Screening And Education On Prevention Of Degenerative Diseases in Coastal Communities in Panjang Island, Batam

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Abstract. The screening and education program on the prevention of degenerative diseases was conducted in the coastal community of Panjang Island, Batam. This initiative aimed to address the high prevalence of degenerative diseases such as diabetes, hypertension, and dyslipidemia through health screenings and community education. The study involved 55 participants, primarily pre-elderly individuals, and included examinations of blood pressure, cholesterol, blood sugar, and uric acid. The results revealed that 65.5% of participants had hypertension (34.5% with Stage 1 and 31% with Stage 2), while 69.1% had high cholesterol levels. Blood sugar screening indicated that 14.5% of participants had elevated glucose levels. Uric acid levels were high in 47.3% of participants, predominantly among women. Additionally, 78% of respondents with comorbidities presented abnormalities in at least one biochemical parameter. Educational sessions resulted in a 26.4% increase in knowledge about disease prevention and healthy lifestyles. The program highlighted the importance of regular health screenings, lifestyle modifications, and community empowerment for sustainable health improvements. Collaboration with local health centers and the establishment of health cadres are recommended for ongoing support and monitoring of degenerative disease prevention efforts.

Keywords : Degenerative diseases, Health screening, Health education lifestyle modification

1. INTRODUCTION

Degenerative diseases have become one of the increasingly worrying global health challenges in recent decades. The World Health Organization (WHO) reports that non-communicable diseases, including degenerative diseases, cause 71% of all global deaths, with 85% of them occurring in developing countries (who, 2022). In Indonesia, the prevalence of degenerative diseases has shown a significant increase, with diabetes mellitus reaching 10.9%, hypertension 34.1%, and dyslipidemia 30.8% in the adult population. Changes in the lifestyle of modern society are the main factors in the increasing incidence of degenerative diseases. Rapid urbanization has changed people's consumption patterns to be more dependent on fast food that is high in fat, sugar, and sodium (Rachmawati et al., 2021)

Research conducted by (Halim et al., 2018), This study found that 22.3% of the respondents had a low physical activity level, and 9.7% of the respondents had a total food consumption higher than the recommended intake. The statistical analysis showed a significant negative correlation between physical activity levels and total food intake (p = 0.008). In conclusion, there is an association between students' physical activity levels and their total food intake. Metabolic disorders such as hyperlipidemia, hyperuricemia, and hyperglycemia are important precursors in the development of degenerative diseases. Longitudinal studies have

demonstrated that individuals with total cholesterol levels above 240 mg/dL have a 2.5 times higher risk of developing cardiovascular disease (Dong et al., 2024). Meanwhile, studies have found that high uric acid levels (>7 mg/dL in men and >6 mg/dL in women) are significantly correlated with an increased risk of arthritis and chronic kidney disease. Diabetes mellitus, as one of the main degenerative diseases, has shown an alarming increasing trend (Biologi et al., 2017; Boleu et al., 2018).

Data from the International Diabetes Federation (IDF) shows that Indonesia ranks fifth in the world for the number of diabetes sufferers, with an estimated 19.5 million cases in 2023 (IDF, 2021). This condition is exacerbated by the fact that 50% of diabetes cases in Indonesia are undiagnosed, which shows the importance of screening and early detection efforts.

