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Health and Socio-Economic Events that Associated with Having High Parity in Mosul, Iraq

Al-Ridhwany HHA[1*], Aljawadi AA[2] and Abduljawd MS[3]

[1]*Department of Public Health and Preventive Medicine, Nineveh Health Directorate, Iraq*

[2]*Department of Family and Community Medicine, College of Medicine, University of Mosul, Iraq*

[3]*Department of Urologist, Nineveh Health Directorate, Iraq*

[*]**Corresponding author:** Hajir Al-Ridhwany, Department of Public Health and Preventive Medicine, Nineveh Health Directorate, Iraq, Tel: 0096-4 770 1700038; E-mail: hajirhusam@gmail.com

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Abstract

Background: High parity adversely affect both the family and the government to support a youthful population.

Aim: The present study aimed to examine the association of high parity with health, social and economic events among families in Mosul.

Method: The study applied a cross-sectional design and multi-stage stratified sampling technique in Mosul at the north of Iraq. Data collection continued almost ten months to complete the estimated sample size (from April, 1st 2011 till the end of Jan, 2012). Statistical equations estimated prevalence of high parity and determined the associated health and socio-economic events by applying chi square test..

Result: The study interviewed 1302 mothers in childbearing age. Prevalence of high parity was 27.8% mainly in suburban and rural areas (p=0.000). It was more frequently reported among mothers of lower social classes (p=0.001), consanguineous marriage (p=0.03), and early maternal and paternal marriage (p=0.000 and p=0.000). High parity was significantly associated with economic-inadequacy (p=0.000), over-crowding state (p=0.000), downward social transition (p=0.001), under five mortality (p=0.001), domestic physical violence (p=0.000), drop-out from primary school (p=0.000), smoking habit among siblings (p=0.000) and working children (p=0.000).

Conclusion: Almost three out of ten mothers, particularly in suburban and rural areas, were grand- or great grand multipara; a behaviour that significantly associated with health and socio-economic penalties.

Keywords: Health care; Education policy; Public health

Introduction

Parity identifies number of live births to women in a given place and time. It has substantially fallen in developing countries, in general, from seven to five children per woman over the last six decades. Even so, high parity still characterizes 33 countries including the Arab area [1]. High parity regimen makes the region of Middle East has the highest natural growth rates in the world, second only to Sub-Saharan Africa. The average parity in Arab World is around 5 children per woman (almost two children more than the world's average of 3.2); but it varies among countries from three children per woman in Lebanon to more than seven in Yemen and Gaza. With an annual natural increase rate of 2.6%, the population of the Middle East is growing 1% faster than the world as a whole. At this rate, the region will double in population size in less than 30 years [2].

In 2011, the total population of Iraq was estimated to be 29.7 million. The annual population growth rate was 3% on average namely one percent higher than that recorded in 2002 (2.0%). The age distribution is typical of a population with high fertility. The population can be described as young since more than half are below age 20 years and 17% is below 5 years. Only around 5% are 60 years or older [3].

Typically, high birth rates adversely affect all family members since it associates with health impairments, low living standards, and low levels of education. Moreover, it can cause stress on the government welfare and family programs to support a youthful population. On the other hand, low birth rates can put stress on families and the government to support the elders as well as to provide adequate senior welfare systems. There will be less children or working age population to support the constantly growing aging population [4]. The present study aimed at estimating prevalence of high parity among families in Mosul as well as to examine the association of some health, social and economic events with such behaviour.

Subjects and Methods

Initially, the present study obtained administrative and ethical agreements from Nineveh Health Directorate in Mosul at the North of Iraq. A cross-sectional study design that based on health institutions was adopted. The required sample size was estimated according to Daniel's equation [5] [$n= [Z (1-\alpha)^2 pq/d^2 \times 2]+5\%$] with 95% confidence interval and 0.03 width. Proportion (p) of married women in child bearing age (15-49 years old) in the equation is substituted by 14% as

the report of Public Health Department in Nineveh Health Office stated in 2012 [6]. The multi-stage stratified sampling method that was followed in the present study divided Mosul into four geographical quarters: North East, North West, South East and South West. Then after, each area was stratified into three social strata (urban, suburban and rural) according to their closeness to downtown. Five primary health care centers (PHCCs) were conveniently selected from each quarters depending on the largest population size and proportion of women in child bearing age in each catchment area.

