

Original Article

Improving Adolescent Knowledge on Mental Health and Balanced Nutrition through Meaningful Youth Participation: RAN PIJAR Health Heroes Experience in Bogor City

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ABSTRACT

Background: Adolescents aged 10–19 experience rapid physical and psychological development, making them vulnerable to nutrition and mental health issues. In Bogor City, these challenges prompted the implementation of the RAN PIJAR program using the Meaningful Youth Participation (MYP) approach through Health Heroes Facilitators to enhance health knowledge. This study aimed to evaluate the effectiveness of the MYP-based health education intervention in improving adolescent's knowledge of mental health and balanced nutrition in Bogor City.

Methods: This quasi-experimental study used a one-group pre-test and post-test design involving 335 adolescents aged 15–18 years from nine senior high schools and one city-level scout organization. Health education sessions applied participatory methods such as Focus Group Discussions (FGDs), Human-Centered Design (HCD), and audiovisual materials. Wilcoxon signed-rank test was used due to non-normal data distribution.

Results: After the intervention, the proportion of respondents with good knowledge on mental health and nutrition increased significantly from 50.1% with poor knowledge to 80.9% with good knowledge. A statistically significant improvement was observed ($p = 0.000$), with median rising from 50 (pre-test) to 90 (post-test).

Conclusions: The intervention using the MYP approach effectively improved adolescent knowledge on mental health and balanced nutrition. The participatory and peer-led design created a relatable and engaging environment for adolescents. Future health education programs should adopt a sustainable, gender-equitable, and media-diverse approach and be integrated with school-based health initiatives such as School Health Units (UKS) and healthy canteens.

Keywords: *adolescent health, health education, nutrition, mental health, school-based intervention.*

INTRODUCTION

Adolescence, defined by the WHO as ages 10 to 19, is a crucial period of rapid physical, cognitive, and psychosocial development. During this time, optimal nutrition is essential to support healthy growth, learning, and overall well-being of adolescence. Ensuring good nutritional status in adolescents not only enhances school achievement but also helps build strong, intelligent, and resilient future generations, which is vital for the prosperity and quality of a nation's human resources^{1–5}.

Nutritional problems among Indonesian adolescents remain a serious concern, including in Bogor City. According to the 2018 Riset Kesehatan Dasar data, the prevalence of obesity and underweight among adolescents in Bogor City were 12.43% and 5.58%, respectively. The prevalence of anaemic adolescent girls reached 16.3%⁶. This figure shows that many adolescents still face micronutrient deficiencies, especially iron, which is essential for health and body function. Anaemia can worsen adolescents' physical and cognitive conditions, which in turn can affect their quality of life in the long term⁷.

In addition, the incidence of stunting remains a significant public health concern in Bogor City. Stunting—a condition marked by impaired growth and development due to chronic malnutrition—results in children having a shorter stature for their age and can lead to long-term consequences, including cognitive delays, poor academic performance, and increased susceptibility to disease. According to data from the Ministry of Health, the prevalence of stunting among toddlers in Bogor City stands at 16.9%, indicating that nearly one in six young children are affected by this condition⁸.

Meanwhile, adolescence is a critical developmental stage characterized by rapid physical, emotional, and

psychological changes. One of the defining features of adolescence is heightened emotional intensity, often arising from the pressures and expectations associated with the transition to adulthood. Adolescents may experience increased stress due to academic demands, social pressures, and identity formation. If left unaddressed, this emotional strain can negatively impact their motivation to learn, academic performance, and overall decision-making abilities².

In response to ongoing health challenges affecting adolescents, RISE Foundation, in collaboration with the Coordinating Ministry for Human Development and Cultural Affairs (Kemenko PMK), the Bogor City Government, and Friedrich Ebert Stiftung (FES) Indonesia, initiated a health education program through the Health Heroes Facilitators of RAN PIJAR in Bogor City. This initiative is part of the implementation of *Permenko PMK No. 1 of 2022* concerning the National Action Plan for Improving the Welfare of School-Age Children and Adolescents (*Rencana Aksi Nasional Peningkatan Kesejahteraan Anak Usia Sekolah dan Remaja – RAN PIJAR*). RAN PIJAR aims to foster the development of healthy, resilient school-age children and adolescents by ensuring they grow up in safe, inclusive, and supportive environments. The program seeks to enhance their opportunities for learning, strengthen life skills, and promote optimal physical and mental health outcomes.

