Effects of a school-based intervention to reduce cardiovascular disease risk factors among secondary school students: A clusterrandomized, controlled trial

ABSTRACT

Background: Cardiovascular diseases (CVDs) are the number cause of death worldwide. In Ghana CVD has been the leading cause of death since 2001. The prevalence of CVD risk factors among adolescents in Ghana has been increasing. This study seeks to develop, implement and evaluate the effects of a behavioral modification intervention program to reduce CVD risk factors among secondary school students in Brong Ahafo, Ghana. Methods: A cluster-randomized controlled trial was conducted with schools as clusters over a period of six-months with pre and post intervention evaluations. Participants were public secondary school students (14-19 years) from four schools in Brong Ahafo, Ghana. Students in the intervention group were trained by the researchers whereas those of the control group received no intervention. The intervention included health education and physical activity modules. Follow-up data using same questionnaire were collected within two weeks after the intervention was completed. Intention-to-treat analysis was performed after replacing missing values using the multiple imputation method. The generalized linear mixed model (GLMM) was used to assess the effects of the intervention study. Results: The GLMM analyses showed the intervention was effective in attaining 0.77($p<0.001$), 0.72($p<0.001$), 0.47($p<0.001$), 0.56($p<0.001$), and 0.39($p = 0.045$) higher total physical activity, fruits, vegetables, seafood, and water scores respectively for the intervention group over the control group. The intervention was also significant in reducing 0.15($p<0.001$),-0.23($p<0.001$),-0.50($p<0.001$),-0.32($p<0.001$),-0.90($p<0.001$),-0.87($p<0.001$),-0.38($p<0.001$),-0.63($p<0.001$), -1.63($p<0.001$), 0.61($p<0.001$), and -1.53($p = 0.005$) carbohydrates, fats and oils, fried eggs, fried chicken, carbonated drinks, sugar, sweet snacks, salted fish, weight, BMI, and diastolic BP. The odds of quitting alcohol use in the intervention group were 1.06 times more than the control group. There was no significant effect on reducing smoking and systolic BP. Conclusion: There is an urgent need for the intervention program to be integrated into the existing curriculum structure of secondary school schools. Implementing the intervention will allow for longer and more consistent impact on the reduction of CVD risk factors among secondary school students.