The included twenty PHCCs were representing 70% of all centers in study setting. Finally, currently married mothers in child-bearing age were interviewed during their attendance to one of the included PHCCs. The eligible mothers were selected on a consecutive base after obtaining verbal consents from them. Distribution of the estimated sample was weighted taking in consideration proportion of married women in child-bearing age in each catchment area. Almost ten months of duration (from April, 1st 2011 till the end of Jan, 2012) were needed to collect the required data.

Data collection tool was a validated questionnaire form (its validity was 83.8% as estimated by Angoff approach [7]. It was constructed to find out the actual parity among the selected families. Grand multipara (5-9 births) and great grand multipara (≥ 10 births) can be recognized. It also inquired about the socio-demographic characteristics of families who have high parity namely having five or more living children. The social class was assessed according to the current occupation of their paterfamilias namely the husbands [8].

A pilot study was conducted before practicing the questionnaire form in order to construct an appropriate and informative edition; assess reliability and to estimate time needed for completing data collection. The intra- observers and inter-observers variations were estimated as 86.8% and 82.9% respectively that made questionnaire's reliability 87.2%. Statistical equations facilitated estimation of prevalence rate of high parity among families in Mosul and eased assessment of the association of the prevalent high parity with the studied health and socio-economic events by applying chi square test. P-value was considered as significant when it was equal or less than 0.05 throughout the analysis. Magnitude of the association was quantified by estimating odds ratio (OR) and it 95% confidence interval (95%C.I).

Results

The current study examined 1302 families by interviewing the eligible mothers while attending one of the included PHCCs. The concerned mothers were in childbearing age (15-49 years old) and their mean age was 30.0 ± 7.7 years. Just 7.4% of them were teenagers, 70.3% were 20-39 years old and the rest (12.3%) were 40-49 years old. The mean age of husbands was 36.0 ± 9.3 years with a range of 19-81 years. Teenagers represented only 0.8% of them while, 23.7% were in their second decade. The remaining 41.4% and 34.1% of husbands were in their thirties and older respectively.

More than half of included families (52.4%) were urban and the majority were Muslim (93.9%) and Arabs (83.7%). Other ethnicities namely Kurds, Turkmen and Shabaks composed 7.3%, 4.8% and 4.1% of the studied population respectively. Urbanization namely moving of families from rural to urban area during the last ten years was recorded among 14.9% of families. More than half of studied families (58.4%) were living within extended structure. Consanguineous marriages were reported among 65.4% of families.

Table 1 demonstrates parity, number of living children per studied mothers, according to area of residence. It shows that almost three quarters (72.2%) of families had a maximum four living children; more than half of such families (56.5%) were residing urban areas. In turn, the remaining quarter (27.8%) were families who have at least five living children; 57.8% of them were suburban and rural residents. This allotment is more evident regarding grand parity namely at least ten living children per mother (p=0.000). The mean parity was estimated as 3.8 children per mother.

Table 2 shows that prevalence of high parity was significantly more common among Turkmeni mothers (41.3%) by two folds (OR=1.9, 95%C.I=1.1-3.3, p=0.01) as well as among Shabak mothers (63.0%) by almost seven times (OR=6.8, 95%C.I=3.7-12.6, p=0.000) than among Arab ethnic mothers (26.0%) (OR=0.6, 95%C.I=0.4-0.8, p=0.001). Low prevalence (22.1%) was recorded among urban mothers in a significant manner (OR=0.6, 95%C.I=0.-0.7, p=0.000). while, urbanized families were significantly more prone to have high parity by almost two folds (OR=2.3, 95%C.I=1.6-3.2, p=0.000).

Based on social class stratification, the same table indicates that only 12.5% and 20.4% of mothers who classified as first and second class or third social class reported having high parity (OR=0.4, 95%C.I=0.1-0.9, p=0.02 and OR=0.5, 95%C.I=0.4-0.6, p=0.000 each). While, higher prevalence rates were reported in mothers derived from fourth and fifth social classes(32.7%) or mothers with unemployed husbands (52.7%) by almost 2-3 folds (OR=1.5, 95%C.I=1.2-1.9, p=0.001 and OR=3.3, 95%C.I=2.2-4.9, p=0.000) in the same order. Family religion showed no significant association with occurrence of high parity.

