modern contraceptives in 2016 (6,9). Moreover, the country is reported to have 45.9% of unintended pregnancies, including 32.5% that are mistimed and 13.4% unwanted pregnancies (9,10), as well as a higher incidence of maternal and neonatal deaths compared to other developing countries, despite ongoing efforts. According to the 2022 TDHS (8), the country had a

maternal mortality rate of 104 per 100,000 live births and a neonatal mortality rate of 24 per 1,000 live births. Therefore, it is imperative to tackle the obstacles related to reproductive health, which can be achieved by implementing effective family planning and contraceptive use measures.

Previous studies conducted in Tanzania on a similar topic were limited to small areas, often reporting findings from only one district or region (11-13). These findings lack national representation statistics on modern contraceptive use; as a result, they can not influence the development of national policies and plans. According to previous studies, there is an increase in fertility and a considerable number of unwanted pregnancies among women of reproductive age, particularly teenagers and young women, as a result of a lack of access to modern contraception (14,15). Moreover, some regions have a low prevalence rate of postpartum contraceptive use, which significantly raises the risk of unintended pregnancies and other reproductive health complications, including mortality, due to the short intervals between pregnancies (12,13). The objective of this study was to investigate the national prevalence and factors associated with the use of modern contraceptives among married women of reproductive age (15-49 years) in Tanzania. This study used a national representative survey, the TDHS of 2022, as the major data source. Addressing the factors that are associated with contraceptive use would help in developing intervention that enhance the use of modern contraceptive methods. This, in turn, will improve both reproductive health and the socio-economic welfare of women in Tanzania.

Theoretical framework

The study design, selection of variables, data analysis, presentation, and discussion of the findings were guided by Andersen's Behavioral Model of Health Services Utilization which was introduced in 1968 (16). The model identifies three main determinants of health service utilization: predisposing factors, enabling factors, and need factors, which collectively influence individuals' access and use of health care services (16,17). This model provides a theoretical framework for understanding access to and use of health services, as well as the factors influencing an individual's decision to seek or access available healthcare services (17,18). First, the model provides the predisposing factors, including age, education level, knowledge of modern contraceptive methods. Second, it includes enabling factors like area of residence, geographical zone and wealth index. Third, the model comprises need factors like history of terminated pregnancy, parity and desire for more children. All these factors are reported to influence the use of modern contraceptives. In Tanzania, all individuals, including married women are encouraged to use modern contraceptives (19). Therefore, this theoretical framework was applied to

gain insights into the factors influencing individuals' decisions regarding the use of modern contraceptive methods.

Materials and methods

Study design and data source

This study used secondary cross-sectional data from the 8th round of the TDHS of 2022. The survey employs a two-stage stratified sampling procedure. The first stage involved stratum, which defined the number of regions required for the survey. The second stage involved the methodical selection of households from each cluster or Enumeration Area (EA), yielding 629 EAs. In each cluster, 26 households were selected. Interviews were conducted with all women aged 15 to 49 who were regular residents or visitors sleeping in the selected households the night before the study. For further details on the methods used in the sampling, population involved, and other procedures used in the survey, please consult the final report of the Tanzania Demographic Health Survey (TDHS) (8). The unit of analysis in the current study is the married woman.

Study population and sample size

The analysis involved only women who were married, aged 15-49 years, obtained from the women's individual file (IR). The study included a total weighted sample of 9,252 married women who were aged 15-49 years at the time of the survey.

Variables

Independent variables

Independent variables included women's characteristics, including age (15-24, 25-35 and 36-49 years), education level (no formal education, primary education, secondary or higher), area of residence (urban and rural), geographical zones (Lake zone, Northern zone, Central zone, Southern zone, Coast zone), wealth quintile (poorest, poorer, middle, richer, richest), working status (yes, no), parity (no birth, 1-4, 5+), desire for more children (wants within 2 years, wants after 2+ years, unsure/undecided, wants no more/infecund/sterilized) and ever had a terminated pregnancy (yes, no). The variables were selected based on literature on a similar topic (11,20-26).

