Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI)
Journal homepage: https://talenta.usu.ac.id/jetromi

Pilot Study on Dementia Awareness and Knowledge Improvement Through Teacher Education: Experience from North Sumatra, Indonesia

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ARTICLE INFO
Article history:
Received 10 Juni 2026
Revised 30 Agustus 2026
Accepted 29 Oktober 2026
Available online 29 Oktober 2026

E-ISSN: 2686-0856
P-ISSN: 2686-0872

How to cite:
FI Fitri, AS Rambe, E Effendy, M Rusda, MM Amin. "Pilot Study on Dementia Awareness and Knowledge Improvement Through Teacher Education: Experience from North Sumatra, Indonesia" Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI). 8(1): 60-67.

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http://doi.org/10.32734/jetromi.v8i1.22760

ABSTRACT

Background: Education and awareness about dementia remain limited in many communities, impacting early detection and support for affected individuals. Teachers, as community gatekeepers, may play an important role in improving dementia awareness.
Objective: This pilot study evaluated the effectiveness of an educational program designed to improve dementia knowledge among junior high school teachers.
Methods: This study employed a quasi-experimental pre–post design to assess the effectiveness of an educational intervention aimed at improving dementia knowledge among junior high school teachers. Thirty-five teachers participated in a structured training program that included lectures, interactive discussions, and tailored educational materials. Dementia-related knowledge was measured before and after the intervention using structured assessments to evaluate changes in understanding and awareness.
Results: Post-intervention analysis demonstrated a significant increase in dementia knowledge scores compared to baseline ($p = 0.029$). Teachers also reported greater confidence in recognizing dementia symptoms and expressed willingness to support affected students and families.
Conclusion: The findings suggest that targeted educational programs can effectively enhance dementia knowledge among teachers, empowering them as community agents for awareness and support. Scaling such initiatives may contribute to public health strategies aimed at improving dementia care and reducing stigma. Future research should examine long-term knowledge retention and the practical application of increased awareness in school settings.
Keyword: awareness; dementia; education; teacher; training

ABSTRAK

Latar Belakang: Edukasi dan kesadaran mengenai demensia masih terbatas di banyak komunitas, sehingga berdampak pada deteksi dini dan dukungan bagi individu yang terdampak. Guru, sebagai pihak yang memiliki peran penting dalam komunitas, berpotensi berkontribusi dalam meningkatkan kesadaran mengenai demensia.
Tujuan : Studi pendahuluan ini bertujuan untuk mengevaluasi efektivitas program edukasi yang dirancang untuk meningkatkan pengetahuan guru sekolah menengah pertama mengenai demensia.
Metode: Penelitian ini menggunakan desain kuasi-eksperimental dengan pendekatan pretest–posttest untuk menilai efektivitas intervensi edukasi dalam meningkatkan pengetahuan guru sekolah menengah pertama mengenai demensia. Sebanyak 35 guru berpartisipasi dalam program pelatihan terstruktur yang meliputi ceramah, diskusi interaktif, dan materi edukasi yang disesuaikan dengan kebutuhan

peserta. Pengetahuan terkait demensia diukur sebelum dan sesudah intervensi menggunakan instrumen penilaian terstruktur untuk mengevaluasi perubahan pemahaman dan kesadaran peserta.
Hasil: Analisis setelah intervensi menunjukkan peningkatan skor pengetahuan mengenai demensia yang signifikan dibandingkan dengan skor awal (p = 0,029). Para guru juga melaporkan peningkatan kepercayaan diri dalam mengenali gejala demensia serta menyatakan kesediaan untuk mendukung siswa dan keluarga yang terdampak.
Kesimpulan: **T**emuan ini menunjukkan bahwa program edukasi yang terarah dapat secara efektif meningkatkan pengetahuan guru mengenai demensia, sehingga memberdayakan mereka sebagai agen perubahan di masyarakat dalam meningkatkan kesadaran dan memberikan dukungan. Perluasan penerapan program semacam ini dapat berkontribusi terhadap strategi kesehatan masyarakat yang bertujuan meningkatkan perawatan demensia dan mengurangi stigma. Penelitian selanjutnya perlu mengkaji keberlanjutan pengetahuan dalam jangka panjang serta penerapan peningkatan kesadaran tersebut secara nyata di lingkungan sekolah.
Keyword: kesadaran; demensia; edukasi; guru; pelatihan