Parity (children per mother)	Urban (682) No (%)	Suburban & Rural (620) No (%)	Total No (%)	p-value
≥ 4	531 (56.5)	409 (43.5)	940 (72.2)	
5-9	145 (42.2)	199 (57.8)	344 (26.4)	
≥ 10	6 (33.3)	12 (66.7)	18 (1.4)	0
Mean	3.8 children per mother			

Table 1: Number of living children (parity) among studied families by area of residence.

Socio-demographic features	Actual parity			OR (95% CI	p-value
	≥ 5 (n=362)	<5 (n=940)	Total N=1302		
	No (%)	No (%)	No (%)		
Religion					
Muslim	345 (28.2)	878 (71.8)	1223 (94.0)	1.4 (0.8-2.5)	
Christian	17 (21.5)	62 (78.5)	79 (6.0)		0.2
Ethnicity					
Arab	283 (26.0)	807 (74.0)	1090 (83.7)	0.6 (0.4-0.8)	0.001
Kurd	19 (20.0)	76 (80.0)	95 (7.3)	0.6 (0.4-1.1)	0.08
Turkmen	26 (41.3)	37 (58.7)	63 (4.8)	1.9 (1.1-3.3)	0.01
Shabak	34 (63.0)	20 (37.0)	54 (4.2)	6.8(3.7-12.6)	0
Residence					
Urban	151 (22.1)	531 (77.9)	682 (52.4)	0.6 (0.4-0.7)	
Suburban	211 (34.0)	409 (66.0)	620 (47.6)		0
Urbanization					
Present	84 (43.1)	111 (56.9)	195 (15.0)	2.3 (1.6-3.2)	
Absent	278 (25.1)	829 (74.9)	1107 (85.0)	-	0
Social class					
1st and 2nd classes	6 (12.5)	42 (87.5)	48 (3.7)	0.4 (0.1-0.9)	0.02
3rd class	128 (20.4)	500 (79.6)	628 (48.2)	0.5 (0.4-0.6)	0
4th and 5th classes	169 (32.9)	345 (67.1)	514 (39.5)	1.5 (1.2-1.9)	0.001
Unemployed	59 (52.7)	53 (47.3)	112 (8.6)	3.3 (2.2-4.9)	0

Table 2: Association of high parity with socio-demographic and structural features of the families.

Regarding family structure and sort of marriage, prevalence of high parity was higher among families with nuclear structure (39.4%) by almost 3 times (OR=2.7, 95%C.I=2.1-2.9, p=0.000) and families with consanguineous marriage (29.8%) (OR=1.3, 95%C.I=1.03-1.7, p=0.03) when compared with extended family structure (19.6%) and absence of consanguineous marriage respectively. Polygamy had no role in occurrence of high parity as statistics indicates.

Table 3 describes the association of having high parity with personal characteristics of the spouses. On the topic of maternal characteristics, it was found that low level of education (below 12-years of schooling), being housewives and practicing teenage marriage and teenage motherhood significantly associated with reporting higher rates of high parity (28.5%, OR=1.8, 95%C.I=1.0-2.5, p=0.04; 28.6%, OR=1.8, 95%C.I=1.1-3.0, p=0.03; 32.2%, OR=1.9, 95%C.I=1.4-2.4, p=0.000 and 31.6%, OR=1.6, 95%C.I=1.2-2.0, p=0.001) respectively when compared with their analogues (18.1%, 18.2%, 20.4% and 22.9%)in same order. In addition, the event of high parity was reported among 46.7% of families whose their paterfamilias had got married before completing 25 years old (OR=5.2, 95%C.I=4.0-6.7, p=0.000).

Table 4 displays health and socio-economic events that associated with occurrence of high parity. High parity was associated with 1.7 increments in reporting of economic-inadequacy (58.0%) (OR=1.7, 95%C.I=1.3-2.2, p=0.000) when compared with families of low parity (54.1%).

In addition, over-crowding state and down-ward social transition were reported five and two folds more frequently among families with high parity (70.2%, 60.2%) consequently (OR=4.9, 95%C.I=3.8-6.4, p=0.000 and OR=2.0, 95%C.I=1.3-2.3, p=0.001) in same order.

