ORIGINAL RESEARCH ARTICLE

Exploring the impact of maternal marital status on child health: insights from the 2022 Tanzanian Demographic and Health Survey

DOI: 10.29063/ajrh2024/v28i7.10

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Abstract

The SDG 2.2 targets the end of all forms of malnutrition by 2030. Despite the efforts by the Tanzania government to attain this goal, over 30 percent of children under-five are stunted. This study explored the relationship between maternal marital status and child health outcomes in Tanzania using the Tanzania Demographic and Health Survey data set of 2022. A multiple logistic regression was conducted with the binary outcome variable "Stunted," using predictors such as the mother's age and education level, the child's birth size, birth order, and gender, as well as other household characteristics. The study findings highlight a significant association between maternal marital status and child stuntedness. The mothers in a marriage relationship are 30% less likely to have stunted children (OR=0.70, 95%CI, 0.56-0.86) compared to the mothers outside the marriage relationship. Mothers with primary and secondary education or higher, show a lower likelihood of having stunted children (OR=0.90, 95%CI 0.70-1.17) and (OR=0.68, 95%CI 0.44- 1.03) respectively compared to their uneducated counterparts. In other words, a mother being married or educated reduces the odds of her children being stunted. The probability of child stuntedness reduces as the wealth quintile of the household increases. This study contributes to the understanding of the factors influencing child health outcomes in Tanzania especially the role of marriage. *(Afr J Reprod Health 2024; 28 [7]: 91-101)*

Keywords: Marital status; malnutrition; stuntedness

Résumé

L'ODD 2.2 vise à mettre fin à toutes les formes de malnutrition d'ici 2030. Malgré les efforts du gouvernement tanzanien pour atteindre cet objectif, plus de 30 % des enfants de moins de cinq ans sont atteints de retard de croissance. Cette étude explore la relation entre le statut matrimonial des mères et les résultats de santé des enfants en Tanzanie en utilisant l'ensemble de données de l'Enquête Démographique et de Santé de Tanzanie de 2022. Une régression logistique multiple a été réalisée avec la variable de résultat binaire "retard de croissance", en utilisant des prédicteurs tels que l'âge et le niveau d'éducation de la mère, la taille à la naissance de l'enfant, l'ordre de naissance, le sexe, ainsi que d'autres caractéristiques du ménage. Les résultats de l'étude mettent en lumière une association significative entre le statut matrimonial des mères et le retard de croissance des enfants. Les mères mariées sont 30 % moins susceptibles d'avoir des enfants atteints de retard de croissance (OR = 0,70, IC à 95 %, 0,56-0,86) par rapport aux mères vivant hors d'une relation matrimoniale. Les mères ayant suivi des études primaires et secondaires ou supérieures présentent une probabilité moindre d'avoir des enfants atteints de retard de croissance (OR = 0,90, IC à 95 %, 0,70-1,17) et (OR = 0,68, IC à 95 %, 0,44-1,03) respectivement, par rapport à leurs homologues non éduquées. En d'autres termes, le fait que la mère soit mariée ou éduquée réduit les chances que ses enfants soient atteints de retard de croissance. La probabilité de retard de croissance infantile diminue à mesure que le quintile de richesse du ménage augmente. Cette étude contribue à la compréhension des facteurs influençant les résultats de santé des enfants en Tanzanie, en particulier le rôle du mariage. *(Afr J Reprod Health 2024; 28 [7]: 91-101).*

Mots-clés: Statut matrimonial, malnutrition, retard de croissance

Introduction

There is a noticeable trend in the increase of unmarried mothers globally[10,20,9,16]. Sub Saharan Africa (SSA) is no exception[31]. Up to a quarter of all children, globally live in single-parent households[18]. In the US, mothers who give birth before the age of 18 tend to be unmarried[6,22,9,21,5]. The trend of unmarried motherhood witnessed in the US is not very different from other high-income countries where production outside the wedlock is on the increase[10]. Single parents tend to be strained economically[3] and thus unable to provide better health care facilities for the children. According to one study[25], 49% of children in single parent families in England in the year 2018 lived in poverty

compared to 25% of children in coupled families. This is explained by the high probability of single parents working in low paying jobs[4]. Single motherhood in SSA is fuelled by widowhood, divorce and unmarried motherhood[31]. Divorce and separation in marriage is a pointer of poor-quality relationship in marriage, which when happens, tend to adversely affect the child health outcomes[29].

