

Community-Oriented Adolescent Health Promotion Strategies Addressing Nutrition, Mental Wellness, And Preventive Pediatric Healthcare Services Today

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Abstract

Adolescence is a pivotal period of development which involves many physical, psychological and social changes all of which are important to lifelong health. Poor nutrition, mental health issues and lack of access to preventive health services are key adolescent public health problems. In this study, the efficacy of community-based health promotion interventions for enhancing the nutritional status, mental health and use of preventive pediatric services among adolescents was assessed. A total of 240 adolescent youth (10–19 years old) participated in a twelve week community-based interventional study. Nutrition education, mental wellness counseling, physical activity promotion and preventive health screening were provided to participants. Structured questionnaires, BMI assessment, and healthcare utilization data were used to gather data. Descriptive statistics, paired t-tests and chi-square tests were used for statistical analyses. For dietary diversity and BMI status, mental wellness scores and utilization of preventive care, significant improvements were observed ($p < 0.05$). The results suggest that community-based health promotion strategies are effective for improving the nutrition, mental health and access to preventive care for adolescents, which facilitates their inclusion in programs geared towards adolescents.

Keywords: Adolescent Health, Community Health Promotion, Nutrition Education, Mental Wellness, Preventive Pediatric Healthcare, Public Health Intervention.

1. Introduction

Adolescence is a period of rapid physical growth, mental development, emotional transformation and social adjustment during which the human organism is in a state of transition. Habits of health developed during this timeframe tend to remain with them as adults and have a dire impact on their future health. Although the overall health field has made great strides, there are many nutrition, mental health and access to preventive healthcare issues for adolescents. Undernutrition, overweight, obesity and anemia constitute adverse nutritional outcomes that are caused by poor nutrition, increased consumption of energy-dense foods, lack of exercise and micronutrient deficiencies. The nutritional problems can have adverse impacts on the growth, education and quality of life.

Adolescent mental wellness has become an equally significant piece to adolescent health. Increased anxiety and depression, emotional distress, and decreased psychological well-being have been linked to academic stress, social expectations, family-related stress, and digital media exposure among adolescents. Early detection and intervention are crucial to avoid chronic mental health problems and the development of healthy psychosocial functioning.

Preventive pediatric health care services—such as regular health check-ups, nutrition assessment, monitoring immunization status and health education initiatives—are important to supporting adolescent health. However, in many communities few people are aware of such services, they are not accessible and there is little community engagement

in utilizing them. Community-based health promotion initiatives offer a useful tool to address these challenges by combining education, counseling, health screening, and family engagement in a community-based context.

While there have been studies examining nutrition, mental health and preventive health care individually, there has been little research examining community-oriented interventions that address all of these areas at once. This study was therefore designed to assess the impact of community-based strategies promoting adolescent health on nutrition status, mental health and access to preventive pediatric health care services to young people. Furthermore, the study aimed to determine measurable health outcomes prior to and post a 12-week structured community-based intervention program.

2. Literature Review

Today, adolescent health is a top global public health concern because of the growing rates of nutritional illnesses, mental health issues, and lack of engagement with preventive health services. International health statistics show that the health status of many adolescents results in nutritional deficiencies, obesity, anemia and other health issues impacting on long-term health and educational status of the adolescent [5]. Lifestyle and changing diets, combined with a lack of exercise, disparities in socio-economic status and rapid urbanization have also added to the burden of adolescent health problems around the world [8]. In recent global health studies (2, 3, 9), the importance of investing in adolescent health has been highlighted particularly because adolescence is a critical life stage, and investments aimed at this age group have to be targeted.

The results of the community-based nutrition interventions showed that there is a strong potential for influencing the dietary practices and nutritional status in adolescents. Increased nutrition knowledge, improved diet diversity, and decreased malnutrition related outcomes have been linked to school based nutrition education, community nutrition awareness campaigns, parental engagement programs and micronutrient supplementation programs [7]. These interventions focus on sustainable behavior change and include the active engagement of adolescents, families, educators and health care professionals [6]. There is also growing evidence in address nutritional needs and emerging nutritional issues in adolescence for the need of evidence-based approaches [1], [4], [12], [14].