A key component of this initiative is the active involvement of Health Heroes Facilitators in Bogor City, which exemplifies the Meaningful Youth Participation (MYP) approach. MYP emphasizes the importance of involving young people in a genuine and structured manner throughout the stages of program development, including planning, implementation, and evaluation. By engaging youth as partners and leaders, the approach ensures that programs are more relevant, sustainable, and effective in addressing their needs. The adoption of the MYP framework also reflects a broader recognition of adolescents as critical agents of change. Young people represent the nation's intellectual and human capital, with significant potential to drive social progress and national development. Empowering adolescents through participatory health education initiatives not only improves their well-being but also invests in the future resilience and prosperity of the nation⁹. Specifically, the objectives of this study are to: (1) describe the characteristics of adolescent participants by location and gender, (2) measure changes in adolescent's knowledge levels before and after the intervention, and (3) assess the statistical significance of adolescent's knowledge.

METHODS

This study employed a quasi-experimental quantitative research design, specifically utilizing a one-group pre-test and post-test format. The research was conducted in the context of health education activities delivered during the *RAN PIJAR Real Action* initiative by 20 members of the Health Heroes Facilitator (HHF) team in Bogor City. The intervention was implemented across 10 schools and youth organizations

distributed throughout the city.

Although the study did not include a control (comparison) group, the pre-test and post-test structure allowed researchers to assess measurable changes in participants' knowledge, attitudes, or behaviors following the intervention. This design, while lacking a randomized control, is valuable for evaluating the effectiveness of programs in real-world community settings.

The health education delivered during the intervention was grounded in the Meaningful Youth Participation (MYP) approach, promoting active youth involvement in both content delivery and engagement. Educational sessions were conducted using counseling-based methods, including Focus Group Discussions (FGDs) and the Human-Centered Design (HCD) approach, to foster collaborative learning and problem-solving among participants. To enhance engagement and understanding, a variety of audio-visual learning media were utilized, including PowerPoint presentations, video screenings, and educational posters. These tools supported the delivery of key health messages and contributed to a more interactive and learner-centered experience for adolescents.

Data collection was carried out between 22 August to 26 September 2024, directly during the health education activities conducted at each participating school and youth organization. The research instrument consisted of a structured questionnaire containing 20 multiple-choice questions assessing knowledge about mental health and balanced nutrition. The questionnaire was reviewed by public health expert and youth engagement specialist to ensure content relevance and appropriateness for adolescents. The questionnaire was administered twice, before the educational session (pre-test) and after the session (post-test). Data collection was conducted anonymously, and all participants provided informed voluntary consent. The collected data were then entered and statistically analyzed using SPSS.

The population in this study consisted of adolescents aged 15 to 18 years from ten schools and youth organizations located across Bogor City. These specific locations were selected based on findings from a prior preliminary needs assessment conducted by the Health Heroes Facilitators (HHF), in coordination with the local government office during the planning phase of the *RAN PIJAR* program. The selected sites were identified as having urgent health-related issues—such as the absence of prior health counseling activities or the presence of concerns related to mental health, nutrition, smoking behavior, or youth violence (e.g., student brawls). The participating institutions included: MAN 2 Bogor City, SMK-SMAK Bogor, MAN 1 Bogor City, SMAN 2 Bogor City, SMA Rimba Madya Bogor City, MA Nurani Bogor City, SMKN 2 Bogor City, SMAN 10 Bogor City, SMK Pembangunan Bogor, and the Scout Organization of Bogor City.

Sampling was conducted using purposive sampling at each implementation site (school and youth organization). The recruitment target per site was approximately 40 participants to maintain appropriate group dynamics and facilitator capacity; recruitment was coordinated with school/organization

staff (principals/teachers/scout leaders) who selected student representatives available on the activity day. The inclusion criteria were: (1) aged 15–18 years, (2) completed both the pre-test and post-test administered during the education sessions, and (3) participated in the full sequence of program activities until completion. Participants who did not meet any of these criteria (e.g., absent for one of the measurements) were excluded from the analysis to ensure that only fully exposed participants were evaluated.

