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Prevalence and Determinants of Anxiety Disorder among Teenage Mothers in Limbe and Buea Health Districts

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ABSTRACT

Background: Adolescent mothers (10–19 years) form a vulnerable group implicated in yearly child bearing worldwide. The consequences surrounding teenage motherhood is a crucial public health concern. Teenage mothers face numerous challenges with direct consequences on their mental health outcome, anxiety disorder being considered to be among the most disabling conditions. Such situation can be magnified in conflict zones, thus the rationale backing this study.

Objective: To determine the prevalence and determinants of anxiety disorder among teenage mothers in Limbe and Buea Health Districts.

Materials and Methods: A community-based cross-sectional survey was used and teenage mothers were sampled using cluster sampling for recruitment of participants, supported by the snow-ball technique. Data were collected using a structured questionnaire adapted from the Beck Anxiety Inventory (BAI) evaluation tool**.** Data were analysed through the Statistical Package for Social Sciences (SPSS) version 27 following the standard scoring guide. Prevalence of anxiety disorder was estimated using frequency and proportion and the 95% confidence interval (CI) was calculated. Logistic Regression models depicted the significant and critical predictors / determinants of anxiety disorder.

Findings: Cumulatively, roughly half of the teenage mothers (51.5%) had moderate or severe anxiety disorder. The significant (P<0.05) determinants of anxiety following binary association were number of children whereby teenage mother with more children were more susceptible to anxiety, marital status as the single were significantly more exposed, person living with as those living alone were significantly more at risk, location as the more inadequate it was, the higher the exposure, then depression as the depressed were more exposed. Based on Binary Logistic Regression, after controlling the predictors for each other, the significant (P<0.05) determinants of anxiety disorder were health district, residence before the crisis, the dominant ethnic in the hosting community and depression. As for the critical predictors (P<0.05; OR >1 and LB-OR>1) they were dominant ethnic in the hosting community, person living with and depression.

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Background

A devastating effect on teen mental health is seen through teenage motherhood [1]. Teenage child bearing remains a global challenge that requires urgent resolve [2]. It has been observed that teenage childbearing remains persistently detrimental to the mental health of teenagers in the world and mostly in developing countries especially those facing internal conflicts like Cameroon [3,4,5]. It is worth emphasizing that the majority of first births occur to girls aged below 17 years and, in 54 developing

countries, Cameroon's adolescent fertility rate of 138 births per 1000 women aged below 19 is the highest in Central Africa [6]. Some underlying drivers of early pregnancy include gender inequality, poverty, sexual violence and coercion, child marriage, social pressures, exclusion from educational and job opportunities, and negative attitudes about girls not living aside the poor sexual education and behaviours of boys and girls. A more holistic approach is required to support girls' rights and to empower them to mitigate their trauma [7,8]. Adverse outcomes for adolescent mothers, including mental health problems such as anxiety disorder, depression, substance abuse, posttraumatic stress disorder, panic attack just to name a few are usually acquired at the onset of pregnancy, during parturition and even postpartum. These ailments tarry as the young mother undergoes stigmatization from the parents and peers [9,10]. In Cameroon and many African societies, adolescent pregnancy is considered a taboo, and often leaves young mothers highly stigmatized by society. Young girls are often considered to be at fault, irrespective of the circumstances of the pregnancy (planned, unplanned, sexual abuse). This usually led to their neglect or their abandon, root cause of their poor mental health [11]. Teen mothers face adverse situations like stigmatization, trauma, limitations and school dropout that can lead to intergenerational cycles of poverty, poor education, and unemployment [12]. Less attention has been paid to pregnant adolescent right up to their adolescent parenthood, despite evidences showing that adolescent girls are at greater risk for developing mental health disorder during pregnancy and after they give birth. Gender-based and income inequalities are highlighted as key in fuelling teen pregnancies by increasing child marriage rates, restricting their career aspirations, and limiting health care and information on safe, consensual sex [12,13]. The psychological effects of deleterious disposition to teenage mothers include suicidal ideation, guilt, loneliness, anxiety disorder (D), anxiety attack, depression (D) and post-traumatic stress disorder resulting from experience like rape and gunshot [8]. Access to mental health services is inequitable and very limited in Cameroon and other means like mental health applications and community intervention which could cover the gaps are equally quasi-absent [14]. Perinatal teenage girls experience heightened stress levels that could increase the prevalence of depression and anxiety disorders [15,16,17], and this concern is magnified in sub-Saharan Africa where the rate of adolescent pregnancy is still extremely high. It was further highlighted adverse outcomes for young mothers including mental health problems such as Anxiety disorder, panic attack, anxiety disorder, depression, substance abuse, and posttraumatic stress disorder just to name a few [18]. Anxiety symptoms showed significant relationship with anxiety among non-pregnant adolescents [19]. Anxiety disorder was critically associated with level of school attained, emotional regulation skills and substance abuse among adolescents [20,21]. Mental disorders in teenage mothers are more likely to persist throughout adulthood if not attended [22,23,24].