Recently, there has been increased attention on mental wellness promotion programs. Counselling services, stress management training, peer-support programs, mindfulness practices and school psychological interventions have been shown to have a positive effect on emotional resilience and to decrease anxiety, depression and psychosocial distress symptoms [9]. The promotion of good mental health in adolescents has become a key element of a holistic approach to adolescent health and has the potential to positively influence overall adolescent health and wellbeing in the long-term [2, 11].

Preventive pediatric healthcare models are based on regular assessment of health, tracking immunizations, health education, and early identification of health issues, both physical and psychological. These services help to ensure timely intervention and optimal health outcomes [3]. But, awareness, accessibility and poor community involvement are all obstacles that can hinder use of services for young people [11].

An integrated community health strategy has proven successful in simultaneously trying to tackle multiple aspects of adolescent health and wellbeing. These models address the four dimensions of improving adolescent well-being—namely nutrition promotion, mental wellness support, preventive screening, and community engagement—all within a single model. Although there is increasing research to support individual interventions, fewer studies have examined an integrated community-oriented health promotion program that considers nutrition, mental wellness and preventive pediatric health service together [10, 13]. This gap emphasizes the need for studies that explore how well multidimensional community-based interventions work at improving adolescent health outcomes in general.

3. Materials and Methods

3.1 Study Design and Participant Selection

The effectiveness of nutrition, mental wellness, physical activity, and preventive pediatrics health promotion strategies were assessed in a community-based interventional study involving adolescents. The study was conducted in selected schools and community health care centers. Adolescents aged 10–19 years were eligible for participation. There were 240 participants, split equally between the intervention group and control group (120 participants per group). The subjects were selected through stratified random sampling to give a balanced sample on age and gender. Adolescents who gave informed assent and parental consent were included, and those with severe chronic disease and/or missing baseline information were excluded. Thus, the intervention was conducted for 12 weeks.

This overall methodology of the study is shown in Figure 1. The process started from recruitment participants and their eligibility screening to determine the baseline condition of their nutritional status, mental state, and preventive healthcare markers. Eligible participants were then subjected to a structured intervention on four pillars of nutrition promotion, mental wellness promotion, physical activity enhancement and preventive healthcare activities. Nutrition promotion consisted of healthy diet promotion, awareness of balanced meals and promotion of iron-rich foods. Mental wellness activities included counseling sessions, stress management workshops and peer support activities. Physical activity promotion supported regular exercise and active lifestyles, and preventive healthcare services comprised health screening, BMI measurement, hemoglobin testing, immunization awareness raising and referral services as needed. A follow-up assessment took place after completion of the intervention to assess change in health outcomes. Collected data were then analyzed and the success of the community-based adolescent health promotion program was assessed.

