ORIGINAL RESEARCH

Association Between Perceived Family Functionality and Teenage Pregnancies

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Background: Teenage pregnancy is a public health concern because of its increasing incidence and its dire consequences. Numerous studies document the role of family in initiating sexual activity and teenage pregnancy, but there is a lack of studies that assess the effects of families and peers on teenage sexual behavior in the Philippines.
Objective: To determine the association between perceived family functionality as measured by the Family APGAR and teenage pregnancy in selected barangays in District 2, Quezon City, Philippines
Methodology: The study enrolled 233 women who are residents of Barangays Commonwealth and Payatas in Quezon City. Cases consisted of 133 women aged 18 to 24 years at the time of the interview who have become pregnant in 2011-2016, while they were 13 to 19 years old, while controls (N=100) were similar but had never been pregnant before age 20. Consecutive respondents who consented to participate in the study were enrolled and interviewed using the Filipino version of the Family APGAR. Respondents were then classified as having functional or dysfunctional families. Odds ratio was computed to determine the relationship between family functionality and teenage pregnancy.
Results: Family dysfunction based on the Family APGAR score was significantly associated with increased risk of teenage pregnancy with an OR 16.69, 1.93-144 (p=0.010) along with having both parents as caregivers with an OR of 29.69, 2.46-345, and teenage pregnancy in the mother with an OR of 15.87, 2.006-125.
Conclusion: Perception of dysfunction in the family based on the Family APGAR score, having both parents as caregivers and teenage pregnancy in the mother are associated with teenage pregnancy. Future researches should investigate the interactions of these factors but targeting family functionality may be key to curbing teenage pregnancies.

Keywords: Family functionality, Family APGAR, teenage pregnancy

Introduction

Teenage pregnancy is a public health concern because of its increasing incidence and its dire consequences to both the young mother and the baby. From 2000 to 2010, the number of live births by teenage mothers rose by an alarming 60% with one in ten women aged 15-19 ever been pregnant, with 8% already mothers and 2% pregnant with their first child.[1] Statistics also show that out of the total 1,784,316 births in 2008, 10.4% (or around 185,000) were from mothers under 20 years of age.[2] Moreover, teenage

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pregnancies lead to the highest maternal and infant mortality rates, cause increased incidence of pre-term delivery, low birth weight babies, as well as anemia and pre-eclampsia in the mothers.

There are several risk factors that are known to be associated with teenage pregnancies, and foremost among these is family functionality. The definition of family function is "the extent to which a family works as a unit".[3] In short, when the family works well as a unit, then the teenager does not start sexual activity early and possibly will avoid teenage pregnancies. Certain characteristics of families such as family cohesion, the quality of teen-parent relationships, parental supervision, and participation in shared activities are protective from early sexual activity.[4-11] On the other hand, risk of teenage pregnancy was significantly related to the number of siblings, the size of the household, the type of family the teenager is a part of; belonging to a family with single parents, divorced parents, an employed mother, and members that have a history of teenage pregnancy.[12-19]

Family functionality can be measured using various tools but one of the most widely used tools in assessing family functioning in the clinical setting is the Family APGAR.[20] This is a qualitative test that elicits perception and level of satisfaction on the family members' relationships.[21] It has also been used in some studies to define the association of family functioning and teenage sexual behavior.[22]

Although there are numerous studies documenting the role of family in initiating sexual activity and teenage pregnancy across the world, there is a dearth of studies that assess the effects of families and peers on teenage sexual behavior specific to the Philippines,[12] and specifically using the Family APGAR to assess family functionality in relation to sexual behaviors and teenage pregnancies. There is also a lack of data on the factors that affect incidence of teenage pregnancy in the country. It is important to understand family functionality in relation to teenage pregnancy in order to plan interventions that will contribute to the reduction of teenage pregnancy in the Philippines by targeting the most basic social unit - the family.

The aim of this study is to determine the association between family functionality as measured by the Family APGAR and the occurrence of teenage pregnancy among women currently aged 18-24 in selected barangay health centers in Barangays Commonwealth and Payatas, District 2, Quezon City.