In Tanzania, parental separation is on the increase[19]. Divorce strains the divorced couples through the loss of support enjoyed by the couple living together and the associated social networks that may be lost due to the separation[19]. Single mothers are at a greater risk of adverse birth outcomes[26]. As family structures change, it is important for us to understand how this is affecting the child health outcomes. The literature surveyed on child health outcomes mostly study the three-child anthropometrics namely; height-for-age (stunting); weight for height (wasting) and weight for age (underweight)[14]. In SSA[6] countries, nearly 40 percent of pre-school children are stunted. In Tanzania, 34 percent of children under-five are stunted, 14 percent are underweight, and 5 percent are wasted[15]. The SDG 2.2 targets the end of all forms of malnutrition by 2030 and adverse child health outcomes stand in the way of the attainment of this goal.

Marital status refers to the state of being married, widowed, divorced, separated, cohabiting or single. The married tend to enjoy better health compared to the unmarried with better positive effects on the health outcomes of the child. The married are less likely to suffer from emotional disturbances and psychological distress compared to the unmarried. Marital status is associated with human health and longevity with married adults tending to have a high life expectancy than their non-married counterparts[16]. Research studies indicate that children who stay with both parents are less depressed compared to children living with a single parent[10,14,3,15].

The theories of family structure posit that children living with their stably married, biological parents generally report the highest levels of child well-being. This is attributed to the various forms of emotional, psychological, economic and social support among others enjoyed by people in stable family relationships[2,16]. Married couples invest significant amounts of time and money together, especially when it comes to their children. According to another study[29], families that stay together tend to devote more resources to their children than non-resident parents do. This is because non-resident parents tend to spread thin their resources across multiple familial responsibilities.

In most societies, marriage was highly valued and associated with better socioeconomic, health and child outcomes[10,5] especially where the marriage is for adults above age 18. When women marry at an early age, they tend to have high fertility and the likely adverse effects on child health outcomes[Error! Reference source not found.]. The adverse effects of early marriage on child health outcomes are supported here[10]. Multiple studies have concluded that children who grow up with continuously married parents have better outcomes than children who grow up with single parents or children whose parents separate during childhood[14,3,15,7,26].

Mothers in marriage tend to make better use of health facilities, better access to employment opportunities[15] and benefit from the support of their husbands[2,16]. Since child upbringing is the joint responsibility of the two parents, we posit that being in marriage is predictive of positive child health outcomes. The death of a parent, often referred to as the death shock[15] tends to result into negative child health outcomes[12]. The probability of a child being stunted increases with the loss of a breadwinner[15].

According to a study on cohabiting[23], even children from cohabiting relationships tend to post better health outcomes than the unmarried. It is in the same line that polygamous relationships prevalent on the African continent including Tanzania[17,4] may post positive childhealth outcomes. The argument is that polygamy enables long child spacing with the associated better health outcomes[17]. Cohabiting relationships however are prone to yielding lesser child health outcomes in relation to the married. This may be because people in cohabiting relatioships tend to experience lower levels of relational and financial commitnent[29]. Yet

marraiage enables resource sharing and mutual investment[16]. The lack of support in a relationship is linked with adverse effects on the child health[29].

Meanwhile, a recent study[10] examined the joint associations of marriage and adolescent maternal age group (<18, 18–19, and 20–24 years) with reproductive, maternal, and infant health indicators in the United States (US). The study finds that marriage among mothers under the age of 18 is linked to both positive and negative reproductive, maternal, and infant health outcomes. The study context was a high-income country-USA. Another study from USA[29] explored how marital quality (happiness, communication, and conflict) affect the well-being of a childhood to adolescence. Poor marital quality was found to have adverse effects on the child's health. All these studies were conducted in the context of the developed countries and no study particularly handled the context of marital status on child health outcomes in a developing country. This is the gap the current study attempts to fill.