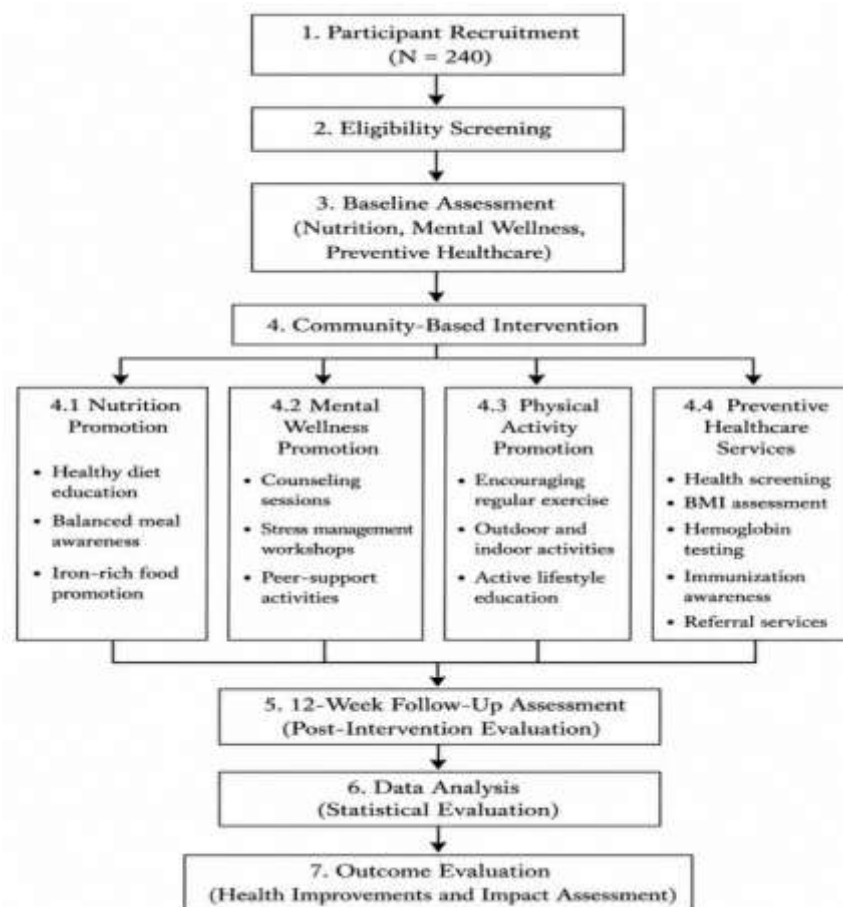


Figure 1. Study Design and Intervention Workflow

3.2 Community Health Promotion Intervention

The community health promotion intervention was a multi-faceted, adolescent-focused intervention to enhance nutrition status, mental wellness, and participation in physical activity and utilization of preventive pediatric health care

services. The intervention was delivered during a 12-week period, by conducting coordinated activities in schools and community health care centers. It aimed to go beyond just any single element of adolescent health, taking a multidimensional approach that encompassed elements of education, counseling, health screening and community engagement.

The nutrition promotion component aimed to provide nutrition education and promote healthy eating habits by delivering nutrition education programs on balanced nutrition, meal planning and eating nutritious foods. High priority was given to iron-rich foods, fruit, vegetables, whole grains and proper fluid intake to aid good growth and minimize deficiencies.

The mental wellness element sought to work on psychological well-being and emotional toughness by providing organized sessions of counseling, stress management classes, and peer support programs. The activities were targeted to address some of the issues faced by young people such as school stress, emotional control, peer relationships and self-esteem.

Physical activity promotion promoted an active lifestyle and decreased the amount of sitting time by informing the participants about the advantages of regular physical activity and participating in age-appropriate recreational and fitness activities.

The preventive healthcare for children was general health screening, BMI assessment, hemoglobin test and health education regarding immunization, personal hygiene, disease prevention and healthful lifestyle. Adolescents in need of further medical assessment or specialized health services were referred to the appropriate services. These components of an integrated intervention were developed together with the goals of fostering a general improvement of overall adolescent health, and improving well-being of adolescents in the community context.

3.3 Data Collection and Assessment Measures

Structured questionnaire, anthropometric measure, standardized assessment tools, and preventive healthcare records were used to collect data at baseline and at the end of 12-week intervention. Demographic factors, nutrition indicators, mental wellness status and access to preventive health care were measured to determine the success of the community based health promotion program.

Demographic data collected was age, gender and place of residence. Nutritional assessment was conducted using the measurement of height and weight, then calculating BMI and determining the nutritional status categories. The Mental wellness was assessed by using a standardized Mental Wellness Scale was designed to assess emotional well-being, stress levels, self-esteem, social functioning and overall psychological health with higher scores representing better mental wellness. A structured checklist was created to assess the utilization of preventive health care services based upon the components of health screenings, BMI checks, hemoglobin checks, immunization awareness initiatives and other preventive health care services.

The study included several input variables: age (X1), gender (X2), BMI (X3), dietary diversity score (X4), physical activity level (X5), and mental wellness score (X6), hemoglobin level (X7), and healthcare utilization score (X8). These variables were chosen because they are relevant to adolescent health and interventions in the community.

