

Integration of Adolescent Health Needs Into Primary Health Care Services: Designing Care Model

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Abstract

Integration of the health needs of all adolescent into primary health services will package all services together which leads to better health overall. **Aims:** toconduct a situational analysis of adolescent health needs in Assiut governorate, assess the primary health care facilities anddevelop a design model to integrate adolescent health needs into primary health care settings and assess its effectiveness. **Methodology:** cross-sectional and quasi-experimental design was used. Sample size was 350 adolescents (175 study and 175 control group) attending two health facilities (urban and rural)which were selected randomly. Three questionnaires were used. Firstly, pre and posttest interview structured questionnaire was used which developed according to evidence –based questionnaires. Secondly, Health care providers' questionnaire asked question in the same modules of adolescent's questionnaire. Last one, questionnaire to assess PHC services' quality as perceived by adolescents. **Results:** One third of adolescents had moderate level of anxiety. Half of them were suffering from various level of depression. About two thirds of them hadn't stress. Violence attitude is lower in studied group. The knowledge scores of all modules (mental, reproductive, Nutritional health, smoking / addiction, accidents and violence) were significantly better among adolescents in studied group than control group. The majority of health providers had high level of knowledge. There are high levels of satisfaction among adolescents of most PHC services. **Conclusion:** Adolescents' knowledge, habits and beliefs were mostly inadequate as regards all modules. After implementation of the program remarkable improvement were achieved in adolescents' knowledge and practice.

Keywords: Adolescent Health , Primary Services, Designing Care Model

Introduction

Adolescence is the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to19. Adolescent in this period undergoes major physical and psychological, social interactions and relationships changes. Globally, 1.2 billion people aged 10 to 19. In Egypt 9.4% of population aged 10- 14 years while 9.7% aged 15-19 years^{[1], [2]}.

Adolescent had many health issues and challenges facing them worldwide included: Early pregnancy and childbirth, HIV, other infectious diseases as diarrhea, lower respiratory tract infections and meningitis. Every day more than 350 adolescents who have tried cigarettes become new regular, smokers.^{[3] [4] [5]}

Mental health issues are among the leading risk factors for death, such as suicides, and causes of disability-adjusted life years. Unhealthy diets associated with overweight and obesity are one of the key risk factors associated with non-communicable disease, particularly cardiovascular disease and diabetes^{[1] [6]}.

In Egypt (2014), the prevalence of obesity among male and female aged 10-14 years is 9.9%, 8.5%respectively^[1]. Injuries due to accidents and Adolescent's violent behavior are the main cause of mortalities in adolescents which rises significantly with male predominance^{[7] [8]}

Adolescents have significant needs for health services. They pose different challenges for the health-care system than children and adults, due to their rapidly development. There had many health problems that are often neglected and didn't have acceptable services because of perceived lack of respect, privacy and imposition of the moral values of health-care providers. Primary health services should providebased on scientifically and socially acceptable methods. It should be accessible to all individuals in the community at every stage of their development in the spirit of self -reliance and self-determination^{[9] [10] [11]}.

OBJECTIVES

General objective:

To develop a design model to integrate adolescent health needs into primary health care services for improving healthcare delivery and health status of adolescents.

Specific objectives are to:

1. Conduct a situation analysis of adolescent health needs in Assiut governorate.
2. Assess the PHC facilities (services and personnel).
3. Develop a design model to integrate adolescent health needs into primary health care setting in Assiut

governorate and assess its effectiveness.

Data and methods:

Study design:

The study design is cross-sectional and quasi-experimental design (Educational intervention study) with pre and post-intervention.

Study setting:

Two districts were randomly selected. They were Assiut District (Al-arbeen) representing urban - Egypt and Al-fath District (Bani-Mor) representing rural - Egypt.

Study population:

They were all adolescents (10- 19 years) that came to the PHC centers.

Sample size:

As the prevalence of overweight in Egypt is 25%, (WHO, 2015), and with considering the overweight as the major adolescent health problem with the highest prevalence, our sample calculated by Epi- info 7 software was 288 and we added 20 % dropped out, so our sample size was 350.

