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Ishikawa Diagram as a Tool for Resolving and Mapping the Causing Factors of Problems

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Abstract

Non-communicable diseases (NCDs) are one of the leading causes of death in the world, especially in low- and middle-income countries. To overcome this problem, NCD prevention and control programs, such as Integrated Non-Communicable Disease Services, have been implemented by the government. However, the implementation of this program faces various obstacles that affect its effectiveness. This study aims to analyze the obstacles in the implementation of the NCD program using the Ishikawa diagram. This diagram helps identify complex factors that cause problems, which are grouped into six main categories: Methods, materials, environment, people, facilities and measurements. The results of the analysis show that the main problems include lack of socialization to the community, limited resources, busy community culture, lack of training for cadres, and limited funds. By using the Ishikawa diagram, problem solving can be done systematically and collaboratively, which can increase the effectiveness of the NCD program in preventing and controlling NCDs in the community.

Keywords: Non-Communicable Diseases, Ishikawa Diagram, Prevention, Control, Program Constraints

Introduction

Non-communicable diseases (NCDs), also known as chronic diseases, are not transmitted from person to person. They last a long time and usually progress slowly [1]. Non-communicable diseases (NCDs) or often called chronic diseases, usually last a long time and are caused by the environment, lifestyle and genetic factors [2]. Approximately 80% of all deaths from NCDs occur in low- and middle-income countries. It is estimated that by 2020, NCDs will account for 27% of deaths in low- and middle-income countries [3]. Most deaths from NCDs can be prevented by addressing modifiable NCD risk factors, such as tobacco use, lack of physical activity, unhealthy diet, and harmful use of alcohol [4].

Globally, there has been an increase in the prevalence of NCDs, from 47% in 1990 to 69% in 2020 [5]. By 2021, China had 11.7 (95% UI: 10.0–13.4) million deaths and 402.6 (95% UI: 348.1–461.1) million Disability-Adjusted Life Years (DALYs). Among them, 10.6 (95% UI: 9.0–12.2) million deaths and 349.3 (95% UI: 301.5–401.2) million DALYs were caused by NCDs, accounting for 91.0% (95% UI: 90.4–91.7%) of all deaths and 86.7% (95% UI: 86.0–87.4%) of all DALYs, far more than the deaths and DALYs caused by CMNN diseases, injuries, and other diseases [6]. In Indonesia, the prevalence of non-communicable diseases, especially stroke, both hemorrhagic and non-hemorrhagic strokes and cardiovascular diseases is very high [7].

Non-communicable diseases (NCDs) and reproductive health morbidity and mortality have become a significant part of the disease burden in the region, requiring a rethink of policy priorities and implementation to minimize this burden [8]. Various efforts have been made for the prevention and control of NCDs at the national level, in line with global and regional approaches. One of the programs that has been and is still being carried out by the Ministry of Health is the Integrated Service for Non-Communicable Diseases (PANDU PTM) at Primary Health Facilities (FKTP). This is an effort to support the achievement of the SPM target and the achievement of the target indicators of the Ministry of Health's 2020-2024 Renstra, namely increasing districts/cities that carry out prevention and control of NCDs [9].

The importance of evaluating the implementation of the PTM program is the main reason for writing this article. By analyzing the implementation of the PTM program, it is hoped that obstacles that affect the success of the program can be found, as well as recommendations that can be used to increase the effectiveness of the PTM program in overcoming PTM among productive age groups. The Ishikawa diagram is an efficient way to identify, analyze, and solve problems by mapping the causal factors that contribute to a problem or effect.

Method

The Ishikawa diagram was invented by Kaoru Ishikawa, who pioneered quality management techniques in Japan in the 1960s. It is considered one of the seven basic tools of quality control [10]. This diagram is also known as a fishbone diagram because of its shape. The 'head of the fish' represents the main problem. Potential causes of the problem, which usually come from brainstorming or research sessions, are shown in the 'fishbones' of the diagram.

As an illustrative example, the low number of productive age groups receiving standard services was chosen as the main problem that emerged. The low number of productive age groups receiving standard services is shown at the head of the Ishikawa diagram (Figure 1). When looking for potential causes of the main problem that emerged, researchers worked together in teams with others. Researchers conducted a brainstorming session to find potential causes of the low number of productive age groups receiving standard services, by writing them on a whiteboard or flipchart. The list will then be reviewed to extract the relevant causes in the context of the main problem at hand. These causes will then be arranged in the "Fishbone" Ishikawa diagram (Figure 1). There is no limit to the number of "fishbones" in the diagram. Each fishbone can be further divided into smaller bones if necessary to show the relationship of all potential causes to the existing problem.