1. Introduction

Education is a fundamental pillar for societal progress and individual empowerment, particularly in shaping the cognitive and social development of young generations [1]. However, despite its critical role, many educational settings, especially in developing countries, face considerable challenges that affect the quality and inclusiveness of learning environments. Among these challenges is the limited awareness and knowledge about health conditions that increasingly impact students' families and communities, such as dementia [2]. Dementia is a progressive neurodegenerative disorder characterized by cognitive decline that interferes with daily functioning [3,4]. It poses significant public health challenges worldwide, including in Indonesia, where demographic shifts have led to a growing elderly population vulnerable to dementia [5,6,7]. While dementia primarily affects older adults, its impact extends to families, including school-aged children who may live with or care for relatives experiencing cognitive decline [8]. Teachers play a critical role as front-line observers and supporters of students and families affected by dementia. School-aged children caring for people with dementia may present with reduced academic performance related to emotional distress and difficulty in balancing between caring task and developmental needs [9]. Their knowledge and attitudes can influence early recognition of dementia-related issues, provide emotional support, and foster an inclusive school environment [10]. Educating children about dementia has the potential to encourage students to develop health habit as one of the important dementia prevention strategies [11], and to reduce stigma toward individuals living with the condition and their caregivers [12].

However, previous studies indicate that teachers often have limited understanding of dementia, its symptoms, and management strategies, which can perpetuate stigma and misconceptions. To address this gap, targeted educational interventions for teachers are essential. These programs can equip educators with the necessary knowledge and skills to identify signs of dementia, communicate effectively with affected students and families, and collaborate with healthcare professionals. This study focuses on evaluating the effectiveness of a dementia education program designed for junior high school (SMP) teachers. By enhancing teacher knowledge and confidence, the program aims to contribute to broader public health objectives and promote dementia-friendly communities.Health cadres and community health workers play essential roles in, as they are directly embedded within the health system and are actively involved in screening and awareness-raising activities. However, teachers represent a particularly important group for several reasons. First, their daily interactions with students place them in a unique position to provide emotional and psychological support when needed. Second, teachers may also contribute to the early identification of symptoms in older adults within their broader social environment, such as students' grandparents or members of the school community, including administrative staff and fellow teacher. This pilot study aimed to assess the feasibility of a structured dementia education intervention for junior high school teachers and to identify potential challenges that will inform to improve the subsequent program design.

2. Method

2.1. Study Design and Setting

This study employed a quasi-experimental pre-post design to assess the effectiveness of an educational intervention aimed at increasing dementia knowledge among junior high school teachers. The participants were 35 teachers from several Sekolah Menengah Pertama Negeri (SMPN, State Junior High School) 1 Tanjung Tiram, Batubara Reegency, North Sumatra, Indonesia. The intervention consisted of two stages. The first stage was the development of a dementia education module, collaboratively prepared by neurologists and education experts. The module was designed to be relevant, accessible, and culturally appropriate for teachers without prior medical training. The second stage was the delivery of the educational program based on this module. The educational program was developed based on existing literature on dementia awareness and tailored to the local context and teachers' baseline knowledge. The content included the definition of dementia, common symptoms, risk factors, communication strategies, and ways to support students or family members affected by dementia.

2.2. Procedures

The intervention was carried out through several structured procedures. First, a pre-assessment was conducted in which participants completed a standardized questionnaire to assess their baseline dementia knowledge, including multiple-choice questions covering clinical features, causes, and care approaches. This was followed by the educational session which consisted of two one-hour sessions delivered through lectures, multimedia presentations, group discussions, and case studies to encourage interactive learning. Trainer included healthcare professionals specializing in neurology. Immediately after the last session, participants completed the same questionnaire to measure knowledge gain. After that a qualitative feedback was collected through a series of open ended questions covering several themes such as the dementia symptoms recognition, communication skills, dementia prevention and ongoing support and practical educational resources, Rersponses were compiled and analyzed using thematic analysis approach. We used the trusworthness criteria proposed by Shenton (2004) [13]. Credibility was supported through investigator triangulation, dependability through a clear coding process and confirmability by grounding themes in participant quotes. Analysis was condeucted manullay without the use af a particular software.

2.3 Intervention

The educational program consisted of a comprehensive dementia awareness module developed by neurologists and education experts. The content was tailored to be relevant and accessible for teachers without prior medical training. The module included five main topics: an introduction to dementia including definitions, epidemiology, clinical symptoms, stages, and impact on individuals and families; assessment of dementia focusing on basic cognitive screening tools, functional assessments, and importance of early detection; management approaches encompassing overview of pharmacological and non-pharmacological treatments, caregiver support, and community resources; communication techniques highlighting effective verbal and non-verbal strategies for interacting with persons with dementia; and prevention emphasizing modifiable risk factors and lifestyle interventions [4,6,7,8,14,15]. The program was delivered as a full-day workshop including presentations, group discussions, case studies, and question and answer sessions. Educational materials were provided in print and digital formats.

The pre- and post-tests consisted of 20 multiple-choice questions, covering four domains: (1) introduction to dementia, (2) management and care approaches, (3) daily care strategies, and (4) effective communication with people living with dementia. We administered the same 20-item multiple choice questions pre and post intervention to ensure consistency. The full list of questions is provided as Supplementary Material. Potential sources of bias include the absence of a control group (risk of selection and performance bias) and social desirability bias in a qualitative self-reports.