Aim

To determine the prevalence and determinants of anxiety disorder among teenage mothers in Limbe and Buea Health Districts.

Materials and Methods

Research Design

A cross sectional survey was used to determine the prevalence and determinants of anxiety disorder.

Area of Study

The study was carried in Cameroon, in Fako division of the Southwest region. Cameroon is a sub-Saharan central African country with over 28 million inhabitants and made up of ten regions. Fako Division lies at the foot of Mount Cameroon. It covers a surface area of 2093 km square and an average altitude of 2833 m with 534854 inhabitants and the average yearly temperature is about 26.4°C around the coast area [25]. In terms of health, the Southwest Region of Cameroon possesses a regional delegation of public health, training schools for medical and health staffs and health supply centres. The Southwest Region comprises 19 health districts as follows: Buea, Limbe, Ekondo Titi, Kumba, Mamfe, Mbonge, Ekondpo, Fontem, Eyumojock, Bakassi, Muyoka, Nguti, Mundemba, Tombel, Wabane, Konye, Tiko, Bangem and Akwaya. This study was carried out in the Limbe and Buea Health Districts. The two health districts solicited for our study gain their grounds on their accessibility and their heavily populated state thank to their relative calmness patterning the socio-political crisis in Northwest and Southwest regions.

Study Setting

This community-based study was conducted among teenage mothers in both Limbe and Buea Health District. While seven areas make up the Buea Health District (Bova, Bokwango, Buea Town, Buea Road, Molyko, Muea and Tole), eight health areas are found in Limbe Health District (Batoke, Bota, Idenau, Seaport, and Zone II, Moliwe, Bojongo and Mabeta).

Participants to this study were randomly recruited from ten health areas purposefully selected from the fifteen health areas that make up Limbe and Buea Health Districts while one of the non-selected areas

was used for the pilot study. Five areas were used in the LHD and five areas were used for BHD. The number of participants recruited per area was done using probability proportionate to size. Bodies like community heads, churches, local NGOs and hospitals facilitated the identification and the recruitment of the participants. Cluster sampling was the sampling method used, supported by the snowball for recruitment where teenage mothers easily connected to others teenage mothers for their recruitment in the study.

Population of the Study

The population for this study was made up of teenage mothers between the ages of 10 to 19 years present in the selected areas of Limbe district.

Sample and Sampling Techniques

The sample consisted of adolescent mothers who have between the ages of 10-19 in both the Limbe and Buea health district who were present at the time of the study. The sample size for this study was calculated using the Cochran's Formula [26].

$$n = \frac{Z^2 p(1-p)}{e^2}$$

Where;
n = minimum sample size
z = the Z value extracted from z table, 1.96 at a 95% CI
e = desired precision (5%)

P is the estimated proportion of the population; a pre-estimate value of P= 70% was be used. This is in accordance to a similar study in Yaounde-Cameroon where the prevalence of depression in teenage mothers showed 70 % [27]. This sample size estimation was equally applied to anxiety as it was handled side by side with depression as a predictor.

q = (1-P) teenage mother with poor mental health status in Limbe and Buea Cameroon.

$$= 1.96^2 \frac{0.7(1-0.3)}{0.05^2} = 323 \text{ participants}$$

The distribution of the sample in the selected health areas was follow the probability proportionate to size, using the demographic data; 8032 for Limbe and Buea 76272 in 2015 [28], table 1.

However, a total of 355 participants were recruited for the study from the selected health areas as to increase the chance for a good return rate. A multi-stage random sampling method was used in this cross-sectional study as thus:

Stage one: A cluster sampling technique was used to share the 8 health areas of Limbe health District into clusters on one hand (Batoke, Bojongo, Bota, Idenau, Mabeta, Moliwe, Seaport, and Zone II), and the 7 health areas of Buea health District on the other hand (Bova, Bokwango, Buea Town, Buea Road, Molyko, Muea and Tole).

Stage two: A simple random sampling technique was used to select 10 of the health areas from the clusters.

Stage three: A probability proportionate to Size (PPS) was used to know the number of participants to be selected from each per health area to meet up the sample size of 355. Inference was made on the sampling frame, made up of the total population of teenage mothers living in Limbe and Buea Health Districts.

