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Empowering Youth Health Cadres as an Effort to Prevent Diabetes Mellitus among Adolescents in Banyumanik Village, Semarang City

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ABSTRACT

The incidence of Diabetes Mellitus (DM) among adolescents in Semarang City increased from 242 cases in 2021 to 344 in 2022, highlighting a pressing need for effective preventive interventions. Peer education through Youth Health Cadres (KKR) is a promising strategy to address this issue. This community service program aimed to evaluate the impact of an educational intervention on DM-related knowledge among prospective KKR at SMPN 12 Banyumanik. The program involved 20 students and was conducted through a single session comprising a pre-test, an interactive educational module on DM etiology and prevention, practical training, and a post-test. Knowledge was measured using a validated 20-item questionnaire. The results demonstrated the proportion of students achieving a 'good' knowledge level increased from 15% to 85%. In conclusion, the targeted educational intervention successfully enhanced the knowledge of Youth Health Cadres. This empowerment provides a critical foundation for their role as agents of change in disseminating DM prevention information within their school environment, contributing to broader public health efforts against the disease.



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INTRODUCTION

The global incidence of Non-Communicable Diseases (NCDs) represents a major public health challenge in the 21st century, with Diabetes Mellitus (DM) posing one of the most severe threats. According to the International Diabetes Federation (IDF), approximately 537 million adults were living with diabetes in 2021, a number projected to rise to 643 million by 2030 (IDF, 2021). While traditionally considered an adult-onset condition, Type 2 Diabetes Mellitus (T2DM) is now increasingly diagnosed in adolescents and young adults, a shift largely attributed to the rise in childhood obesity and sedentary lifestyles globally (Mayer-Davis et al., 2017). This trend is particularly alarming in low- and middle-income countries like Indonesia, which faces

a double burden of communicable and non-communicable diseases. Data from Indonesian Basic Health Research (Riskesdas) show the prevalence of diabetes has increased significantly from 6.9% in 2013 to 10.9% in 2018 (Kemenkes RI, 2018).

The DM epidemic is acutely felt at the local level. In Central Java, DM is a priority disease with a prevalence of 10.7% (Dinkes Kota Semarang, 2022). Specifically, Semarang City reported 40,623 DM cases, with Banyumanik District contributing 3,391 cases in 2022. Most concerning is the notable increase in cases among adolescents in Semarang, which rose from 242 in 2021 to 344 in 2022. This underscores the urgent need for targeted preventive strategies for this age group (Qifti et al., 2020). Adolescence is a critical period for establishing lifelong health behaviors, characterized by growing autonomy, peer influence, and vulnerability to unhealthy lifestyle choices (Sawyer et al., 2012). Unhealthy dietary patterns, characterized by high consumption of sugary drinks and processed foods, combined with low physical activity, are key risk factors among Indonesian adolescents (Soewondo et al., 2013).

Conventional health education programs delivered by adults often fail to resonate with adolescents due to generational and communication gaps (Patton et al., 2016). A promising strategy is peer education, which leverages the powerful influence adolescents have on one another, as information from peers is often perceived as more credible and relatable (Harden et al., 2001). In Indonesia, the *Posyandu Remaja* (Adolescent Health Post) is a community-based platform that utilizes youth health cadres (*Kader Kesehatan Remaja*) as health promoters within their own communities (Kementerian Kesehatan RI, 2019). However, these cadres often lack specific training to address the growing threat of DM. Therefore, this community service program aimed to leverage this existing structure by empowering youth health cadres in schools with a focused intervention on DM prevention.

The specific objectives of this program were to: (1) establish and train Youth Health Cadres in junior high schools in Banyumanik Village as peer health promoters for DM prevention; (2) increase the cadres' knowledge regarding DM risks and prevention strategies among adolescents; and (3) develop and disseminate educational media for DM prevention within the school environment.