Efforts to prevent and control degenerative diseases require a comprehensive approach involving promotive, preventive, and early detection aspects. The Ministry of Health of the Republic of Indonesia emphasizes the importance of community empowerment in preventing degenerative diseases through the Healthy Living Community Movement (GERMAS) program. This program emphasizes three main pillars: regular physical activity, a balanced diet, and routine health checks. Several community intervention studies have shown the effectiveness of health education programs in increasing awareness and changing community behavior (RI, 2022). Research conducted by (Yunita et al., 2024) demonstrated that community-based health education programs can increase knowledge about degenerative diseases by 65%, with 89% of respondents experiencing an increase in understanding after education. This activity not only has a positive impact on public health knowledge but also helps change behavior towards a healthy lifestyle. It is hoped that similar programs can be implemented sustainably to support efforts to prevent degenerative diseases in other areas. Panjang Island in Batam City, Riau Islands, is one of the small islands inhabited by people who generally rely on marine resources as their main livelihood. They catch fish, squid, shrimp, and other seafood using traditional boats. Marine Cultivation: Some residents are also involved in marine cultivation such as fish cages or seaweed cultivation. Seafood Trade: The catch is usually sold to Batam City or nearby ports. Social Life: The people of Panjang Island live in small communities with close family ties. Mutual cooperation is still a strong tradition, especially in activities such as building houses or traditional events. Challenges in education and health: Limited access to education and health facilities makes people have to struggle to meet these basic needs (Azhari, 2023). Based on this background, this community service activity is designed to conduct health screening and provide education on preventing degenerative diseases, with a focus on three main parameters: cholesterol, uric acid, and blood

sugar. This program is expected to contribute to efforts to prevent and control degenerative diseases at the community level, while also providing empirical data for the development of public health intervention programs in the future.

2. IMPLEMENTATION METHOD

Time and place of implementation of the activity

The date of implementation of the screening and education activity for degenerative diseases is September 7, 2024, located on Panjang Island, Galang District, Batam City.

Technical implementation of activities

This community service activity is carried out with a participatory and systematic approach through three main stages :

1. **Preparation Stage**

   a. Licensing and coordination stage, the preparation stage takes approximately 2 weeks, including: Coordination and Licensing, Submission of permits to the Village Head and the Galang Island Health Center which oversees Panjang Island, coordination with health cadres for data collection of Panjang Island participants, location mapping and determining the place of implementation of activities, formation of an implementing team from the campus lecturers and students of the pharmacy study program, while assistance from the health center includes doctors and nurses.

   b. Preparation of Tools and Materials: The source of the budget for the tools and materials needed for the examination comes from Batam University, the following are details of the tools needed.

   Examination tools:

   1) Glucometer and blood sugar test strips
   2) Cholesterol measuring device and cholesterol test strips
   3) Uric acid measuring device and uric acid test strips
   4) Digital sphygmomanometer
   5) Weight scale and height meter
   6) Stationery and examination forms

   Consumables:

1) Alcohol swab

2) Lancet

3) Cotton

4) Gloves

5) Medical mask

c. Preparation of Educational Materials: starting from the creation of educational modules on degenerative diseases of hypertension, diabetes mellitus, uric acid and cholesterol, then continued with designing and printing educational leaflets and creating presentation media.

2. Implementation Stage

a. Registration and Initial Screening: Participant registration, Filling out identity and health history forms, Anthropometric measurements (weight, height), Blood pressure measurements

b. Health Check-up

1) Participant Preparation: Confirmation of 8-10 hours fasting status for fasting blood sugar examination, explanation of examination procedure, filling out informed consent

2) Examination Procedure:

3) Blood sugar examination: Capillary blood sampling, Use of standardized glucometer, Interpretation of results

4) Cholesterol examination: Capillary blood sampling, Use of portable cholesterol meter, Recording results

5) Uric acid examination: Capillary blood sampling, Use of digital uric acid meter, Documentation of results

c. Health Education

1) Presentation Session: takes approximately 45 minutes with explanation: Introduction to degenerative diseases including hypertension, diabetes mellitus, gout and cholesterol disorders. Risk factors and symptoms, Complications and prevention, Tips for a healthy lifestyle

2) Demonstration (30 minutes): Examples of healthy food menus, Simple exercise techniques according to age, How to measure food portions

3) Discussion and Q&A (15 minutes): Consultation session with the health team, Discussion of examination results, Providing individual recommendations

4) Evaluation: the final stage: Distribution of educational leaflets and collection of participant feedback.

3. RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

Figure 1. Demographic Characteristics of Respondents: age, gender and comorbidities
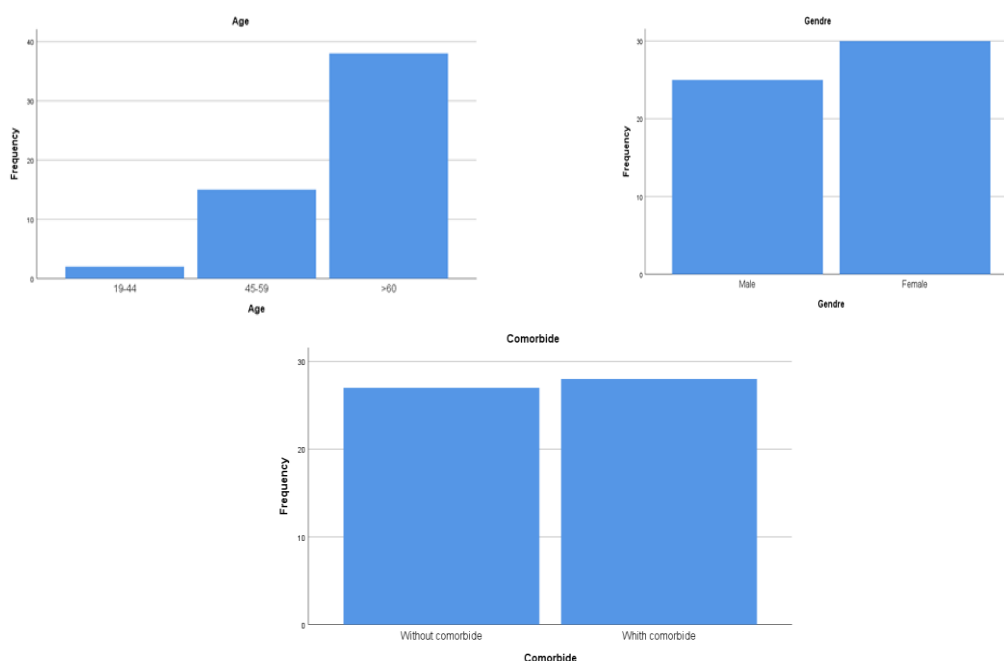

Figure 1 explains the demographic characteristics of respondents, age, gender and comorbidities of the Panjang Island community who participated in degenerative disease counseling, including :

a. Age Distribution: The majority of respondents are in the pre-elderly age group (45-59 years) as many as 38 people (69.1%), followed by the adult group (19-44 years) as many as 15 people (27.3%), and the elderly (≥60 years) only 2 people (3.6%). The dominance of the pre-elderly group indicates a population at high risk for degenerative diseases, because in this age range there is a decline in organ function and changes in metabolism.

b. Gender Distribution: There are more female respondents (31 people, 56.4%) than male respondents (24 people, 43.6%). This gender difference is important in the context of the risk of degenerative diseases, considering that women, especially at menopause, have a higher risk of cardiovascular disease and metabolic disorders.

c. Comorbid Status: There is an almost balanced distribution between respondents with comorbidities (28 people, 50.9%) and without comorbidities (27 people, 49.1%). The high proportion of comorbidities indicates a significant burden of disease in the population.

Blood Pressure Parameter Analysis

**Figure 2. Distribution of Hypertension screening data**
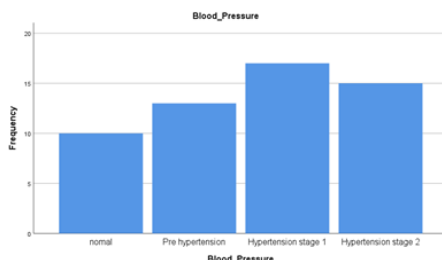
Total hypertension sufferers (Stage 1 and 2) reached 36 people (65.5%), Stage 1 Hypertension: 19 people (34.5%), Stage 2 Hypertension: 17 people (31.0%), Pre-hypertension: 11 people (20.0%), Normal: only 8 people (14.5%). Clinical Implications, the high prevalence of hypertension (65.5%) indicates a serious public health problem, The significant proportion of pre-hypertension (20.0%) indicates a population at risk that requires preventive intervention, The low proportion of normal blood pressure (14.5%) indicates the urgency of a hypertension control program