The same table shows that high parity associated also with adverse effect on siblings. Under five mortality domestic physical violence against children had occurred among 18.1% and 30.8% of the studied families. The possibility of such events raised by 1.6 and 1.7 folds respectively among families with high parity (23.8%) (OR=1.6, 95%C.I=1.2-2.2, p=0.001) and (39.0%) (OR=1.7, 95%C.I=1.3-2.2, p=0.000) in the same order.

Structural features	Actual parity			OR (95% CI	p-value
	≥ 5 (n=362)	< 5 (n=940)	Total N=1302		
	No (%)	No (%)	No (%)		
Family					
Nuclear	213 (39.4)	328 (60.6)	541(41.6)		
Christian	149 (19.6)	612 (80.4)	761 (58.4)	2.7 (2.1-2.9)	0
Consanguineous marriage					
Present	254 (29.8)	598 (70.2)	852 (65.4)		
Absent	108 (24.0)	342 (76.0)	450 (34.6)	1.3 (1.03-1.7)	0.03
Polygamy					
Present	26 (27.4)	69 (72.6)	95 (7.3)		
Absent	336 (27.8)	871 (72.2)	1207 (92.7)	1.0 (0.6-1.6)	0.9

Table 3: Association of high parity with structural features.

Socio-demographic features	Actual parity			OR (95% CI	p-value
	≥ 5 (n=362)	< 5 (n=940)	Total N=1302		
	No (%)	No (%)	No (%)		
Maternal education					
< 12 years	347 (28.5)	872 (71.5)	1219 (93.6)		
≥ 12 years	15 (18.1)	68 (81.9)	83 (6.4)	1.8 (1.0-2.5)	0.04
Maternal occupation					
Housewives	344 (28.6)	859 (17.4)	1203 (92.4)		
Working	18 (18.2)	81 (81.8)	99 (7.6)	1.8 (1.1-3.0)	0.03
Maternal age at marriage					
< 20 years	263 (32.2)	553 (67.3)	816 (62.7)		
≥ 20 years	99 (20.4)	387 (79.6)	486 (37.3)	1.9 (1.4-2.4)	0.001
Maternal age at first pregnancy					
< 20 years	232 (31.6)	503 (68.4)	735 (53.5)		
≥ 20 years	130 (22.9)	437 (77.1)	567 (43.5)	1.6 (1.2-2.0)	0.001
Paternal age at marriage					
< 25 years	251(46.7)	286 (53.3)	537 (41.2)		
≥ 25 years	111 (14.5)	654 (85.5)	765 (58.8)	5.2 (4.0-6.7)	0
Paternal education					
< 12 years	285 (27.3)	760 (72.2)	1045 (80.3)		
≥ 12 years	77 (30.0)	180 (70.0)	257 (19.7)	0.8 (0.7-1.2)	0.4

Table 4: Association of high parity with personal characteristics of spouses.

Moreover, it was found that more than half of families (55.6%) and most of high-parity families (89.5%) had school-age children. Drop-out from primary schooling was reported among 31.6% of families, in general. The percent significantly increased (49.4%) by almost five times among families with high parity (OR=4.7, 95%C.I=3.3-6.6, p=0.000). In addition, high parity significantly raised the possibility of smoking and working of siblings while they are still children (≤ 14 years old) by eight and five folds to become 20.4% and 40.9% respectively (OR=8.1, 95%C.I=5.2-12.6, p=0.000 and OR=5.4, 95%C.I=4.1-7.3, p=0.000) consequently.

Discussion

The present study adopted a cross-section study design that based on health-institutions to achieve the settled aim. Such design has the advantage of being fairly quick, less expensive, easy to perform and the studied subjects are more accessible and cooperative [9-11]. But, it is more prone to selection bias. However, the present study devoted all efforts to ensure representativeness by adopting multi-stage stratified sampling technique in order to include all social strata distributed in urban, suburban and rural setting. The mean parity, as estimated by the present study, was 3.8 children per mother. However, three out of ten families (27.8%) were grand- or great grand multipara (had ≥ 5 children) and were more frequently living in suburban and rural areas (34.0%, p=0.000) or they were urbanized families (43.1%, p=0.000).