Table 1: Table Presenting the Distribution of sample size in the two health districts

Health Districts	Total teen girls estimated per HD	Proportion	Sampling Size by HD
Limbe	8032	55.8	198
Buea	76272	44.2	157
Total	84304	100	**355**

Research Instruments

Anxiety disorder was assessed using a close-ended questionnaire assessing in section A: the socio-demographic information, section B: quality of life as predictor of anxiety disorder, section C: Health behaviour and section D: Factors associated with anxiety disorder in teenage mothers. The questionnaire was adapted from the Beck Anxiety Inventory (BAI) evaluation tool. The psychometric properties of BAI are found to discriminate well between anxious and non-anxious diagnostic groups in the participants [39].

Validity and Pretesting of the Questionnaire

Content and construct validity were ensured. Prior to field data collection for cross sectional study, the research team went to the field and got some questionnaire filled by fewer adolescent mothers found in health areas that was not selected in the study. This enabled to amend the lapses in the questionnaire to capture all aspects of the determinants of anxiety disorder in order to suit the objectives of the study, thus consolidating content and construct validity and ensuring face validity. The internal consistency assumption was verified using Cronbach's Alpha reliability coefficient [40]. The reliability coefficient was 0.7, which is good [30]. This was calculated considering location, quality of life and anxiety disorder's indicators.

Procedure to Get Questionnaires Filled

Data collection for the cross-sectional survey study was gotten from a structured questionnaire that was administered face-to-face.

Ethical Considerations

Ethical Clearance

Ethical clearance to carry out this study was obtained from the institutional Review Board of the Faculty of Health Sciences of the University of Buea (2024/2578-08/UB/SG/IRB/FHS). This was gotten after the review board has reviewed the research proposal submitted to the board to ensure that safe scientific procedures were used in collecting data and ethics respected.

Administrative Clearance

Administrative approval was obtained from the Faculty of Health Science administration of the University of Buea, the Regional Delegation of Public Health for the Southwest region of Cameroon, the Chief of service at the Limbe and Buea Health Districts and the chiefs of the community.

Informed Ascent and Consent

The study objectives were thoroughly explained to participants. The impact and benefits of voluntary participation was equally clarified to them. The data collection tools were confidentially coded as initial step to participate in the study. Ascent and consent were sought since participants were all minors for some of them. Language barrier was taken care of as well as questions from the participants that were allowed for all clarification patterning to the study. To the knowledge of the participants, all data provided and all conversation were to be held in strict confidentiality.

Data Analysis Procedure

Data were digitalized using EpiData Version 3.1 (EpiData Association, Odense Denmark, 2008) which has an in-built consistency check to control for invalid entry [29,30]. Data were analysed through the Statistical Package for Social Sciences (SPSS) version 21(IBM, 2012) [31] following the standard scoring guide. The prevalence of anxiety was estimated using frequency and proportion and the 95% confidence interval (CI) was calculated. Logistic Regression models depicted the significant and critical predictors / determinants of depression. A predictor was deemed significant when the asymptotic significant felt below the Alpha set at 0.05 for a 98% CL (Confident Level). As for the critical predictors, they were sorted out based on their values of the Odds Ratio (OR). A determinant was critical when the OR was greater than one and the LB-OR (Lower Bound of Odd Ratio) did not go below one. The screening of predictors was sequential; it started with binary association whereby the significant one was highlighted by the Chi-Square test of Independence. Those that were significant for the binary association were introduced as independent predictors in Binary Logistic Regression and controlled for each-other to depict the significant and critical predictors. The significant predictors depicted by bivariate association and Binary Logistic Regression were concatenated in a Multinomial Logistic Regression model to depict the magnitude of difference among predictor's categories.

Findings

Socio-demographic information

Table1: Socio-demographic information of teenage mothers in Limbe and Buea health Districts

Health district	**n**	**%**
Limbe	198	55.8
Buea	157	44.2
Age range (years)	**n**	**%**
11-16	58	16.3
17-18	127	35.8
19	170	47.9
Religion	**n**	**%**
Christian	332	93.5
Muslim	6	1.7
ATR	11	3.1
Atheist	6	1.7
Place of residence before the crisis	**n**	**%**
Limbe	79	22.3
Buea	67	18.9