METHOD

This community service initiative was conducted on August 22, 2023, at SMPN 12 Banyumanik, a public junior high school in Semarang City, Indonesia. To ensure institutional support and sustainability, initial coordination was undertaken with the school principal and the coordinator of the School Health Unit (*Usaha Kesehatan Sekolah* or UKS). Through this collaboration, a cohort of 20 students was purposively selected to serve as prospective Youth Health Cadres (*Kader Kesehatan Remaja*). The participants were active members of the school's Red Cross Youth (*Palang Merah Remaja* or PMR), a criterion chosen based on their demonstrated interest in health issues and prior experience in student-led activities.

The program was structured into three sequential phases: planning, implementation, and monitoring & evaluation, as outlined below.

1. Planning Phase

The planning phase involved a situational analysis and needs assessment through discussions with school stakeholders. This process identified the specific need for peer-based interventions targeting non-communicable diseases, particularly Diabetes Mellitus (DM), among adolescents. Based on this assessment, a

comprehensive one-day training module was designed to equip cadres with essential knowledge and practical skills.

2. Implementation Phase: The Empowerment Workshop

The implementation was executed through an intensive, interactive workshop for the 20 selected cadres. The workshop was designed to be participatory, moving beyond didactic lectures to foster active engagement and skill development. The agenda was structured as follows:

- **Pre-test and Baseline Assessment:** The session commenced with the administration of a 15-item multiple-choice pre-test to evaluate the participants' baseline knowledge of DM.
- **Educational Session 1: "Understanding Diabetes Mellitus":** This session, facilitated by a medical expert (Dr. dr. Jessica Juan, M.Si.Med), covered core concepts including the definition, types, risk factors (with emphasis on modifiable factors like diet and physical inactivity), symptoms, and complications of DM.
- **Educational Session 2: "The Role and Skills of a Youth Health Cadre":** This session, led by a public health specialist (Zefan Adiputra Golo, S.KM, M.Kes), focused on translating knowledge into action. Topics included the roles and responsibilities of a health cadre, effective peer communication techniques, and strategies for disseminating health information.
- **Hands-on Media Creation Activity:** To apply their learning, the cadres worked in small groups to develop their own health promotion media, such as educational posters and social media content briefs, focused on DM prevention messages.
- **Post-test Administration:** The workshop concluded with the administration of a post-test, using the same instrument as the pre-test, to measure immediate knowledge improvement.

3. Monitoring and Evaluation Phase

A multi-faceted approach was employed for monitoring and evaluation:

- **Knowledge Assessment:** The pre- and post-test scores were compared using a paired t-test to determine the statistical significance of knowledge gains.
- **Process Evaluation:** Facilitators observed and documented the cadres' participation and engagement during interactive sessions and the media creation activity.
- **Framework for Long-term Monitoring:** To support sustainability, a dedicated WhatsApp group was established. This platform serves as a channel for continuous communication, resource sharing, and future monitoring of the cadres' activities as peer educators.

RESULTS AND DISCUSSION

The program began with participant registration from 07:30 to 08:30 WIB, followed by a pre-test to assess baseline knowledge of DM and the role of Youth Health Cadres. The first session, delivered by Dr. dr. Jessica Juan, M.Si.Med, covered DM definition, risk factors, symptoms, and prevention. This was followed by an interactive

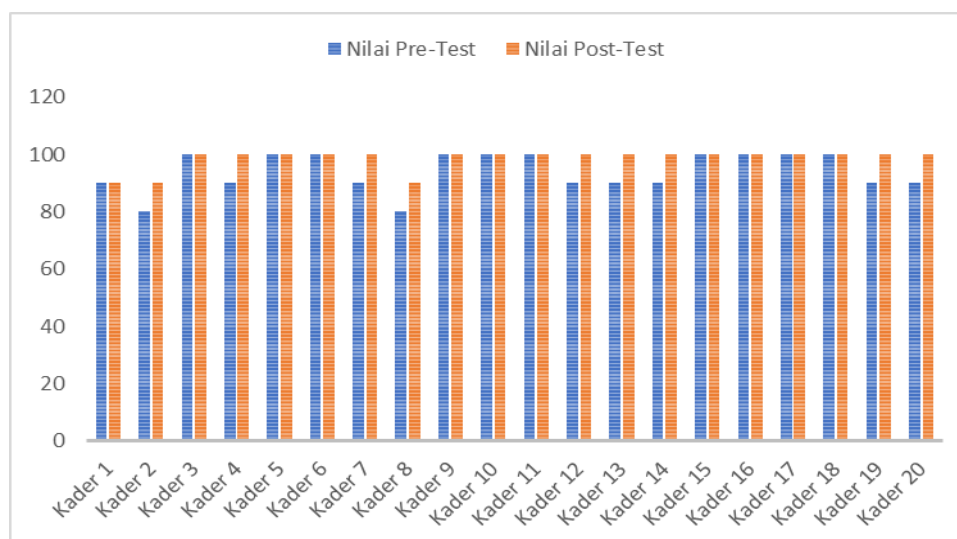
Q&A session.