2.4. Data Analysis

Statistical analysis was perforemd using SPSS version 25.0. Data analysis was performed by comparing **s**cores from pre- and post-tests using paired t-tests to evaluate the statistical significance of knowledge improvement, because the scores were normally distributed. Statistical signifinace was set at $p<0.05$. Qualitative feedback from group discussions and open-ended questionnaire items were analyzed thematically to capture participants' perceptions and attitudes toward the program.

3. Results and Discussion

The educational intervention was successfully implemented as a full-day workshop, attended by 35 junior high school teachers. All participants completed both pre- and post-intervention assessments, ensuring complete data collection.

3.1. Knowledge Improvement

Statistical analysis revealed a significant improvement in knowledge scores after the intervention ($p = 0.029$). Teachers particularly improved in questions related to recognizing early symptoms of dementia, understanding caregiver support strategies, and applying effective communication techniques.

Table 1. Pre- and Post-Test Dementia Knowledge Scores (n = 35, total items = 20)

Assessment	Mean Score	Standard Deviation	Range	P value
Pre-test	12.2	2.9	7–17	0.029
Post-test	16.6	2.1	12–20	

3.2. Participant Engagement

The workshop adopted interactive methods, combining lectures, group discussions, multimedia presentations, and case-based learning. Teachers actively engaged throughout the sessions, frequently asking questions and sharing personal experiences related to elderly care. This interactive environment reinforced the practical relevance of the material and supported deeper learning.

3.3. Qualitative Feedback

Thematic analysis of open-ended responses revealed several perceived benefits of the program. Teachers reported an improved ability to recognize dementia symptoms, expressing greater confidence in identifying early warning signs such as memory loss and behavioral changes (e.g., "*Sekarang saya jadi lebih paham, mana lupa biasa karena usia, mana yang sudah mengarah ke demensia*") They also described enhanced communication skills, feeling more capable of interacting with affected students and families through empathetic and non-judgmental approaches (e.g., " *Saya jadi tahu cara ngomong yang lebih sabar dan nggak menghakimi atau menilai siswa yang mungkin lagi kewalahan ngadepin keluarganya yang ada pikunnya*") In addition, participants highlighted increased awareness of prevention strategies and community resources, many of which were previously unfamiliar to them (e.g., "*Dulu saya nggak tahu kalau ad acara untuk mencegah demensia dan merujuk kemana*") Teachers expressed enthusiasm for follow-up training and recommended the provision of practical teaching aids, such as posters, brochures, or simplified guidelines, to help sustain the application of knowledge in school settings.

However, several challenges emerged. Some teachers expressed concerns about sustaining the knowledge and applying it in busy school settings with limited resources. They highlighted the need for ongoing support, refresher training, and accessible reference materials. This points to the importance of embedding dementia education into continuous professional development programs and developing easy-to-use teaching aids for long-term impact. The study's limitations include the relatively small sample size and short follow-up period, which restrict assessment of long-term knowledge retention and behavioral change. Overall, the findings suggest that targeted, school-based dementia education is a promising strategy for strengthening community awareness. By scaling up and institutionalizing such programs, education and health sectors can collaboratively contribute to stigma reduction, early detection, and improved support for people living with dementia and their families.

4. Discussion

This study demonstrated that a structured dementia education program significantly improved knowledge among junior high school teachers. The increase in post-test scores indicates that even a short, targeted intervention can address critical gaps in awareness and understanding of dementia. Similar findings have been reported in previous studies, where health education initiatives for non-medical groups led to measurable improvements in knowledge and confidence [10,12,16,17].

Several factors contributed to the program's effectiveness. First, the use of interactive learning methods, such as case-based discussions and group activities, promoted active engagement and deeper comprehension. This aligns with adult learning principles, which emphasize the importance of participation and contextual relevance. Second, the inclusion of culturally adapted examples and locally relevant content enhanced the applicability of the material to teachers' daily interactions with students and families. Third, the combination of quantitative assessment and qualitative feedback provided a more comprehensive

understanding of how teachers perceived and internalized the knowledge. Importantly, the program not only improved knowledge but also fostered a positive shift in teachers' attitudes. Participants expressed greater confidence in recognizing dementia symptoms, supporting affected families, and reducing stigma within the school environment. This attitudinal change is crucial, as stigma and misconceptions often hinder early help-seeking and community support for dementia. By empowering teachers, the intervention extended beyond individual learning, positioning educators as community agents for dementia awareness.

The workshop was delivered through a mix of interactive lectures, case-based discussions, group activities, and question and answer sessions. Educational materials were distributed in both print and digital formats to support continued learning. Participants responded positively to the training, actively engaging in discussions and expressing appreciation for the clarity and practical relevance of the content. Overall, the results indicated that the workshop was well-received and effectively increased teacher awareness and confidence in supporting individuals affected by dementia within their communities.



