

COLLABORATION OF HOSPITAL MANAGEMENT AND COMMUNITY IN PREVENTION OF DIABETIC RETINOPATHY: STUDY OF COMMUNITY SERVICE PROGRAM AT UNDAAN EYE HOSPITAL SURABAYA

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Abstract

This study aims to increase public awareness of DR prevention through education, screening, and training of health cadres. The methods used in this program include health education, interactive discussion sessions, and eye screening for participants at risk. The education was conducted in three sessions with a total of 150 participants consisting of diabetes sufferers, families, and the general public. Health screening involved 70 participants to detect the possibility of DR at an early stage. In addition, 10 health cadres were trained to assist in providing education to the surrounding community. The results of the program showed an 85% increase in participants' understanding of DR prevention based on a post-education survey. Although no DR cases were found in the screening, this activity still provided benefits in increasing public awareness of the importance of routine eye examinations. Health cadre training also had a positive impact by strengthening the role of the community in ongoing education. With a community-based approach and collaboration between hospitals and the community, this program is expected to contribute to reducing the incidence of DR and improving the quality of life of diabetes sufferers.

Keywords: *Diabetic, Retinopathy, Counseling, Health, Prevention*

INTRODUCTION

Diabetic retinopathy (DR) is one of the serious complications of diabetes mellitus that can lead to blindness if not properly managed. The prevalence of this disease continues to increase along with the growing number of diabetes patients in Indonesia. According to data from the Ministry of Health, approximately 30% of diabetes patients in Indonesia experience DR at various levels of severity. Unfortunately, public awareness of the importance of early detection and prevention remains low. Delayed diagnosis often occurs due to a lack of understanding of the long-term impact of this disease and limited access to eye healthcare services in several regions (Astari et al., 2022).

Diabetic retinopathy (DR) can be defined as damage to the microvascular system in the retina due to prolonged hyperglycemia. (Shaw & Lee, 2017). The leading cause of blindness DR affects 34 million people worldwide; it is estimated to account for 4% of blindness cases. While in Indonesia 42% of people with diabetes mellitus in Indonesia experience diabetic retinopathy complications and 6.4% are in the Proliferative stage of Diabetic Retinopathy stage. Patient data from January to October 2020 there were 3656 patients who sought treatment at the Cicendo Eye Hospital National Eye Center with a diagnosis of diabetic retinopathy (Purnama, 2023).

There are several factors that increase the risk of DR including disease duration, glycemic control, hypertension, hyperlipidemia, renal failure, anemia, age, puberty and pregnancy. Some patients do not have regular eye examinations, thus the need for health education related to diabetes mellitus and diabetic retinopathy must be optimized so that patients are more aware of the condition and related complications. Based on the literacy search, there is no study results related to the knowledge and awareness of diabetic retinopathy patients in Indonesia. Compared to the large number of people with diabetes, diabetic retinopathy will likely become a public health burden in Indonesia. Eye studies show that the for the onset and progression of diabetic retinopathy are duration of diabetes, degree of glycemic control, and hyperlipidemia. Hypertension does not play a major role in association with diabetic retinopathy. The roles of oxidative stress, atherosclerotic endpoints and genetic factors in susceptibility to diabetic retinopathy have been studied. It was found that diabetic retinopathy was associated with

increased intima-media thickness and arterial stiffness in type 2 diabetic subjects in Indonesia which suggests that common pathogenic mechanisms might influence diabetic microangiopathy. Curcumin, the active ingredient of turmeric, has been shown to inhibit retinal endothelial cell proliferation *in vivo* (Erlyana Suryawijaya, 2019). As a specialized eye healthcare center focusing on comprehensive services, Rumah Sakit Mata Undaan Surabaya plays a strategic role in the prevention and management of DR. However, these efforts cannot be optimally implemented without collaboration with the community. One of the main challenges in DR prevention is the low involvement of the community in early detection programs and health education. Many patients seek medical attention only when symptoms have worsened, limiting available treatment options (Shaniaputri *et al.*, 2022). Therefore, a collaborative model that integrates the roles of hospitals and communities in prevention efforts is necessary.

The community service program conducted at Rumah Sakit Mata Undaan Surabaya aims to increase public awareness regarding DR prevention through education, early screening, and community empowerment. This program adopts a collaboration-based approach between healthcare professionals, patients, and local communities to create a sustainable prevention ecosystem. Health education is carried out through seminars, counseling sessions, and the distribution of informational materials, while early screenings are conducted periodically to detect DR at an initial stage. Additionally, this program involves community health cadres trained to recognize early symptoms of DR and provide information to diabetes patients in their surroundings.

The primary issue in DR prevention is the limited access to eye healthcare services, particularly among low-income communities. Many patients are unaware that they have DR until the symptoms become severe. This highlights the importance of community-based interventions that can reach vulnerable groups and raise awareness about the significance of routine eye examinations (Puteri *et al.*, 2022).