The key factors that were found in the review of literature to be significantly related to the occurrence of adolescent pregnancy were included in the study. It must also be noted that although some references would relate family functionality with sexual initiation and behavior, the occurrence of pregnancy is given primacy in this case as it relates to the study's objectives, and as it is the final measure that is determined by family functionality.

Patients and Methods

Study Design

A cross-sectional study design was employed to investigate the relationship of teenage pregnancy with family functionality assessed using the family APGAR.

Setting

The study was conducted on a total of six barangay health centers, representing two barangays from District 2, Quezon City, namely Brgy. Commonwealth and Brgy. Payatas as these were the areas with the highest recorded number of teenage pregnancies reported in 2014. These barangay health centers include Commonwealth, Doña Nicasia, NGC, Payatas A, Payatas B, and Lupang Pangako.

Study Participants

Women were recruited if they met the following screening criteria: aged 18-24 years old at the time of the study, availed of services in the health centers and able to read and write in Filipino. The age requirement was limited based on the ability to independently give an informed

consent as well as to minimize recall bias. They were classified as cases if they got pregnant before the age of 20, and controls if they are nulligravid or have gotten pregnant at the age of 20 years and above. A total of 235 participants were recruited with 233 included in the analysis.

Study Tools and Procedures

The study objectives and procedures were explained to each of the women who were recruited for participation, written informed consent forms were given to each and signed prior to any study-related activities. Participants were then asked to answer a self-administered questionnaire composed of identifying data, the Filipino-version of the family APGAR for the assessment of family functionality, as well as sociodemographic factors which were found to affect early pregnancy in teens. These factors include educational attainment of the teen, educational attainment of the mother and the father, household size, family type (i.e. biological, blended or with step parent, single parent, etc.), parents' status (i.e. living together or separated), number of siblings, primary caretaker, family breadwinner, presence of a family member (mother or sister) who became pregnant as an adolescent, and household income. The participants were asked to answer the family APGAR questionnaire based on their situation at the time of their pregnancy or their situation in the past 5 years.

This tool was adapted from a Filipino-translated version available from local family medicine textbooks and consists of 5 items with a 3-point Likert scale that ranged from 0 (hardly ever) to 2 (almost always). Interpretation of the results depends on their total score with 8-10 defined as "functional" while a score less than 8 defined as "dysfunctional". This tool has been found to be valid with similar associations with some variables from the original study, with good internal consistency and with no differences in the results as the English version when controlled for age, sex, marital status, educational attainment, and monthly family income.[24] Various studies using the adapted Filipino Family APGAR also report Cronbach alpha values ranging .80 to .85, and item-to-total correlations ranging from .50 to .65, making it an ideal tool for measuring perceived family functionality in the Philippines. (Supportive Hospice & Palliative Medicine, n.d.). The socio-demographic questions had choices available or are otherwise answerable by yes or no.

Data Analysis

Data from all evaluable subjects who satisfy the inclusion/exclusion criteria were included in the analysis. Missing values were not replaced or estimated during the statistical analysis of outcome variables. Summary statistics were presented in tables and reported as mean $\pm$ SD or median (range) for quantitative characteristics and number (%) for qualitative characteristics. Column percentages were computed relative to total data excluding missing values. Checks for normality assumption and homogeneity of sample population was done. T-test or Mann Whitney U test was used to compare averages. Chi-square test or Fisher's exact test was used to compare proportions. Univariate analysis was performed to determine independent significant associations of family functionality, sociodemographic and other characteristics with teenage pregnancy with significant p-value at <0.05. Multivariate logistic regression analysis was used to determine significant association between family functionality considering effects of other factors. Best multivariate regression model was determined. Odds-ratios (OR) and 95% confidence intervals (CI) were estimated. Statistical significance was based on p-values ≤ 0.05 for the multivariate analysis. SPSS v20 was used in data processing and analysis.