Analysis of Biochemical Parameters (blood sugar, uric acid and cholesterol)

a. Blood Glucose

Figure 3. Distribution of Blood Glucose Screening
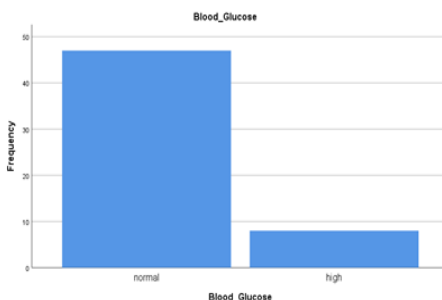
The majority of respondents had normal glucose levels (47 people, 85.5%), Only 8 people (14.5%) had high glucose levels, Distribution by gender: Male: normal 83.3%, high 16.7%, Female: normal 87.1%, high 12.9%. Patterns by age show a concentration of cases in the pre-elderly group

Uric Acid

Figure 4. Distribution of Uric Acid screening data
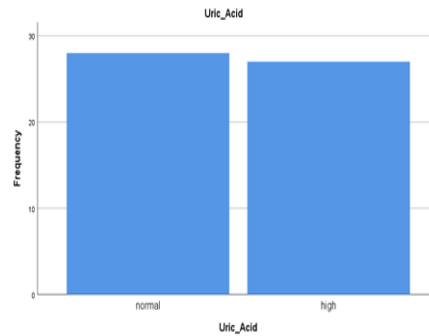
Distribution is almost balanced: normal 29 people (52.7%), tall 26 people (47.3%). Significant gender differences: Men: normal 62.5%, tall 37.5%, Women: normal 45.2%, tall 54.8%. High uric acid levels are more common in women, possibly related to age of menopause

Cholesterol

Figure 4. Distribution of cholesterol screening data
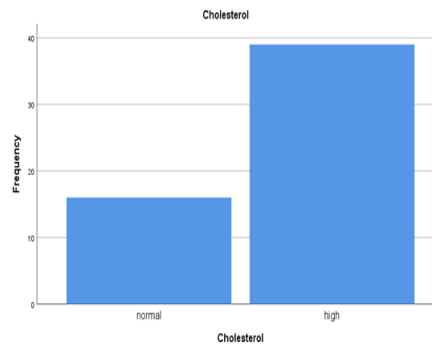
Most dominant health problems: 38 people (69.1%) have high cholesterol, Gender differences: men: normal 33.3%, high 66.7%, Women: normal 29.0%, high 71.0%, Pre-elderly group has the highest prevalence (73.7%)

Multi-Parameter Analysis: Comorbidity patterns include 78% of respondents with comorbidities having at least one abnormal biochemical parameter, Stage 2 hypertension is strongly correlated with multiple abnormal parameters, High cholesterol is the most frequent parameter in the combination of abnormalities, Implications for Health Interventions.

Intervention Priorities: Management of hypertension and cholesterol as the main problem, Prevention programs for pre-hypertension groups, Control of gout, especially in the female population. Gender and Age-Based Strategies: Specific programs for women focus on cholesterol and uric acid management, Interventions for men emphasize prevention of hypertension. Age-Based Approach: Focus on prevention in adults, Intensive management programs for pre-elderly groups. Close monitoring for the elderly

These data show the complexity of health problems in Pulau Panjang, with hypertension and dyslipidemia as the main problems, followed by uric acid metabolism disorders. Comprehensive interventions that consider age, gender, and comorbid status are needed for effective treatment.

