

## THE EFFECT OF HEALTH PROMOTION - DALIHAN NA TOLU IN THE PREVENTION OF TYPE 2 DIABETES MELLITUS AT RISK GROUPS OF THE MANDAILING TRIBE IN PADANGSIDIMPUAN CITY

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### ABSTRACT

The local wisdom of the Batak people, known as Dalihan Na Tolu, should be able to develop its usefulness through the involvement of family members in the prevention of a disease. The consequences of Type 2 Diabetes Mellitus (DM) are very serious for sufferers. This chronic disease can cause various complications in the blood vessels, hypoglycemic conditions, fear of hypoglycemia, and fear of long-term consequences can cause a decrease in the quality of life of sufferers. Data from the Padangsidempuan City Health Office in 2020 shows that there are 2,076 people with DM in Padangsidempuan City, with a prevalence rate of 0.94 percent, spread over 10 health centers. The purpose of this study was to prove the effect of Health Promotion - Dalihan Na Tolu in the Prevention of Type 2 Diabetes Mellitus at Risk Groups in the Mandailing Tribe in Padangsidempuan City. This type of research is an experiment with one group pre-test-post-test design, on 16 samples. Data analysis with paired sample t test. Padangmatinggi Health Center with the highest DM sufferers 428 people. There has never been a cultural approach to DNT before in an effort to prevent the occurrence of type 2 DM at risk groups. Therefore, an approach to social conditions that applies locally is needed, in designing a health promotion model with a DNT cultural approach to prevent the occurrence of DM type 2 at risk groups in the Mandailing Tribe in Padangsidempuan City. This study aims to design a health promotion model with a DNT approach in preventing Type 2 DM at risk groups in the Mandailing Tribe in Padangsidempuan City. This research is qualitative research with a participatory action research approach consisting of five stages, namely: information, consultation, joint decision making, acting together and supporting the interests of independent communities. The number of informants is 16 people. The stages of data analysis are: data reduction, data exposure, drawing conclusions and leveraging. The pattern of implementing health promotion in an effort to prevent diabetes mellitus through the Dalihan Na Tolu approach is considered effective using the diffusion of innovation, so that there is a pattern of behavior that changes towards healthy behavior by preventing type 2 diabetes mellitus in risk groups in the Mandailing Tribe in Padangsidempuan City. The City of Padangsidempuan to apply the DNT approach with a participatory approach in carrying out efforts to prevent type 2 diabetes mellitus, which is carried out in an integrated and cross-sectoral collaboration with other agencies. Efforts are suggested to invite traditional leaders with Dalihan Na Tolu to be involved in using a cultural approach in health promotion as informants, but also to act as important agents of change to improve the effectiveness and efficiency of the program.

**Keywords:** Health Promotion Model, Dalihan Na Tolu, Prevention of Type 2 DM.

## BACKGROUND

The local wisdom of the Batak people, known as Dalihan Na Tolu, should be able to develop its usefulness not only in traditional events, but the values of Dalihan Na Tolu in the future are expected to be applied through the involvement of family members in the prevention of a disease. The type of disease that really needs the participation or role of family members in giving attention and conveying health messages is Diabetes Mellitus Type 2. The consequences of type 2 diabetes mellitus (DM) are very serious for sufferers. This chronic disease can cause various complications in small blood vessels such as retinopathy and neuropathy, and also in large blood vessels such as myocardial infarction, angina pectoris and stroke. In addition to complications related to diabetes, the occurrence of hypoglycemic conditions, fear of hypoglycemia, and fear of long-term consequences can cause a decrease in the quality of life of patients. [1].

Before type 2 diabetes occurs, prediabetes is preceded, namely the condition of blood sugar levels that are not high enough to be categorized as type 2 diabetes but are close to the borderline number. This can be the basis of efforts to prevent type 2 DM, namely by controlling and managing prediabetes so that it can return to normal and not lead to type 2 DM [2]. Controlling and managing prediabetes is a role that is not only carried out by the individual himself but the husband or wife, kahanggi, Anak boru dan mora through application Dalihan Na Tolu. The function of DNT also regulates and controls a person's behavior in social life [3], [4], [5], [6].