Ethical Considerations

The study was approved by the Ethics Committee of the Ateneo School of Medicine and Public Health. It followed the principles of research ethics as defined by the declaration of Helsinki including confidentiality, autonomy, justice, and beneficence.

Results

A total of 233 participants were included in the study with 133 cases and 100 controls. The mean age of participants was 21 years ± SD 1.95 with participants residing in Barangay Commonwealth (56%) and Payatas (42.5%), having lived there an average of 9.5 years, ± SD 8.39. The following is the distribution of respondents according to functionality of their families: 161/233 (69.10%) were functional, 69/233 (29.61%) were from moderately dysfunctional, and 3/233 (1.29%) were from severely dysfunctional families. The total percentage of respondents who are from dysfunctional families (total of moderately and severely dysfunctional groups) is 30.90%. Regarding family income, 105/233 (45.06%) of the respondents were above the poverty threshold, while 103/233 (44.21%) were below the threshold.

Less than half of the participants had parents who graduated from high school at 106/233 (48.18%) for mothers and 86/233 (40.38%) for fathers. The greater majority had their parents living together (175/233 or 77.09%) with around 7 household members while they were 13-19 years. The primary caretaker was the mother in 93/233 (35.91%) respondents, followed by both parents at 74/233 (28.57%). Most participants had at least one sibling, with 45/233 (28.48%) having siblings from a stepparent.

The percentage of mothers of the respondents who also had had previous teenage pregnancy was 102/233 (43.77%), while teenage pregnancies in the respondents' sister was found among a third of the subjects at 77/233 (33.05%) The primary wage earner for most was their father (127, 54.98%) while the primary decision maker was either their mother (80, 34.78%) or their father (77, 33.48%).

There were 133 (57.1%) women aged 18 to 24 during the interview who had been pregnant and 100 (42.9%) who had not been pregnant from 2011 to 2016 while they were 13 to 19 years old (p=0.002). Of those who had their first pregnancy at 15-17 years old, 22 have been pregnant once, 21 have been pregnant twice, 7 have been pregnant thrice, 2 have been pregnant four times, and 2 have been pregnant five times. Of those who had their first pregnancy at 18-19 years old, 36 have been pregnant once, 35 have been pregnant twice, 4 have been pregnant thrice, 2 have been pregnant four times, and 1 has been pregnant five times. Based on family APGAR scores, there were 68.7% functional families, 30.0% moderately dysfunctional and 1.3% severely dysfunctional (p=0.000). Teenage pregnancy was more common among functional families (63.2% vs 36.8%; p=0.046).

Family functionality was significantly associated with teenage pregnancy (p=0.046; Table 1). Other significant factors, based on univariate results included primary caretaker (p=0.021), stepsiblings in the household (p=0.020) and teenage pregnancy in sister (p=0.023). Teenage pregnancy was more likely to occur in dysfunctional families, among families with both parents as primary caretaker and those with mothers who had teenage pregnancy.

Based on the results of multivariate regression analysis, the final regression model took into account effects of factors associated with teenage pregnancy significant at 10% level based on univariate results. Results show that family functionality based on APGAR score was significantly associated with teenage pregnancy. Other factors of teenage pregnancy were having both parents are primary caretaker and teenage pregnancy in mother (Table 2). Teenage pregnancy was more likely to occur among those with perception of having dysfunctional families, among families with both parents as primary caretaker and those with mothers who had teenage pregnancy.

Discussion

The results show that perceived family dysfunction as measured by the Family APGAR is associated with teenage pregnancy. This finding is consistent with the literature, where family functionality has been found to be instrumental in teenage sexual behavior, particularly in sexual initiation, contraceptive use, and pregnancy.[12] Certain aspects of family functionality, such as parent/child closeness and parental regulation, were identified to