The effectiveness of the interventions was assessed with four main outcome measures: (Y1) nutritional improvement, (Y2) mental wellness improvement, (Y3) prevention-related use of health services, and (Y4) overall health outcome measures. These measures enabled us to conduct a comprehensive evaluation of the effects of the community-based adolescent health promotion program.

3.4 Outcome Measurement and Equations

Evaluation of the effectiveness of the community-based adolescent health promotion program was done with respect to both primary and secondary outcome measures. Outcome measures were completed pre- and post- the 12 week intervention phase. The effect of intervention was assessed by evaluating changes in nutritional status, mental wellness and preventive healthcare use. Standardized indicators and equations of mathematics were used to assess outcomes of participants in an objective manner.

Body Mass Index (BMI) was used to assess nutritional status based on measured height and weight. BMI was an important parameter to assess nutritional changes in the subjects. The BMI was calculated with the equation shown below:

$$BMI = \frac{Weight(kg)}{Height^2(m^2)} \quad (1)$$

A Health Improvement Rate (HIR) was derived as a quantification of the effectiveness of the intervention to be used. This was a percent change from pre-intervention to post assessment scores. The HIR was calculated based on the following equation:

$$HIR(\%) = \frac{Post-Intervention\ Score - Pre-Intervention\ Score}{Pre-Intervention\ Score} \times 100 \quad (2)$$

The main outcome measures were changes in BMI, mental wellbeing scores and preventive health services utilisation. BMI improvement was associated with positive shifts in nutrition and mental wellness improvement with positive shifts in mental wellness and emotional resilience as a result of participating in counselling and wellness activities. Healthcare utilization improvement measured by increased taking up of health screening, BMI, haemoglobin testing, immunization awareness programmes and referral services.

Secondary outcome measures were: 1) Nutritional Awareness; 2) Participation in physical activity; and 3) Uptake of preventive health screening. Participants' knowledge about healthy eating habits and balanced nutrition was assessed and the nutritional awareness was evaluated. Physical activity participation evaluated level of activity in exercise and active lifestyle behaviors encouraged in the intervention. Preventive health screening uptake was defined as number of adolescents who did not use recommended preventive health screening services during the study period.

These measures together enabled a holistic evaluation of the effectiveness of the intervention in supporting the physical, mental, and preventative health care engagement of adolescents in the community context.

3.5 Statistical Analysis and Ethical Considerations

The results of the data collected were coded and analyzed with IBM SPSS Statistics software. Descriptive statistics were provided to describe participant characteristics and study variables. Categorical variables (gender, residence and utilization of health services) were presented in frequencies expressed in percentages, and continuous variables (BMI, dietary diversity score, physical activity, mental wellness score, hemoglobin level) were presented as mean + standard deviation (Mean + SD).

Intervention was evaluated for effectiveness by conducting inferential analyses. Pre- and post-comparison of proportions and associations with categorical variables were determined using a Chi-square test. The mean scores for the nutrition, mental wellness, and healthcare utilization scores were compared using a paired t-test pre- and post-intervention. The results were statistical significant for 95% of confidence interval where $p < 0.05$ was considered statistic significant.

Cronbach's α coefficient was applied to evaluate the reliability of the instruments that were used in the study. The internal consistency and reliability of the questionnaire and assessment measures were found to be satisfactory with the obtained value of 0.84.

This study was carried out in an ethically sound manner in terms of human participant studies. The collection of data was done after obtaining ethical approval from the Institutional Ethics Committee. Parents/carers gave written informed consent and participating adolescents provided informed assent. There was complete confidentiality and privacy of participants and the data collected were solely used for research purposes. The measures guaranteed the safeguarding of the participants rights and well-being throughout the research process.

4. Results

4.1 Demographic Characteristics

The total number of the participants in this study was 240 children in age 16–18, comprising 120 in the intervention and 120 in the control group. A description of the subjects is given in Table 1. The mean ages of participants in intervention group and control group were 14.8 ± 2.1 years and 14.6 ± 2.3 years, respectively. There were slightly more female participants than males in the intervention group, but equal numbers of males and females in the control group. The majority of participants were from urban areas in both groups. There were no differences between the intervention and control groups compared to some of the demographic characteristics, thus supporting the homogeneity at baseline and the validation of the subsequent outcome comparison.