Researchers[14] also investiaged the factors affecting family planning literacy among women of child bearing age in the rural Lake zone, Tanzania. Household responsibilities and lack of support from male partners were identified as factors negatively affecting the uptake of family planning. Single mothers, in particular, often face inadequate male partner support, which increases their household responsibilities This may negatively effect the health outcomes of a child. The low uptake of family planning services by the rural women compared to the urban women is reported[14]. Other investigations[15] were on the effects of household shocks on the nutrition status of children between 0–59 months in Tanzania using the national panel survey data of Tanzania collected in three waves: 2008/09, 2010/11, and 2012/13. The study findings indicated that shocks in form of weather, death of a family members and increase in food prices increase the probability of a child being stunted and underweight. The study predictor variable was the household shocks[15]. Another related investigation[19] was on the effects of marital divorce on children's well-being in Iringa Municipality. The study's interest was to understand how marital divorce affect the psychological effects of children's well-being. The findings revealed that divorced marriages have negative effects on the children's well-being. Although other researchers[11] support this finding, the study fails short of handling the whole concept of marital status in its various forms that the current study attempts to address.

The common measures of child health outcomes identified in the literature are the anthropometric indicators of nutritional status[15,17]. The common indices that are used in measuring children's health outcomes are weight-for-age Z-score (underweight), height-for-age Z-score (stunted), and weight-for-height Z-score (wasting)[15] . In the literature[7], child stunting is often regarded as the most severe issue among the three anthropometric indicators with a target group of children below 5 years old. In this study, we explore the relationship between maternal marital status and child health outcomes in Tanzania, using stuntedness as a proxy for child health outcomes.

Methods

Data source and study design

This study used the Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS) for 2022 which utilized a thorough sampling approach to generate nationwide estimates, covering urban and rural regions across Tanzania Mainland and Zanzibar[30]. It provided specific indicators, such as contraceptive use, for all 31 regions—26 within Tanzania Mainland and 5 within Zanzibar. Data collection employed a stratified two-stage design. Initially, 629 clusters were selected, each representing an enumeration area (EA) from the 2012 Tanzania Population and Housing Census (PHC). These EAs were chosen with probabilities proportional to their size within sampling strata, resulting in 211 urban and 418 rural clusters. In the second stage, 26 households were systematically selected from each cluster, with an anticipated sample size of 16,354 households[30].

Before the main survey, household listing operations were conducted in all selected EAs. Field staff visited each EA to create location and sketch maps, and list residential households with addresses and household head names. These lists formed the

sampling frame for the second stage. Of the expected 16,354 households, 16,312 households were selected and of these 15,907 households were occupied. Of the occupied households, 15,705 were interviewed, reflecting a 99% response rate. From these households, 15,254 eligible women were interviewed out of 15,699, resulting in a 97% response rate. For eligible men (6,367), 5,763 were interviewed, yielding a 91% response rate. This study analyses 3,071 children from successfully interviewed mothers.

Study setting

The study area is the Republic of Tanzania which has a total area of 945,087 sq. km, including 61,000 sq. km of inland water. The total surface area of Zanzibar is 2,654 sq. km. The 2022 TDHS-MIS data was collected from nine zones eight of which on Tanzania's mainland and on Zanzibar Island. These included: Western zone: Tabora, Kigoma Northern zone: Kilimanjaro, Tanga, Arusha. Central zone: Dodoma, Singida, Manyara. Southern Highlands zone: Iringa, Njombe, Ruvuma. Southern zone: Lindi, Mtwara. Southwest Highlands zone: Mbeya, Rukwa, Katavi, Songwe. Lake zone: Kagera, Mwanza, Geita, Mara, Simiyu, Shinyanga. Eastern zone: Dar es Salaam, Pwani, Morogoro. Zanzibar zone: Kaskazini Unguja, Kusini Unguja, Mjini Magharibi, Kaskazini Pemba, Kusini Pemba[30].

Outcome variable

The outcome variable for this study is Child Health proxied by height-for-age (stunting). Stunting is defined as the proportion of children whose height-for-age falls below two standard deviations (SD) below the median[33,34]. The outcome variable 'stunted' is coded as '1' if a child is stunted, and '0' otherwise. Height-for-age is one of the three child anthropometrics measures: height-for-age (stunting); weight for height (wasting) and weight for age (underweight) recognised by the World Health Organisation (WHO). However, unlike wasting or weight-for-height, stunting demonstrates the long-term cumulative effects of inadequate nutrition[35]. This study therefore focuses on stunting as a proxy for child health. All the variables used in this study (outcome, predictor, and covariates) were generated based on the literature reviewed.

Predictor variables

The study key predictor variable was marital status of the mother coded to produce two responses of married or unmarried. The unmarried category consisted of the divorced, widowed, separated as well as those living together but not married.