Neither Limbe nor Buea (IDP)	209	58.9
Level of education	**n**	**%**
Primary level of education	152	42.8
Secondary level of education	116	32.7
High school level of education	67	18.9
Never been to school	20	5.6
Number of children	**n**	**%**
One	249	70.1
Two-three	106	29.9
Occupation	**n**	**%**
Serving	10	2.3
Farming	2	.6
Hair dressing	2	.6
None	296	83.4
Petty trading	42	11.9
Tailoring	5	1.4
Employment status	**n**	**%**
Employed	59	16.6
Not employed	296	83.4
Marital status	**n**	**%**
Married	2	.6
Single	339	95.5
Cohabiting	14	3.9
Duration of stay in the community	**n**	**%**
1-3(Years)	166	46.8
4-17(Years)	189	53.2
Dominant ethnic in the hosting community	**n**	**%**
Bakweri	347	97.7
Banyangui	2	.6
Haousa	3	.8
Meta	2	.6
Oroko	1	.3
Dominant ethnic in the hosting community	**n**	**%**
Bakweri	347	97.7
Others	8	2.3
Dominant ethnic in the hosting community is the same as one's ethnic	**n**	**%**
Yes (Identical)	147	41.4
No (Different)	208	58.6
Person living with	**n**	**%**
Alone	131	36.9
With family, friend or relative	177	49.9
With partner	47	13.2
Location	**n**	**%**
Inadequate	188	53.0
Adequate	167	47.0
Quality of life	**n**	**%**
Very poor	114	32.1
Poor	241	67.9

N=355

Health district

Teenage mothers were sampled in two health districts notably Limbe health district with a proportion of 198 (55.8%) and Buea health district with a proportion of 157 (44.2%).

Age

The mean age was 18% with the youngest aged 11 years and the oldest 19 years. The median was 18 years meaning that roughly half of them was aged 18 years or less, and the other half 19 years. The standard deviation was 1.5, meaning that teenage mothers were relatively diversified in their ages. Based on distribution by ranges, 58(16.3%) of them were aged 11-16 years, 127(35.8%) 17 to 18 years and the rest 170(47.9%) 19 years. Cumulatively, 52.1% of them were aged 11 to 18 years.

Division of Origin

The mode was Fako 147(41.4%), followed by Meme 39(11.0%), Mezam 24(6.8%), Momo 28(7.9%), Manyu 22(6.2%), Ndian 22(6.2%), Menchum 15(4.2%), Bui 11(3.1%), Lebialem 9(2.5%), Kupe Manenguba 8(2.3%), Boyo 5(1.4%), Ngoketunjia 5(1.4%), Mifi 4(1.1%), Mungo 4(1.1%), Batouri 1(0.3%), Benoue 1(0.3%), Diamare 1(0.3%) and Ndian 1(0.3%).

Religion

Teenage mothers were generally Christian 332(93.5%), 11(3.1%) were practicing African Traditional Religion, 6(1.7%) were Muslim while 6(1.7%) were Atheist.

Place of residence before the crisis

As for the place of residence before the crisis, they were for the majority IDPs 209(58.9%), followed by those from Limbe 79(22.3%) while 67(18.9%) were from Buea.

Level of education

The mode here was primary level of education with a proportion of 152(42.8%), followed by secondary level of education 116(32.7%), High school level 67(18.9%), while 20(5.6%) had never been to school.

Number of children

They mostly had one child 249(70.1%), while 89(25.1%) had 2 children while 17(4.8%) had 3 children.

Employment status

Most of them were unemployed 296(83.4%), 40(11.3%) were involved in petty business, 5(1.4%) were house help and the same proportion were doing tailoring. Other occupations were bar attendant, farming, hair dressing and sales girl while 2 said to be self-employed without specifying what they were actually doing. This makes a proportion of 59(16.6%) that were employed and 296(83.4%) that were not employed.

Marital status

They were generally single 339(95.5%), 14(3.9%) were cohabiting (come-we-stay), while 2(0.6%) were married.

Duration of stay in the hosting community

The mean duration of stay was 6 years, the minimum 1 and maximum 19 years. The median was 4 years meaning that half of them had stayed less than 4 years and the other half 4 year and above. The standard deviation was 5.5 meaning that teenage mothers were highly diversified in their duration of stay. Based on ranges, 166(46.8%) had stayed 1-3 years, 189(53.2%) 4-19 years.

Dominant ethnic in the hosting community

The dominant ethic in the hosting community was generally Bakweri 347(97.7%). Others included Haoussa, Banyangui, Meta and Oroko. Other grouping gives Bakweri 347(97.7%) and others 8(2.3%).

Dominant ethnic in the hosting community is the same as one's ethnic

Less than majority 147(41.4%) had dominant ethnic in the hosting community been the same as one's ethnic group, which could pose adaptation challenges.