Table 1. Demographic Characteristics of Study Participants (N = 240)

Characteristic	Intervention Group (n = 120)	Control Group (n = 120)
Age (years), Mean $\pm$ SD	14.8 $\pm$ 2.1	14.6 $\pm$ 2.3
Gender		
Male, n (%)	58 (48.3)	60 (50.0)
Female, n (%)	62 (51.7)	60 (50.0)
Residence		
Urban, n (%)	72 (60.0)	70 (58.3)
Rural, n (%)	48 (40.0)	50 (41.7)
Educational Level		
Middle School, n (%)	52 (43.3)	50 (41.7)
High School, n (%)	68 (56.7)	70 (58.3)

Table 1 shows that the age, gender, residence and educational level distributions were similar in both study groups. This comparability reduces the risk of confounding factors and allows for a validness to assess the effect of the community-based intervention on adolescent health and wellbeing.

4.2 Nutritional Outcomes

The nutritional effect of the intervention was measured using the changes in nutritional status of the participants as determined by BMI before and after the 12-week community health promotion program. The results of the study are reported in Table 2. Total 89.3% of the participants had normal weight, whereas 25.8% were underweight, 14.2% were overweight and 3.3% were obese. After the intervention, the percentage of underweight adolescents dropped to 16.7%, and the percentage of adolescents with normal weight rose to 68.3%. It was also noted that overweight status decreased a bit and obesity prevalence did not change over the years. The results suggest a positive trend in nutrition and physical activity towards healthy nutrition in the participants following their exposure to nutrition education, physical activity promotion and preventive healthcare services.

Table 2. Changes in BMI and Nutritional Status Following the Intervention (n = 120)

Nutritional Category	Baseline n (%)	Post-Intervention n (%)
Underweight	31 (25.8)	20 (16.7)
Normal Weight	68 (56.7)	82 (68.3)
Overweight	17 (14.2)	14 (11.7)
Obese	4 (3.3)	4 (3.3)
Total	120 (100)	120 (100)

These results are presented graphically in Figure 2. The figure clearly shows that after the intervention, the number of participants with under normal weight decreased from 31 to 20 while the number of normal weight increased from 68 to 82. In particular, the underweight group saw a fall of ~35.5% and the normal weight group saw a rise of ~20.6%. Reductions in overweight category and stability in the obesity category, once again, illustrate the positive effects of the intervention. Overall, Figure 2 presented the progress made in the nutritional status of adolescents due to the community-based approach of the adolescent health promotion program, further reinforcing the impact of integrated nutrition education and health promotion programs.

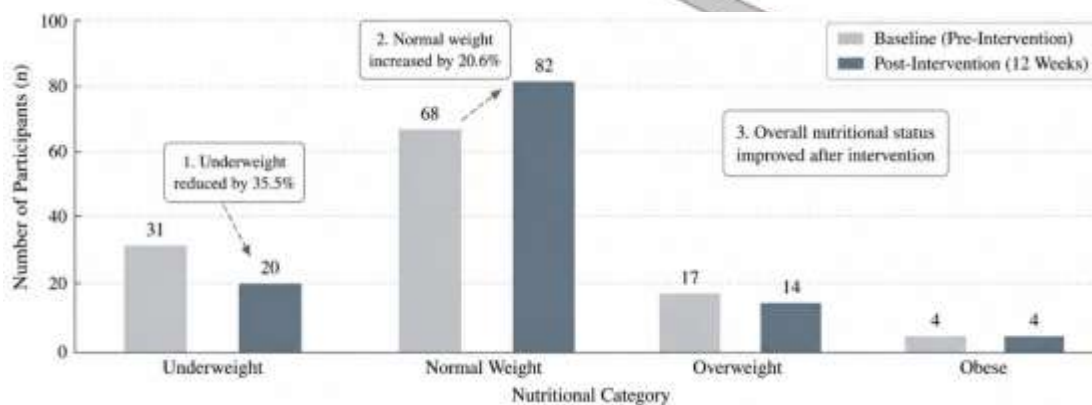


Figure 2. Nutritional Status Before and After Intervention.