Covariates

The covariates comprised of demographics of mothers and children as well as household characteristics.

Wealth

The literature reveals the existence of a positive relationship between household wealth and the well-being of a child[13,8]. Mothers in wealth households have high odds of producing from a health facility and deliver safe childbirth[2,24,28]. The married poor are more likely to have stunted, wasted and underweight children compared to the rich married mothers[3]. Teenage mothers tend to have low socioeconomic status and thus likely to produce underweight children due to poor feeding and lack of adequate prenatal care. This is supported by research findings[15] which indicated that the probability of child stunting increases by 34 percent in response to rises in food prices.

Education

The literature indicates that girls who delay marriage are more likely to attain higher levels of education, attain better jobs and maintain healthier families**Error! Reference source not found.**. Higher levels of education are positively linked to health facility utilization[2]. According to the study on household shocks[15], the likelihood of child stuntedness or underweight reduces with the level of education attainment of the household head. Education empowers and increases the decision-making powers of the mother in the household. Existing literature links this female autonomy with positive child health outcomes[8].

Access to the newspapers

Mothers in wealthy cohorts are more likely to access newspapers[2] and use the information gained to better

the health outcomes of their children than their counterparts.

Data analyses

The data has been analysed using Stata v14. Descriptive statistics were used to summarize and present the data in tables. All results were presented using odds ratios at 95% Confidence Interval (CI).

Ethical approval

This study used a secondary data (TDHS), hence, no further ethical approval was required. The datasets are freely available for download in the public domain with no identifiable information about participants.

Model

Employing a multiple logistic regression, this study examines the binary outcome variable, "Child health." Child health is represented as '1' for children showing stunting or having a height-for-age z-score below negative two standard deviations, and as '0' otherwise. The objective is to estimate the likelihood of stuntedness vis-à-vis good child health. Marital status is investigated as the exposure variable, categorized as "1" for mothers in a marital relationship and "0" for mothers not in a marital relationship. Additional covariates included maternal age, maternal education level, child's birth size, birth order, gender, and household socioeconomic status. The logistic regression model was specified as follows:

$$log\left(\frac{P(y=1)}{1-P(y=1)}\right) = \beta_0 + \beta_1 marital\ status + \beta_n Other\ covariates$$

Where $P(y=1)$ represents the probability that $y=1$ or that the child is stunted.

Stata software is used to analyse the data, reporting odds ratios with 95% confidence intervals. Marital status was interacted with access to newspapers to analyse the combined effect of marriage and maternal awareness on child health. The model's specification is evaluated using the Hosmer-Lemeshow goodness-of-fit test, grouped in 10, wherein the null hypothesis of a satisfactory model fit is upheld based on the F-statistic and associated p-value.

Results

In this section, a descriptive analysis of the percentage of children categorized as stunted or not stunted is presented in Table 1, and the odds ratios are provided in Table 2. During the pre-analysis, a significant relationship could not be established between marital status, weight, and wasting. Consequently, these indicators were excluded from the final analysis, which focused solely on stunting. Stunting exhibited a significant relationship with marital status.

Table I, displays the association of each variable with the outcome variable (stuntedness). It shows the proportion of children who are not stunted and those who are stunted, along with the corresponding chi-square statistic and p-value. For some covariates, descriptive statistics indicate no association with the outcome variable. However, for marital status variable 35% of children with unmarried mothers are likely to be stunted, compared to 27% of children with married mothers. This association is significant 1% level of significance. The wealth index variable shows a significant association with the stuntedness at 10 percent level of significance. The poorest category has the highest proportion of stunted children at 37%, followed by the poorer at 36%, the middle income and the rich both at 30%, and the richest at 14%. This indicates that the probability of a child being stunted decreases with increasing wealth category of the Household.