Person living with

They were mostly living with family, friend or relative 177(49.9%), 131(36.9%) live alone while 47(13.2%) live with a partner.

First communication language

Their first communication language was mostly Pidgin 310(87.3%), followed by English 40(11.3%) while French made up 5(1.4%).

Quality of life

The quality of life was poor for the majority of them 67.9% (241).

Characterisation of anxiety disorder in teenage mothers

Table 2: Characterization of anxiety disorder in teenage mothers

SN	Item	Response options	
		Yes	No
1	Have a supportive relationship with the baby's father	114(32.1%)	241(67.9%)
2	Experience stress related to parenting responsibilities	252(71.0%)	103(29.0%)
3	Have access to resources or support for parenting challenges	63(17.7%)	292(82.3%)
4	Have experienced any traumatic events or abuse in the past	251(70.7%)	104(29.3%)
5	Experiences contribute to your feelings of anxiety as a teenage mother	258(72.7%)	97(27.3%)
6	Experience significant emotional or mood changes during pregnancy or after childbirth	261(73.5%)	94(26.5%)
7	Feel that one has effective strategies for managing anxiety	116(32.7%)	239(67.3%)
8	Impact of stigma or judgment from others due to being a teenage mother on mental well-being	273(76.9%)	82(23.1%)
9	Impact of stigma or judgment from others due to being a teenage mother on mental well-being	76(21.4%)	279(78.6%)
10	Have sought out mental health support for feelings of anxiety or stress	138(38.9%)	217(61.1%)

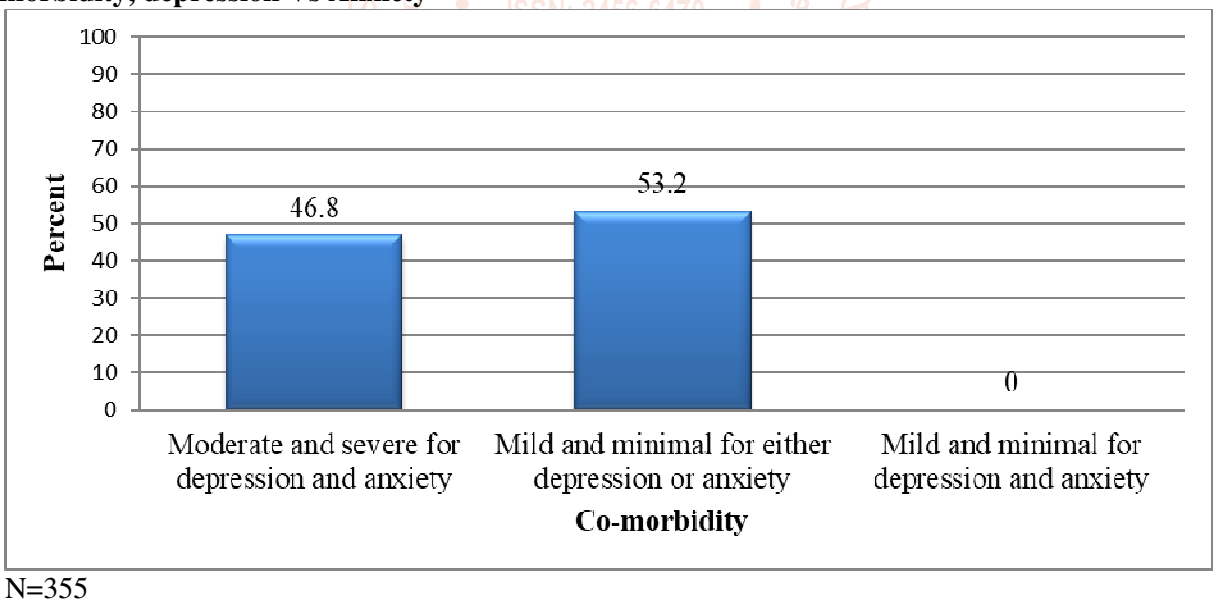
Prevalence of anxiety disorder of teenage mothers

Most teenage mothers had moderate anxiety 175(49.3%), followed by the 143(40.3%) with minimal, 29(8.2%) with mild while 8(2.3%) had severe anxiety. Cumulatively, roughly half of the teenage mothers (51.5%) had moderate or severe anxiety (table 3).

