

Community Health Initiatives Promoting Adolescent Nutrition Awareness and Long-Term Pediatric Wellness Through Educational Interventions Today

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Abstract

The role of adolescent nutrition is critical as it relates to physical development, brain development, and health in the long term. But poor nutrition education and unhealthy eating habits are still common among teenagers, which poses the risk of malnutrition and other health issues related to nutrition. Educational interventions that are community based have proved to be effective measures in enhancing nutrition knowledge and health promotion among the younger populations. The aim of this study was to assess the success of community health programs in improving the nutrition awareness of adolescents and long-term pediatric health via systematic educational programs. An intervention pre and post test study was done in a community based setting on 300 adolescents aged between 12 and 18 years. The participants were provided with nutrition awareness programs, community health promotion programs, interactive education, group discussions, nutrition counseling and educational resources. The structured questionnaire was used to measure the demographic factors, Nutrition Awareness Score (NAS), Healthy Eating Behavior Index (HEBI), and Pediatric Wellness Score (PWS). Descriptive statistics, paired t -tests, Pearson correlation analysis, and multiple linear regression analysis with a significance level of $p < 0.05$ were performed using the statistical tests. The educational intervention led to significant increase in Nutrition Awareness Score (NAS) meaning improved knowledge on balanced diets, food groups, micronutrients, healthy eating practices and prevention of diseases related to nutrition. There were also better outcomes of healthy eating habits and pediatric wellness. Correlation analysis revealed that there were positive associations between NAS, HEBI and PWS whereas regression analysis revealed nutrition awareness as a strong predictor of wellness in pediatrics. The results reveal that community health educational interventions are effective in enhancing the knowledge of nutrition among adolescents and leading to healthier eating habits and a higher health outcome among pediatrics. The inclusion of nutrition education in community health programs could be useful in promoting sustainable health and long-term well-being among adolescents.

Keywords

Adolescent Nutrition, Nutrition Awareness Score, Community Health Initiatives, Educational Interventions, Healthy Eating Behavior, Pediatric Wellness.

1. Introduction

Adolescence is a critical period of human development, defined by the maximum physical growth, cognitive development, and behavioral changes, which come to a considerable effect on health throughout a person's lifetime. Proper nutrition at this age plays an important role in ensuring growth, boosting immunity, improvement in academic achievement and avoidance of chronic illnesses in adulthood. Although healthy eating habits have been identified as significant in cyberspace, a large number of teenagers still display poor eating habits, unregulated meal intakes and insufficient intakes of healthy foods. The challenges are usually affected by lack of nutrition knowledge,

socioeconomic, family set-ups, and growing exposure to unhealthy foods. Therefore, making adolescents more aware of nutrition is now a global issue of public health concern.

Community health programs have become viable solutions to nutrition-related issues through the provision of health education within schools and communities. Nutrition workshops, counseling, awareness campaigns and interactive learning activities are some of the educational interventions that can be used to enhance knowledge of the adolescents on the importance of balanced diets, food groups, micronutrient needs and disease prevention mechanisms. Past researches have established positive correlations of nutrition education with healthier eating habits, but the evidence of the long-term impact of this intervention on the health of children has been weak. Moreover, most of the programs in place are mainly concerned with dissemination of knowledge without systematic testing of changes in nutrition awareness and other related health outcomes using standardized measures of assessment.

The current paper fills this gap by exploring how community health educational interventions can be effective in improving the adolescent nutrition awareness and pediatric wellness. The intervention program was conducted in a structured form and its effect was measured with the help of Nutrition Awareness Score (NAS) as the main outcome measure among adolescents aged 12-18 years. Besides the nutrition awareness evaluation, the experiment also examined the alterations in the healthy eating habits and overall wellness measurements. Correlation and regression analyses were used to investigate the relationship between nutrition awareness, dietary behaviors and the wellness outcomes of children, thus presenting a holistic picture of the effectiveness of community-based nutrition education.

This research has fourfold contributions. First, it will provide a systematic system of assessment of community health educational interventions that will enhance adolescent nutrition awareness. Second, it employs the use of Nutrition Awareness Score (NAS) as a standardized measurement of pre and post intervention nutrition knowledge changes. Third, it investigates the relationship between nutrition awareness, healthy eating practices and pediatric wellness using statistical tests. Fourth, it gives evidence-based suggestions on how nutrition education can be incorporated into community health initiatives to help promote sustainable health among adolescents and well-being in pediatric care in the long run. Such contributions can help healthcare workers, educators, and policymakers to come up with effective strategies to enhance nutritional health among adolescents.