Step-by-step recruitment procedure: (1) the Health Heroes team contacted the schools/organizations to obtain permission and set schedules; (2) the schools/organizations nominated student representatives to be invited; (3) before the session, participants received study information and provided voluntary consent; (4) participants completed the pre-test questionnaire, attended all education sessions that focused specifically on issues related to nutrition and mental health among adolescents, and then completed the post-test questionnaire.

A univariate analysis was first performed to describe the frequency distribution of respondents based on key demographic variables, including research location and gender. Subsequently, a bivariate analysis was conducted to assess the effectiveness of the health education intervention in improving adolescent knowledge. Given that the distribution of the data did not meet the assumptions of normality, the Wilcoxon signed-rank test, a nonparametric statistical method, was employed. This test is appropriate for comparing paired data, such as pre-test and post-test scores, and determining whether there were statistically significant changes in knowledge levels following the intervention.

Administrative approval to conduct this study was obtained from the Coordinating Ministry for Human Development and Cultural Affairs, the Bogor City Government, the Bogor City Health Service, the Bogor City Ministry of Religion, the West Java Region II Education Service Branch Office, and the Scouting Organization of Bogor City. As this research involved non-clinical educational activities and did not collect any sensitive or personally identifiable data, formal ethical clearance was not required under local research regulations. Participation of students was voluntary, and confidentiality and anonymity were maintained throughout the data collection process.

RESULTS

a. Respondent of RAN PIJAR Program in Bogor City based on Location and Gender

The participation of respondent based on location can be seen in the table 1. A total of 335 respondents participated in the study, comprising students from nine senior high schools (SMA or equivalent) and one city-level scouting organization (Pramuka Kwartir) in Bogor City. The highest participation was from SMA Rimba Madya at 11.64% of the total sample, while the lowest participation was at SMAN 10 Kota Bogor at 8.1%.

Table 1. Respondent of RAN PIJAR Program in Bogor City based on Location

Location	Total (n)	Percentage (%)
MAN 2	35	10,4
SMK-SMAK	31	9,3
MAN 1	38	11,3
SMAN 2	31	9,3
SMA Rimba Madya	39	11,6
Pramuka Kwartir	36	10,7
MA Nurani	31	9,3
SMKN 2	38	11,3
SMAN 10	27	8,1
SMK Pembangunan	29	8,7
Total	335	100

The participation of respondent based on gender can be seen in the table 2. Based on the data presented in Table 2, of the 335 respondents who participated in RAN PIJAR program intervention, 137 were male adolescents (40.9%), and 198 were female adolescents (59.1%). This indicates a higher level of participation among female students compared to their male counterparts.

Table 2. Respondent of RAN PIJAR Program in Bogor City based on Gender

Gender	Total (n)	Percentage (%)
Male	137	40,9
Female	198	59,1

b. Distribution of Adolescent's Knowledge Levels

The distribution of adolescent's knowledge levels can be seen in the table 3.

Table 3. Distribution of Adolescent's Knowledge Levels about Mental Health and Balanced Nutrition Before and After Intervention

Knowledge	Pre-Test		Post-Test	
	Total (n)	Percentage (%)	Total (n)	Percentage (%)
Poor	168	50,1	22	6,6
Adequate	129	38,5	42	12,5
Good	38	11,3	271	80,9

Based on table 3, it can be seen that the majority respondent had poor knowledge (50.1%) about mental health and balanced nutrition before receiving health education from Health Heroes RAN PIJAR Program. However, after receiving health education, the majority of respondents experienced an increase in their knowledge, as indicated by the increase in the number of respondents with good knowledge (80.9%).

c. Effectiveness of RAN PIJAR program on the Level of Knowledge of Adolescents

Further analysis using the Wilcoxon signed-rank test, as shown in Table 4, showed a p-value of 0.000, which is statistically significant at the 0.05 level.