For the General Public: Lifestyle Modification by Doing routine physical activity for at least 30 minutes a day, 5 times a week, Reducing salt consumption to no more than 1 teaspoon per day, Limiting foods high in cholesterol and saturated fat, Increasing consumption of vegetables and fruits (5 servings a day), Avoiding foods high in purine to prevent gout. Health Monitoring: Conducting routine blood pressure checks every month, Attending periodic health checks (at least once every 6 months), Recording and monitoring health check results regularly, Bringing health records when visiting health facilities. Stress Management: Doing relaxation techniques such as meditation or yoga, Arranging sufficient rest time (7-8 hours per day), Participating in social and recreational activities, For High-Risk Groups.

For Hypertension sufferers, it is better to routinely measure blood pressure at home, take medication regularly according to doctor's prescription, reduce caffeine consumption, avoid cigarettes and alcohol, for High Cholesterol Sufferers: Limit consumption of fatty foods, increase fiber consumption, consume low-fat protein, exercise routinely according to ability and age considering that the coastal community of Panjang Island likes to consume coconut milk and seafood which are high in cholesterol. Meanwhile, for Gout Sufferers, it is better to

limit foods high in purine (offal, seafood, nuts), drink at least 8 glasses of water per day, avoid alcoholic beverages, maintain ideal body weight (Hypertension et al., 2015).

For families of degenerative disease sufferers, it is dominant in pre- and elderly ages so that Health Support is needed such as: Helping family members in monitoring health, Supporting healthy lifestyle changes, Reminding them of medication schedules, Accompanying them during visits to health facilities. There needs to be Education that includes: Learning the signs and symptoms of emergencies, Understanding risk factors for degenerative diseases, Recognizing the importance of early prevention, Sharing health information within the family. For the Community and Community Leaders, it is necessary to have: Community Empowerment: Forming a joint exercise or sports group, Holding routine health education activities, Forming health cadres at the RT/RW level, Activating the Elderly Posyandu. Creating a Healthy Environment by Maintaining environmental cleanliness, Creating open spaces for physical activities, Developing community vegetable gardens, Supporting smoke-free programs

To realize the implementation of these suggestions is certainly not easy, it requires a joint commitment from all levels of society. The success of the degenerative disease prevention and control program is highly dependent on the awareness and active participation of the community in implementing a healthy lifestyle

4. CONCLUSION

Based on the results of community service activities in the form of screening and education on prevention of degenerative diseases that have been implemented, several conclusions can be drawn:

1. **Participant Health Profile:**
   a. Of the 55 participants examined, a fairly high prevalence of metabolic disorders was found, with 18.2% having diabetes, 23.7% having high cholesterol, and 43.6% having increased uric acid levels.
   b. There is a tendency for increased abnormalities in metabolic parameters with increasing age, especially in the age group over 50 years.
   c. A positive correlation was found between high BMI (obesity) and increased metabolic parameters, where 38.2% of participants were included in the obese category.

2. **Risk Factors:**

   a. An unhealthy lifestyle is still a major problem, with 63.6% of participants having insufficient physical activity and 52.7% having an unhealthy diet.

   b. Hereditary factors play a significant role, where 32.7% of participants have a family history of diabetes.

3. **Effectiveness of Education:**

   a. The education program showed positive results with an increase in participant knowledge of 26.4%, from an average score of 65.8 to 83.2.

   b. There was an increase in participant understanding of the importance of prevention and early detection of degenerative diseases.

4. **Sustainability of the Program:**

   a. The formation of health cadres and health care groups shows the potential for program sustainability in the community.

   b. The establishment of cooperation with the local Health Center allows for continuous monitoring of participants who require further treatment.

5. SUGGESTIONS

A regular health screening program is needed, at least every 3 months, to monitor the health status of participants. It is necessary to strengthen community education and empowerment programs with a focus on healthy lifestyle modifications. The importance of establishing a referral system that is integrated with health facilities to handle cases that require medical intervention. This community service activity has succeeded in identifying health problems related to degenerative diseases in the coastal communities of Panjang Island and providing early intervention in the form of health education. The high prevalence of metabolic disorders found shows the importance of prevention efforts and early detection of degenerative diseases at the community level. Increasing participant knowledge and the formation of a community support system through health cadres provide a strong foundation for the sustainability of degenerative disease prevention programs in the future

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