2. Literature Review

Adolescence is a critical stage of development during the time when physical development, hormonal fluctuations, cognitive and nutritional needs are active. Healthy nutrition is critical at this age to promote healthy growth, bone development, immune system and general wellbeing. It has been found out that undernutrition and overnutrition are both still among the concerns of the public health among adolescents all around the world, which leads to poor health outcomes and a higher disease burden in the future [1], [2], [3], [6]. The increasing incidences of overweight, obesity and micronutrient deficits among adolescents underscore the essence of inculcating nutrition awareness and healthy eating habits among young people at a young age [1], [11], [14]. Moreover, nutrition knowledge has also been found as key determinant of food intake and lifestyle habits, which affects both short-, and long-term health conditions. The more friends are aware of balanced diets and healthy eating habits, the higher their chances that they will be able to develop positive dietary habits that allow optimal growth and development [5], [11], [12].

There has been a growing awareness of the community health programs as a powerful means of increasing awareness of nutrition among adolescents and a healthier lifestyle. School-based nutrition programs, community outreaches as well as public health campaigns are also other good platforms to spread nutrition related information and promoting healthy behavior change among young populations [2], [6]. These programs usually include coordination of the activities of healthcare providers, educators, families, and community agencies in order to establish conducive environments in which nutrition education and health promotion can take place. It has been indicated that a community involvement increases the effectiveness of health interventions through increased engagement, access and

sustainability of educational programs [2], [6]. The strategies are especially relevant when dealing with nutritional inequalities and minimizing the malnutrition burden among adolescents in various socioeconomic contexts.

One of the pillars of nutrition promotion in communities is educational interventions. Nutrition education interventions such as workshops, counseling, interactive learning exercises, technology-based educational services have been found to enhance nutrition knowledge and prompt healthier eating habits among the adolescents [9], [13]. Interactive and family-centered interventions are especially helpful since they do not only target personal habits but environmental factors that affect the choice of dietary habits as well [9]. Moreover, innovative options to deliver nutrition information and promote life-long interaction among adolescents have been offered through the use of digital health tools, and structured educational programs [13]. There is evidence that nutrition awareness has a positive relationship with healthier food choices, better adherence to balanced diets, and better quality of life [10]. The results suggest that comprehensive nutrition education is to be included in community health interventions as a means of long-term behavior change and pediatric wellness promotion.

Even though research studies have widely investigated adolescent nutrition, dietary practices, and health programs in a community, there are still some research gaps that are of importance. The available studies have mostly concentrated on individual nutritional outcomes like obesity, malnutrition or adherence to diet instead of thoroughly analyzing the interdependent relationships between community health programs, nutrition education, nutritious eating habits, and well being among children [1], [2], [10], [14]. In addition, most intervention research designs evaluate the amount of knowledge gained without a systematic measure to assess nutrition knowledge and its role in general wellness interventions [9], [13]. There is a paucity of data on the effect of integrated educational interventions assessed using a systematic Nutrition Awareness Score (NAS). Hence the current research fills this gap by undertaking a systematic evaluation of the effects of community health educational interventions on adolescence nutritional awareness, healthy eating habits and pediatric wellness through the use of NAS as the main measurement tool. The results will be projected to give evidence-based information on how to develop effective community health initiatives aimed at promoting long-term adolescent health and well-being and promoting pediatric health in the long term.

3. Materials and Methods

3.1 Study Design and Participants

The community-based pre-test-post intervention study was carried out to assess the impact of educational interventions on the enhancement of the understanding of adolescent nutrition and the promotion of long-term well-being in children. About three hundred adolescents were recruited into the study including 12- to 18-year-olds, who were selected at schools and community health centers. The inclusion and exclusion criteria were predefined and used to select the participants. The study involved adolescents who voluntarily consented to take part in it and have parental or guardian consent, but those whose response was not complete, as well as those with medical conditions that might have a great impact on dietary habits, were excluded. During the study, ethical standards were upheld and all the information of the subject participants was handled with great confidentiality.