Table 4. Effectiveness of RAN PIJAR program on the Level of Knowledge of Adolescents

Variable	Wilcoxon Result			P-value
	Median	Min	Max	
Pre Test	50	0	100	0,000
Post Test	90	20	100	

These results confirm that the health education intervention had a significant impact on improving adolescents' health knowledge. Furthermore, there was a significant increase in the median test score, from 50 (pre-test) to 90 (post-test). Improvements were also observed across the minimum and maximum score ranges, indicating a broader shift across all participants' initial knowledge levels.

DISCUSSION

Knowledge is a predisposing factor that plays a critical role in influencing behavioral change. In this context, health education serves as a strategic tool to enhance individuals' understanding of health-related issues, ultimately contributing to the promotion of healthier behaviors at the individual, group, and community levels¹⁰. Health education is also recognized as a long-term investment in behavioral change. While its most immediate and observable outcome is typically an increase in knowledge, the ultimate goal is to facilitate enduring changes in attitudes and practices. The short-term impact of health education is primarily reflected in improvements in knowledge, which then serve as the foundation for gradual shifts in behavior over time¹¹.

Recent studies further emphasize that knowledge is a fundamental precursor to behavioral change, particularly in health promotion among adolescents.^{12,13} The knowledge improvement through structured education interventions significantly predicts positive health practices, such as dietary management and stress regulation.^{14,15} Increasing health literacy can strengthen adolescent's self-efficacy, enabling them to make informed decisions regarding their mental and physical well-being.¹³ These findings reaffirm the theoretical model proposed by the Health Belief Model (HBM), which identifies knowledge as a predisposing factor that shapes attitudes and perceived benefits toward healthy behaviors.¹⁶

Based on the results of the study, the median knowledge score of respondents increased significantly from 50 in the pre-test to 90 in the post-test. The bivariate analysis further supports this conclusion, with a p-value of 0.000 obtained from the Wilcoxon signed-rank test. This statistically significant result confirms that the health education activities conducted by the Health Heroes Facilitators of RAN PIJAR Bogor City, utilizing the Meaningful Youth Participation (MYP) approach, were effective in enhancing knowledge about nutrition and mental health among adolescents from 10 SMA/SMK/MA-

equivalent schools and one scouting organization in Bogor City.

Effective health education programs must go beyond cognitive transmission by integrating participatory and reflective learning methods. The participatory education stimulates emotional engagement, critical thinking, and peer reinforcement, three elements that contribute to sustained behavioral change.¹⁷ This aligns with the view of Leonita *et al.* 2025, which stresses that adolescent health promotion should adopt learner-centered, interactive, and context-based approaches to achieve long-term behavioral transformation.¹⁸ The engaging and participatory learning methods used in this study optimized adolescents' cognitive abilities, reasoning, and skill development. Interactive, student-centered approaches build learners' confidence and accelerate changes across cognitive, affective, and psychomotor domains, ultimately leading to comprehensive and sustainable health behavior improvements.

The presence of the Health Heroes RAN PIJAR Bogor City represents a tangible embodiment of the Meaningful Youth Participation (MYP) approach in achieving the objectives outlined in the RAN PIJAR framework. This study demonstrates that the Health Heroes, comprising selected adolescents from various schools in Bogor City can serve effectively as peer partners in delivering targeted health education to fellow adolescents. Their involvement has proven to be not only strategic but also impactful in engaging youth audiences. This effectiveness is evident in the high level of active participation observed during the *Real Action* activities facilitated by the Health Heroes. Adolescents reported feeling a safe, relatable, and non-judgmental environment when engaging with Health Heroes, particularly when discussing mental health and other sensitive issues. The shared age group and lived experiences helped foster trust and openness, which are critical components in adolescent health communication. These findings are consistent with the research of Herbawani (2023), which supports the MYP model as an effective strategy for improving both adolescent knowledge and participation in health programs¹⁹.