Table 3: Prevalence of anxiety disorder of teenage mothers

Anxiety	Frequency	Percent (95% CI)	Cumulative Percent
Severe	8	2.3 (1.1-4.2)	2.3
Moderate	175	49.3 (44.1-54.5)	51.5
Minimal	143	40.3 (35.3-45.5)	91.8
Mild	29	8.2 (5.6-11.4)	100.0
Total	355	100.0	

Co-morbidity, depression Vs Anxiety



N=355

Figure 1: Co-morbidity, depression Vs Anxiety

The percentage of those with moderate and severe for depression and anxiety was 46.8% (166) [95% CI: 41.6-52.0], figure 1.

Determinants of anxiety disorder

Inter-item correlation

Table 4: Test of normality

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Sum of score location	.074	355	.000	.987	355	.003
Quality of life score	.070	355	.000	.986	355	.002
Health behavior score	.131	355	.000	.967	355	.000
Anxiety score	.124	355	.000	.958	355	.000
Depression score	.073	355	.000	.988	355	.004

The normality assumption was violated for all the variables (P<0.05). The non-parametric Spearman's Rho was then used for inter-item correlation (table 4).

Table 5: Inter-item correlation

Spearman's rho	Stats	Location	Quality of life score	Health behavior score	Anxiety score	Depression score
Location	R	1.000	.211**	.013	.070	.158**
	P-value	.	.000	.806	.187	.003
	N	355	355	355	355	355
Quality of life score	R	.211**	1.000	.174**	.025	.159**
	P-value	.000	.	.001	.639	.003
	N	355	355	355	355	355
Health behavior score	R	.013	.174**	1.000	-.040	.094
	P-value	.806	.001	.	.448	.078
	N	355	355	355	355	355
Anxiety score	R	.070	.025	-.040	1.000	.374**
	P-value	.187	.639	.448	.	.000
	N	355	355	355	355	355
Depression score	R	.158**	.159**	.094	.374**	1.000
	P-value	.003	.003	.078	.000	.
	N	355	355	355	355	355

The more comfortable the location, the better the quality of life and the better the depression, the better the anxiety disorder, and these correlations were significant. The better the location, the better the depression, the better the quality of life, the better the depression, and these relationships were significant (table 5). Location and quality of life by impacting depression significantly indirectly impact anxiety disorder which is significantly controlled by depression.

Table 6: Association between demographic information and anxiety disorder

Demographic information	Categories	Anxiety disorder		n	χ2-test
		Moderate and severe	Minimal and mild		
Health district	Limbe	94(47.5%)	104(52.5%)	198	χ2=2.976 P=0.085
	Buea	89(56.7%)	43.3% (68)	157	
Age range(years)	11-17	46(47.9%)	50(52.1%)	96	χ2=0.695 P=0.404
	18-19	137(52.9%)	122(47.1%)	259	
Religion	Christian	175(52.7%)	157(47.3%)	332	χ2=3.578 P=0.311
	Muslim	2(33.3%)	4(66.7%)	6	
	ATR	3(27.3%)	8(72.7%)	11	
	Atheist	3(50.0%)	3(50.0%)	6	
Residence before the crisis	Limbe	32(40.5%)	47(59.5%)	79	χ2=4.995 P=0.082
	Buea	36(53.7%)	31(46.3%)	67	
	Neither Limbe nor Buea (IDP)	115(55.0%)	94(45.0.%)	209	

Level of education	Primary level of education	85(55.9%)	67(44.1%)	152	$\chi2$=4.401 P=0.221
	Secondary level of education	58(50.0%)	58(50.0%)	116	
	Tertiary level of education	28(41.8%)	39(58.2%)	67	
	Never been to school	12(60.0%)	8(40.0%)	20	
Number of children	One	113(54.4%)	136(54.6%)	249	$\chi2$=12.702 P=0.000
	Two -Three	70(66.0%)	36(34.0%)	106	
Employment status	Employed	32(54.2%)	27(45.8%)	59	$\chi2$=0.205 P=0.651
	Unemployed	151(51.0%)	145(49.0%)	296	
Marital status	Married	0(0.0%)	2(100%)	2	$\chi2$=7.539 P=0.023
	Single	180(53.1%)	159(46.9%)	339	
	Cohabiting	3(21.4%)	11(78.6%)	14	
Duration of stay in the community	One –three (years)	81(48.8%)	85(51.2%)	166	$\chi2$=0.947 P=0.331
	Four –seventeen (years)	102(54.0%)	87(46.0%)	189	
Dominant ethnic in the hosting community	Bakweri	178(51.3%)	169(48.7%)	347	$\chi2$=0.393 P=0.531
	Others	5(62.5%)	3(37.5%)	8	
Dominant ethnic in the hosting community is the same as one's ethnic	Yes(Identical)	84(57.1%)	63(42.9%)	147	$\chi2$=3.143 P=0.076
	No(Different)	99(47.6%)	109(52.4%)	208	
Person living with	Alone	83(63.4%)	48(36.6%)	131	$\chi2$=16.849 P=0.000
	With family, friend or relative	86(48.6%)	91(51.4%)	177	
	With partner	14(29.8%)	33(70.2%)	47	
First communication language	English	17(42.5%)	23(57.5%)	40	$\chi2$=1.806 P=0.405
	French	2(40.0%)	3(60.0%)	5	
	Pidgin	164(52.9%)	146(47.1%)	310	
Location standard	Inadequate	93(56.7%)	71(43.3%)	164	$\chi2$=3.247 P=0.049
	Adequate	90(47.1%)	101(52.9%)	191	
Quality of life	Very poor	62(54.4%)	52(45.6%)	114	$\chi2$=0.541 P=0.462
	Poor	121(50.2%)	120(49.8%)	241	
Depression	Moderate and severe	166(55.3%)	134(44.7%)	300	$\chi2$=11.101 P=0.001
	Minimal and mild	17(30.9%)	38(69.1%)	55	