3.2 Community Health Educational Intervention

The goal of the educational intervention was to improve the nutrition knowledge and promote healthy dieting habits among the adolescents through a broader community health intervention. The intervention programs included nutrition awareness, community outreach, interactive educational sessions, group discussions, nutrition counseling, provision of education brochures and electronic learning media. All these were carried out with a systematic period of intervention to enhance the knowledge of the participants regarding balanced diets, food groups, micronutrient needs, healthy dieting habits, and prevention of diseases involving nutrition. The general steps involved in nutrition awareness evaluation and outcome measurement are shown in Figure 1.

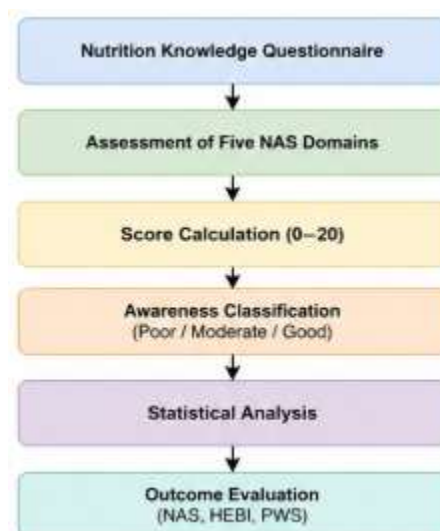


Figure 1. NAS Assessment Process

3.3 Data Collection Instrument and Study Variables

A structured questionnaire, designed to measure demographic data, nutrition awareness, dietary habits, and wellness outcomes in pediatrics, was used to collect the data. The instrument was used in pre and post-intervention to measure the change in knowledge and health behaviors of the participants. The main study variable was the Nutrition Awareness Score (NAS) which was the main indicator of nutrition knowledge. The several secondary variables were Healthy Eating Behavior Index (HEBI), Pediatric Wellness Score (PWS), Educational Intervention Effectiveness Score (EIES), and Family Support Index (FSI). The choice of these variables was determined to give a complete analysis of the success of the intervention and how it contributed to the health outcome of the adolescents.

Table 1. Study Variables

Variable	Description
NAS	Nutrition Awareness Score
HEBI	Healthy Eating Behavior Index
PWS	Pediatric Wellness Score
EIES	Educational Intervention Effectiveness Score
FSI	Family Support Index

3.4 Nutrition Awareness Score (NAS) Assessment

The nutrition awareness was measured based on a standardized 20 item questionnaire with particular aim of measuring the knowledge of the participants concerning the balancing of diets, identification of food groups, awareness of micronutrients, healthy eating habits, as well as prevention of related diseases. Each correct response was awarded

one point and incorrect responses were awarded zero points hence a total of 0-20 points was gained. The score was higher with the increased degrees of nutrition awareness. On the overall score derived, participants had been classified as poor, moderate or good awareness. The classification system made it easier to assess the effectiveness of interventions as it was possible to compare awareness levels provided before and after the educational program was attended. Table 2 shows domains that will be included in the assessment and their scoring rules.

Table 2. NAS Domains and Scoring Criteria

NAS Domain	Maximum Score
Balanced Diet Knowledge	4
Food Group Identification	4
Micronutrient Awareness	4
Healthy Eating Practices	4
Nutrition-Related Disease Awareness	4
Total NAS Score	20

Table 3. Classification of Nutrition Awareness Score (NAS) Levels

NAS Range	Awareness Level
0-7	Poor Awareness
8-14	Moderate Awareness
15-20	Good Awareness

3.5 Data Collection Procedure and Statistical Analysis

Data collection was done in three successive phases which included a pre-intervention assessment, the implementation of the educational intervention and the post-intervention assessment. The first phase entailed gathering of baseline data on nutrition awareness, dietary behavior and health indicators in all the participants. The same assessment tool was used to assess the changes in outcomes of the study after the completion of the intervention activities. The obtained data were checked, coded and inputted into the statistic software package in order to be analyzed. The characteristics of the participants and the variables of the study were summarized using descriptive statistical measures such as frequency distributions, percentages, means and standard deviations. Paired t-tests, Pearson correlation analysis, and multiple linear regression analysis were used as inferential analyses to determine the differences in pre- and post-intervention results, relationship among NAS, HEBI, and PWS, and the significant predictors of pediatric wellness, respectively. The statistical significance was defined as the p-value below 0.05.