Furthermore, social and economic factors also play a crucial role in the success of DR prevention. The lack of information about DR, the scarcity of eye healthcare professionals in remote areas, and the high cost of examinations are the main barriers preventing people from accessing necessary healthcare services. Therefore, an innovative approach is required, not only involving medical professionals but also strengthening the role of the community in early detection and prevention of DR (S. Day *et al.*, 2024).

With a collaborative approach involving various stakeholders, including hospitals, healthcare professionals, and local communities, it is expected that the blindness rate due to DR can be reduced. Rumah Sakit Mata Undaan Surabaya serves as a referral center and an educational hub in implementing this strategy. Through a well-structured community service program, the public is expected to become more proactive in maintaining their eye health, thereby significantly improving the quality of life for diabetes patients.

LITERATURE REVIEW

Diabetic Retinopathy

Diabetic retinopathy (DR) is a retinal disorder that occurs in patients with diabetes mellitus. DR can be classified based on clinical conditions: non-proliferative DR is characterized by intraretinal vascular changes, while proliferative DR involves neovascularization due to ischemia. The incidence of DR increases with the duration of diabetes and patient age. It is rare in children under the age of 10 but becomes more prevalent after puberty. According to the Wisconsin Epidemiology Study of Diabetic Retinopathy (WESDR), 99% of type 1 diabetes patients and 60% of type 2 diabetes patients will develop diabetic retinopathy within 20 years. Furthermore, proliferative DR occurs in 50% of type 1 diabetes patients after 15 years. The primary cause of DR is chronic hyperglycemia, which triggers a series of microvascular changes in the retinal blood vessels. DR is categorized into non-proliferative diabetic retinopathy (NPDR), proliferative diabetic retinopathy (PDR), which represents an advanced stage, and diabetic macular edema (DME). This guideline discusses diabetic retinopathy, including diabetic macular edema.

The diagnosis of DR can be established through patient history and supported by diagnostic tests such as fundus photography and optical coherence tomography (OCT). The main treatments for DR include laser photocoagulation, intravitreal anti-VEGF injections, intravitreal corticosteroid injections, and vitrectomy. The most effective way to prevent the progression of DR is by maintaining optimal blood sugar levels. Currently, more than 170 million people worldwide are estimated to have diabetes, and this number is projected to reach 366 million by 2030. In Indonesia, approximately 8 million people had diabetes in the year 2000, and this number is expected to rise to over 21 million by 2030. The longer a person has diabetes, the higher the risk of complications. DR is the most common complication, affecting approximately 75% of patients who have had diabetes for 20 years. In its early stages, DR often has no alarming symptoms, but as it progresses, it can lead to blindness. Early detection and regular monitoring can prevent up to 90% of blindness cases caused by DR. The global prevalence of DR is

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approximately 34.6%, while in Indonesia, it is around 43.1%, with sight-threatening DR occurring in 26.1% of cases. Most diabetes patients live in low-income settings within developing countries. In these regions, including Indonesia, diabetes management does not always align with established guidelines, such as the Consensus of the Indonesian Society of Endocrinology for type 2 diabetes management. This includes gaps in early detection and treatment of diabetic retinopathy. This guideline is intended to serve as a reference for ophthalmologists and internal medicine specialists in Indonesia. Vision loss and blindness in diabetic retinopathy patients are primarily caused by macular edema, macular capillary non-perfusion, vitreous hemorrhage, retinal distortion or tractional retinal detachment, and complications such as neovascular glaucoma.

METHOD

The implementation method in this community service program consists of three main approaches: educational lectures, interactive discussions, and hands-on screening sessions. The lecture method is used to deliver comprehensive information on diabetic retinopathy (DR), its risk factors, prevention strategies, and the importance of early detection. Healthcare professionals will present structured materials using visual aids such as slides, infographics, and videos to enhance participant understanding. This method ensures that participants, including diabetes patients and community members, receive accurate and standardized knowledge about DR and eye health maintenance.

In addition to lectures, an interactive discussion session is conducted to encourage two-way communication between healthcare professionals and the community. This method allows participants to ask questions, clarify doubts, and share personal experiences related to diabetes and DR. The discussion session fosters engagement, helping to address misconceptions and promote behavioral change. To maximize effectiveness, this session will be guided by facilitators who can provide clear and evidence-based explanations tailored to the participants' level of understanding.

The final component of the implementation method is the hands-on screening session, which involves practical eye health checks conducted by trained medical personnel. Participants at risk of DR will undergo preliminary eye examinations, including visual acuity tests and retinal imaging, to identify potential cases requiring further medical attention. Additionally, trained community health cadres will assist in the screening process and follow-up efforts, ensuring that at-risk individuals receive appropriate referrals and long-term monitoring. This comprehensive approach is designed to integrate hospital expertise with community involvement, fostering sustainable DR prevention efforts.

