



“The Association between Child Loss, Children’s Paternity and High Parity in Dar Es Salaam, Tanzania”: A Cross Sectional Survey at the National Referral Hospital

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Abstract

Objectives: The study aimed at examining factors that influence the persistence of grand multiparity.

Methods: A cross-sectional study conducted at Muhimbili National referral Hospital in Tanzania inquired about and compared age, socioeconomic status, perception of obstetric risks of grand multiparity, contraceptive knowledge and practice, obstetric history and having children of different paternity, between grand multiparas and lower parity women using Chi-square and student’s *t*-tests.

Results: Fewer grand multiparas than lower parity women had formal education, but awareness of grand multiparity and its adverse outcomes and knowledge of contraception was similar in the two groups. Compared with lower parity women, more grand multiparas had ever used contraceptives, yet more had an unplanned current pregnancy. Grand multiparity was associated with history of abortion, intrauterine fetal death and neonatal death. Higher proportion of grand multiparas than lower parity women had children of different paternity.

Conclusions: Grand multiparity was highly associated history of pregnancy loss and children of different paternity.

Keywords

High parity, Family planning, Contraception, History of pregnancy loss, Children with different paternity, Tanzania

high parity remains common [8-10]. Tanzania Demographic Health Survey (2010) illustrated a rather subtle reduction of Total Fertility Rate (TFR) from 6.3 to 5.4 children per woman in 1995 to 2010 respectively, despite a marked increase in modern contraception prevalence rate from 26% in 1995 to 34% in 2010. In addition, about 33% of married women (from 15-49yrs) were of high parity with mean number of children of women with history of at least one child loss(4 children per woman) being higher than those with all living children (3 children per woman) [10].

The World Health Organization (WHO) has defined good reproductive health as the state of complete physical and social well-being, in all matters related to the reproductive system. In Tanzania, health education on obstetric risk factors and family planning are provided as part of antenatal and postnatal care. Furthermore, data indicated at least 80% of both pregnant women and parturients receive health education either antenatal or post-natal clinic [10]. The health education includes family planning counselling, including education on contraception, and the effects of high parity. However, as high as 16% - 21% of parturients attending antenatal care and delivering in health facilities are grand multiparas [11,12]. Therefore, it was of interest to know factors that influence persistence of high parity despite effort in family planning through contraception. Furthermore, since the RCH guidelines definition of high parity not distinguishing the number of living or deceased offspring, and high perinatal and child mortality rate in Tanzania, evidence of association of history of child loss and contraception practise was important for effective family planning counselling and contraception.

Some African traditions and customs allow plural marriage and child out of wedlock for the sake of male partner’s preference of a biological child [13], thus pre-empting a parallel argument that the same traditional and customary attitude might oblige remarried women to endure child birth for the sake of a biological child to subsequent husbands, regardless of her parity. Furthermore, previous studies have also observed women disempowerment and male couples’ control in matters related to contraception, number of children and mode of delivery [13-17]. Limited published evidence

Introduction

High parity has been associated with socio-economic problems including poverty, women disempowerment and inability to access contraception [1]. In obstetrics, high parity has proven to be a marker of poor pregnancy outcomes [2-4]. Reproductive and Child Health (RCH) guidelines of the Tanzania Ministry of Health and Social Welfare (MoHSW) defines high parity as parity of more or equal to five. This definition was because of the fact that at this parity, risks for obstetric complications, neonatal morbidity and perinatal death increase markedly [5-7]. In developing countries such as Tanzania;

[13] that linked use of contraception in special groups such as women with history of pregnancy loss and those having children of different paternity, to high parity. Therefore, our research aimed at examining factors associated with persistence of high parity despite the efforts dedicated to provision of health education on adverse effects of high parity and emphasis of family planning through contraception. We compared (a) knowledge of the definition of grand multiparity and awareness of its adverse outcomes, (b) awareness and practice of family planning through contraception and (c) the prevalence of past obstetric history and children paternity on high parity; between the grand multiparas and lower parity women.