4. Results

4.1 Demographic Characteristics of the Participants.

Figure 2 shows the distribution of the ages of the 300 adolescents that participated in the study. Among the participants, 28 (9.3%) were aged 12 years, 42 (14.0%) were aged 13 years, 55 (18.3%) were aged 14 years, 60 (20.0%) were aged 15 years, 48 (16.0%) were aged 16 years, 38 (12.7%) were aged 17 years, and 29 (9.7%) were aged 18 years. The largest percentage of participants was 15-year-old and the lowest percentage was with the teenage who are 12 years

old. The distribution shows that there was a sufficient representation of all age groups with most of the respondents falling within the age group of 14-16 which reflects a balanced sample that can be used to assess the effectiveness of the nutrition awareness intervention.

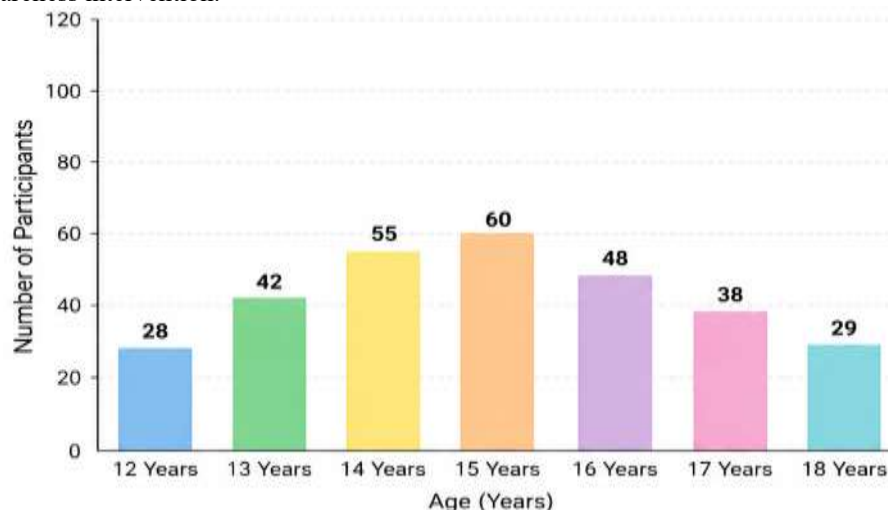


Figure 2. Age Distribution of Study Participants (N = 300)

4.2 Nutrition Awareness Score (NAS) Before and After Educational Intervention

Figure 3 demonstrates the comparison of the Nutrition Awareness Scores (NAS) at the baseline and after the educational intervention in 300 adolescents. The average NAS also significantly rose in the pre-intervention measurement of 10.8 ± 2.4 to the post-intervention measurement of 16.9 ± 1.8 or by 6.1 points or about 56.5 percent. The decrease in the standard deviation between 2.4 and 1.8 suggests that there is more uniformity in nutrition knowledge of participants at the intervention. The results reveal that the community health educational intervention was successful in increasing adolescents' knowledge on balanced diets, food groups, micronutrients, healthy eating habits, and disease prevention associated with nutrition and the improvement was statistically significant ($p < 0.001$).