Dependent variable

Dependent variable was the use of the modern contraceptive, which was dichotomized into yes or no responses. In the analysis, all women with missing values on the dependent variable of interest were dropped from the analysis.

Statistical analysis

Data were analyzed using STATA version 18 software. Univariate, binary with Chi-square and multivariable analysis models were used to find the association and the prevalence ratios of using modern contraceptives based on selected independent variables entered in the models. The Chi-square test was used to examine the association between categorical independent variables and the dependent variable. Variables with a p-value < 0.25 in the binary analysis were tested for multicollinearity and included in the multivariable models. Since the dependent variable was not rare (31%), a modified Poisson regression model was used in the multivariable analysis to estimate the magnitude of association between the independent and dependent variables while controlling for other variables. The adjusted prevalence ratio (APR) was used to assess the association, with a p-value < 0.05 considered statistically significant, and the 95% Confidence Interval (CI) used as a measure of the strength of the association.

Ethical considerations

The study analyzed the collected data from TDHS, which had already obtained ethical clearance from the Tanzanian National Bureau of Statistics (NBS) for data collection; hence, this study did not need another ethical clearance. However, permission to use the data was obtained from the DHS programme after submission of the concept note.

Results***Socio-demographic characteristics of the study participants***

The study involved 9,252 female respondents. Most of the respondents 3,792 (41.0%) were aged 25-34 years. More than half 5,399 (58.4%) had primary education, with a few having informal education 1,887 (16.1%). More than half 6,358 (68.7%) of the respondents were residing in rural areas. Nearly half were from the richest wealth quartile 1,961 (21.2%). Most of the respondents (65.1%) had 1-4 parity, and about 63.5% were employed. In addition, the overall prevalence of

modern contraceptive use among married women aged 15-49 years was 31.1% (95%CI: 29.7-32.0) as detailed in Table 1.

Table 1: Socio-demographic characteristics of married women aged 15-49 years (N=9,252)

Variable	Number	Percent
Age (Years)		
15-24	2,179	23.5
25-35	3,791	41.0
36-49	3,282	35.5
Education level		
No formal education	1,887	20.4
Primary education	5,399	58.3
Secondary or higher	1,966	21.3
Place of residence		
Urban	2,894	31.3
Rural	6,358	68.7
Wealth index		
Poorest	1,714	18.5
Poorer	1,779	19.2
Middle	1,881	20.3
Richer	1,918	20.7
Richest	1,960	21.3
Parity		
No birth	604	6.5
1- 4	6,021	65.1
5+	2,627	28.4
Geographical zones		
Lake zones	3,582	38.8
Northern zone	1,058	11.4
Central zone	948	10.2
Southern	1,857	20.1
Coast zone	1,807	19.5
Respondent currently working		
No	3,380	36.5
Yes	5,872	63.5
Desire for more children		
Wants within 2 years	2,234	24.1
Wants after 2+ years	3,261	35.3
Unsure/Undecided	1,409	15.2
Wants no more/infecund/sterilized	2,348	25.4
Ever had a terminated pregnancy		
No	7,600	82.1
Yes	1,652	17.9
Use of modern contraceptive		

No	6,375	68.9
Yes	2,877	31.1

Prevalence and factors associated with modern contraceptive use among married women in Tanzania

All included variables were associated with the use of modern contraceptives among married women. The high use of modern contraceptive was observed among women aged 25-35 years (34.6%), women with secondary or higher education (34.5%), and all women who wanted more children within 2 years (16.7%) (Table 2).

Table 2: Factors associated with modern contraceptive use among married women in Tanzania