RESULTS AND DISCUSSION

Knowledge is awareness of something, such as facts (descriptive knowledge), skills (procedural knowledge), or objects that contribute to one's understanding. The community service program carried out at Undaan Eye Hospital Surabaya was successfully implemented with several main achievements:

Activity Results

1. Community Education and Counseling

The implementation of counseling and community education in this community service program has taken place in three sessions with a total of 70 participants. Participants consisted of diabetes sufferers, families, and the general public who are concerned about preventing diabetic retinopathy (DR). The material presented in the counseling includes the definition and risks of DR, the importance of routine eye examinations, and a healthy lifestyle to reduce the risk of diabetes complications. The delivery of the material was carried out interactively with the support of presentation and audiovisual media to improve participant understanding.

In the first session, the main focus was to provide a basic understanding of DR and the risk factors that can accelerate its development. Participants were introduced to the concept that DR is a serious complication of diabetes that can lead to blindness if not detected early. In addition, participants were given information about the early signs of DR and the importance of recognizing symptoms before the condition worsens. This session went quite well, as seen from the active responses of participants in asking questions related to their eye conditions.

The second session focused on the importance of regular eye examinations as a primary step in early detection of DR. In this counseling, it was explained that eye examinations are not only important for diabetics who already have visual impairment, but also for those who have not experienced any symptoms. Participants were given information about eye examination procedures that can be performed at health facilities and the

recommended examination intervals for diabetics. Participants' understanding of this topic increased significantly, as seen from the interactive discussion and their interest in finding out more about access to eye health services.

The third session discussed a healthy lifestyle that can help reduce the risk of diabetes complications, including DR. The material presented included a healthy diet, the importance of physical activity, and optimal blood sugar management. Participants were also given concrete examples of the types of food that are recommended and those that should be avoided to maintain eye health and prevent the development of DR. In addition, the important role of families in supporting diabetes sufferers to be more disciplined in implementing a healthy lifestyle was also conveyed.

A post-education survey was conducted to measure the effectiveness of the program in increasing participants' understanding of DR. The survey results showed that 85% of participants experienced an increase in understanding of the importance of DR prevention. Most participants who previously did not know that DR could be prevented with routine check-ups now realized the importance of having regular eye check-ups. This shows that the educational method applied in this program is quite effective in increasing public awareness of the risks of DR and preventive measures. In addition to increasing understanding, many participants expressed their intention to immediately undergo an eye examination after receiving information from the counseling. Several participants also said that they would share the information they received with family members and the surrounding environment. This active participation shows that the education provided not only has an impact on individual participants, but can also contribute to increasing community awareness more broadly.

2. Implementation of Diabetic Retinopathy Screening

The implementation of diabetic retinopathy (DR) screening in this program was attended by 70 participants consisting of diabetes sufferers and high-risk individuals. This activity aims to detect early signs of DR in participants in order to prevent the development of more serious complications. The examination was carried out by experienced medical personnel using standard equipment. The screening process includes a funduscopy examination to see the condition of the retina and checking intraocular pressure to assess the risk of other eye complications. Participants were given an explanation of their examination results directly after the screening process was completed.

The results of the screening showed that no participants were identified as having DR at this stage of the examination. However, some participants were found to have risk factors such as unstable blood sugar levels and high blood pressure, which may contribute to the development of DR in the future. Therefore, participants who have risk factors are given additional education on the importance of maintaining blood sugar levels and blood pressure within normal limits. In addition, they are also advised to have regular eye examinations to ensure that their eye condition is well monitored. This step is important to prevent DR that may develop without clear early symptoms.

Participants' enthusiasm for the screening activity was quite high, as evidenced by their active involvement in the consultation session after the examination. Many participants who were previously unaware of the importance of early detection of DR felt helped by this free screening. They also appreciated the opportunity to get direct explanations from medical personnel regarding their eye conditions. Several participants even expressed their desire to have regular eye examinations after gaining deeper insight from this activity. This shows that the screening program not only provides direct benefits in detecting disease risks, but also increases public awareness of eye health.

3. Health Cadre Training

The training of community health cadres in this program involved 10 participants selected based on their active involvement in community health activities. This training aims to equip cadres with basic knowledge and skills regarding the prevention of diabetic retinopathy (DR) so that they can disseminate accurate information to the community. The materials provided include an understanding of diabetes and its complications, DR risk factors, the importance of regular eye examinations, and communication strategies in delivering health education. In addition, cadres are also given training on how to identify high-risk individuals and steps that can be taken to encourage them to undergo regular eye examinations.