Table 1. Results of univariate analyses, N= 233, Quezon City, Philippines

Characteristic	Teenage Pregnancy		p-value	Odds-Ratio (95% CI)
	Yes N=133	No N=100		
Family functionality (Family APGAR), n (%)				
Dysfunctional	49 (36.8%)	24 (24%)	0.046*	1.847
Functional	84 (63.2%)	76 (76%)		(1.036,3.294)
Age at first pregnancy, mean ± SD	17.6 ± 1.2	21.2 ± 1.1	0.000*	**
Student during the last 5 years, n (%)				
Yes	80 (60.2%)	60 (63.8%)	0.583	0.855
No	53 (39.8%)	34 (36.2%)		(0.496,1.476)
Number of pregnancies, n (%)				
1	57 (42.9%)	65 (82.3%)	0.000*	0.162
> 1	76 (57.1%)	14 (17.7%)		(0.083,0.316)
Monthly income, n (%)				
Equal/ below poverty threshold**	64 (54.2%)	41 (45.6%)	0.263	1.416
Above poverty threshold	54 (45.8%)	49 (54.4%)		(0.817,2.457)
Household size, median (IQR)	7.7 ± 16.0	7.1 ± 3.4	0.206	**
Household size, n (%)				
2 - 5	39 (29.5%)	31 (31.3%)	0.775	0.920
> 5	93 (70.5%)	68 (68.7%)		(0.522,1.620)
Primary caretaker, n (%)				
Father	17 (13.0%)	5 (5.1%)	0.021*	**
Mother	45 (34.4%)	48 (49.0%)		
Both parents	39 (29.8%)	34 (34.7%)		
Stepmother	-	-		
With or only stepfather	1 (0.8%)	-		
Others	29 (22.1%)	11 (11.2%)		
Educational attainment of mother, n (%)				
None/Primary	52 (42.3%)	35 (36.8%)	0.473	**
Secondary	60 (48.8%)	47 (49.5%)		
Post-secondary	11 (8.9%)	13 (13.7%)		
Educational attainment of father, n (%)				
None/Primary	50 (41.7%)	40 (43.5%)	0.678	**
Secondary	52 (43.3%)	35 (38.0%)		
Post-secondary	18 (15.0%)	17 (18.5%)		
Stepsiblings in the household, n (%)				
Yes	33 (35.9%)	12 (18.2%)	0.020*	2.517
No	59 (64.1%)	54 (81.8%)		(1.181,5.365)

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Characteristic	Teenage Pregnancy		p-value	Odds-Ratio (95% CI)
	Yes N=133	No N=100		
Number of siblings in the household, mean ± SD	5.1 ± 2.6	4.7 ± 2.6	0.282	**
Living arrangement of parents, n (%)				
Living together	95 (74.2%)	77 (79.4%)	0.429	0.748
Separated	33 (25.8%)	20 (20.6%)		(0.398,1.406)
Primary wage earner, n (%)				
Father	75 (56.8%)	51 (52.6%)	0.359	**
Mother	18 (13.6%)	20 (20.6%)		
Both parents	20 (15.2%)	17 (17.5%)		
Others	19 (14.4%)	9 (9.3%)		
Woman is the wage earner in the household, n (%)				
Yes	53 (40.2%)	43 (44.3%)	0.588	0.843
No	79 (59.8%)	54 (55.7%)		(0.496,1.432)
Woman is primary decision-maker in the household, n (%)				
Yes	87 (66.4%)	60 (61.9%)	0.488	1.219
No	44 (33.6%)	37 (38.1%)		(0.706,2.107)
Teenage pregnancy in mother, n (%)				
Yes	63 (48.1%)	34 (35.1%)	0.058	1.717
No	68 (51.9%)	63 (64.9%)		(1.001,2.945)
Teenage pregnancy in sister, n (%)				
Yes	50 (38.5%)	24 (24.2%)	0.023*	1.953
No	80 (61.5%)	75 (75.8%)		(1.094,3.488)
Duration of residence in current address, median (IQR)	6 (17)	6 (18)	0.736	**
Duration of residence in current address, n (%)				
≤ 6 years	58 (53.7%)	45 (54.2%)	0.944	0.980
> 6 years	50 (46.3%)	38 (45.8%)		(0.552,1.739)

SD: standard deviation, IQR: interquartile range. Data presented as mean ± SD for normally distributed continuous variables and median (IQR) for variables with skewed distribution or n (%) for qualitative variables.