Sample methods:

Questionnaires were developed according to evidence –based questionnaires and the national based questionnaires as DHS surveys^[14] which included 3 questionnaires:

The first questionnaire was divided into multiple modules, namely; socio-demographic data, weight, height, hemoglobin and glucose level also situation analysis of the following items:

- Mental health knowledge and Depression Anxiety Stress Scales (DAAS) were used ^[12].
- reproductive health
- Nutrition
- Smoking and addiction
- Accidents and motor car injuries.
- Violence module used Maudsley Violence Questionnaire (MVQ)^[13] is a 56-item true/false questionnaire.

The second questionnaire : Health care providers' questionnaire asked question in the same modules of adolescent's questionnaire.

The third questionnaire: to assess PHC services quality.

Data collection:

The questionnaire was pilot-tested on 50 adolescents to ensure that the questionnaire was understandable to all studied sample. Data collected from July, 2017, to November, 2017. At the initial visit a teen was seen by a trained physician to receive a comprehensive physical exam. The total sample of the adolescents was 350 tested by the pre-test questionnaire. The sample was divided into two groups 175 were chosen randomly for receiving the health educational program and immediate post intervention questionnaire was administered to evaluate the immediate impact of the educational program. The other 175 was considered as control group. The whole adolescents receiving the intervention returned after 3 months to evaluate the long term effect of our health education program.

Designing model (Health is our choice) consists of main 3 pillars:

1-Comprehensive clinical examination

2-Screening of anemia, D.M and obesity.

3-Detailed health education about mental health, healthy nutrition, reproductive health. Smoking & addiction, accidents and violence.

The educational program phase is a behavioral prevention intervention based on Guidelines for Adolescent Preventive Services (GAP). It was applied under the address of "**Health is our Choice**". The program had been strengthened by a colorful educational booklet and posters.

Data management:

All questionnaires were revised, coded and cleaned and checked for missing and non-logic skip pattern.

Descriptive statistics were used to illustrate respondents' demographic characteristics. Categorical variables were measured as percentages while continuous variables were expressed as mean \pm standard deviation. The Shapiro test was applied to determine the nature of distribution. Scores were used to evaluate adolescent's knowledge. Questions were scored as 1 marks for correct answer and 0 marks for wrong or no answer or in refusing to answer.

Mann-Whitney U test and independent T-test were performed to compare binary variables with knowledge and attitude scores. Kruskal-Wallis test was used to compare the knowledge and attitude scale scores with multiple variables. Wilcoxon test used to evaluate the effect of health education program by difference between pre and post intervention level of knowledge. Chi-square tests and Fisher Exact test were used to investigate possible differences in the studied sample.

DAAS for mental health and Maudsley score for violence were tested for evaluating their reliability. SPSS statistical package version 20 was used for statistical analysis with 5% level of significance.

Ethical considerations

- Research proposal was approved from ethical committee in the Faculty of medicine, Assiut University.
- Confidentiality and anonymity was assured.
- Written consent was obtained from each adolescent in the study

Results

Table 1: Background Characters of Adolescent in Bani-Mor and Alarbeen PHC Units in Assiut.