In the training session, the cadres received theoretical explanations delivered by experienced medical personnel and eye health practitioners. The methods used in this training include interactive lectures, group discussions, and role simulations in providing education to the community. This simulation is designed to train the cadres' ability to explain information clearly and persuasively, so that they can be more effective in delivering

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material to the wider community. Cadres are also given materials in the form of educational modules and brochures that can later be used as a guide in socialization activities in their environment. With this approach, it is hoped that cadres will be able to carry out their role as agents of change in efforts to prevent DR.

In addition to receiving theoretical materials, the cadres are also invited to be directly involved in educational sessions provided to the community during the program. This aims to provide practical experience in conveying information and answering questions from education participants. Through this direct involvement, cadres can develop better communication skills and understand the various challenges that may be faced when providing education in the field. The cadres also receive feedback from medical personnel on how they convey information, so that they can make improvements and increase the effectiveness of the delivery of the material.

The results of the training showed that health cadres had high motivation to play an active role in disseminating information about DR prevention. Most cadres stated that they felt more confident in providing education to the community after participating in this training. In addition, they also proposed that similar training programs be conducted periodically to update their knowledge and improve their skills in assisting the community. With cadres who have been equipped with this knowledge and skills, it is hoped that DR prevention efforts can be more effective and reach a wider community.

Discussion

Collaboration between Undaan Eye Hospital Surabaya and the community in preventing diabetic retinopathy (DR) has shown positive results. This activity has succeeded in attracting community participation in various eye health education and screening sessions, which is the first step in increasing awareness of the importance of early detection of DR. According to research conducted by (Natasia & Evatta, 2022), a community-based approach in preventing DR can increase accessibility of eye health services and encourage changes in preventive behavior. In this program, community involvement is not only limited to being participants, but also as active partners in eye health education and advocacy efforts. With this collaboration, the hospital not only plays a role as a provider of medical services, but also as a facilitator in building health awareness at the community level.

The success of the outreach program in increasing public understanding can be seen from the survey results which showed an increase in participant understanding of up to 85%. This is in line with the findings put forward by (Purqoti *et al.*, 2022), which stated that community-based education can increase compliance of diabetes patients in undergoing regular eye examinations. During the outreach session, participants showed a positive response, with many questions asked regarding the early symptoms of DR and preventive measures. This increased understanding is expected to encourage behavioral changes, such as increasing the frequency of eye examinations and adopting a healthy lifestyle to prevent diabetes complications. In addition, the distribution of educational materials in the form of brochures and modules also helped participants understand the information provided, so that they could disseminate this information to their families and communities.

Although the program has shown positive results, there are several challenges in its implementation. One of the main obstacles is that there are still participants who are reluctant to undergo eye screening due to fear of a serious diagnosis. This is in line with a study conducted by (Ila *et al.*, 2023), which found that fear of diagnosis results can be an inhibiting factor in early detection programs for DR. In addition, limited time and resources in reaching a wider community are also obstacles in implementing this program. The wide coverage area and limited health workers are factors that limit the number of participants that can be reached in one program session. To overcome these obstacles, a more systematic strategy is needed in distributing information and expanding the reach of eye health services to areas that have not been reached.

In order for this program to have a wider impact, a sustainable program involving more local communities is needed. According to a study by (Reubun *et al.*, 2022), community-based health programs that are carried out sustainably have a more significant long-term impact in increasing community awareness and compliance with routine health checks. In addition, strengthening the role of community health cadres as agents of change in their environment is also an important factor in the sustainability of this program. Health cadres can help bridge communication between hospitals and the community, so that health messages can be conveyed more effectively. In addition, consultation and assistance services need to be provided for people diagnosed with DR so that they gain a better understanding of managing their disease and remain motivated to undergo regular eye examinations. With a more structured and sustainable strategy, this program is expected to continue to provide benefits to the community and contribute to reducing the incidence of blindness due to DR (Deviyana *et al.*, 2024).

CONCLUSION

The community service program conducted at Undaan Eye Hospital Surabaya has succeeded in increasing public awareness of the importance of preventing diabetic retinopathy (DR). Through counseling, screening, and training of health cadres, the community has become more aware of the risks of DR and the preventive measures that can be taken. Survey results showed an increase in participant understanding, while the involvement of health cadres allowed for ongoing education in their environment. Collaboration between the hospital and the community proves that a community-based approach can be an effective strategy in preventing DR, as supported by various previous studies.

However, although this program has a positive impact, there are still several challenges that need to be overcome, such as participants' fear of diagnosis and limited resources in reaching the wider community. Therefore, a sustainable program is needed involving more parties, including health workers, community cadres, and support from local governments. With a more systematic and sustainable approach, it is hoped that the incidence of DR can be reduced, so that the risk of blindness due to diabetes complications can be reduced significantly.

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