* Significant at 5% level

** No statistic computed. Not applicable.

*** Approximately PhP8,000.00 to PhP9,000.00 estimate of average monthly income based on 2014 National Statistical Coordination Board Poverty threshold equivalent to PhP8,778.00 monthly income for a family of five.

Table 2. Multivariate analyses of various factors and teenage pregnancy, N-233, Quezon City, Philippines.

	p-value	Odds-Ratio	95% CI
Family functionality			
Dysfunctional	0.010*	16.689	(1.933,144.081)
Functional (Reference)			
Primary caretaker			
Both parents	0.008*	29.694	(2.460,345.311)
Others (Reference)			
Teenage pregnancy in mother			
Yes	0.009*	15.871	(2.006,125.554)
No (Reference)			

* Significant at 5% level

decrease the risk of teenage pregnancy.[9] Other studies have also demonstrated a protective effect of positive family dynamics in reducing risk factors related to pregnancy, particularly in delaying initiation of sexual activity among teenagers.[4,5,11,22,23,25] Woodward, Fergusson and Horwood in 2001 offered some theories on the increased risk of pregnancy among teenagers from dysfunctional families. Teenagers from disrupted families can more likely become pregnant because of exposure to early romantic behaviors between parents, less effective monitoring of adolescent behavior, and the desire to hasten exit of the adolescent from the family.

The study also reveals there is significant association with having both parents as caretakers and teenage pregnancy, contradicting numerous studies from different countries regarding the role of the parent in the risk of teenage pregnancy. Studies from New Zealand,[26] United States,[28] Turkey,[29] and Malaysia[30] all show the risk of teenage pregnancy being increased when the teenager comes from a family with a single parent. A case-control study in the Philippines[31], found that teenagers were more likely to become pregnant if their parents were separated as compared to living together. An exception in the literature is a study done in Mexico[17] that showed the highest cases of adolescent pregnancies among households with both biological parents, and living with a non-intact family as a protective factor against adolescent pregnancy. They attribute these findings to effective parental monitoring and communication, and compliance of the adolescent to the household rules despite only one parent as household head.

Despite both parents being caretakers of the teenager and being present for the teenager's upbringing, the dynamics between the parent and the child may put a teenager at risk for risky behaviors. Having more parental supervision and rules have been related to less likelihood of initiation of sex[8] and pregnancy in adolescence.[9,32] Parent/child closeness or connectedness was also found to decrease the risk of adolescent pregnancy.[9] Family attitudes may play a role, as a Turkish study found that a family's attitude towards adolescent marriage[29] and teen intercourse[9] is associated with teenage pregnancy.

History of teenage pregnancy in the family and occurrence of teenage pregnancy in an adolescent were also found to be associated. This is partly because mothers and older siblings are perceived as the family's primary source of influence and because they share the same context.[33]

There are studies suggesting that having both a sister and a mother with a history of teenage pregnancy greatly increases the risk for being a teenage mother.[18] Another study even suggested that it is the sister's pregnancy that greater influences the risk for teenage pregnancy compared to the mother having a child before the age of 19.[18,33] In line with this, the study found that teens with mothers who had experienced teenage pregnancy are 15.87 times more likely to get pregnant early when considering all other variables. Although it was also noted that having a sister that has experienced teenage pregnancy has a greater influence on teenage pregnancy (1.95 times more likely) compared to the teen's mother having a child in her teens as well (1.71 times more likely), this finding was only seen when considering these variables independently.

The influence of the mother's early pregnancy on increasing the risk of her child also experiencing teenage pregnancy is said to be due to the environment that the situation fostered.[34] The components of this setting include the indirect effects of the family's socioeconomic condition (i.e. low opportunity and low level aspiration), the mother's role-modeling, and the values transmitted from the previous generation.[34] The teenagers may also develop a preference for early pregnancy and engage in unprotected sex early in their lives as a result of low maternal monitoring and control. The results of this study therefore highlight the occurrence of intergenerational teenage pregnancy and that the control of which requires interventions geared for both the teens and their mothers.