4.3 Mental Wellness Outcomes

The effect of the community-based health promotion intervention on mental wellness was assessed by examining mental wellness status pre-and post-intervention over a period of 12 weeks. This is shown by the results in Table 3. In total, 34 (28.3%) participants had poor mental wellness, 62 (51.7%) had moderate mental wellness, and 24 (20.0%) had good mental wellness. Improvement was seen after the intervention as the number of participants who were poor mental wellness decreased significantly to 12 (10.0%) and moderate mental wellness was reduced to 45 (37.5%). In contrast, adolescents' good mental wellness status rose significantly to 63 (52.5%). The results of these findings indicate that there is a significant improvement on psychological well-being and emotional health of the participants after engaging in counselling session and stress management workshop and peer support activities.

Table 3. Mental Wellness Score Comparison Before and After Intervention (n = 120)

Mental Wellness Category	Baseline n (%)	Post-Intervention n (%)
Poor Wellness	34 (28.3)	12 (10.0)
Moderate Wellness	62 (51.7)	45 (37.5)
Good Wellness	24 (20.0)	63 (52.5)
Total	120 (100)	120 (100)

This is further reflected in Figure 3, which shows the changes in the categories of mental wellness. The number of adolescents who reported poor mental wellness saw a decrease from 34 to 12, a decrease of around 64.7%, as shown in the figure. Moderate mental wellness also dropped from 62 to 45 with an increase in the good category. The biggest change was seen in the good mental wellness group, where nearly double the number of participants, or approximately 162.5% (from 24 to 63), had been in the group at its start and end. In general, Figure 3 shows a positive mental wellness status after the intervention, and a positive impact of the mental wellness promotion activities offered in the community on the psychological health and emotional resilience of adolescents.

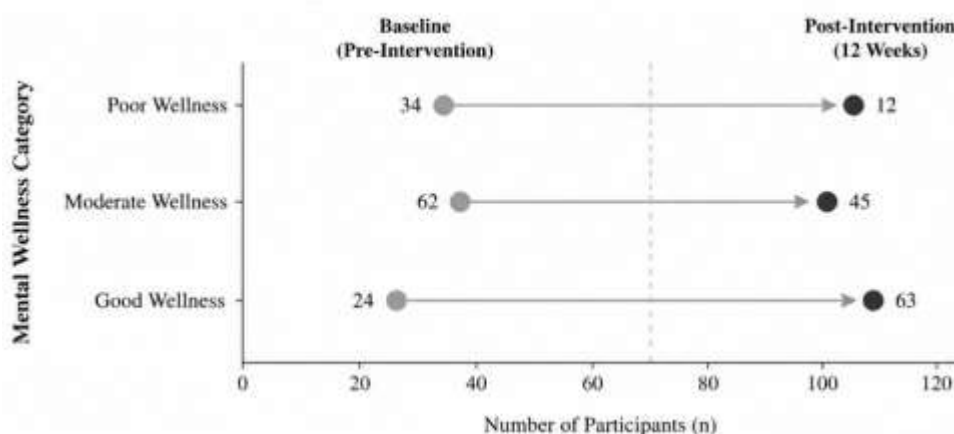


Figure 3. Mental Wellness Improvement Following Intervention.

4.4 Preventive Pediatric Healthcare Outcomes

Healthcare preventive pediatric services use was measured before and after implementing a community based health promotion program. The results of the study are presented in a tabular format as shown below in Table 4. The rate of preventive healthcare services was modest in all domains at baseline. The use of general health screening was utilized by 46 of the participants (38.3%), BMI assessment used by 52 (43.3%), hemoglobin testing used by 40 (33.3%), mental health counseling used by 28 (23.3%), and nutrition counseling used by 36 (30.0%) and immunization status review used by 44 (36.7%). Significant gains were seen in all categories of health care services after 12 weeks of the intervention. There were 104 participants (86.7%) who participated in general health screening, 110 participants (91.7%) who participated in BMI assessment, 96 participants (80.0%) who participated in hemoglobin testing, 88 participants (73.3%) who participated in mental health counseling, 102 participants (85.0%) who participated in nutrition counseling, and 98 participants (81.7%) who participated in immunization status review.