The results of interviews on February 26, 2021 with 15 health workers in 10 Padangsidempuan City Health Center Work Areas, those who have a high risk of developing type 2 Diabetes Mellitus have not shown a good diet (73.34%), the food consumed is not different from members

other families (73.34%), have not been able to reduce the consumption of meat and coconut milk (93.33%), high sugar content such as rice and sweet tea (66.67%) and likes to consume fast food snacks (86.67%) and lack of regular and measured physical activity for 30 minutes every day (71.11%).

Based on the FGD conducted during the preliminary survey with traditional leaders, it was stated that what caused him to get Type 2 DM was eating large amounts of rice and lack of exercise. The results of interviews with 15 people with type 2 DM concluded that their family and closest people played a role in mentoring efforts (26.67%), providing advice by reminding them of their diet (26.67%) and the physical activities they should do (13.33%). When doing gymnastics held by our health center, we also have problems with movement and feel tired quickly (40%)

Related research has been carried out by identifying information on the management of type 2 DM, complications, and awareness of self-control, and quality of life of patients with diabetes mellitus [7]–[10]; adoption and adherence of doctors to the guidelines for the management of type 2 DM [11], [12], and prevalence and potential risk factors for type 2 DM in Indonesia [13]. This means that in general, research is still mostly focused on curative and clinical efforts.

This condition indicates that in Indonesia there is still a gap of knowledge with the real conditions experienced by the community regarding the prevention of type 2 DM. This means that research on the prevention of type 2 DM is very rare. Now also starting to occur degradation of moral, social and cultural values and have an impact on public safety and health. [14]. Therefore, as an effort to overcome the problem and prevent type 2 DM in Indonesia, especially in Padangsidempuan City, it is important to develop a health promotion model with a cultural approach to DNT in the prevention of type 2 DM, implement the model and evaluate its success.

Nutrition and health problems can affect children due to lack of nutritional intake, such as delayed growth, obesity, anemia, dental problems, PEM, IDD, anemia, obesity, and so on. Schoolchildren need a variety of foods that can provide energy, protein, carbohydrates, fats, vitamins, and minerals for growth and development (Kemenkes RI, 2017: 231). Based on data from Riskesdas (2018), the nutritional status of children in Indonesia shows an improvement. The proportion of good dietary levels decreased from 37.2% in 2013 to 30.8%. Likewise, poor nutritional quality and malnutrition balance decreased from 19.6% in 2013 to 17.7%. However, what needs attention is the trend of increasing the proportion of obesity in children since 2007, which was 10.5% in 2007, 14.8% in 2013, and in 2018 it rose to 21.8% (Riskesdas, 2018). Based on the 2018 Basic Health Data (RISKESDAS), it shows that the Jambi Province prevalence of concise children in children aged 5-12 years is 8.9% and short is 17.5%, skinny 3.0% and then 6.0%, obese (obese) 11.4%, and fat 12.2%.

## RESEARCH METHODS

The type of research used is qualitative with a Participatory Action Research (PAR) approach. Researchers consider that this method is appropriate to use in designing a DNT health promotion model in preventing type 2 DM disease at risk groups in the Mandailing Tribe in Padangsidempuan City. Participatory Action Research is a study with the characteristics of researchers having to work in groups to understand or improve situations identified by groups using systematic, analytical, and reflective techniques to collect data that leads to the development of action plans to solve problems based on the information collected [15]

Action Research allows for involvement between researchers and participants in the form of collaboration and focuses on naturalistic and humanistic

approaches. This Action Research study was conducted in 4 (four) main stages, namely planning, acting, observing, and reflecting [16]. It is hoped that the data obtained will produce information to formulate a DNT health promotion model in preventing Type 2 DM disease, the Mandailing Tribe risk group in Padangsidempuan City. The stages of research are as follows: information, consultation, joint decision making, acting together and supporting the interests of independent communities. The number of informants is 16 people. The stages of data analysis are: data reduction, data exposure, drawing conclusions and leveraging.