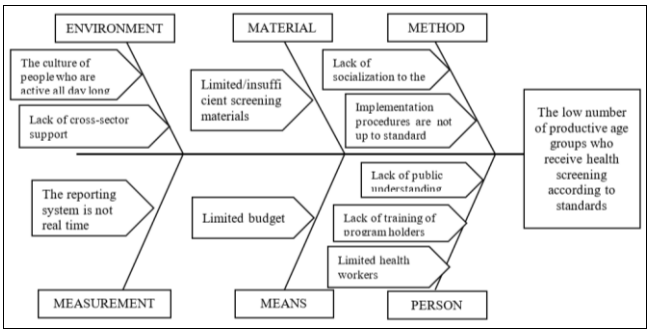

Fig 1: Ishikawa diagram

Results and Discussion

Potential causes of low levels of productive age receiving standard health screening have been identified and categorized into six groups related to methods, materials, environment, people, facilities and measurement.

1. Methods. There are several methods available to find potential causes, including:

a. Lack of socialization regarding PTM to the community.
Lack of socialization about Non-Communicable Diseases (NCDs) to the community can have a huge impact on understanding. Prevention and control of these diseases. NCDs include diseases such as heart disease, diabetes, cancer, and stroke, which are usually caused by lifestyle factors, such as unhealthy diet, lack of physical activity, smoking, and alcohol consumption. People who have less knowledge about Posbindu PTM because the information they get about Posbindu PTM is lacking, such as the lack of public knowledge about the benefits of Posbindu PTM and the lack of counseling provided by health workers. Posbindu PTM provides many benefits for the people who follow it, one of which is feeling changes in health after following Posbindu PTM [11].

b. The implementation procedures for the PTM program are not yet up to standard
The implementation procedure of the Non-Communicable Disease (NCD) program that is not in accordance with standards can have an impact on the effectiveness of efforts to prevent and control NCDs in the community. The results of the implementation of the NCD program have not been optimal, due to the inadequate stages of program implementation. Stages that have not been optimal include the minimal availability of health resources, infrastructure, and community participation. The non-communicable disease program that has been carried out has been in accordance with the Healthy Living Community Movement (Gerakan Masyarakat Hidup Sehat (GERMAS)) program by the government. Problems and obstacles are still found in the implementation of the program, which has an impact on the achievement of success [12].

2. Materials. The materials obtained are: limited/insufficient screening materials.
Limited or inadequate screening materials for Non-Communicable Diseases (NCDs) can be a major obstacle in efforts to prevent and control NCDs. Appropriate and routine screening is essential to detect NCDs early, so that treatment and lifestyle changes can be carried out more quickly and effectively.
The research was conducted in the Sungai Piring health center area where facilities and infrastructure, especially equipment that supports Posbindu PTM activities, are still lacking, such as not all have Posbindu KIT, cholesterol and blood sugar check sticks are limited, special buildings for Posbindu PTM do not yet exist, Posbindu PTM activities are still carried out in village halls and community homes. In addition, extension media or educational aids are limited [13].

3. Environment. Environmental factors that are found to be causes include:

a. The culture of people who are active all day long so they cannot visit the health post
The culture of people who have a busy and active routine all day long can be a big challenge in accessing health services such as visits to Posbindu (Integrated Development Post), especially for screening and prevention of infectious diseases (PTM). Posbindu is an important place for early detection of diseases such as hypertension, diabetes, and high cholesterol, which require regular visits to monitor health. The importance of public awareness in the prevention and control of non-communicable diseases such as conducting regular

health checks at the Health Center or visiting Posbindu. This goal is for the community to obtain an early diagnosis or early detection and control existing diseases [14].

b. Lack of cross-sector support

Lack of cross-sector support in the prevention and control of NCDs can be a major obstacle in efforts to reduce the prevalence of NCDs and improve the quality of life of the community. NCDs are health problems that are influenced by various factors that involve more than just the health sector, such as the education, economic, social, environmental, and public policy sectors. Without adequate support from various sectors, efforts to overcome NCDs can be hampered or ineffective.