Table 4. Healthcare Service Utilization Before and After Intervention (n = 120)

Healthcare Service	Baseline n (%)	Post-Intervention n (%)
General Health Screening	46 (38.3)	104 (86.7)
BMI Assessment	52 (43.3)	110 (91.7)
Hemoglobin Testing	40 (33.3)	96 (80.0)
Mental Health Counseling	28 (23.3)	88 (73.3)
Nutrition Counseling	36 (30.0)	102 (85.0)
Immunization Status Review	44 (36.7)	98 (81.7)
Total Participants	120 (100)	120 (100)

The overall pattern of preventive health care services is depicted in Figure 4. The radar chart shows an overall increase in the use of healthcare services after the intervention, with all domains of service usage significantly surpassing baseline levels after the intervention. The greatest gain was seen in mental health counselling, nutrition counselling and hemoglobin testing indicating the positive impact of the integrated health promotion activities. The wider distribution of the post-intervention profile suggests improvements in adolescent awareness, access, and engagement with preventive health care services. Overall, the intervention showed a significant improvement in the utilization of preventive health care and helped to increase the positive health-seeking behavior among the study participants, as shown in Figure 4.

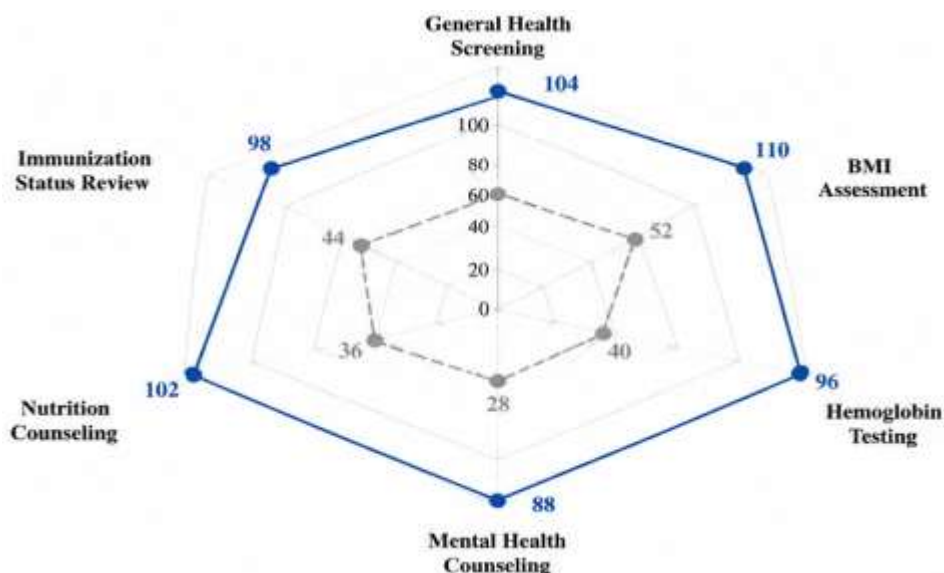


Figure 4. Preventive Healthcare Uptake Before and After Intervention.

4.5 Overall Health Promotion Outcomes

The effectiveness of the community-oriented adolescent health promotion program was assessed by measuring the differences between primary and secondary outcome measures before and after the 12-week intervention. There was improvement seen in all assessed domains, such as nutritional status, mental wellness, preventive healthcare utilization, nutritional awareness, physical activity participation and uptake of preventive health screening. The intervention led to a decrease in underweight status, improvement in mental wellness status, improved health care utilization, and improved health-promoting behaviors. The main and secondary outcomes are summarized in Table 5.

