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Original Article

Community medicine Section

Pubertal Timing and Demographic Predictors of Adolescents in Southwest Nigeria

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ABSTRACT

Background: Changes in the timing of puberty have been an area of research interest in developed countries because of its associated health and psychosocial problems. Adolescents in Africa are no exception as they are reaching adulthood today much earlier than before. This changing trend may have a major influence on adolescents' sexual behaviour.

Aim: This study determined the timing of puberty and demographic predictors among the adolescents in southwest Nigeria.

Materials and Methods: The study was a cross-sectional study. Using Modified Sexual Maturity Scale (MSMS) of pubertal assessment, data were collected from 1000 respondents from rural and urban areas of Osun state, Nigeria. Data were collected using pre-tested Assisted Self Completion Questionnaires (ASCQ). The rate of pubertal development was based on age group and current pubertal stage. Data were analysed using SPSS version 16. Chi-square and logistic regression analyses were done to identify significant demographic predictors. Statistical significance was at 5% level.

Results: The overall mean age of the respondents was 14.22±2.47 years. The mean age for males was 14.19±2.38 years and 14.25±2.57 years for females. A total of 52.9% of the respondents were males and 47.1% were females. Higher proportions of the females, 41.6% were already in late puberty stages compared to their male counterparts where 21.9% were at this stage. With regards to this rate of pubertal development, more males, 14.2% significantly had late rate of pubertal development than the females 5.1%. The significant demographic predictors was socio-economic class in females only.

Conclusion: From this study, the timing of puberty was early for females and socio-economic class is an important demographic predictor for pubertal development. This study was however limited because intrinsic factors such as genetic makeup and nutritional status which could affect the finding were not be excluded.

Keywords: Assessment, Rural, Sexual maturity, Urban

INTRODUCTION

Sub- Saharan Africa is said to be a young subcontinent; its children and adolescents make up 60% of the total population, representing almost two-third of the population of the location, a larger share of the population than in any location of the world [1]. Nowhere are the challenges faced by adolescents greater than in sub- Saharan Africa [2]. Research on adolescence is important not only because of the large proportion of the population that this group represents, but also the average young person makes several important life transitions [3].

The World Health Organization (WHO) recognizes adolescence as the phase in human growth and development where children transform to become adults categorically from age 10 to 19 years [4]. It is a flowing phase in the life span, as individuals move at their own rate through a series of transitional events. Development of secondary sexual characteristics otherwise called puberty usually marks the beginning of adolescence. These changes transform boys and girls from physical immaturity to biological maturity [5].

Puberty is an important milestone in reproductive life, though it starts early in females, the period usually occurs later and for a longer period in males [4]. Changes in the timing of puberty have been an area of great research interest in developed countries for decades because of its associated health and psychosocial problems [6]. Current literature suggests that there has been a decline in the ages of pubertal onset and that pubertal development is influenced by social context [7]. This historical trend towards early puberty is worldwide, adolescents have been observed to be maturing at younger ages when compared with the former times [6]. This secular trend ceased in most developed countries after the 1960s, but concerns were re-ignited in the late 1990s with the publication of American studies that suggested a sudden fall in the age of onset of puberty in girls and boys [8]. Several factors such as nutritional status, in-family stress, weight and socioeconomic class have however been implicated [9].

Adolescents in Africa are no exception as they are also reaching adulthood today much earlier than their parents [10]. This changing trend may have a continuous major influence on their sexual behaviour as these adolescents are seen to be starting sexual activities much earlier than in previous years [11]. The average age at puberty among adolescents in Africa has also fallen as many adolescents are seen to be entering puberty much earlier than their parents ranging between 12 to 15 years [12]. Adolescent development as earlier mentioned takes place within the context of the adolescent's social environment. In developing countries, inequalities related to socio-economic status and general living conditions are still prominent and might account for variations in timing of puberty within and among countries as observed in studies in Africa [13].

Knowledge of the timing of puberty is now of continuous social and public health interest, given that early developers are at an increased risk of negative reproductive health outcomes in both adolescence and adulthood. Although researches on puberty have accelerated over the years, it is limited to developed countries, research focussing on timing of pubertal development and predictors is lacking in this environment. This study determined the timing of puberty as well as related demographic predictors among the adolescents in southwest Nigeria.