Methods

Setting

This was a cross sectional study conducted at MNH, a tertiary hospital and university teaching hospital for Muhimbili University of Health and Allied Sciences (MUHAS) in Dar es Salaam. The majority of women delivering at MNH come as self-referrals (60%) without elevated risk factors. Others were referred from public and private hospitals in Dar es Salaam. A few women come from the nearby Coastal region. MNH handles about 8,000-9,000 deliveries each year, with the largest number of women giving birth being primigravida (40%-50% of deliveries). Majority of low parity multiparas include parturients in their second delivery (20%-24%), followed by those in their third (8%-12%) and fourth (6%-7%) deliveries. Grand multiparas constitute 16%-17% of parturients of majority are in the fifth delivery (10%-12%) followed by those in sixth (5%) and equal or more than seventh delivery ($\leq 2\%$) (MNH obstetric database, unpublished report). Women attending the ANC and/or delivering at MNH undergo family planning and contraception counselling during antenatal clinic visits and/or after delivery. During the time in the ward before discharge, a mother and childcare (MCH) nurse conducts health education on puerperal care, childcare and family planning. Post vaginal delivery mini lap tubal ligation and IUCD is also provided free of charge under hospital exemption policy. An antenatal and post-delivery health education is provided in all MCH clinics and other maternity hospitals countrywide as part of RCH guidelines of MoHSW that also include provision of contraceptives free of charge.

Study population and sampling

All multiparas women who delivered at a gestational age greater than or equal to 28 weeks during the study period (1 July-31 Dec 2007) were assessed for eligibility to join the study. Women who delivered during the study were identified after delivery from the delivery registry and report books in the labour and postnatal wards. Multiparas who were not able to consent because of severe illness were excluded from the study. Through convenient sampling, all eligible women were recruited subsequently after delivery until the desired sample size was reached. The sample size was calculated using EpiInfo™, Version 6 software program. For the calculation, the power of the study ($1-\beta$) was set to 80%, and the level of significance was set to 5%. The risk ratio was set to 3.0, and the odds ratio to 3.13. With these parameters, the minimum required sample size was 1025 (265 grand multiparas and 760 lower parity women).

Data collection

Data was collected over a period of 6 months (1 July-31 Dec 2007), by two adequately trained research assistants. The principal investigator and research assistants collected data as recruitment proceeded. Clinical notes, partograms, ANC cards and interviews were used to extract information according to the variables of interest laid down by the standard questionnaire. The variables of interest were age, parity, marital status, level of formal education, socioeconomic status, perception of risks associated with grand multiparity, knowledge and use of contraception, history of previous pregnancy paternity and history of pregnancy loss (including history of neonatal death, intrauterine fetal death and abortion/miscarriage). Pre testing of the questionnaire assessed flow of inquiry and comprehensiveness

of variables of interest, as well as evaluated the consistency of the measurability of participants' responses. For the purpose of this study, socioeconomic status was assessed using the wealth index method as used in 2004-2005 Tanzania Demographic and Health Survey. The wealth index is calculated using data on household ownership of or access to selected assets (e.g. car, dependable business, television set, radio, materials used for housing construction, type of water access, sanitation facilities). More details of the application of the wealth index is as shown in Table S1 and Table S2.

Data analysis

Data entry and cleaning was done using EpiInfo™, Version 6, and then transferred to SPSS, Version 13.0 (SPSS Inc., Chicago, IL, USA) for statistical analysis. Data cleaning involved amendment of information that was incomplete or suspected to be incorrect by re-checking the case notes; ANC card and ward report logs. Typographic errors and duplicated information was removed. All of the questionnaires were included in the analysis. Chi-square tests and Student's *t*-tests were used to analyse and compare associations in the studied groups for categorical variables and continuous variables, respectively. Statistical significance was set at *p*-value < 0.05 .

Ethical issues and clearance

The study procedures were granted ethical clearance by the MUHAS Research and Publication Committee on June 2007, (Ref. No MU/DPG/AEC/MUHAS/..) Written informed consent was requested and obtained, from all participants. Participants consented for voluntary interview and use of their medical data. Confidentiality was also assured.

Results

In total, 1025 multiparas were recruited into the study out of 3494 deliveries in the period of study. The sample included 265 grand multiparas (parity ≥ 5) and 760 lower parity women (parity of 2-4). The mean age of the women in the study was 29.75 ± 5.76 . For grand multiparas, the mean age was 35.15 ± 4.8 , and the mean age for other multiparas was 27.86 ± 4.8 . ($p = 0.001$) (Table 1).