Variable	N	Frequency n (%)	95%CI	χ^2	P-value
Age (Years)				48.70	<0.001
15-24	2,179	567 (26.0)	(23.4-28.8)		
25-35	3,791	1,313 (34.6)	(32.4-37.0)		
36-49	3282	997 (30.4)	(28.4-32.4)		
Education level				83.15	<0.001
No formal education	1,887	424 (22.5)	(19.7-25.5)		
Primary education	5,399	1,775 (32.9)	(31.0-34.8)		
Secondary or higher	1,966	678 (34.5)	(31.8-37.3)		
Place of residence				31.38	<0.001
Urban	2,894	1,016 (35.1)	(32.7-37.6)		
Rural	6,358	1,860 (29.3)	(27.3-31.3)		
Wealth index				70.98	<0.001
Poorest	1714	405 (23.7)	(20.5-27.2)		
Poorer	1779	512 (28.8)	(25.8-32.0)		
Middle	1881	635 (33.8)	(30.9-36.7)		
Richer	1918	661 (34.5)	(32.0-37.0)		
Richest	1960	662 (33.8)	(30.7-37.1)		
Parity				251.53	<0.001
No birth	604	15 (2.5)	(1.3-4.5)		
1-4	6021	2,046 (34.0)	(32.2-35.8)		
5+	2627	817 (31.1)	(28.8-33.5)		
Geographical zones				158.38	<0.001
Lake zones	3582	892 (24.9)	(22.4-27.6)		
Northern zone	1058	337 (31.9)	(25.3-39.2)		
Central zone	948	289 (30.5)	(26.6-34.7)		
Southern	1857	770 (41.5)	(38.8-44.3)		
Coast zone	1807	587 (32.5)	(29.3-35.9)		
Respondent currently working				73.67	<0.001
No	3380	866 (25.6)	(23.1-28.3)		

Yes	5872	2,011 (34.3)	(32.5-36.1)		
Desire for more children				314.99	<0.001
Wants within 2 years	2234	374 (16.7)	(15.0-18.6)		
Wants after 2+ years	3261	1,242 (38.1)	(35.6-40.7)		
Unsure/Undecided	1409	415 (29.5)	(26.2-33.0)		
Wants no more	2348	845 (36.0)	(33.5-38.6)		
/infecund/sterilized					
Ever had a terminated pregnancy				10.78	0.007
No	7,600	2,419 (31.8)	(30.2-33.6)		
Yes	1,652	457 (27.7)	(25.0-30.5)		

Factors associated with modern contraceptive use

After controlling for other covariates, married women with secondary or higher education had a 1.24 times higher prevalence of modern contraceptive use (APR=1.24; 95%CI:1.07-1.44) compared to those with no formal education. Married women from richer households had 1.53 times higher prevalence of modern contraceptive use (APR=1.53; 95%CI:1.15-1.59) than those from the poorest households. Married women who desired to have more children after two or more years had 2.01 times higher prevalence of modern contraceptive use (APR= 2.01; 95%CI:1.79-2.27) than those who wanted more children within two years. Equally, married women residing in rural areas had (APR=0.84; 95%CI:0.76-0.93) lower prevalence of modern contraceptive use compared to those residing in urban areas, as shown in Table 3.

Table 3: Factors associated with modern contraceptive use among married women

Variable	CPR (CI)	p-value	APR (CI)	p-value
Age (Years)				
15-24	1		1	
25-35	1.33 (1.20-1.48)	<0.001	1.09 (0.98-1.21)	0.115
36-49	1.17 (1.04-1.31)	0.010	0.92 (0.81-1.05)	0.222
Educational attainment				
No formal education	1		1	
Primary education	1.46 (1.28-1.67)	<0.001	1.26 (1.12-1.42)	<0.001
Secondary or higher	1.54 (1.32-1.78)	<0.001	1.24 (1.07-1.44)	0.05
Place of residence				
Urban	1		1	
Rural	0.83 (0.76-0.92)	<0.001	0.84 (0.76-0.93)	0.001
Wealth index				
Poorest	1		1	
Poorer	1.22 (1.03-1.43)	<0.018	1.17 (1.01-1.37)	0.033
Middle	1.43 (1.21-1.68)	<0.001	1.34 (1.15-1.55)	<0.001
Richer	1.46 (1.24-1.71)	<0.001	1.34 (1.16-1.55)	<0.001