Other Factors

Other factors that were associated with teenage pregnancy but did not reach significance were a monthly income below the poverty threshold and having a female primary decision-maker in the household, being a student during teenage years, having parents who are living together, and having a woman as the primary wage earner in the household. Previous studies have also reported conflicting data on the role of these factors in teenage pregnancy.

Significance for Public Health

Existing local policies on adolescent health are focused on sex education and family planning service provision. However, this research suggests that national health strategies geared towards reducing teenage pregnancy should also include family counseling as a core component. Furthermore, the data suggest that a screening mechanism be put in place in order to identify at-risk teenagers, including those from dysfunctional families, in order to prevent cases of teenage pregnancy. Further studies need to be conducted on interventions for teenage pregnancy that can target families, family dynamics, and family functionality.

Limitations

The chosen population consisted of women aged 18-24 who were previously pregnant during their adolescent years, and not currently pregnant teenagers. They were asked to answer questions on family functionality based on their situation during the time of pregnancy possibly leading to recall bias. The selection of these participants was done through convenience sampling, and the absence of random selection may have resulted in selection bias, negatively affecting the study's internal validity. The inclusion of 18 and 19 year old women who were nulligravid at the time of the study may also lead to information bias because of the operational definition of teenage pregnancy. Lastly, the wide confidence intervals of the odds ratio indicates lack of precision or a relatively small sample size. The sample size can still be increased in future studies to validate the results of this study.

The collection of data included answering the Family APGAR and the administration of a survey that were done in crowded health centers. The location of the interview may have influenced the occurrence of social acceptability bias in answering the survey. In addition, the busy setting may have impeded the clear understanding of the instructions of the survey. There are also limitations of the family APGAR itself, including being restricted to what the respondent is willing

to disclose, and measuring the respondent's perception of and satisfaction with their family functionality.[21]

In the data analysis, it was noted that there were no controls and only three cases in the severely dysfunctional family functionality population. Furthermore, respondents living in the same households, which may have different perceptions for their family's functionality, were unaccounted for in the analysis.

Conclusion

Family dysfunction based on the Family APGAR score, having both parents as caregivers and teenage pregnancy in the mother are associated with greater odds of teenage pregnancy. The results reflect the importance of conducting family counseling and screening, with particular interest in family functionality, to identify teenagers at risk. The lack of studies regarding teenage pregnancy and family functionality in the Philippine setting compel further research to be conducted.

For future researches, it is recommended to extend the scope of the study and increase the sample size. Attention and further investigation should be given to family dynamics and functionality, the role of biological parents, primary caretaker/s and their employment status and dynamics with the teens, and the family history of teenage pregnancy. Other tools to measure family functionality may also be considered for use. It is also favorable to have currently pregnant teenagers as respondents.

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Conflicts of Interest: None

Ethical Standards

The authors assert that all procedures contributing to this work comply with the Helsinki Declaration of 1975, as revised in 2008.