The role of policy makers to facilitate the establishment of Posbindu PTM still depends on the Health Center, only other community empowerment activities have mostly gone quite well, such as community self-reliance to overcome the limitations of examination tools and the activeness of cadres has mostly gone well. For partnerships with networks or the business world that only support in the form of sponsorship, there has been no cooperation in the form of an MOU. The role of the Health Center in socializing the importance of Posbindu to related cross-sectors has not been optimal, there has been no role of the Sub-district and Village in socializing Posbindu PTM from health worker counseling [13].

4. People. Causes identified from people, namely:

a. Lack of public understanding regarding PTM

Lack of public understanding of Non-Communicable Diseases (NCDs) is one of the main obstacles in efforts to prevent, detect, and manage NCDs. NCDs, which include diseases such as diabetes, hypertension, cancer, heart disease, and stroke, often develop slowly and do not show symptoms in the early stages, so it is important for the public to have a good understanding so that they can take preventive measures early. In line with the results of the study which stated that women who have formal education are almost twice as likely to have good awareness of NCD screening during the preconception period compared to their peers [15].

b. Lack of training for program holders and posbindu cadres

Lack of training for program holders and cadres of Posbindu (Integrated Development Post) can be one of the main obstacles in the effectiveness of the prevention and control program of Non-Communicable Diseases (NCDs). Posbindu is one of the most important forums in early detection of Non-Communicable Diseases (NCDs), providing education to the community, and encouraging healthy lifestyle changes. Therefore, adequate training for program holders and cadres is very necessary so that they can carry out their duties well and provide maximum benefits to the community.

Findings from a study conducted in sub-Saharan Africa suggest the need for continuing education and training on NCDs, particularly among nurses with longer work experience. Continuing education programs tailored to the needs of health care workers in resource-limited settings should be prioritized. These programs can help improve the quality of NCD care and reduce the burden of NCDs [16].

c. Limited health workers

The limited number of health workers is one of the main challenges in efforts to prevent and control Non-Communicable Diseases (NCDs), especially at the community level through Posbindu (Integrated Development Posts). Limited health workers, both in terms of number and skills, can hinder the effective implementation of programs. This can affect the quality of health services provided to the community, as well as reduce the ability to achieve early detection and prevention of NCDs optimally.

The success of health centers depends on the availability of qualified nurses and other health workers in each health center, who are often recruited from the local community for training and placement in their hometowns after graduation. Implementing rural health worker retention policies such as local recruitment and placement in hometowns. As well as financial and non-financial incentives result in higher rural retention [17].

5. Facilities. The facilities that are the cause of the root of the problem are: Limited budget/funds for implementing the PTM program.

Limited budget/funds for the implementation of the NCD program is one of the main challenges in the prevention and control of Non-Communicable Diseases (NCDs). Insufficient funding can hamper various important aspects of the program, from the implementation of activities in the field, the provision of medical materials and equipment, to the training of health workers and cadres. With limited funds, many efforts designed to overcome NCDs are hampered or not optimally implemented.

The main concerns for NCD sufferers are the limited pooled funds for NCDs and the high cost of NCD treatment services. Given the chronic nature of the condition, the cost of NCD treatment as experienced by the participants pushes a large proportion of NCD sufferers into poverty and affects their livelihoods. In this study, the need to review the benefit package for NCDs to ensure access to quality care services for NCDs and better patient care [18].

6. Measurement. The potential cause identified is the NCD program reporting system which is not real time.

The non-real-time reporting system of NCD programs is a significant challenge in the prevention and control of Non-Communicable Diseases (NCDs). When data or reports related to NCDs are not recorded accurately or updated in real time, several problems can arise that can affect the effectiveness of the program. Non-real-time reporting can cause delays in decision-making, public health monitoring, and necessary preventive or treatment actions.

Research findings in Vietnam, which has a well-functioning NCD surveillance system, highlighted a number of quality issues related to NCD surveillance data. Multiple factors were identified for incomplete, unconfirmed, and inaccurate mortality data and current disease surveillance data. Data on NCD management and treatment were reported to be of better quality than data for screening, targeted treatment, and counseling communication, key factors affecting NCD surveillance

implementation, limited human resource capacity in NCD departments, and lack of funding for NCD surveillance activities [19].

Conclusion

Problem solving using Ishikawa diagrams can help identify the various factors that cause complex problems. This diagram groups the causes into different categories, such as methods, materials, environment, people, means and environment. In this way, Ishikawa diagrams facilitate systematic analysis to find the root cause of a problem. This technique is effective in visualizing cause-and-effect relationships, helping teams to focus on more appropriate and effective solutions. In addition, this diagram facilitates collaboration within the team by organizing the causes of the problem in a structured manner.

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