Children's likelihood of stunting decreases with maternal education: 32% for no education, 31% for primary, and 22% for secondary or higher education. There is also a significant association between sex of the household head and child stuntedness at 1% level of significance. Children in households headed by the male have a higher chance of getting stunted (34%) compared to the children in female-headed households (26%). Similarly, the smaller the size of the child at birth, the higher the likelihood of becoming stunted. Children born very small have a 80% chance of being stunted, those

Table 1: Descriptive statistics

Variable	Not stunted	Stunted	Chi –square	P-value
Current marital status				
Unmarried	0.6479	0.3521		
Married	0.7301	0.2699	14.8276	0.0001
Total	**0.6977**	**0.3023**		
Wealth Index				
Poorest	0.6318	0.3682		
Poorer	0.6390	0.3610		
Middle	0.6999	0.3001		
Richer	0.6956	0.3044	9.3839	0.0000
Richest	0.8558	0.1442		
Total	**0.8863**	**0.1137**		
Highest Education Level				
No education	0.6350	0.3650		
Primary education	0.6902	0.3098	10.6314	0.0000
Secondary education or higher	0.7766	0.2234		
Total	**0.6977**	**0.3023**		
Household Size				
One –three	0.6788	0.3212		
Four –six	0.7071	0.2929		
Seven –ten	0.6875	0.3125	0.4326	0.7205
Above ten	0.7089	0.2911		
Total	**0.6977**	**0.3023**		
Freq of reading newspaper/magazine				
Not at all	0.6920	0.3080		
Less than once a week	0.7350	0.2650		
At least once a week	0.7020	0.2980	0.9032	0.4049
Total	0.6977	0.3023		
Household age				
Young adult	0.6855	0.3145		
Middle adult	0.7018	0.2982	0.7400	0.4760
Old aged	0.7228	0.2772		
Total	0.6977	0.3023		
Sex of household head				
Male	0.6575	0.3425		
Female	0.7394	0.2606	15.0148	0.0001
Total	**0.6977**	**0.3023**		
Birth order number				
1	0.6650	0.3350		
2-3	0.7259	0.2741		
4-5	0.7427	0.2573	6.2055	0.0005
6+	0.6192	0.3808		
Total	**0.6977**	**0.3023**		
Size of child at birth				
Very small	0.1991	0.8009		
Small	0.5997	0.4003		
Average or larger	0.7129	0.2871	9.2417	0.0000
Missing	0.6409	0.3591		
Total	**0.6977**	**0.3023**		
Age in five-year groups				
15-19	0.6955	0.3045		
20-24	0.6718	0.3282		
25-29	0.7305	0.2695		

30-34	0.7202	0.2798	1.4503	0.1934
35-39	0.6572	0.3428		
40-44	0.7116	0.2884		
45-49	0.6526	0.3474		
Total	**0.6977**	**0.3023**		

Note: Sample size is 3,071 children

Table 2: Odds ratios-a logistic regression (stuntedness on marital status)

Variable	OR (95%CI)	Std. Err.
Wealth index		
Poorer	0.99(0.74,1.32)	0.15
Middle	0.73(0.52,1.02)*	0.13
Richer	0.73(0.46,1.17)	0.17
Richest	0.31(0.20,0.47)***	0.07
Mother's education		
Primary	0.90(0.70,1.17)**	0.12
Secondary or higher	0.68(0.44,1.03)*	0.15
Household size		
four-six	1.03(0.74,1.43)	0.17
seven-ten	0.99(0.67,1.47)	0.20
above10	0.89(0.55,1.43)	0.22
Marital status		
Married	0.70(0.56,0.86)***	0.07
Freq. of reading newspaper/magazine		
Less than once a week	1.11(0.70,1.75)	0.26
At least once a week	1.58(0.93,2.68)*	0.43
Freq. of reading newspaper/magazine VS marital status		
Married Vs less than once a week	0.83(0.44,1.56)	0.27
Married Vs at least once a week	0.44(0.19,1.01)**	0.19
Household age		
Middle adult (36-55 years)	0.83(0.63,1.11)	0.12
Old aged (56-95 years)	0.68(0.47,0.99)**	0.13
Sex of household		
Female	0.85(0.66,1.10)	0.11
Birth order		
2-3	0.67(0.49,0.93)**	0.11
4-5	0.52(0.32,0.83)***	0.13
6+	0.79(0.47,1.35)	0.21
Birth size		
Small	0.13(0.03,0.51)***	0.09
Average or larger	0.08(0.02,0.26)***	0.05
Missing	0.09(0.03,0.33)***	0.06
Sex of the child		
Female	0.63(0.51,0.76)***	0.06
Respondent's age		
20-24	1.29(0.91,1.85)	0.24
25-29	1.33(0.87,2.03)	0.29
30-34	1.41(0.89,2.22)	0.33
35-39	1.76(1.00,3.07)**	0.50
40-44	1.46(0.80,2.64)	0.44
45-49	1.62(0.63,4.15)	0.78
_cons	27.93(7.15,109.11)**	19.38

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 and Sample size is 3,071 children

born small have a 40% chance, and those born average or larger-sized have 29% chance.