References

1. Republic of the Philippines: Philippines Statistics Authority (2013) NSO Release 2013 Philippines in Figures. Available at: https://psa.gov.ph/content/nso-releases-2013-philippines-figures (Accessed Oct 12 2016).
2. Natividad J. Teenage Pregnancy in the Philippines: Trends, Correlates and Data Sources. J ASEAN Fed Endocr Soc 2014; 28: 30. doi:http://dx.doi.org/10.15605/jafes.028.01.07
3. Smilkstein G. The family APGAR: A proposal for a family function test and its use by physicians. J Fam Pract 1978; 6(6): 1231-9. https://www.ncbi.nlm.nih.gov/pubmed/660126
4. Graaf HD, Schoot RVD, Woertman L, Hawk ST, Meeus W. Family cohesion and romantic and sexual initiation: A three wave longitudinal study. J Youth Adolesc 2012; 41(5): 583–92. doi.org/10.1007/s10964-011-9708-9.
5. Pearson J, Muller C, Frisco ML. Parental involvement, family structure, and adolescent sexual decision making. Sociol Persp 2006; 49 (1): 67–90. http://doi.org/10.1525/sop.2006.49.1.67
6. Adolph C, Ramos D, Linton K, Grimes D. Pregnancy among Hispanic Teenagers: Is good parental communication a deterrent?. Eur J Contracep Reproduc Health Care 1995; 51(5): 303-6. https://doi.org/10.1016/0010-7824(95)00081-K
7. Pereira AIF, Canavarro MC, Cardoso MF, Mendonca D. Relational factors of vulnerability and protection for adolescent pregnancy: A cross-sectional comparative study of Portuguese pregnant and nonpregnant adolescents of low socioeconomic status. J Adolesc 2015; 40: 159. Available from: https://www.ncbi.nlm.nih.gov/pubmed/16268140
8. Roche, KM. Parenting influences on early sex initiation among adolescents: How neighborhood matters. J Fam Issues 2005; 26 (1): 32–54. http://doi.org/10.1177/0192513x04265943
9. Miller B. Family influences on adolescent sexual and contraceptive behavior' J Sex Res 2002; 39(1): 22-6. http://www.columbia.edu/cu/psychology/courses/3615/Readings/Miller_2002.pdf