The estimated mean parity seems to be increased by 0.7 during the last two decades since Al-Kandaly [12] in 1989 recorded that the mean parity in Mosul was 3.1 children per mother and 27.4% of her studied sample had parity of five children or more. However, during the same time interval and study locality, another cross-sectional studies were conducted by Alnemo [13] in 1992 and Al-Fadhel [14] on 2003 recorded that 49.1% of mothers attending one of the PHCCs in the West side of Mosul City and 47.3% of mothers who consulted a family planning centers had ≥ 5 living children respectively. The different sample derivation made it unreasonable to rely on their results.

The estimated number of children per mother coincides with that in Arab Region. In 2010, United Nations [15] reported that during the period 2005-2010, the total fertility was 3.6 children per woman. The same report also elucidated that during the period 1970-1975 to 2005-2010, Iraq has witnessed more than 50% fertility decline together with Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Qatar, Saudi Arabia, Syria, Tunisia and the United Arab Emirates. The sharpest fertility decline in the Arab Region and perhaps the world during the same period was experienced by Algeria, where fertility fell by 5 children, from 7.4 to 2.4 children per woman. However, fertility remains above 4 children per woman in the Occupied Palestinian Territory, Yemen, Oman, and Somalia. The later has the highest total fertility in the Region (6.4 children per woman).

The estimated parity seems to be still lagging beyond replacement level fertility (at which women in the same cohort have exactly enough daughters to replace themselves in the population) [16]. Replacement level was recorded in Iran where total fertility rate fell sharply from 7.0 children per woman during the period of Iraq-Iran's War to 2.17 in 2000 [17]. Similarly, Turkey has experienced a remarkable fertility decline since the substantial social and economic changes in the mid-twentieth century. The 2003-Turkey DHS [18] detected a fertility decline from 7 children per woman to almost replacement level by 2003 and even less in three out of the five included regions, namely the West, the Central and the North Anatolia regions. On the other hand, the estimated mean parity is lower than that recorded in Malaysia by Shafei et al. [19] in 2012 when they found that the mean parity of the couples was 5.1 and it ranged between one and eleven.

The present study found that diminutive maternal education below 12-years of schooling significantly amplified event of high parity by around two folds (OR=1.8, p=0.04). Such effect was manifested through various means. First, maternal education significantly heightened maternal age at marriage as well as maternal age at starting reproduction which in turn associated with lowering parity [1,20]. Second, education is the principal means for both parents to get a good occupation and subsequently an advance on social hierarchy. It was confirmed, by the present study, that the higher the social class, the lower the prevalence of high parity. The average prevalence of high parity could be halved by stepping-up on social hierarchy to third class and further decreased among first and second classes (OR=0.4, p=0.02 and OR=0.5, p=0.000) respectively. In addition, non-working state of mothers was found as a significant magnifier for the event of high parity by approximately two folds (OR=1.8, p=0.03).

World Bank in 2009 [21] declared that education directly influenced women health status and any restrictions on women's education will affect their ability to make informed choices regarding health practices, to access health care services, to interact with health care personnel and even to participate in treatment regimens. Furthermore, Ban Ki-moon, [22] the general secretary of UN in 2012 made it clear that women's education exposes them to information, empowers them, makes them more likely to be employed outside their home environment, and makes them more aware of their own health and the health of their children; all of which are negatively associated with the number of children a woman will have during her reproductive life. He added that educated women are more likely to postpone marriage, have smaller family size, and use contraception than uneducated women do.

The inverse relationship between the number of children a woman has and her education, income and age at marriage was also suggested by El-Zanaty and Way [23] in Egypt in 2008 as well as by Mobaraki and Söderfeldt [24] in Saudi Arabia in 2010.

Adhikari et al. [25] in 2010 stated that the total fertility rate in Nepal has decreased from 6.3 births per woman in 1981 to 3.1 in 2009 mainly due to improvement of women's education and female labor force participation. These two factors in particular were among the fundamental reasons for such fertility change in Nepal since both were negatively associated with the number of children a woman may have. The study also showed that illiterate women have almost double the crude number of children ever born than do literate women.

Takyi et al. [26] when studied fertility behaviours of married men and women in Ghana, Sub-Saharan Africa in 2006 witnessed a significant inverse relationship between educational attainment of both men and women and the fertility levels. Those mothers with no education having the highest number of children ever born and the above secondary category having the lowest.