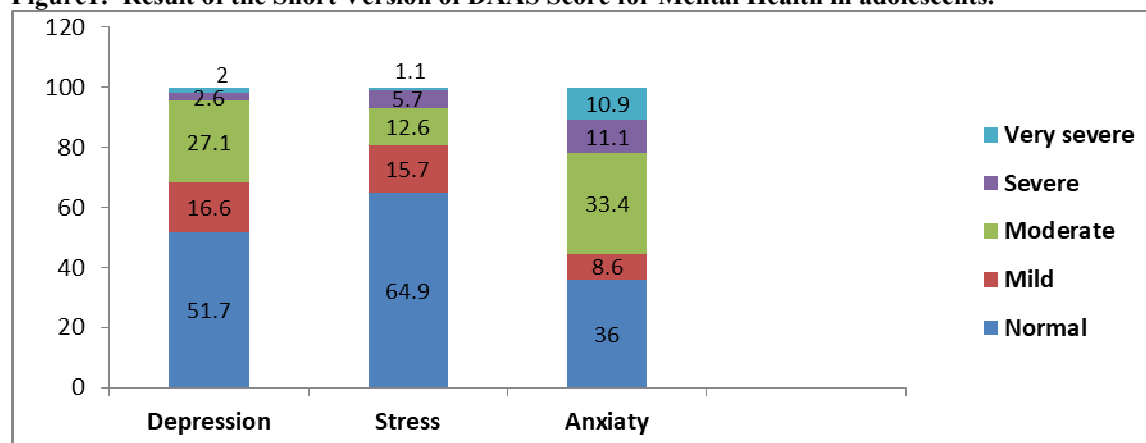
Variables	Total Sample	studied group		Control group	P-value
		N (%)			
Age group	10-13	205(58.5)	92(52.6)	113(64.6)	0.06*
	14-16	94(26.5)	52(29.7)	42(24.0)	
	17-19	51(14.5)	31(17.7)	20(11.4)	
Sex	Male	118(33.7)	49(28.0)	69(39.4)	0.03*
	Female	232(66.3)	126(72.0)	106(60.6)	
Education	Illiterate	8(2.3)	7(4.0)	1(0.6)	0.06**
	Educated	342(97.7)	168(96.0)	174(99.4)	
Type of place	Rural	177(50.6)	88(50.3)	86(49.1)	0.83*
	Urban	173(49.4)	87(49.7)	89(50.9)	
Religion	Muslim	297(84.9)	144(82.3)	153(87.4)	0.23*
	Christian	53(15.1)	31(17.7)	22(12.6)	
Work	Yes	25(7.1)	18(10.3)	7(4.0)	0.03*
	No	325(92.9)	157	168	
Marital status	Single	350(100.0)	175(100.0)	175(100)	-
	Married	0(0.0)	0(0.0)	0(0.0)	
Family income	Less than 1000 pound	50(14.3)	22(12.6)	28(16.0)	0.55**
	1000-5000	7(24.3)	42(24.0)	43(24.6)	
	More than 5000	85(2.0)	5(2.9)	2(1.1)	
	I Don't know	208(59.4)	106(60.6)	102(58.3)	
Hg Status	Anemic	155(44.4)	86(49.1)	69(39.4)	0.06*
	Not anemic	195(55.7)	89(50.9)	106(60.6)	
Weight(kg)		43.36±11.3	43.8±12.1	42.9±10.4	0.70***
Height (cm)		143.0±12.1	142.8±11.7	143.1±12.5	0.71***
Hemoglobin(g/dl)	Mean ± SD	11.98±0.9	11.9±0.98	12.0±0.84	0.05***
Glucose(gm.)		98.08±19.0	98.4±21.9	97.6±15.6	0.92***
BMI		21.09±4.6	21.2±4.3	20.9±5.0	0.25***
	Normal weight		282(80.6)		
	Under weight		15(4.3)		
	Over weight		35(10)		
	Obesity		18(5.1)		

N=350

*Chi square test**Fisher Exact test***Mann Whitney test

Table (1) showed that 92 of cases (52.6%), and 113 controls (64.4%) were between the ages of 10–13years. Only 2, 3% of the studied sample were illiterate. Twenty four (24%) of cases and controls had an average family monthly income from 1000-5000 pound. Underweight presented in 4.3% and (5.1%) of the studied sample are obese. The remaining demographics and difference between the two groups are reported in table 1

Figure1: Result of the Short Version of DAAS Score for Mental Health in adolescents.



The Figure 1 shows the results of DAAS mental score. Regarding anxiety, 33.4% from adolescent had moderate level of anxiety. Half of them were suffering from various level of depression. More than 60% of the adolescents didn't have stress.

Table2: Effect of health education intervention on adolescent knowledge and behavior(Immediate and late evaluation).

Modules	Max. points of each module	Late test evaluation		P-value	Immediate test	Late test	P-value
		Study group	Control group		study group	study group	
		Mean±(SD)	Mean±(SD)		Mean±(SD)	Mean±(SD)	
Mental Health	17	9.9(1.8)	4.4(3.7)	0.00	9.8(1.8)	9.9(1.8)	0.81
Reproductive Health	30	18.8(3.2)	5.1(2.9)	0.00	18.6(3.4)	18.8(3.2)	0.97
Nutritional Health	26	16.2(2.2)	7.5(3.0)	0.00	14.8(2.3)	16.2(2.2)	0.00
Smoking /addiction	17	9.1(2.8)	3.0(2.1)	0.00	8.0(2.5)	9.1(2.8)	0.00
Accidents	5	4.2(0.7)	3.4(1.0)	0.00	4.5(0.65)	4.2(0.7)	0.003
Violence attitude	56	19.7(8.6)	22.1(10.1)	0.00	-**	19.7(8.6)	-

*Using Wilcoxon test for non-parametric data

**Violence score was not done in the immediate post –test

The knowledge scores of all modules were significantly better among adolescents in studied group than control group in late evaluation. Violence attitude is lower in studied group as more score mean more violence. Difference between immediate and late test evaluation were not significant in mental and reproductive health knowledge while it were significant in the other modules. The knowledge increased more in late evaluation in the nutrition and smoking /addiction modules but decreased in accident module.