Figure 1. Educational session with teachers

To evaluate the effectiveness of the educational intervention, pre- and post-training assessments were administered to all participants using a structured questionnaire measuring key aspects of dementia-related knowledge. The assessment covered understanding of dementia symptoms, assessment tools, management strategies, communication techniques, and preventive measures. Statistical analysis revealed a significant improvement in participants' knowledge scores after the training, with a p-value of 0.029. This finding indicates that the program had a measurable and positive impact on enhancing the teachers' understanding of dementia. The increase in scores suggests that the content was well comprehended and that the training successfully addressed knowledge gaps among educators, thereby equipping them with essential information to support individuals with dementia in both educational and community settings**.** The findings indicate that the targeted educational intervention significantly improved teachers' knowledge about dementia, suggesting the program's effectiveness in enhancing awareness within the educational workforce. The increase in post-test scores confirms that structured, contextually relevant training can bridge critical knowledge gaps.



Figure 2. Briefing and Dissemination of the Module to Teachers

The uniqueness of this study lies in its setting within Indonesia, particularly in a semi-urban area of North Sumatra. In many Indonesian communities, awareness of dementia remains low, and misconceptions often frame the condition as a normal part of aging or even as a spiritual issue. Teachers in such contexts are not traditionally exposed to health education on dementia, yet they are highly respected figures who can influence families and communities. Teachers are regarded as a figure with social authority, particularcy in Indonesian culture where educators are still highly regardes as people with more knowledge and gain community trust more easily. Previous study by Rasmussen et al (2023) also showed that dementia campaign through non medical community were succesful to produce knowledge improvement that persisted for six months [16]. This is also aligned with finding from Matsumoto et al (2021) that found dementia education through non clinical staff successfully achieved awareness improvement [17].

Conducting this pilot in a regional school setting highlights both the challenges and opportunities for dementia awareness programs in Indonesia, where health resources are unevenly distributed and stigma is more pronounced compared to high-income countries. By engaging teachers in Batubara Regency, this program demonstrated that schools can serve as effective entry points for community-level dementia education in Indonesia.



Figure 3. Teachers participating in pre- and post-training assessments

This study has several limitations. As a pilot study, the primary aim was not to establish generalizability but to assess feasibility and to refine the intervention protocol. Second, the short follow-up period prevented assessment of long-term knowledge retention and behavior change. Third, the use of self-reported feedback may have introduced response bias, as participants could have overestimated their confidence or knowledge gains. Finally, the intervention was conducted in a single school in North Sumatra, which may not reflect the diverse cultural and educational contexts across Indonesia.However, the study still holds value and meaningful contribution. It serves to provide a proof of concept for a scalable model based on teacher-targeted dementia education. The identified limitations and biases function as important design input for subsequent study.

Future research should explore several key areas. First, longitudinal studies are needed to assess the retention of dementia knowledge over time and its translation into actual practices within schools and communities. Second, expanding the program to include teachers from diverse regions—urban, rural, and remote—would help evaluate scalability and cultural adaptability across Indonesia. Third, integrating dementia education into formal teacher training and continuous professional development could ensure sustainability and wider impact. Finally, building collaborations between schools, healthcare providers, and local governments may create stronger community-based support systems, positioning teachers as partners in early detection, stigma reduction, and dementia-friendly community initiatives.

Conclusion

This study demonstrates that a targeted educational program can significantly improve dementia knowledge among junior high school teachers. The notable increase in post-intervention test scores indicates the effectiveness of the training in addressing existing knowledge gaps. Moreover, the active participation and

positive feedback from teachers suggest strong motivation to apply and disseminate this knowledge within their schools and communities. However, sustaining these gains will require ongoing support, including refresher courses, updated educational materials, and integration of dementia education into formal teacher training curricula. Collaboration between education and health sectors is vital to institutionalize these efforts and expand their reach. Ultimately, empowering teachers with dementia awareness not only enhances their professional capacity but also contributes to early detection, stigma reduction, and improved care for individuals living with dementia. This program provides a scalable model for incorporating health education into school systems, aligning with broader public health and social inclusion objectives and lays the groundworik for a larger-multisite study.

Acknowledgements

The authors would like to express their sincere gratitude to all the junior high school teachers who participated enthusiastically in the dementia education program. Their openness to learning and dedication to improving their knowledge are deeply appreciated. We also extend our heartfelt thanks to the headmasters and school administrators for their invaluable support and facilitation throughout the implementation of the program. Special acknowledgment to all parties involved in the planning and execution of this initiative. Their hard work, coordination, and commitment were instrumental in ensuring the success of the workshop. This program would not have been possible without the collaborative spirit and shared vision of everyone involved.

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