Meaningful involvement empowers youth not just as recipients of information but as active agents of change, capable of influencing their peers and contributing to broader public health outcomes. Accordingly, adolescents should be granted meaningful opportunities to voice their needs and exercise their rights through structured youth participation. This aligns with UNESCO's perspective, which emphasizes that empowered youth can contribute significantly to social, economic, and community development.^{20,21} Similarly, a study by Booth *et al.* 2023 also found that youth facilitators in school-based health promotion programs improved communication effectiveness and program retention compared to adult-led initiatives.

The success of the Health Heroes program thus aligns with growing evidence that peer-to-peer approaches strengthen adolescents's critical thinking, empathy, and problem solving skills core competencies of health literacy.

This participatory and empathetic communication style is particularly vital for addressing stigmatized topics such as mental health, as peer facilitators create psychologically safe and non-judgmental spaces that foster openness and message acceptance.^{22,23} This participatory and empathetic communication style is particularly vital in addressing sensitive topics such as mental health, where stigma often limits open discussion.²⁴ The presence of relatable peer facilitators provides a psychologically safe environment that fosters openness and mutual respect, thereby improving both message acceptance and behavioral intent.²⁵

Moreover, the MYP approach resonates with the concept of youth empowerment described by UNESCO, where adolescents are positioned as co-creators of solutions rather than passive beneficiaries. Empowered adolescents develop stronger civic engagement, confidence, and decision-making skills, attributes that extend beyond health and contribute to social development.²⁶ Consequently, integrating MYP into national adolescent health programs such as RAN PIJAR not only supports health literacy but also builds a generation of proactive, resilient, and socially responsible youth.

In addition to the effectiveness of peer-based participation, contextual factors such as urban environments also shape adolescent health behaviors. Adolescent health issues in urban areas like Bogor City require upstream interventions that prioritize meaningful youth participation. Rapid urbanization and lifestyle transitions have increased risks of mental distress, poor nutrition, and sedentary behavior among adolescents.^{27,28} Actively involving young people in designing and implementing health programs enhances relevance, ownership, and sustainability by ensuring that interventions address contextual determinants such as peer influence, digital exposure, and school-related program.^{29,30}

Moreover, integrating gender equality within adolescent health initiatives is essential to ensure equitable access to health information and services for both male and female adolescents, supporting the fulfillment of the right to health for all youth.³¹ The presence of health risks among both female and male adolescents necessitates the development and implementation of health programs that promote gender equality, in order to support the realization of the right to health for all adolescents.³²

Youth participation also enhances the sustainability of health programs by fostering a sense of ownership and accountability among adolescents.³³ When young people are included as co-designers rather than passive beneficiaries, they become more invested in the success of the intervention. This approach has been proven effective, where youth advisory councils in public health programs increased program retention and local advocacy capacity.³⁴

Gender equality is another critical dimension of adolescent health promotion. Persistent gender norms and stereotypes often limit boy's and girl's access to health information, care, and decision-making autonomy.³⁵ Gender-transformative approaches that address these structural inequities are therefore necessary to achieve inclusive

adolescent health outcomes. Such approaches emphasize the transformation of harmful gender norms and the promotion of shared responsibility between male and female adolescents in achieving health equity.^{33,34}

Integrating gender-responsive strategies within youth participation frameworks amplifies the effectiveness of health education interventions. Evidence from ... shows that programs incorporating gender equity discussions not only improved health knowledge but also enhanced mutual respect, empathy, and cooperation among adolescent participants.³⁶ This reinforces the view that gender equality is not merely a human rights issue but also a determinant of collective well-being and social cohesion.³⁷ In the context of RAN PIJAR, combining MYP with gender-transformative health education ensures that both male and female adolescents have equal opportunities to learn, express themselves, and participate in shaping healthier environments.