A plan will work well, when it is agreed and jointly implemented. In this case, the agreement reached is as follows:

1. The traditional leader of Dalihan Na Tolu is willing to be given education by health workers about type 2 diabetes mellitus
2. At-risk groups are willing to adopt a healthy lifestyle with a companion from the traditional leader Dalihan Na Tolu
3. The risk group, Dalihan Na Tolu, health workers and village officials together agreed to create a routine program that can assist in the prevention of type 2 diabetes mellitus.
4. The traditional leader of Dalihan Na Tolu will play an active role in supporting the research program through a “memory sheet”.
5. Dalihan Na Tolu is willing to supervise and direct groups at risk of developing type 2 diabetes mellitus in carrying out mutual agreements through reminder sheets.

## RESULTS

**Table 1** Description of informant characteristics at risk group

Characteristics	Description	Quantity
Sex	Male	5 people
	Female	11 people
Age	Minimum	19 years
	Maximum	70 years
Education	Senior high school	15 people
	Bachelor	1 person
Marital status	Marry	14 people
	Single	2 people
Job	Doesn't work	1 person
	House wife	8 people
	Student	2 people
	Retired	1 person
	Entrepreneur	4 people

**Table 2:** Results of find risk before prevention efforts

Total Score	Information	Total	Percentage
<7	Very low	0	0,00%
7-11	Low	0	0,00%
12-14	Medium	3	18,75%
15-20	High	10	62,50%
>20	Very High	3	18,75%

There are 2 traditional leaders who were identified with an age range of 74 - 76 years, and both were male and their education level was 1 person and one was high school. Based on the results of interviews, data obtained in the form of two people or 100 percent said Dalihan Na Tolu was never involved in any health promotion or disease prevention activities in Padangsidempuan. The identified health workers have the characteristics of an age range of 34 - 45 years, both health workers are female, and have a three-diploma education level. The results of interviews with health workers obtained data from two people or 100 percent, saying that Dalihan Na Tolu had never been involved in any disease prevention health promotion activities in Padangsidempuan.

## Observation of the prevention of type 2 diabetes mellitus with the Dalihan Na Tolu approach

Observations were made on the implementation of the agreement that had been agreed, this observation was carried out for 90 days, each week the researchers' made visits to informants while collecting reminder sheet actions. This is done continuously and continuously; observations are carried out using a form filled out by Dalihan Na Tolu and the risk group. This is an effort to empower Dalihan Na Tolu in this program.

Monitoring evaluation is carried out every month with an assessment of one action carried out on the form sheet given a value of 1, and if it is not carried out it is given a value of 0. After scoring, it is found that the interval value for a month is 0-240, which is divided into 3 categories, 0 -80 categorized as non-routine, 81-160 categorized as routine, and 161-240 categorized as very routine. The results of the monitoring in the first month were as follows: 13 people or 81.25 percent were not routine, and three people or 18.75 percent were categorized as routine. In the second month, eight people or 50 percent were categorized as non-routine, four people or 25 percent were categorized as routine, and four people or 25 percent were categorized as very routine. In the third month, zero people or zero percent were categorized as non-routine, four people or 25 percent were categorized as routine, and 12 people or 75 percent were categorized as very routine.

As many as 62.5 percent know the role of Dalihan na Tolu or how to prevent type 2 diabetes mellitus, as much as 75 percent of the goal is to increase knowledge, awareness and skills, as much as

87.5 percent are profitable, 100 percent say it is beneficial related to diet, physical activity, sunbathing, avoiding smoking smoke in preventing type 2 diabetes mellitus. Attitudes and interest in

the health promotion model with the Dalihan Na Tolu approach in preventing type 2 DM disease by 100 percent.