Table 2 displays the odds ratios from a logistic regression together with the confidence intervals (at 95%) and the standard errors. The results show that the likelihood of the child being stunted reduces as the household's wealth quintile increases. The mothers in the middle quintile show a 27% decrease in the odds of having stunted children (OR=0.73, 95%CI 0.52-1.02) while the mothers in the richest quintile show a 69% decrease (OR=0.31, 95%CI 0.20-0.47). The same trend is true for the poorer and richer quintiles when compared to the poorest quintile though the results for these groups are not significant.

Mothers who have attained some level of education are less likely to have stunted children compared to their counterparts with no education at all. The likelihood of a mother having a stunted child decreases with higher levels of educational attainment. A mother with primary education is 10% less likely to have a stunted child (OR=0.90, 95% CI 0.70-1.17), while a mother with secondary education or higher is 22% less likely (OR=0.68, 95% CI 0.44-1.03) compared to a mother with no education.

The mothers in a marriage relationship are 30% less likely to have stunted children (OR=0.70, 95%CI, 0.56-0.86) compared to the mothers outside the marriage relationship. This impact is highly significant at one percent level of significance indicating a strong influence of marital status on child health outcomes. Married mothers who read newspapers at least once a week are less likely to have stunted children compared to their counterparts-the unmarried, that do not read newspapers at all (OR=0.44, 95% CI 0.19-1.01) with a combined effect/odds of 0.486 (0.70 x 1.58 x 0.44).

The birth order of the child significantly influences the probability of the child being stunted. Birth order 2-3 reduces the probability of being stunted by 33% (OR=0.67, 95% CI 0.49-0.93), while birth order 4-5 reduces the probability of being stunted by 48% (OR = 0.52, 95% CI 0.32 – 0.83). The significance is lost from birth order 6 and above. Similarly, the birth size of the child has significant implications on the child health outcomes. Children who are born small are 87% (OR =0.13, 95% CI 0.03-0.51) less likely to be stunted compared to children who are born very small (reference group). The children born with average size are 92% (OR=0.08, 95% CI 0.02 -0.26) less likely to be stunted compared to the reference group.

The sex of the child plays a significant role in the child health outcomes. The female child is 37% (OR=0.63, 95%CI 0.51-0.76) less likely to get stunted compared to the male counterpart. The findings regarding the respondent's age showed mixed results. The only significant result was observed in the age group 30-35 years, which had a 76% higher likelihood (OR = 1.76, 95% CI 1.00 - 3.07) of having stunted children compared to the age group 15-19 years.

Discussion

This study investigated the impact of marital status on the child health outcomes, specifically examining stuntedness as a proxy for child health. The study findings revealed that marital status has a significant impact on the child health outcomes. The mothers in a marriage relationship are 30% less likely to have stunted children compared to the mothers outside the marriage relationship. These findings are in line with earlier research findings[10,14,3,15] that associate marriage with better child health outcomes. The supporting relationship between partners in marriage[2,16] help to improve the health outcomes of the child. The single parents are more likely to be economically strained [3,16,25,4]. The mothers in marriage not only have the support of their husbands[2,16], but also more likely to access better employment opportunities out of the created social network[19].

The results from the covariates have shown that wealth, education, household age, the birth order of the child; the birth size and sex of the child do influence the child health outcomes. The likelihood of the child being stunted reduces as the wealth quintile of the household increases. This finding is in support of earlier research studies conducted by [13,8]. It also echoes[3] observation that the married women from poorer households have a high probability of producing stunted children.

The education of the mother is important if a country is to bring down the adverse child health outcomes. As the mother attains more education, the

probability of having a stunted child reduces from 10% (primary education) to 22% (secondary education or higher). The literature associates the positive child health outcomes visible with the mother's education to the various transmission mechanisms. The education of the mother delays early marriage, improves utilization of health care facilities[2], empowers the mother[8] and improves her access to better employment opportunities[Error! Reference source not found.].

The birth order of the child influences the probability of the child being stunted. Results indicate that as the number of children increases from 2 to 5, the probability of being stunted significantly decreases (although this significance is lost with six or more children). This reduction could be explained by the increasing parental care experience with more children. The birth size of the child does influence health outcomes. When the mother is economically strained, she may not be able to adequately care for her pregnancy. This situation can lead to the birth of underweight or stunted children. Results have also shown that male children are more likely to be stunted compared to be the female children.