Figures 1. Implementation of KKR educational activities.

The second session, delivered by Zefan Adiputra Golo, S.KM, M.Kes, focused on the roles and responsibilities of Youth Health Cadres and effective peer education techniques. The speakers emphasised the significance of KKR's contribution to the dissemination of health-related information and the promotion of healthy lifestyles among their peers. The second session also provided practical guidance on the effective conduct of outreach initiatives, with a view to ensuring the efficacious dissemination of health messages to peers.

Pre- and post-test results showed that 55% of cadres experienced an increase in scores, indicating improved knowledge, while 45% maintained consistently high scores (90–100). This suggests the program was effective both in enhancing knowledge among those with lower initial understanding and in sustaining knowledge among already well-informed participants.



Graph 1. The findings of the pre- and post-test of the Health and Wellbeing of Adolescents

The findings of this study suggest that the majority of participants demonstrated an enhancement in their comprehension following participation in the educational programme. The KKR played a pivotal role in the dissemination of health information among peers, which in turn contributed to diabetes prevention efforts among adolescents. It is evident from extant research that the strategy of empowering students through the KKR has been demonstrated to be efficacious in the domain of

health promotion. A study by [Yuliani et al. \(2022\)](#) provides empirical evidence to support the claim that the strategic empowerment of students as health promotion agents within primary schools can yield substantial improvements in students' levels of knowledge and adoption of healthy behaviours. The present study demonstrates that active student involvement in health promotion activities has a dual impact: it enhances their knowledge and fosters a proactive attitude towards maintaining their own health and that of their surroundings ([Sitohang et al., 2018](#)).

Furthermore, the implementation of structured health education programmes, which engage students as active participants, has been demonstrated to have a favourable impact on the enhancement of awareness and comprehension regarding the significance of maintaining a healthy lifestyle and the prevention of diseases among students in educational institutions ([Nugroho & Utama, 2020](#)). This approach, which was also applied in community service at SMPN 12 Banyumanik, proved to be effective in strengthening students' understanding of health risks and the preventive measures that need to be taken. In the context of KKR empowerment, the importance of ongoing support from schools and community health centres is a determining factor ([Dewi et al., 2022](#)). It was emphasised that, in order to ensure long-term effectiveness, empowerment programmes must be accompanied by continuous monitoring and evaluation. This is of paramount importance in ensuring that the cadres who have undergone training remain active and effective in the dissemination of health information ([Rohmah & Safika, 2023](#)). The approach adopted at SMPN 12 Banyumanik involves the establishment of communication groups, which serve as a forum to support the sustainability of KKR's role in promoting health in schools.

CONCLUSION AND RECOMMENDATIONS

It can be concluded that educational activities are effective in improving cadres' understanding of diabetes mellitus. This is evidenced by the fact that more than half of the participants showed an increase in their scores. Conversely, for cadres exhibiting consistent scores, this finding serves as a confirmation that the educational programme continues to maintain a high level of knowledge. Monitoring activities were also conducted by creating a WhatsApp group as a platform for communication between the service team and students as Youth Health Cadres, as well as assessing to what extent the Youth Health Cadres have become agents of change among their peers in school and home environments.

The recommendations made include the necessity for ongoing evaluation of the long-term impact of these activities, including the assessment of the extent to which Youth Health Cadres actively promote health in their communities following the conclusion of the service activities.

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