Richest	1.43 (1.20-1.69)	<0.001	1.53 (1.15-1.59)	<0.001
Parity				
No birth	1		1	
1-4	13.81 (7.48-25.52)	<0.001	9.95 (5.41-18.28)	<0.001
5+	12.64 (6.81-23.46)	<0.001	10.13 (5.46-18.76)	<0.001
Geographical zones				
Lake zones	1		1	
Northern zone	1.28 (1.01-1.63)	0.046	1.18 (0.98-1.43)	0.080
Central zone	1.23 (1.04-1.45)	0.019	1.19 (1.02-1.40)	0.024
Southern zone	1.67 (1.47-1.89)	<0.001	1.66 (1.49-1.85)	<0.001
Coast zone	1.31 (1.13-1.51)	<0.001	1.21 (1.06-1.39)	0.006
Respondent currently working				
No	1		1	
Yes	1.34 (1.20-1.49)	<0.001	1.23 (1.12-1.35)	<0.001
Desire for more children				
Wants within 2 years	1		1	
Wants after 2+ years	2.28 (2.03-2.56)	<0.001	2.01 (1.79-2.27)	<0.001
Unsure/Undecided	1.76 (1.50-2.07)	<0.001	1.46 (1.25-1.71)	<0.001
Wants no more/infecund/sterilized	2.15 (1.90-2.44)	<0.001	1.91 (1.66-2.20)	<0.001
Ever had a terminated pregnancy				
No	1		1	
Yes	1.15 (1.04-1.27)	0.008	0.89 (0.80-0.98)	0.023

APR=Adjusted Prevalence Ratio; CPR=Crude Prevalence Ratio

Discussion

The study determined the prevalence and factors associated with the use of modern contraceptives among married women of reproductive age in Tanzania. The findings showed that the prevalence of modern contraceptive use among married women aged 15-49 years was 31.1%. The observed prevalence is a bit lower compared to the pooled prevalence of 33.8% reported in the nine East African countries (27). This may indicate that Tanzania needs to increase efforts to at least reach the observed regional prevalence.

Specifically, the current study revealed that married women who had secondary or higher education level had a higher prevalence of using modern contraceptives compared to those with no formal education. This finding may suggest that higher level of education among married women are associated with an increased use of modern contraceptives (11,22). Education empowers women to be independent and equips them with the essential information, leading them to make informed decisions about their reproductive health (25). Another study reported that higher levels of education are important in improving modern contraceptive use (21). Similar findings have been reported on the role

of education in improving the use of modern contraceptives (24,28). However, contradictory findings were reported in previous TDHS 2004-2016 (29,30), that increased education was associated with decreased modern contraceptive use. The reason for the observed differences may be due to the influence of higher education on modern contraceptive use, that is education can promote or discourage the use of modern contraceptives.

Furthermore, married women who were working had a higher prevalence of using modern contraceptives than those who were not working. The reason could be the role of income from workplaces in enhancing women's economic empowerment, including the use of modern contraceptives (22,31). The working status plays a meaningful role in women's empowerment through making informed choices on issues related to reproductive and family planning. In contexts like Tanzania, where working opportunities can empower women socially and economically. The finding suggests that improving women's participation in the workforce may indirectly contribute to increased uptake of health services, including contraceptives, and better overall health outcomes. The association between women's working status and modern contraceptive use might indicate that working women have a high chance of using modern contraceptives than their non-working counterparts (31-33). Similar findings were reported in Tanzania (11) and Cambodia (22).

In terms of wealth status, married women who were from richer households had a higher prevalence of modern contraceptive use than those from the poorest households. This may imply that the economic status of a woman may affect the use of modern contraceptives. This finding corroborates the findings reported in studies conducted in East African countries and Ethiopia (27,32). However, a contradictory finding was reported in Bangladesh, where women from the richest households had decreased modern contraceptive use (34). The observed differences could be due to cultural differences between the two study settings.

In this study, married women who had five or more parities had a tenfold higher prevalence of modern contraceptive use than those with no parity. This finding may suggest that having a higher parity is associated with increased use of modern contraceptives (32). On the other side, married women who have zero parity may not use contraceptives as they desire to have children in the near future (35). Similar findings has been reported elsewhere, whereby higher parity is associated with increased use of modern contraceptives (27).