When examining demographic and socioeconomic characteristics by parity (Table 2), more than 70% of the women in the sample were married, and there was no statistically significant difference between

Table 1: Distribution of age by parity.

Age	Grand multiparas n = 265 (%)	Multiparas n = 760 (%)	Total N = 1025 (%)	p-value
Mean (years)	35.15 \pm 4.8	27.86 \pm 4.8	29.75 \pm 5.76	0.001
< 25	3 (1.1)	183 (24.1)	186 (18.1)	
25-29	34 (12.8)	309 (40.7)	343 (33.5)	
30-34	71 (26.8)	186 (24.5)	257 (25.1)	
> 35	157 (59.3)	82 (10.8)	239 (23.3)	

Table 2: Demographic and socioeconomic characteristics by parity.

Variable	Grand multiparas n = 265 (%)	Multiparas n = 760 (%)	Total N = 1025 (%)	p-value
Marital status				
Not married	8 (3.0)	56 (7.4)	64 (6.2)	
Married	214 (80.8)	577 (75.9)	791 (77.1)	0.070
Divorced	5 (1.9)	10 (1.3)	15 (1.5)	
Cohabiting	38 (14.3)	117 (15.4)	155 (15.1)	
Level of education				
No formal education	47 (17.7)	90 (11.8)	137 (13.4)	
Primary school	188 (71.0)	549 (72.2)	737 (71.9)	0.09
Secondary school and above	30 (11.2)	121 (18.4)	151 (14.7)	
Socioeconomic status				
Low	76 (28.7)	268 (35.3)	344 (33.6)	
Medium	82 (31.5)	244 (32.1)	325 (31.7)	0.049
High	108 (40.8)	248 (32.6)	356 (34.7)	
Regular financial income	163 (61.5)	414 (54.5)	28 (56.1)	0.047

the two parity groups in marital status categories ($p = 0.07$). The grand multiparous women were less educated, with 17.7% having no formal education, compared with 11.8% of the lower parity group ($p = 0.09$). The majority of women in the study (89%) had at least a primary school education. Grand multiparas had better socioeconomic status than lower parity women ($p = 0.049$). Moving from low to high socioeconomic status, we noted a consistent increase in the percentage of grand multiparas in each category. Conversely, there was also a consistent decrease in the percentage of lower parity women in each category as socio economic status increased. Furthermore, a higher proportion of grand multiparous women (61.5%) than lower parity women (54.5%) had a regular income ($p = 0.047$).

Table 3 shows the results of the comparison of grand multiparas and lower parity women in terms of awareness of grand multiparity and contraception and practice of family planning. This comparison revealed no statistically significant difference in awareness of the risks of grand multiparity or of the definition of grand multiparity. Overall, 28.7% of women knew that grand multiparity is associated with adverse pregnancy outcomes, but only 16.5% understood the definition of grand multiparity ($p = 0.60$). Of all the women in the study, 97% knew at least one contraceptive method, and 6% knew of emergency contraception. Significantly more grand multiparas (69.4%) than lower parity women (58.7%) had ever used contraceptives ($p = 0.002$). Significantly fewer grand multiparas women (32.5%) than women with lower parity (55.4%) planned for their recent pregnancy ($p = 0.001$).

History of spontaneous and induced abortions/miscarriages were significantly higher in grand multiparas (26.0%) compared with women with lower parity (16.2%), and crude rates of history of stillbirth were significantly higher for grand multiparas (21.1%, $p < 0.001$) than for lower parity women (7.4%, $p < 0.001$). Similarly, history of previous neonatal death was significantly more common in the grand multiparas (27.2%) than in the lower parity group (4.9%, $p < 0.001$). Having children with different paternity was also more common among grand multiparas (26%) than among women with lower parity (12.6%, $p < 0.001$) (Table 4).

Discussion

Grand multiparity was highly associated with history of pregnancy loss and children of different paternity. Despite higher prevalence of lack of formal education among grand multiparas,

Table 3: Awareness of definition and risks of grandmultiparity and contraception and family planning practice by parity.