Table 3: Health providers knowledge score

Characteristics	Mean Rank	P-value
Total Level of knowledge	Low	9(26.5%)
	Middle	14(41.2%)
	High	11(32.4)
Max. points of knowledge score =94		

*Using Mann-Whitny test for non-parametric data. **Using independent T-test for parametric data.

Table 3 showed that the mean of knowledge score was 42.0. 26.5% of health providers have low level of knowledge.

Table 4: Differences between Urban and Rural PHC Services' Quality as Perceived by Adolescents.

Service availability		Site of PHC				P-value*
		Rural		Urban		
		N	%	N	%	
The place of PHC						
PHC is easily accessible	Yes	163	93.7%	168	95.5%	0.46
Present of educational and health materials	Yes	152	87.4%	124	70.5%	0.001
Suitable waiting places	Yes	141	81.0%	163	92.6%	0.001
PHC rules and regulations are respected	Yes	135	77.6%	166	94.3%	0.001
Air conditioner	Yes	127	73.0%	91	51.7%	0.001
PHC cleanness	Yes	133	76.4%	158	89.8%	0.001
Bathroom cleanness	Yes	136	78.2%	119	67.6%	0.02
Health care providers						
Presence of doctors in working hours	Yes	136	78.2%	153	86.9%	0.03
Doctor examined teen in detail	Yes	137	78.7%	103	58.5%	0.001
Doctor asks without examination	Yes	141	81.0%	68	38.6%	0.001
Doctor explains the cause of medical tests	Yes	149	85.6%	120	68.2%	0.001
Inquiries are answered immediately	Yes	149	85.6%	160	90.9%	0.12
Adolescents satisfied with laboratory's service	Yes	151	86.8%	152	86.4%	0.92
A political treat	Yes	152	87.4%	165	93.8%	0.04
Giving advice about health	Yes	157	90.2%	163	92.6%	0.42
Privacy in examination	Yes	150	86.2%	143	81.2%	0.20
Time						
Waiting time is long	Yes	130	74.7%	57	32.4%	0.00
Working hours are adequate	Yes	146	83.9%	154	87.5%	0.42
Drugs and medicines						
Availability	Yes	158	90.8%	155	87.5%	0.42
Using instructions.	Yes	146	83.9%	153	86.9%	0.001
Storing	Yes	98	56.3%	47	26.7%	0.001
adverse effects of the drug.	Yes			81	46.6%	19
		10.8%	0.001			
Referral of the patients in PHC						
transferred to another health center	Yes	152	87.4%	29	16.5%	0.001
Explained reasons for referring	Yes	145	83.3%	26	14.8%	0.001
The health has improved after using	Yes	161	92.5%	163	92.6%	0.9

*P-value by chi square test.

Table 4 showed that there are high levels of satisfaction among adolescents for most of PHC services. Regarding the differences between urban and rural, the findings indicated that there were significant variations in most items especially regarding pharmacy and patient transfer to another health facility.

Discussion

This is the first known study to be conducted in Egypt that comprehensively demonstrates adolescents' knowledge, attitudes, and practices toward major health problems facing the adolescents. There was higher female predominance in the sample compared to males, which may be reflective of more general patterns of PHC services utilization^[15].

One of the important results of this study was that 44% of the adolescents were anemic. This finding resembles the result produced by an Egyptian study in Upper Egypt among adolescents which was 40%^[16]. Obesity and overweight prevalence was 15.1% demonstrating the existence of the burden of overweight and obesity among adolescents in Egypt. Overweight represented 10% in the studied sample while obesity was 5.1%. This prevalence resembles that was detected by another study on the Egyptian adolescents in which overall prevalence of overweight and obesity was 12.1 and 6.2%, respectively^[17].

DAAS score for mental health in the present study emphasizes the terrifying fact that depression is prevalent among adolescents. Nearly the half of the studied sample was suffering from various levels of depression. This percentage is higher than the worldwide adolescent depression prevalence which ranges from 15-20% among adolescents between the ages of 14-19 years^[11]. This may be explained by the fact that our study is PHC based and the adolescents who come to utilize health services may be suffering from diseases that make them have depression^[18].