Table 5. Summary of Primary and Secondary Outcomes Following the Intervention (n = 120)

Outcome Indicator	Baseline Value	Post-Intervention Value	Improvement (%)
Primary Outcomes			
Mean BMI (kg/m ²)	20.9 ± 3.2	21.7 ± 2.8	3.8
Mental Wellness Score	24.2 ± 5.6	31.8 ± 4.9	31.4
Preventive Healthcare Utilization (%)	38.3	86.7	126.4
Secondary Outcomes			
Nutritional Awareness Score	5.2 ± 1.4	8.1 ± 1.2	55.8
Physical Activity Participation (min/day)	34.5 ± 12.8	58.6 ± 15.4	69.9
Preventive Health Screening Uptake (%)	38.3	86.7	126.4

The intervention resulted in positive outcomes for all of the indicators measured as displayed in Table 5. During the intervention period, there was a greater than two-fold rise in the use of preventive health care and a 31.4% rise in mental wellness scores. Improvement in nutritional awareness and physical activity participation also were strong, showing that healthful behaviors were successfully adopted. The overall improvement of both the primary and secondary outcomes indicated that the intervention improved the well-being and health of adolescents in a variety of ways within a community-based context.

5. Discussion

The results of this study indicate that a community-based adolescent health promotion program has the potential to positively impact the nutrition status, mental wellness, and use of preventive pediatric health care services in a community. The six indicators assessed positive outcomes from the integrated intervention: nutrition education, mental wellness support, physical activity promotion and preventive health activities.

There was a positive trend towards better nutrition outcomes in the direction of healthier BMI categories after the intervention. The decrease in the underweight and the rise in the normal weight group is indicative of the effect of improved nutritional awareness and healthy nutrition gained by participants. The results showed the significance of community nutrition educations in supporting the growth and development of the adolescents.

Levels of mental wellness outcomes also showed significant improvement. This improved psychological wellness from a decrease in poor mental wellness and significant improvement in good psychological wellness demonstrates the positive impact of counseling sessions, stress management workshops and peer support activities. This emphasizes the need to integrate mental health promotion into adolescent health programs.

The utilization of preventive care for children increased significantly in all services, such as health screening, BMI assessment, hemoglobin testing, nutrition counseling, mental health counseling, and immunization review. These improvements indicate better awareness and health-seeking behaviour of the adolescents after the intervention.

The results of the present study are in line with various earlier studies that have indicated that health promotion in the community using integrated and multidisciplinary approaches has a positive impact on improving the health of

adolescents. These interventions provide multiple and long-lasting health effects by focusing on nutrition, mental health and prevention.

The public health implications of the study are that community based health promotion interventions with schools, families, health professionals and community groups are warranted and should be implemented. Such partnership initiatives can help improve the health and well-being of adolescents, mental health, and better use of preventive health services.

Structured intervention design and a multifaceted evaluation of several domains of health are strengths of the study. There are, however, some restrictions involved, such as the brief time frame of intervention, the limited study context, and some of the measures being self-reported. Additional studies with greater numbers of participants and follow-up time are suggested to continue to assess the sustainability of the effectiveness of adolescent health promotion programs delivered in the community.

6. Conclusion

The results of this study confirmed the effectiveness of community-based approaches for adolescent health promotion for improving nutrition, mental health and pediatric health preventive service use among adolescents. The 12-week intervention, which included nutrition education, mental wellness counseling, promoting physical activity and preventive healthcare activities, had a measurable impact on a number of health indicators. Overall, improvements were seen in BMI-based nutritional status, mental wellness scores, and in physical activity participation, healthcare services utilization and nutritional awareness.

The results highlight the need to use community-based integrated approaches to meet the multitude of physical, psychological and preventative health needs of adolescents. These programs can be used to motivate healthier lifestyles and better emotional health, as well as the increased adoption of preventative health related services, by reaching out to schools, health providers, families and community members.

The study also underscores the viability of community-based interventions as feasible, viable public health strategies for enhancing adolescent health outcomes. These methods can help prevent disease early, increase health awareness and support overall health at an important development time. Further research is recommended to determine the long-term effectiveness and generalizability of such interventions with larger samples, across a wider geographic area and with greater follow-up time. The findings suggest a strong case for the implementation of comprehensive health promotion programmes in adolescent health policies and health care services in the community context.

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