Variable	Grand multiparas n = 265 (%)	Multiparas n = 760 (%)	Total N=1025 (%)	P-value
Perception of :				
Definition of GM	15.5	16.8	16.5	0.60
Adverse outcome of GM	27.5	29.1	28.7	0.63
Knowledge on:				
Contraception	95.1	97.4	96.6	0.12
Emergency contraception	4.9	6.6	6.1	0.30
Practise on:				
Modern contraceptive use	69.4	58.7	61.5	0.002
Planned current Pregnancy	32.5	55.4	45.9	0.001

Table 4: History of previous pregnancy loss and pregnancy with different paternity by parity.

Variables	Grand multiparas n = 265 (%)	Multiparas n = 760 (%)	Total N = 1025 (%)	p-value
Previous abortion/miscarriage	69 (26.0)	123 (16.2)	192 (18.7)	<0.001
Previous intrauterine fetal death	56 (21.1)	57 (7.5)	113 (11.0)	<0.001
Previous neonatal death	72 (27.2)	37 (4.9)	109 (10.6)	<0.001
Children of different paternity	69 (26.0)	96 (12.6)	165 (16.0)	<0.001

knowledge of high parity and its obstetric risks, and contraception was comparable between the studied groups. Thus, lack of formal education did not significantly influence awareness of high parity and its obstetric risks, and contraception. This suggested a deficiency of health education in formal education curriculum, and for the same reason, health workers as community members, might as well conform to perception of the community regarding high parity and contraception. Furthermore, health education provided in health facilities might not have reached the majority of women, due to either infrequent reproductive education sessions or poor attendance at the antenatal and family planning clinic. Mbaruku [18] observed lack of awareness of the definition and risks of high parity among as many as 60% of health workers in rural Tanzania. More importantly, Mbaruku also found that women who delivered more than one child had increasingly increased risk of complication to the mother and child hence detrimental to the future of the country. Concurrent with our study, more than 70% of women in both parity groups did not recognise grand multiparity as an obstetric risk factor, and more than 80% did not know that it was riskier to deliver after the 4th child than the 2nd and 3rd child.

Higher prevalence of contraceptive ever use among grand multiparas did not reflect adherence to contraception practise or reliability of the contraceptive method, as grand multiparity were also associated with high prevalence of unplanned pregnancy. Thus, the findings provided a baseline for further analysis of high parity beyond use and knowledge of contraception. Furthermore these findings suggested more emphasis in appropriate choice of contraception, adequate adherence counselling, and ceasing opportunities of access to reliable contraception especially post-partum long term contraception such as post-delivery insertion of intrauterine devices and bilateral tubal ligation, as recommended by FIGO [19,20].

In contrast to our findings [3], grand multiparity has been associated with low socioeconomic status, due to poverty and social deprivation such as poor health and lack of education, because of large family size. A higher socioeconomic status of our grand multiparas was contrary to the anticipated better awareness of contraception, formal education and reproductive health when compared to low parity group. The findings as a result of significant numbers of lower parity women being single parents, and the majority (60%) at a younger age (less than 30 years), thus more likely of financial instability and dependence compared with the grand multiparas women. In support of this, majority of lower parity women had less regular family income compared to the counterparts. In contrast to our findings, other literature [3] has reported a link between grand multiparity and low socioeconomic status in connection with poverty and social deprivation being associated with large family size.

In the present study, similar to the results of a previous study [16], the overall knowledge of emergency contraception was also very low (6.1%), with no significant difference between grand multiparas women and those with lower parity. Grand multiparity or age or both increased lifetime exposure to contraceptive use but did not affect the occurrence of unplanned pregnancies, even though evidence revealed high contraceptive use to prevent unintended pregnancy and induced abortions [21,22]. Thus, the demonstrated overall rate of contraceptive ever use (60%) was higher than the overall prevalence in Tanzania in 2004-2005 (26%) [8], and unreflective of adherence to contraception practice. Concurrently, African studies have demonstrated a progressively higher unmet need for limiting fertility, but stagnant rates of unmet need for family spacing [13]. Inconsistent use of contraception demonstrated to be among reasons for unplanned pregnancy [23]. Socioeconomic and cultural circumstances, regarding family composition [24] and children regarded as part of family labour force can contribute to high parity [25]. In this study, some women were motivated towards large family size mimicking their parents' families (coincidental communication).