Conclusion and policy implications

This study investigated the impact of marital status on the child health outcomes, specifically examining stuntedness as a proxy for child health. The study utilized the 2022 Tanzania Demographic and Health Survey (TDHS) and sheds light on the implications of marital status on child stuntedness in Tanzania. The findings underscore the need for the government to come up with interventions or policies in support of marriage relationships. Such interventions should promote the institution of marriage and enable of stable families. The poor in marriage need to be supported through income support measures, access to health facilities, reproductive health education and employment. There exists an inverse relationship between wealth, education, and child stuntedness. It is thus recommended that all efforts geared towards the improvement of welfare for family and the general population be strengthened for better child health outcomes. Similarly, interventions that empower the mothers through education such as universal primary and secondary education or higher, need prioritization.

This study relied on the DHS data, which is a secondary data source, hence limiting our detailed analysis of the variables in the data set. Given the cross-sectional designs of the DHS data set, our analysis was limited to only establishing associations between the study variables. The study does not provide insights into change dynamics and the related individual experiences' trajectory. This study also does not dwell into the quality of the marriage relationship, which may have a significant impact on the child health outcomes[29]. The research provides valuable insights for policymakers and healthcare practitioners with interest in improving child health outcomes in Tanzania.

Author contributions

All authors have contributed as a team in having the work in its present state. All authors have read and agreed to submit the manuscript for publication in this journal.

Funding

No external source of funding was received.

Conflict of interest

The authors declare no conflict of interest.

Ethical approval

This study used a secondary data (TDHS), hence, no further ethical approval was required.

Data availability statement

The datasets are freely available for download in the public domain with no identifiable information about participants.

Acknowledgment

The researchers express gratitude to the management of the Demographic Health Surveys for providing

access to the valuable dataset that facilitated the publication of this paper.