10. Kalina O, Geckova AM, Klein D, Jarcuska P, Orosova O, Dijk JPV, Reijneveld SA. Mother's and father's monitoring is more important than parental social support regarding sexual risk behaviour among 15-year-old adolescents. Eur J Contracept Reprod Health Care 2013; 18(2): 95–103. http://doi.org/10.3109/13625187.2012.752450
11. Levin KA, Kirby J, Currie C. Adolescent risk behaviors and mealtime routines: does family meal frequency alter the association between family structure and behavior? Health Educ Res 2012; 27(1): 24-35. Available from doi:10.1093/her/cyr084
12. Gipson JD, Hicks AL, Gultiano SA. Gendered differences in the predictors of sexual initiation among young adults in Cebu, Philippines. J Adolesc 2014; 54(5): 599–605. Available from http://doi.org/10.1016/j.jadohealth.2013.10.014
13. Okigbo CC, Speizer IS. Determinants of sexual activity and pregnancy among unmarried young women in urban Kenya: A cross-sectional study. Public Library of Science One 2015; 10(6). doi:10.1371/journal.pone.0129286
14. Santos MI, Rosario F. A score for assessing the risk of first-time adolescent pregnancy. J Fam Pract 2011; 28(5): 482-8. doi:10.1093/fampra/cmr015
15. Gaudie J, Mitrou F, Lawrence D, Stanley FJ, Silburn SR, Zubrick SR. Antecedents of teenage pregnancy from a 14-year follow-up study using data linkage. BMC Public Health 2010; 10(1): 63. http://doi.org/10.1186/1471-2458-10-63
16. Guijarro S, Naranjo J, Padilla M, Gutierez R, Lammers C, Blum R. Family risk factors associated with adolescent pregnancy: study of a group of adolescent girls and their families in Ecuador. J Adolesc Health 1999; 25(2): 166-172 https://doi.org/10.1016/S1054-139X(99)00020-8
17. Vasquez-Nava F, Vazquez-Rodriguez CF, Saldivar-Gonzalez, AH, Vazquez-Rodriguez EM, Cordova-Fernandez JA, Felizardo-Avalos J, Sanchez-Marquez W. Unplanned pregnancy in adolescents: Association with family structure, employed mother, and female friends with health-risk habits and behaviors. J Urban Health 2014; 91(1): 176-85. doi:10.1007/s11524-013-9819-6
18. East PL, Reyes BT, Horn EJ. Association between adolescent pregnancy and a family history of teenage births. Persp Sexual Reprod Health 2007; 39(2): 108-15. DOI: 10.1363/3910807
19. Bonell C, Allen E, Strange V, Oakley A, Copas A, Johnson A, Stephenson J. Influence of family type and parenting behaviours on teenage sexual behaviour and conceptions. J Epidemiol Comm Health 2006; 60(6): 502–6. http://doi.org/10.1136/jech.2005.042838
20. Supportive Hospice & Palliative Medicine: Philippine physician network (no date) ABOUT THE SHPM. Available at: https://sites.google.com/site/hospiceandpalliativemedicine/homepage/about-the-sphc (Accessed: 15 Oct 2015)
21. Nicodemus LA and Umali MJP. Family assessment tools and their application in family practice. In: Leopando ZE (editor): Textbook of Family Medicine. Vol. 1. Quezon City: C&E, 2014. pp 77-83.
22. Muyibi A, Ajayi I, Irabor A, Ladipo M. Relationship between adolescents' family function with sociodemographic characteristics and behaviour risk factors in a primary care facility. African J Primary Health Care Fam Med 2010; 2(1). doi:10.4102/phcfm.v2i1.177
23. Adebayo A, Ajuonu E, Betiku B. Family functionality and parental characteristics as determinants of sexual decision-making of in-school youths in a semi-urban area of Southwest Nigeria. Int J Adolesc Med Health 2015; 28(4): 413-8. doi: 10.1515/ijamh-2015-0029.
24. Pineda AV. Tools for Family Assessment. In: Bugayong R, Pineda A (eds), PAFP Proceedings of the Orientation Course in Family Medicine. Makati City: Philippine Academy of Family Physicians 1999; 36-50.
25. Liu A, Kilmarx P, Jenkins RA, Manopaiboon C, Mock PA, Jeeyapunt S, Griensven FV. Sexual initiation, substance use, and sexual behavior and knowledge among vocational students in Northern Thailand. Int Persp Sexual Reproduc Health 2006; 32(03): 126–35. http://doi.org/10.1363/3212606
26. Woodward L, Fergusson DM, Horwood LJ. Risk factors and life processes associated with teenage pregnancy: Results of a prospective study from birth to 20 years. J Marriage Fam 2001; 63: 1170-84. http://www.popline.org/node/252885
27. Fasula AM, Miller KS. African-American and Hispanic adolescents' intentions to delay first intercourse: parental communication as a buffer for sexually active peers. J Adolesc Health 2006; 38(3): 193-200. http://doi.org/10.1016/j.jadohealth.2004.12.009
28. Hockaday C, Crase S, Shelley M, Stockdale D. A prospective study of adolescent pregnancy. Journal Adolesc 2000; 23(4): 423-38. doi 10.1006/jado.2000.0329
29. Gokce B, Oxsahin A, Zencir M. Determinants of adolescent pregnacy in an urban area in Turkey: A population-based case-control study. J Bioso Sci 2007; 39(2): 301–11 doi:10.1017/S0021932006001763
30. Omar K, Suriati H, Muhammad NA, Jaffar A, Hashim SM, Siraj HH. Adolescent pregnancy outcomes and risk factors in Malaysia. Int J Gynecol Obstet 2010; 111(3): 220–3. doi:10.1016/j.ijgo.2010.06.023
31. Garcia JB. Factors affecting teenage pregnancy among Filipino adolescents in selected urban and rural institutions: A case control study. Filipino Fam Phys 2005; 43(3): 98-102.
32. Miller B, Benson B. Family relationships and adolescent pregnancy risk: A research synthesis. Dev Rev 2001; 21(1): 1–38. doi: 10.1006/drev.2000.0513
33. Wall-Wieler E, Roos L, Nickel N. Teenage pregnancy: the impact of maternal adolescent childbearing and older sister's teenage pregnancy on a younger sister' BMC Pregnancy Childbirth 2016; 16: 120. doi:10.1186/s12884-016-0911-2
34. Dogan-Ates A, Carrion-Basham CY. Teenage pregnancy among Latinas examining risk and protective factors. Hispanic J Behav Sci 2007; 29(4): 554-69. doi: 10.1177/0739986307308163