The compatibility indicator of the characteristics of innovation as much as 100 percent stated that this model was new; in accordance with the culture of the Mandailing Batak people; according to need, and is a necessity. Indicators of complexity or obstacles from the characteristics of innovation are as much as 100 percent stated that they disagree with the statement that this model is an obstacle; is a difficult thing to do; very difficult to understand. As many as 12.5 percent felt heavy obstacles, and 25 percent felt light obstacles. Barriers to managing physical activity exercises for the prevention of type 2 diabetes mellitus were 6.25 percent felt severe obstacles, 18.75 percent felt mild obstacles. As many as 100 percent said there were no obstacles in sunbathing activities. Barriers to avoiding cigarette smoke for the prevention of type 2 diabetes mellitus were 6.25 percent felt severe obstacles, 18.75 percent felt light barriers. Barriers to adequate rest for the prevention of type 2 diabetes mellitus are as many as 25 percent feel severe obstacles, 6.25 percent feel light obstacles.

Indicators that can be tested from the characteristics of innovation are as much as 100 percent sure; related to its implementation, as many as 68.75 percent are routine, 31.25 percent are rarely; related to diet management or routine 75 percent; management of routine physical activity exercises 62.5 percent; sunbathing activities are only 12.5 percent routine, 75 percent of avoiding cigarette smoke say rarely and never. The indicator that can be seen from the characteristics of innovation is that as much as 100 percent there is support from relatives, staff, health workers, traditional leaders and village officials.

Research on the social system shows that those who have an influence on the type 2 diabetes mellitus prevention

program are 50 percent of parents/in-laws and 50 percent of husband/wife. A total of

62.5 percent answered that the husband made the decision. As many as 100 percent stated that decision making by discussion. As many as 62.5 percent stated that norms in society, in relatives and also norms in the family did not participate in the prevention program for type 2 DM. As many as 75 percent of diet management programs sometimes violated the cultural rules of DNT.

The role of the leader is illustrated by the result that there is 100 percent advice, roles and discussions with husbands or partners to participate in this activity. Regarding the agents of change, it was found that 75 percent had received information. Sources of information were 100 percent from health workers, and as many as 87.5 percent stated that relatives provided further information, and only 25 percent said there were no home visits. As many as 100 percent participated, were able to accept, support, and after knowing they immediately applied the health promotion model with the Dalihan Na Tolu approach to prevent type 2 diabetes mellitus.

**Table 3:** Results of find risk after monitoring evaluation

Total Score	Information	Total	Percentage
<7	Very low	0	0,00%
7-11	Low	11	68,75%
12-14	Medium	5	31,25%
15-20	High	0	0,00%
>20	Very High	0	0,00%

Based on table 3, the results after 90 days of monitoring are as follows: A total of 11 people or 68.75 percent were categorized as low risk, five people or 31.25 percent were categorized as moderate risk.



**Table 4:** Hasil analisis uji statistik paired t test

Variable	n	Mean	SD	Min-Max
Pre-Test	16	1,50	0,508	8-15
Post Test	16	14,38	4,757	12-24

**Table 5:** Analysis Results of Paired T-Test

Variable	n	Mean	SD	Min-Max
Pre-Test	16	12,875	5,160	0,000
Post Test				

Based on the results of the paired t-test, it is known that there is an effect of Health Promotion - Dalihan Na Tolu in the Prevention of Type 2 Diabetes Mellitus in Risk Groups in the Mandailing Tribe in Padangsidempuan City ( $p = 0.000$ ).

## DISCUSSION

The involvement of Dalihan Na Tolu in the prevention of type 2 diabetes mellitus can be done by referring to the following three themes: 1) Dalihan Na Tolu in the community, 2) Groups at risk of developing type 2 diabetes mellitus, 3) Efforts to prevent type 2 diabetes mellitus. The three themes become a value that can be measured in the effort to prevent type 2 diabetes mellitus, these themes are also a synergy of internal factors, namely risk groups, and external factors, namely the Dalihan Na Tolu traditional instrument.

Dalihan Na Tolu and the community must work together to prevent type 2 diabetes mellitus through systematic, analytical, and reflective identification. This is in accordance with the opinion [15], [17]. Health promotion involving Dalihan Na Tolu is also able to improve health education for at-risk groups regarding the prevention of type 2 diabetes mellitus, this is in line with the opinion of Mubarak et al, 2007, Health promotion is a revitalization of health education in the past, where in the concept of health promotion not only is a process of public awareness in terms of providing and increasing knowledge in the

health sector, but also as an effort that is able to bridge behavior change, both within the community as well as in organizations and their environment.