The present study demonstrates that health knowledge and attitude regarding adolescents' health was unsatisfying before program implementation. After implementation, there was a significant increase in knowledge among the adolescents in the studied group than the control group. Similar findings demonstrated the role of health education in positively changing adolescents' knowledge and attitude as the study that was conducted in Brazil and reported improvements in health practice as decreasing consumption of sweets, in a group of 150 adolescents, who participated in the health education intervention program^[19].

Substantial deficits in adolescents' health knowledge and practice in all study modules were remarkably obvious. This is consistent with a study that was conducted in Sri-Lanka and reported the same finding among students aged 16-19^[20].

Role of health education in improving the population health is well established and the link between education and health was proven on an evidence-based basis^[21].

Although the period of adolescence is markedly exposed to deep dynamic changes, it is often neglected by health care providers^[4]. We surveyed the knowledge of Egyptian health care providers (nurses and doctors) toward most important adolescents' health issues. It revealed a low level of knowledge in a quarter of the sample regarding mental health, reproductive health, nutrition, smoking/addiction and accidents. "Situation analyses and needs assessment exercises carried out in different parts of the world point to shortcomings in their professional capabilities and in their 'human qualities' as a result of which they are unable and oftentimes unwilling to deal with adolescents in an effective and sensitive manner" said WHO^[1].

As an overall view, there was an average level of satisfaction in adolescents from PHC services. More than 90% of the studied samples felt improvement in their health after receiving treatment in PHC and more than 85% were satisfied with the service they received in the laboratory or radiation department. More than 80% saw that medications prescribed by doctors are available at the PHC pharmacy. The majority of adolescents were satisfied about the privacy that doctors dealt with. Also, more than 80% saw that working hours in PHC are adequate and more than 90% agreed that PHC is easily accessible with no differences in these items between urban and rural adolescents.

Differences between urban and rural PHC services were shown clearly in that urban PHC was better regarding suitable waiting places, rules and regulations within the PHC are respected, general cleanliness, presence of doctors in working hours and that doctors treat them with a polite way. Rural PHC was better in presence of educational and health materials, air conditioner, bathroom cleanliness, the health care provider has explained the potential adverse effects of the drug, the doctor explained the cause of the medical tests if asked, the doctor gave instructions to store the medicine, the doctor when examined them, he examined in details.

Adolescents in rural PHC were more suffering from that doctor just asks about illness without examination and that time they waited before receiving care is long. Our result is not in line with the study that was done in Ethiopia that cleared that adolescents' health service use and satisfaction were low^[24] and this explained by that Egypt has excellent allocation of PHC facilities throughout the country that is considered a source of pride to the Ministry of Health^[25]. Adolescents' satisfaction on the PHC service is important to increase utilization of these services^[22].

Conclusion

In the light of the study results, it can be concluded that adolescents lacked adequate knowledge about their health in the pre-program phase. Adolescents' knowledge, habits and beliefs were mostly inadequate as regards mental health, reproductive health, healthy nutrition, smoking/addiction accidents and violence. After

implementation of the program (*Health is our choice*) remarkable improvement were achieved in adolescents' knowledge and practice. Therefore the educational program was successful in achieving its goals of favorable impact in the knowledge, habits and beliefs owned by Adolescents.

Recommendation

- Primary health care centers(PHCC) should provide comprehensive health education for adolescent using various educational media as lectures, workshops, colorful booklets and posters.
- To be most successful, public health interventions need to address all the health problems threaten adolescent's quality of life and take action on many fronts – including public policies, local communities, families and adolescents themselves.
- General practitioners must take a fundamental role in diagnosing mental health's problems in order to reduce the overall burden.
- The better preventive plan and periodic screening for adolescents as anemia, diabetes and obesity.
- Addressing the sexual and reproductive health of adolescents to provide them with perfect health care with related information, education, support and counseling.
- Strengthening health care providers' knowledge and practices is essential in meeting adolescents' health needs as they have significant influence on adolescents' health promotion.
- Health care providers should be aware about the effects of media influences on adolescents as violent attitude and mental health.
- Health plans should promote accurate screening by primary care physicians for smoking, substance abuse and alcohol abuse.
- Improving the quality of health care services for adolescent by designing health services that can attract the adolescents, create special atmosphere to them for health promotion and prevention.

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