MATERIALS AND METHODS

The study was carried out over three months; between September and November 2013 in six rural and urban local government areas (LGA) in Osun state, southwestern part of Nigeria. It was a cross sectional study design. One thousand respondents were randomly recruited from selected secondary schools using multistage sampling technique. Data were collected using pre-tested Assisted Self Completion Questionnaires (ASCQ). ASCQ method is one in which an interviewer reads questions and answer options aloud while the respondents complete questionnaires independently as described by Plummer et al., [14]. ASCQ has been found to be useful in

assessing sexual related issues in African adolescents especially the semiliterate ones in the rural areas [14]. The questionnaire is freely reusable and was tested for validity both internally and externally. The questionnaires were internally validated at the adolescent health clinic at the Urban Comprehensive Health Centre, Eleyele., Osun State, Nigeria. Twelve clients- six males and six females who attended the clinic were randomly selected and given the questionnaires to fill. They were subsequently examined by the attending physician at the clinic and pubertal findings were recorded on separate sheets. The data were analysed and similarities were observed between the physician's rating and respondents' rating. Pubertal stages were assessed using Modified Sexual Maturity Scale (MSMS). This instrument has been used in developed and developing countries and has been found to be useful and reliable for community based studies [15-17]. The rate of pubertal development was based on age group and current pubertal stage. The respondents' age group which corresponds with their adolescence subgroups was marched with their current pubertal stage (MSMS) to categorize them into this status. Where the pubertal stage and age group tallies, the rate of development is termed appropriate puberty however where the pubertal stage is ahead or more advanced than the age group, this is termed early puberty and where the pubertal stage is later than the age group, this is termed late puberty.

The research team constituted trained research assistants who were males and females undergraduate students who were still in their teenage years. This selection was purposive to ensure maximum cooperation during data collection. Male research team members attended to male respondents only and vice versa for females. The research team was effectively supervised by the main researchers during data collection. Ethical approval was obtained from appropriate authorities while consent was obtained from parents/guardians of respondents. Data were analysed using SPSS version 16. Chi-square and logistic regression analyses were done to identify significant demographic predictors of puberty. Statistical significance was tested at the 5% level.

RESULTS

One thousand students were approached to participate in the study and consent was obtained from all giving a response rate of 100%. The overall mean age of the respondents was 14.22±2.47 years. The mean age for males was 14.19±2.38 years and 14.25±2.57 years for females. The socio-demographic characteristics revealed that 529 (52.9%) of the respondents were males and 471 (47.1%) were females. The socio-demographic characteristics of the male and female respondents were not statistically significant. Majority of the respondents were early adolescents (10-13years) for both sexes and majority were also found to belong to the middle socio-economic class. Most of these respondents lived with both parents as seen in [Table/Fig-1].

[Table/Fig-2] shows that higher proportions of the females (41.6%) were already in late puberty stages compared to their male counterparts (21.9%). These male – female disparities of pubertal stages were statistically significant (p<0.0001). [Table/Fig-2] also shows the rate of pubertal development among the respondents. More males (14.2%) had late rate of pubertal development when compared with females (5.1%) and more females (58.0%) had early rate of pubertal development than their male colleagues. These findings were statsically significant (p<0.0001).

[Table/Fig-3] show results of logistic regression were used to identify the independent relationship between pubertal timing (early puberty) and selected demographic variables. The demographic predictors of puberty were place of residence (rural versus urban), living conditions and socioeconomic class. The odds of attaining puberty early were high among those living with both parents (1.704 for males and 1.970 for females). This finding was however not statistically significant. Although, socioeconomic class was not a positive predictor of early puberty among the males, it was significant for the females.

Variable	Male	Female	Total	χ^2	p-value
	n= 529 Frequency (%)	n= 471 Frequency (%)	n=1000 Frequency (%)		
Age groups					
10-13	247 (46.7)	191 (40.6)	438 (43.8)	3.923	0.141
14-16	178 (33.6)	173 (36.7)	351 (35.1)		
17-19	104 (19.7)	107 (22.7)	211 (21.1)		
Living situation					
Both parents	362 (68.4)	313 (66.5)	675 (67.5)	2.060	0.725
Mother only	66 (12.5)	70 (14.9)	136 (13.6)		
Relatives	57 (10.8)	52 (11.0)	109 (10.9)		
Father only	32 (6.0)	23 (4.8)	55 (5.5)		
Live alone	12 (2.3)	13 (2.8)	25 (2.5)		
Socio-economic class					
Upper class	199 (37.6)	197 (41.8)	396 (39.6)	2.275	0.321
Middle class	259 (48.9)	221 (46.9)	480 (48.0)		
Lower class	71 (13.4)	53 (11.3)	124 (12.4)		