In this study, married women residing in the Southern zone had a higher prevalence of modern contraceptive use compared with those in the Lake zone. These findings may suggest variations in the use of modern contraceptives among regions in Tanzania (29). A study which was conducted in sub-Saharan African countries noted that geographical disparities in contraceptive use are inevitable among married women worldwide (24). The disparities are also associated with other factors such as variations in wealth index, parity, education level and place of residence (22).

Moreover, women who desired to have more children after more than two years had more than twice the prevalence of using modern contraceptives compared to those who wanted a child within the next two years. Similarly, women who were unsure or undecided about having more children also had a significantly higher prevalence of using modern contraceptives than those who wanted a child within the next two years. The finding on women being unsure or undecided about having more children suggests that uncertainty about future childbearing may influence their decisions to use or not to use modern contraceptives. Overall, these findings on women's future fertility intentions suggest that fertility intentions are strongly associated with the use of modern contraceptives, with women who delay, are undecided, or do not desire more children being significantly associated with higher modern contraceptives use (36).

Rural residence was significantly associated with decreased modern contraceptive use. Similar findings are reported elsewhere (11,22,23,27). These findings highlight inequalities in modern contraceptive use among married women in Tanzania, emphasizing the need for targeted interventions addressing rural-urban disparities to improve the use of modern contraceptives and the general reproductive health outcomes among the rural population (23).

Married women who experienced a terminated pregnancy had a lower prevalence of using modern contraceptives than those who had not. This may suggest that married women who experienced a terminated pregnancy may still avoid using modern contraceptive to get another pregnancy (37). Similar findings have been reported elsewhere (27,37). However, contradictory findings were reported in Angola and East African countries, whereby women who experienced abortion had an increased use of modern contraceptives (27,38-40). The observed contradiction may reflect differences in intentions of women about conceiving soon after a terminated pregnancy as observed in the current study compared to the women in Angola and other East African countries (38-41).

The findings from this study align with Andersen's Model of Healthcare Services use (16,17) by emphasizing the association between the factors, like education level and modern contraceptive use. Moreover, rural residence, geographical zone and wealth index were the factors that hindered or facilitated married women in the use of modern contraceptives. Also, the findings relate to the model by reporting the association like history of terminated pregnancy, parity and desire for more children on modern contraceptive use among married women.

These findings have important policy implications for Tanzania, particularly in strengthening modern contraceptive programmes. The increased modern contraceptive use among married women who wish to have children after two or more years or delay or stop childbearing suggests that policies should focus on increasing use of a wide range of modern contraceptive methods with Tanzania's National Family Planning Costed Implementation Plan 2019-2023 (42), the rural-urban disparities in the use of modern contraceptive support scaling up efforts to increase modern contraceptives in rural areas to reach women with unmet needs, ultimately contributing to improved maternal health outcomes.

Study limitations

The study did not include some of the important variables like breastfeeding information and religion, which are reported to influence modern contraceptive use (31). In addition, conducting a qualitative study is crucial to explore reasons from the perspectives of married women themselves and provide in-depth information on aspects that cannot be captured using DHS data, such as how these factors influence married women's decisions not to use modern contraceptives.

Conclusions

This study found that the prevalence of modern contraceptive use among married women of reproductive age is suboptimal. Higher education, higher parity, residing in the Southern zone, working and married women who belong to the richest households were associated with higher contraceptive use. Additionally, rural areas and having a history of terminated pregnancy were linked with lower contraceptive use. This highlights persistent inequalities in the modern contraceptive use among married women. The findings emphasize the need for targeted, regionally tailored interventions, including campaigns to promote the use of modern contraceptives in regions and geographical zones with low use.

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Authors' contribution

PW - conceptualization of the study, data curation, interpretation of the findings and writing and reviewing all versions of the manuscripts, PL - conceptualizing the idea for the study, technical assistance in the data analysis, writing a first draft of the manuscript, reviewing and editing the final manuscript. All authors reviewed and approved the final manuscript.

Availability of data and materials

The data used in the analysis are available online and can be requested from the DHS custodian (<https://dhsprogram.com/Data/>).

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