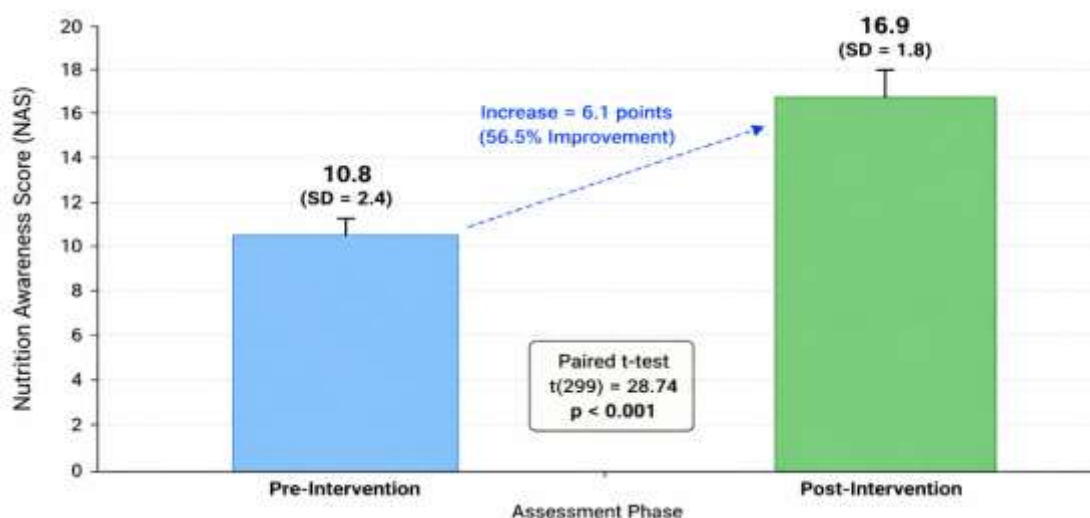


Figure 3. Improvement in Nutrition Awareness Score (NAS) Before and After Educational Intervention (N = 300)

4.3 Healthy Eating Behavior Outcomes

Figure 4 displays the differences in Healthy Eating Behavior Index (HEBI) scores pre- and post-educational intervention in a sample of 300 adolescents. The mean of HEBI was 58.4 8.2 in pre-intervention and 78.6 7.1 in the post-intervention and this represented an increase of 20.2 points or about 34.6. The standard deviation reduction between 8.2 to 7.1 indicates that there is more consistency in healthy eating routines amongst the participants at the end of the intervention. These findings indicate that the adolescents adopted healthier eating habits, such as eating more fruits, vegetables and other nutrients rich foods whilst eating less processed foods and sugar sweetened drinks. The statistically significant improvement ($p < 0.001$) supported the effectiveness of the nutrition education program in enhancing positive changes in dietary behavior.

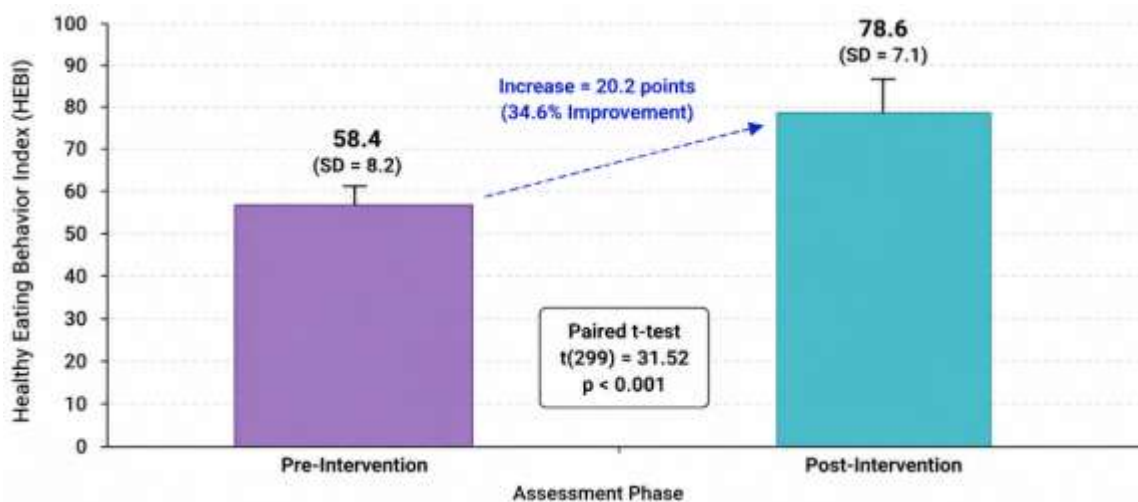


Figure 4. Healthy Eating Behavior Outcomes Before and After Educational Intervention (N = 300)

4.4 Pediatric Wellness Outcomes

The results of Pediatric Wellness Score (PWS) is shown in Table 4 (pre-intervention and post-intervention). The average PWS rose to 82.7 ± 6.3 in post-intervention assessment as compared to 64.2 plus 7.5 in pre-intervention assessments and this shows an increase of 18.5 or about 28.8 percent. The decrease in standard deviation (7.5 to 6.3) suggests a higher degree of uniformity in the results of wellness among the respondents after the intervention. These results imply that there are significant changes towards understanding physical health, healthy lifestyle and preventive health behavior. The recorded improvement in PWS supports the idea that greater nutrition knowledge and healthier dietary habits played an important role in the overall pediatric wellness as the change in pre- and post-intervention scores was statistically significant ($p < 0.001$).