Based on bivariate association, the significant (P<0.05) determinants of anxiety disorder were number of children whereby teenage mother with more children were more susceptible to anxiety, marital status as the single were significantly more exposed, person living with as those living alone were significantly more exposed, location as the more inadequate it was, the higher the exposure, then depression as the depressed were more exposed to anxiety disorder (table 6).

Table 7: Wald Statistics in Binary Logistic Regression depicting significant and critical predictors of anxiety disorder after controlling predictors for each other

Predictors	B	S.E.	Wald	df	Sig.	Exp(B)	95% C. I. for EXP(B)	
							Lower	Upper
Heath district	-.590	.269	4.790	1	.029	.554	.327	.940
Age categorized	-.042	.279	.022	1	.881	.959	.555	1.658
Religion	.387	.240	2.602	1	.107	1.472	.920	2.355
Residence before the crisis	-.372	.153	5.907	1	.015	.689	.511	.931
Level of education	.097	.143	.460	1	.498	1.102	.833	1.457
Number of children	-.761	.287	7.027	1	.008	.467	.266	.820
Employment status	.077	.330	.055	1	.815	1.080	.566	2.063
Marital status	1.070	.618	2.998	1	.083	2.915	.868	9.789
Duration of stay in the community	-.374	.253	2.189	1	.139	.688	.419	1.129
Dominant ethnic in the hosting community	-1.026	.837	1.504	1	.220	.358	.069	1.847

Dominant ethnic in the hosting community is the same as one's ethnic	.580	.252	5.290	1	.021	1.787	1.090	2.929
Person living with	.566	.185	9.348	1	.002	1.762	1.225	2.533
First communication language	-.231	.198	1.362	1	.243	.794	.538	1.170
Location standard	.338	.240	1.977	1	.160	1.402	.875	2.244
Quality of life score	-.054	.260	.042	1	.837	.948	.569	1.578
Depression	.793	.353	5.039	1	.025	2.210	1.106	4.418

Considering predictors controlled for each other (table 7), the significant (P<0.05) determinants of anxiety that emerged were health district as those in Buea were more susceptible to anxiety (table 7), residence before the crisis whereby the IDPs were more at risk, then dominant ethnic in the hosting community whereby those that shared the same ethnic at the one of the hosting community were more at risk. As for the critical predictors (P<0.05; OR >1 and LB-OR>1) there were 'the dominant ethnic in the hosting community is the same as one's ethnic', 'person living with' and 'depression'.

The significant predictors depicted by bivariate association and Binary Logistic Regression were concatenated in a Multinomial Logistic Regression model to depict the magnitude of difference among predictor's categories.

Table 8: Wald Statistics in Multinomial Logistic Regression depicting significant and critical predictors' categories for anxiety disorder after controlling predictors for each other