Furthermore, the present study identified an additional socio-cultural factor of high parity which was the consanguinity. It was proved to be associated with 1.3 times growth in prevalence of high parity (OR=1.3, p=0.03). Such association may be explained by its well-established association with maternal teenage marriage (OR=1.9, p=0.000 for child's marriage and OR=2.1, p=0.000 for adolescents' marriage). Similar findings were stated by Tadmouri et al. [27] in 2009 that consanguineous couples in Qatar, Kuwait, Saudi Arabia, Tunisia

and Mauritania had fertility average significantly higher than non-consanguineous couples.

However, in the present study, it was unexpectedly to realize that prevalence of high parity was higher among families with nuclear structure by almost three times (OR=2.7, p=0.000). Such observable behaviour may be attributed to the fact that in the settings of the present study, having high parity motivated couples to establish a nuclear structure. According to the general norms, living within an extended structure especially during the first years of marriage, is almost universal. Then after, as family size enlarges, the couples become more dependent and start to create their own household; so, necessity for nuclear structure emerges. Adding to that, Nanda [28] in 2005 found that the higher fertility rate in India was found within women from nuclear family structure. These findings are incompatible with Wusu et al. [29] in Southwestern Nigeria in 2006 who proved the interconnections between the extended structure and high fertility behaviours.

Parity is a key factor in respect with several health, economic and social issues [21]. Event of child mortality was viewed as a concomitant problem with high parity (OR=1.6, p=0.001). This result matches the fact that high parity and high birth order are well-established risk factors for adverse pregnancy outcomes including perinatal mortality [30].

High parity paved the way for child mortality probably through its effect on social position of the families. The present study indicates that high parity was significantly common among low social class mothers in a progressive mode namely the lower the social class the high the probability of high parity. Furthermore, high parity promoted downward social transition of the whole family (OR=2.0, p=0.001). Such mode of action is confirmed by Remes et al. [31] in 2010 in his study about social determinants of mortality from childhood to early adulthood. They found that social gradients in health and mortality have been observed within different societies wherein each successive level of social position enjoys better health and lower mortality in general and child mortality in specific. So, social inequality in infant death is well documented.

The significant association of social class and child mortality might be explained by intermediation of nutritional status of children since Al-Ahad in 2012 assessed nutritional indicators among under-five children in Al-Hamdanya District in the north of Iraq who found that the mean birth weight gradually decreased while stepping down from first social class toward fifth class (p=0.000) and it significantly associated with under-five mortality (p=0.000).

High parity, as proved in the present study, worsened economic condition of the family (OR=1.7, p=0.000) and made it necessary for children to leave their school (OR=4.7, p=0.000) and work outside home to help in household's expenses (OR=5.4, p=0.000). Thus, high parity will repeat itself through pushing children into the vicious cycle of poverty, low education and high parity. The present study proposed that once the children enter into labor ambiance, they become more vulnerable to risk of pathological secondary socialization as smoking habits (OR=8.1, p=0.000). Anyhow, the present may underestimate such phenomenon as many children smoke confidentially.

Alike association comes along with results of Smits [32] in 2007 when he examined the effects of family background and context on educational participation of children aged 8-15 in five Arab countries: Morocco, Algeria, Tunisia, Egypt, and Syria. He stated that the currently major challenge is not to get them in school but to keep them there since after age 11, as he mentioned, participation rates decreased strongly. Smits reported that among demographic factors that may influence the educational participation of children were family size and birth order. He added that in developing countries, the cost of high fertility may be borne by older siblings rather than by the parents so that the younger children in such families would have more opportunities to go to school because the older children run the household chores in order to contribute to the household income. Besides, the number of children may play a role, as he concluded, since family size was found to be negatively correlated to educational participation. Probably, Smits explained, because the available resources have to be divided among more children.

Under such conditions, parents may prefer to invest in the education of their sons. This would imply that the chances of education that girls get are lower if they have a higher number of brothers. Moreover, Schultz in 2005 [33] predicated that high fertility behaviours in New Haven, USA have long term effects for individuals and families at both micro- and macro-perspective represented by school enrollment of descent, individual income and human capital formation

Conclusion

The present study concluded that three out of ten mothers, particularly in suburban and rural areas, were grand- or great grand multipara; a practice that significantly associated with health and socio-economic penalties.

Recommendations

Formal education including health edification is principally recommended in order to regulate fertility rate and accordingly regress the associated adverse events.

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