Table 4. Pediatric Wellness Score (PWS) Results

Assessment Phase	Mean PWS	Standard Deviation
Pre-Intervention	64.2	7.5
Post-Intervention	82.7	6.3

Improvement (%)	28.8	—
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4.5 Correlation Analysis Between NAS, HEBI, and PWS

Table 5 shows the Pearson correlation coefficients between Nutrition Awareness Score (NAS), Healthy Eating Behavior Index (HEBI), and Pediatric Wellness Score (PWS). The findings showed that NAS had a high positive correlation with HEBI ($r = 0.79$, $p = 0.001$), meaning that the more adolescents were aware of nutrition, the more they were likely to engage in more healthy eating habits. On the same note, NAS showed the highest positive correlation with PWS ($r = 0.82$, $p < 0.001$) indicating that better nutrition knowledge was closely correlated with better pediatric wellness outcomes. Moreover, there was a significant positive relationship between HEBI and PWS ($r = 0.76$, $p < 0.001$) which validated that healthier eating behaviors led to improved wellness status. All the correlation coefficients were greater than 0.75, which means that the relationships between the variables could be discussed as strong and statistically significant, as nutrition awareness and healthy eating behaviors influence each other and overall pediatric wellness.

Table 5. Correlation Matrix Among NAS, HEBI, and PWS

Variable	NAS	HEBI	PWS
NAS	1.000	0.790	0.820
HEBI	0.790	1.000	0.760
PWS	0.820	0.760	1.000

4.6 Multiple Regression Analysis of Factors Influencing Pediatric Wellness

The analysis was done using multiple linear regression to determine the significant predictors of pediatric wellness. This model was based on the independent variables Nutrition Awareness Score (NAS) and Healthy Eating Behavior Index (HEBI) and dependent variable Pediatric Wellness Score (PWS). Regression analysis showed that NAS and HEBI were significant predictors of pediatric wellness ($p < 0.05$). NAS was the most influential predictor of PWS, which indicates the value of nutrition knowledge in predicting adolescent health outcomes. The overall regression model accounted a significant percentage of the variation of pediatric wellness, which proved educational interventions to be effective in promoting health and wellbeing among adolescents.

5. Discussion

The results of the work have proved that community health educational interventions are effective in enhancing adolescents' nutrition awareness, healthy eating habits and wellness outcomes in children. The great improvement in the Nutrition Awareness Score (NAS) after the intervention suggests that nutrition workshops, counseling and awareness campaigns were effective in improving the knowledge of healthy dietary practices among the participants. The gains in the Healthy Eating Behavior Index (HEBI) indicate positive dietary behavior change was associated with greater nutritional knowledge, whereas the greater Pediatric Wellness Score (PWS) indicated greater overall health gains with enhanced nutritional knowledge. Correlation and regression analyses also asserted further that nutrition awareness is closely intertwined with healthy eating habits and is a strong predictor of pediatric wellness. These results are in line with the past literature that has placed an emphasis on the importance of nutrition education in promoting adolescent health as well as the importance of incorporating structured community-based nutrition programs in the public health strategies to facilitate the long-term pediatric health.

6. Conclusion

This paper does conclude that community health programs and educational programs are useful tools in raising nutrition awareness among teenagers. The fact that the Nutrition Awareness Score (NAS) increased significantly shows that structured nutrition education positively influenced the nutrition level of adolescents regarding their perceptions of balanced diets, healthy nutrition habits, as well as prevention of diseases related to nutrition. Greater nutrition awareness also correlated with better eating habits and outcomes with better pediatric health, which underscores the role of nutrition education in enhancing the overall health of adolescents. Also, positive correlations between NAS, Healthy Eating Behavior Index (HEBI), Pediatric Wellness Score (PWS) underscore the role of educational interventions in promoting health in the long-run. So, comprehensive nutrition education programs can be incorporated into the community health and school-based programs to facilitate sustainable behavioral change and enhance wellness outcomes and provide future generations with healthier populations.

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