Finally, advancing youth and gender inclusion in health programs requires multisectoral collaboration involving schools, local governments, NGOs, and families. Sustainable adolescent health promotion cannot rely solely on temporary projects but must be institutionalized through national and local policies. The meaningful youth engagement when supported by gender equality frameworks builds social capital and strengthens public trust in health systems. Therefore, integrating participatory and gender-responsive strategies into Indonesia's adolescent health initiatives is essential to foster not only health literacy but also empowerment, inclusivity, and resilience among the younger generation.³⁸

Limited male participation in health education reflects that a broader pattern documented globally in adolescent health research.³⁹ Young men are less likely than young women to engage in preventive health programs, primarily due to masculine norms that equate help-seeking with weakness.^{40,41} These norms discourage boys from participating in discussions on nutrition, mental health, or reproductive well-being.⁴¹ The male students expressed discomfort and stigma when involved in school-based health education sessions, particularly those addressing emotional topics.⁴²

In the context of the RAN PIJAR program, future interventions should strengthen male involvement by integrating gender-responsive facilitation, representation of male Health Heroes, and activities that challenge traditional masculine norms. Encouraging balanced participation is not only a matter of inclusion but also a determinant of program success. The equitable participation of both genders enhances the collective capacity of adolescents to become agents of change, ensuring that health promotion efforts are comprehensive, just, and sustainable.³⁴

In addition to strengthening youth participation and gender inclusivity, it is equally important to institutionalize adolescent health promotion within the school environment. Institutionalizing adolescent health promotion within schools is crucial to ensure long-term impact. Schools serve as strategic environments for early prevention and behavior development,

making them ideal platforms for sustained health education. Integrating the Meaningful Youth Participation (MYP) approach into existing school health initiatives, such as School Health Units (*Usaha Kesehatan Sekolah*, UKS) and healthy school canteens can create a holistic system that continuously supports students' physical and mental well-being.^{43,44} UKS can monitor health conditions, while healthy canteens reinforce nutritional habits, and peer-led programs like RAN PIJAR enhance engagement and behavior change beyond the classroom.

Strengthening collaboration between schools, communities, and health authorities can broaden the reach and effectiveness of adolescent health programs.⁴⁵ Partnerships involving UKS, parents, and local health offices ensure continuity of care and stronger referral mechanisms for at-risk students. Additionally, using diverse communication platforms such as audiovisual materials, social media, and interactive workshops can increase adolescent's health literacy and participation.⁴⁶ Embedding participatory and gender-responsive approaches into these systems transforms short-term interventions into sustainable institutional practices.⁴⁷

This study confirms that health education interventions based on the MYP approach significantly improve adolescents's knowledge of mental health and balanced nutrition. The peer-led and participatory design of RAN PIJAR fosters confidence, empathy, and critical thinking essential foundations for healthy behaviors. To ensure lasting results, youth engagement and gender equality must be institutionalized through gender-transformative education and multisectoral collaboration. By integrating MYP principles with equitable policies and inclusive practices, Indonesia can cultivate a generation of informed, empowered, and resilient adolescents capable of driving positive health transformations within their communities.

CONCLUSIONS

This study involved a total of 335 adolescent respondents drawn from nine senior high schools and one city-level scouting organization in Bogor City. The distribution of respondents across institutions was relatively balanced, with SMA Rimba Madya contributing the largest proportion (11.6%), followed by MAN 1 Bogor City and SMKN 2 Bogor City, each contributing 11.3%. The majority of participants were female (59.1%), indicating a higher level of engagement among adolescent girls in the health education activities.

The results of the Wilcoxon signed-rank test yielded a p-value of 0.000, indicating a statistically significant difference between pre-test and post-test scores. These outcomes provide strong evidence that the health education intervention delivered using the Meaningful Youth Participation (MYP) approach was effective in enhancing adolescents' knowledge related to mental health and balanced nutrition. The peer-led, participatory nature of the program likely contributed to its success by creating a supportive learning environment that resonated with adolescents.

It is recommended that health education interventions

utilizing the Meaningful Youth Participation (MYP) approach be implemented in a sustainable and continuous manner. These efforts should be grounded in principles of gender equality and supported by a diverse combination of media and educational methods to effectively enhance adolescents' knowledge and promote positive health-related behaviours.

Furthermore, to improve adolescent health outcomes within the school setting, it is essential to strengthen and integrate school-based health programs. This includes optimizing the roles of healthy school canteens and School Health Units (UKS) in supporting the monitoring of growth and development, particularly in areas related to nutrition and mental well-being. By embedding health promotion into the daily environment of schools, these institutions can become key platforms for preventive care and early intervention among school-aged children and adolescents.

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