Predictors	Categories	B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Health district	Buea	.291	.257	1.282	1	.258	1.338	.808	2.216
	Limbe	0[b]	.	.	0	.	.	.	.
Residence before crisis	IDP	.727	.303	5.739	1	.017	2.068	1.141	3.748
	Buea	.455	.389	1.365	1	.243	1.575	.735	3.378
	Limbe	0[b]	.	.	0	.	.	.	.
Number of children	Two - Three	.843	.268	9.924	1	.002	2.323	1.375	3.925
	One	0[b]	.	.	0	.	.	.	.
Marital status	Single	1.720	.721	5.693	1	.017	5.587	1.360	22.957
	Cohabiting	-16.518	.000	.	1	.	0.000	0.000	0.000
	Married	0[b]	.	.	0	.	.	.	.
Dominant ethnic in the hosting community is the same as one's ethnic	Yes (Identical)	.527	.247	4.536	1	.033	1.694	1.043	2.750
	No (Different)	0[b]	.	.	0	.	.	.	.
Person living with	Alone	1.150	.396	8.455	1	.004	3.159	1.455	6.859
	Family, relative or friend	.761	.379	4.030	1	.045	2.140	1.018	4.498
	Partner	0[b]	.	.	0	.	.	.	.
Location	Inadequate	.292	.234	1.557	1	.212	1.339	.847	2.118
	Adequate	0b	.	.	0	.	.	.	.
Depression	Severe and moderate	.873	.341	6.542	1	.011	2.394	1.226	4.673
	Minimal and mild	0[b]	.	.	0	.	.	.	.

IDPs were significantly more at risk than those living in Buea and Limbe. Teenage mothers having 2-3 children were significantly more at risk of anxiety than those having 1 child. The single teenage mothers were significantly more at risk than those cohabiting or married. Those living in communities with the same ethnic group were significantly more at risk than those living among people with different ethnic group. Those living alone were significantly more at risk than those living with partner and more at risk than those living with friend or relative, while those living with friend or relative were significantly more at risk than those living with partner. Those with severe and moderate depression were significantly more at risk of anxiety compared to those with minimal and mild depression (table 8).

Discussion

Cumulatively, roughly half of the teenage mothers (51.5%) had moderate or severe anxiety. Relatively high prevalence of anxiety was reported among teenage mothers (33.7%) at varying levels as well, whereby moderate anxiety was 26.3% while high anxiety was 7.4% [32]. This percentage is lower as compared to this study context which contrasts by the fact that it is a conflict zone. Risk of anxiety among teenage mothers was also reported among pregnant mothers [33]. Studies in Sub-Saharan Africa and Southern Asia show that teenage motherhood is associated with unhealthy environment, low educational attainment and poverty; this corroborate the present findings [34,35-36]. The use of cannabis was significantly associated with anxiety among teenage mothers [37] but this parameter was not much considered in this study. In this study context, the significant determinants of anxiety were number of children whereby teenage mother with more children were more susceptible to anxiety, marital status as the single were significantly more exposed, person living with as those living alone were significantly more at risk, location as the more inadequate it was, the higher the exposure, then depression as the depressed were more exposed to anxiety. Location and company as predictors of mental health disorder to pregnant and post-natal adolescents were earlier highlighted [20,38]. More generally, it was found that logistical and environmental obstacles, service uptake, support from other adults, counseling, integrate routine mental health screening into existing obstetric services, de-stigmatize mental health problems, optimize screening coverage, sensitize care providers, non-judgmental, caring and confidential relationship between counselors and clients is crucial for successful interactions could highly determine the dynamism of mental health to pregnant and postnatal adolescent women [36].

Conclusion and Recommendations

Anxiety disorder was high among teenage mothers thus posing a major public health concern. Though mental health services are emerging in some urban health facilities like regional hospitals for the sampled health districts, there is a paucity of mental health data base indispensable for adequate planning and forecast. Anxiety disorder can lead to severe risk of trauma, distress and can even resort to suicidal risk. Socio-economic factors coupled with their unexpected condition as teenage mothers and environmental factors accounted for this high prevalence of anxiety disorder. number of children whereby teenage mother with more children were more susceptible to anxiety, marital status as the single were significantly more exposed, person living with as those living alone were significantly more at risk, location as the more inadequate it was, the higher the exposure, then depression as the depressed were more exposed to anxiety. From these findings, the followings can be recommended: (i) The government shall put in place mechanism to provide data base for teenage mother; (ii) The mental health unit of the health facilities should formally integrate teenage mothers in their census, recording, screening and counseling process; (iii) Improving the quality of life of teenage mothers; (iv) considering the negative impact of their location of environment where they live; (v) avoiding loneliness or making sure they live with experienced adult or husband, (vi) and making sure they don't have more children in such condition. (vii) Above all, an urgent intervention is needed for the reintegration of teenage mothers in the society.

Limitations

The study was conducted among teenage mothers from 11 to 19-years old only, living out those aged 20 years with more than 1-year old children who got them while being teenagers, thus probable exposure to similar trauma. Those aged 10 years were not found though reported by the literature in other settings, thus leaving a gap in this study.

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