[Table/Fig-1]: Socio-demographic characteristics of respondents

Variable	Pubertal stages					χ^2	p-value
	Pre Freq (%)	Early Freq (%)	Mid Freq (%)	Late Freq (%)	Post Freq (%)		
Male	75 (14.2)	149 (28.2)	145 (27.4)	116 (21.9)	44 (8.3)	89.231	<0.0001
Female	18 (3.8)	65 (13.8)	130 (27.6)	196 (41.6)	62 (13.2)		
Rate of pubertal development							
	Early Freq (%)	Appro-priate Freq (%)	Late Freq (%)			χ2	p-value
Male	175 (33.1)	279 (52.7)	75 (14.2)			68.916	<0.0001
Female	273 (57.9)	174 (36.9)	24 (5.1)				

[Table/Fig-2]: Pubertal stages and rate of pubertal development of respondents

Independent variables	Odds ratio	Lower Confidence interval value	Upper Confidence interval value	p-value
Males				
Place of residence				
Rural	0.979	0.629	1.524	0.924
Socio-economic class				
Upper	0.989	0.488	2.001	0.975
Middle	1.435	0.734	2.805	0.291
Living situation				
(Living with parents)	1.704	0.896	3.241	0.104
Females				
Place of residence				
Rural	0.961	0.579	1.595	0.878
Socio-economic class				
Upper	0.473	0.226	0.991	*0.047
Middle	0.788	0.393	1.580	0.502
Living situation				
(Living with parents)	1.970	0.988	3.929	0.054

[Table/Fig-3]: Predictors of early pubertal development among respondents
* significant

DISCUSSION

Our study has shown that the respondents were maturing early. Their age groups reflected that close to half of them were early adolescents, aged 10-13 years, however, the pubertal staging clearly showed that a greater percentage of them were at pubertal stages much older

than their age groups. In fact, over half of the male respondents had attained puberty early while eighty percent of the female respondents had also attained puberty early. The change towards early maturity is in keeping with both old and new studies as reported in literatures [7,18]. In such studies, individual parameters are looked at while assessing pubertal development. A cross-sectional study done among Iran girls showed that the girls were beginning pubertal development at 10 years which is 0.7 years earlier than suggested in Tanner's reference [19]. These changes may be due to increase industrialization, westernization of diet and changing lifestyle and stress related activities being experienced globally [20].

Similar studies especially in this environment are outdated and are only focused on a single parameter in the pubertal development such as menarche only or thelarche only. A classical example is a study carried out in Nigeria among teenage girls and the results showed the age at menarche among urban girls to be between 14 years and less in 1970s and 80s as against 15-18 years obtained in earlier years. However, research conducted by Umeora and Egwuatu [21] reported 15 years as mean age of menarche among rural adolescents while Ezem reported 13 years among urban girls. Our study has considered the entire pubertal development process during the staging of an adolescent making this study more reliable.

Our study further showed the disparities in the males and females pubertal stages and rate of pubertal development. Although, the males and females in this study had similar socio-demographic characteristics, the female respondents were at higher puberty stages (late puberty and post puberty) when compared with the males. Our findings showed that close to 40% of females were in the late pubertal stage while only 20% of males were found to be at this stage. This finding is similar to studies that have shown females attaining puberty earlier than their male counterparts with similar socio-economic background [9,22]. Jones LL and his colleagues in South Africa also documented that there is evidence to suggest that the tempo of pubertal maturation is increasing in girls than in boys [23].

Furthermore, the rate of pubertal development was found to be earlier amongst the females in this study. About half of the male respondents had appropriate rate of pubertal development, while almost two-fifth of the females had appropriate rate of development, whereas more than half of the females had early rate of pubertal development compared with their male counterparts where only about a third had early rate. Further researches may be necessary to look at why females attain puberty earlier than males with similar socio-demographic/economic characteristics in this environment.

Socio-economic class was a significant predictor of attainment of puberty observed in this study. Higher/upper socioeconomic class is contributory to early puberty. In a study done among Turkey adolescents, socioeconomic factors however did not statistically significant influence on their pubertal development [9] in family-stress was said to have cause early puberty among girls which was not determined in our study

LIMITATION OF THE STUDY

This study was however limited by intrinsic factors such as genetic makeup or nutritional status which could affect pubertal timing. These factors were not excluded in this study.

CONCLUSION

Adolescents' pubertal timing was explored in this study. Adolescents from both rural and urban were examined in order to ensure adequate representativeness. The study showed that adolescents attain puberty earlier than expected with more prominence amongst the females. This early puberty should be examined as a possible factor influencing adolescent sexuality issues. This study adds to teeming publications that suggest that adolescents are entering puberty early; hence strategies should be put in place to cater for this category of people.

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