References

1. Adedini S and Odimegwu C. Polygynous family system, neighbourhood contexts and under-five mortality in sub-Saharan Africa. Development Southern Africa 2017; 34(6): 704–720.
2. Agaba P, Magadi M, and Orton B. Predictors of health facility childbirth among unmarried and married youth in Uganda . PLoS ONE; 2022; 17(4): 1-14.
3. Amadu I, Seidu A, Duku E, Okyere J, Hagan JE Jr, Hormenu T and Opoku BA. The joint effect of maternal marital status and type of household cooking fuel on child nutritional status in sub-Saharan Africa: Analysis of cross-sectional surveys on children from 31 Countries. Nutrients 2021; 13(1541): 1-16.
4. Arthi V and Fenske J. Polygamy and child mortality: Historical and modern evidence from Nigeria's Igbo. Review of Economics of the Household 2018; 16(1): 97–141.
5. Brown S. Marriage and child well-being: Research and policy perspectives. J Marriage Fam 2010; 72(5): 1059–77.
6. Buckles KS and Price J. Selection and the marriage premium for infant health. Demography 2013; 50(4): 1315–1339.
7. Carlson MJ and BL. What kids get from parents: Packages of parental involvement across complex family forms. Soc Serv Rev 2013; 87: 213–49.
8. Carlson G, Kordas K and Murray-Kolb LE. Associations between women's autonomy and child nutritional status: A review of the literature. Maternal and Child Nutrition 2015; 11(4), 452–482.
9. Cherlin A. Degrees of change: An assessment of the deinstitutionalization of marriage thesis. J Marriage Fam. 2020; *82* (1): 62–80.
10. Fafard AA, Kirby RS and Urquia M L. Reproductive health among married and unmarried mothers aged less than 18, 18–19, and 20–24 years in the United States, 2014–2019: A population-based cross-sectional study. PLoS Medicine 2022*; 19*(3): 1-20.
11. Feng T, Xiyuan J, Lucy P and Xiajun Z. Academic performance and the link depressive symptoms among rural Han and minority Chinese adolescent. Int.J.Environl Res Pub Health 2022; *19*: 60-26.
12. Halmdienst N and Winter-Ebmer R. Long-run relations between childhood shocks and health in late adulthood — Evidence from the survey of health, ageing, and retirement in Europe. CESifo Economic Studies 2014; 60(2) : 402-434.
13. Kafle K, Dean J and Dean J. Do different types of assets have differential effects on child education? Evidence from Tanzania. World Development 2018*;* 109: 14-28.
14. Kassim M and Ndumbaro F. Factors affecting family planning literacy among women of childbearing age in the rural Lake zone, Tanzania. BMC Public Health 2022; 22(646): 1-11.
15. Kauky MS, Martin JC and Razack BL. The effects of household shocks on child nutrition status in Tanzania. Journal of Education, Humanities and Sciences 2021; 10(4): 40–56.
16. Kiran RP, Yang F, Kathleen AC, Smieliauskas F, Meltzer DO and Gregory WR. The impact of marital status on health care utilization among Medicare beneficiaries. Medicine 2019; 98(12): 1-8.
17. Lawson DW and Mhairi AG. Polygynous marriage and child health in sub-Saharan Africa: What is the evidence for harm? Demographic Research 2018; 39(6): 177-200
18. Lut I, Woodman J, Armitage A, Ingram E, Harron K and Hardelid P. Health outcomes, healthcare use and development in children born into or growing up in single-parent households: A systematic review study protocol. BMJ Open 2021: 1-5.
19. Malema AA, Msomba G and Frank P. Effects of marital divorce on children's well-being in Iringa municipality, Tanzania. Asian Research Journal of Arts & Social Sciences 2023; 21(3): 151-162.
20. Martin J. Births: final data for 2019; 2021.
21. Martin J, Hamilton BE, Osterman MJK and Driscoll AK. Births: final data for 2018. Natl Vital Stat Rep 2019; 68(13): 1–47.
22. Martin J, Hamilton BE, Osterman MJK and Driscoll AK. Births: final data for 2019. Natl Vital Stat Rep 2021; 70(2): 1-51.
23. Martinez G and Curtin S. Birth outcomes for unmarried women: Are there differences by cohabitation status? Evidence from the National Survey of Family Growth 2016.
24. Rai R, Singh PK, Singh L and Kumar C. Individual characteristics and use of maternal and child health services by adolescent mothers in Niger. Matern Child Health J 2014; 18: 592–603.
25. Rothwell D and McEwen A. Child poverty and family structure during the Recession in English-speaking Liberal Welfare States. LIS Working papers 665 , LIS Cross-National Data Center in Luxembourg 2018.
26. Shah PS, Zao J and Ali S. Maternal marital status and birth outcomes: A systematic review and meta-analyses. Maternal and Child Health Journal 2011; 15(7): 1097–1109.
27. Shah P, Zao J and Ali S. Maternal marital status and birth outcomes: A systematic review and meta-analyses. Matern Child Health J 2011; 15: 1097–1109.
28. Singh A, Kumar A and Pranjali P. Utilization of maternal healthcare among adolescent mothers in urban India: Evidence from DLHS-3. Peerj 2014; 2(e592).
29. Spencer JL, Nelson DA, Jorgensen-Wells MA, and Calder D. Marital quality over the life course and child well-being from childhood to early adolescence. 22 Development and Psychopathology 2022; 34: 1492–1505.
30. TDHS-MIS. Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS) 2022.

31. Tolefac PN, Njamen TN, Yeika EV, Nkemnji SA, Ntsama Y and Njotang PN. Trends and patterns of family planning methods used among women attending family planning clinic in a rural setting in sub-Sahara Africa: The case of Mbalmayo District Hospital, Cameroon. Research Notes 2018; 11(541): 1-5.
32. Twaweza. (2021/05).
33. Novina N, Hermanussen M, Scheffler C, Pulungan AB, Ismiarto YD, Andriyana Y, Biben V and Setiabudiawan B. Indonesian national growth reference charts better reflect height and weight of children in west java, indonesia, than who child growth standards. JCRPE Journal of Clinical Research in Pediatric Endocrinology, 2020; 12(4), 410–419. [2]
34. De Onis, M. WHO Child Growth Standards: Length/Height-for-Age, Weight-for-Age, Weight-for-Length, Weight-for-Height and Body Mass Index-for-Age; World Health Organization: Geneva, Switzerland, 2006.
35. Ikeda N, Irie Y and Shibuya K. Determinants of reduced child stunting in Cambodia: analysis of pooled data from three Demographic and Health Surveys. Bulletin of the World Health Organization, 2013; 91(5), pp.341–349.