As in previous studies [26,27], our grand multiparas had higher history of neonatal death, intrauterine fetal death and abortion. Previous pregnancy losses could have led to mothers' wish to compensate their loss

by continuing to bear children, regardless of the dangers of high parity as definition of high parity included both living and dead children. Since the TDHS 2010 reported that an average women preferred a family size of 5 children [10], then perception and attitude towards contraception among women who suffered pregnancy losses should differ from those who do not. Therefore, a special consideration should be made when designing interventions to promoting family planning, through contraception in special groups. History of previous perinatal loss (approximately 25%) in the study group was unacceptably high, and hence reflective of generally low socioeconomic status and obstetric care. Thus, provision of adequate and accessible perinatal care, will not only reduce perinatal mortality, but also high parity with respect to less women being in need to compensate for child loss. As shown in Asia studies, much better contraceptive services reduced family size and poor pregnancy outcomes [28,29].

Preference of a biological child from predominantly African men [15], and coincidental revelation by seven women during data collection, suggested a sense of obligation upon re-married women to fulfil their husbands' wishes of having biological children. The cause of the women's obligation could perhaps be in desperation for a long lasting relationship or assurance of social security through the husband. Such evidence seemed parallel to our study as higher proportions of grand multiparas had children of different paternity compared to their counterpart. Supporting our conclusion [13,30], men have demonstrated a greater influence in decision making on contraception, although, their participation in reproductive health-related issues has been low [31]. Thus, in order to address challenges in acceptability and accessibility of contraception, family planning programmes should be male gender-inclusive. Furthermore, effective and efficiency of contraception counselling and provision demand consistent family planning counselling during ANC clinic regardless of parity; thus, even those that will caesarean delivery can opt for long term contraception including IUCD insertion and sterilization during CS, in case of a healthy baby [19,20].

Study Limitations

Our cross sectional study reported association between high parity, knowledge and use of contraception and, family experience of child loss and children with different paternity. The binary associations cannot be used to demonstrate causal link between the associations but rather provide a baseline for further qualitative and quantitative when discussing high parity and family planning. The WHO, World Bank and other health welfare institutions have used wealth index as a tool to estimate socioeconomic status. However, interpretation of presence of a regular income should be with caution, as it did not take into account the quality of income, risk of subjectivity in recall and approximation of income or fluctuation of economic status according to income and expenditure over time. Despite the limitations, this study highlighted important aspects of high parity that should be considered, in improving quality of contraception service including appropriate timing, choice and adhere counselling.

Conclusion

Grand multiparity was highly associated history of pregnancy loss and children of different paternity. Family planning programmes should pay special attention to maternal and paternal characteristics in special groups such as those with previous pregnancy loss and children of different paternity.

Contribution to Authorship

AHM participated in the conception of the study, data collection, analysis, and manuscript writing. HLK participated in data analysis; results interpretation, manuscript writing. HNM participated in project development, results interpretation and manuscript writing. All authors read and approved final version of the manuscript for submission for publication.

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Declaration of Conflict of Interests

The authors declare that they have no competing interests.

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Table S1: Scoring of household assets to the perceived corresponding value.

Household asset	Score
Household ownership	
Personal House	5
Rented House	4
House quality*	
Category I	5
Category II	4
Category III	3
Property ownership	
Car	4
Dependable business	3
Television set	2
Radio	1
Source of drinking water	
Tap	2
Well/spring	1
Type of latrine	
Flush or tap water based system	2
Pit latrine	1

*House quality was defined as category I: Brick/block built house, roofed with iron sheets or roof tiles and floored by cement or tiles floor; category II: House built with mud, tree pole supported by sticks, roofed with iron sheet and floored with or without cement; and category III: House built with mud, tree pole supported by sticks and roofed with grass, nylon or mud.

Table S2: Cumulative frequency of standardized factor scores to corresponding relative socioeconomic status.

Standardized factor score	Cumulative frequency	Socioeconomic status
-1.022646 to -0.679675	≤ 33.3%	Low
-0.6796751 to -0.112225	33.31% to 66.60%	Medium
-0.1122251 to 2.48175	66.61% to 100%	High