Knowledge about culture is important for health service providers, health workers to create excellent service with full care and love, because with Dalihan Na Tolu it has a positive impact on health. Therefore, it requires a planned effort, and a joint role in its application and optimization [18], [19]. Dalihan Na Tolu as a kinship system that is used as a living principle of Batak culture [20]. A symbol of caring and togetherness in independence through assistance, in this case to those who are at risk of developing type 2 diabetes mellitus, so that kinship is well maintained (Harahap, 2019). Changes in behavior by maintaining a healthy lifestyle have shown results that require changes in the patient's lifestyle (Mahfouz & Awadalla, 2011), which of course is inseparable from the role of the family in the application of Dalihan Na Tolu culture by always functioning as a companion by providing advice.

Cultural acculturation can be eschadistic (behavior of avoiding new cultures and trying to return to the original culture) because there is a longing for the old culture. Meanwhile, those who are willing to accept are called adaptive futurists but go through a transitional stage [25], [26], [27]. Dalihan Na Tolu culture is part of family support that functions as a support system for its members and family members view that people who are supportive are always ready to provide help with assistance if needed [28].

Dalihan Na Tolu's position in customary interaction can be understood through the structural- functional theory proposed by Talcott Parsons [29], based on motivational orientation and value orientation. The adoption of an innovation is influenced by the characteristics of the individual itself and also the social system

in which the individual is located [30], [31].

Prevention of type 2 Diabetes Mellitus involving family members and residents in ideals and social realities and analysis of social life perspectives, in the DNT concept. The role of DNT is related to the culture of sharing roles, helping each other, positive and negative habits, the use of fruit, food, drinks that are traditionally used as medicine, the culture of caring for relatives, the culture of respecting relatives, the culture of advising relatives, the culture of visiting relatives, the culture of bringing food, the culture of helping material, culture of responsibility.

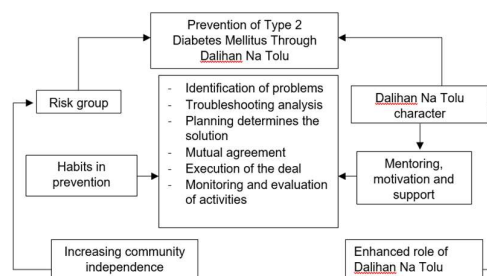
The government has made various prevention efforts but has not shown significant results. Taking into account this matter, a concerted effort is needed to change behavior to become health sensitive that includes the community, regardless of age, gender, occupation, socioeconomic status and location of residence [32].

Therefore, there is a need for synergy between the government and the community in preventing type 2 diabetes mellitus by utilizing the potential of human resources by taking into account the values of existing local wisdom.

The role of the traditional leader Dalihan Na Tolu in health promotion with the Dalihan Na Tolu approach for the prevention of type 2 diabetes mellitus at risk groups illustrates a structured pattern and interrelationships between the agents involved. This structure serves to provide assistance to groups at risk of developing type 2 diabetes mellitus so that they comply with the prevention program until it becomes a habit.

The prevention program for type 2 diabetes mellitus with the Dalihan Na Tolu approach is an applicable program at the smallest community level, namely in the village or sub-district for at-risk groups, both individually and as a community. So

far, the prevention aspect has only been carried out by health workers and educational institutions.



**Figure 1** Prevention of type 2 diabetes mellitus with dalihan na tolu

The feasibility of the model can be met based on aspects of transferability, dependability, credibility, and confirmability. The transferability aspect of this model relates to the existence of clear procedures or steps in the implementation of empowering traditional leaders, starting with the exploration of qualitative problems that produce the theme Dalihan Na Tolu in the midst of society, risk groups, and prevention efforts. Followed by action to at-risk groups to test the suitability of the theme with the methods used starting from problem identification, problem solving analysis, solution planning, agreement with the traditional leaders of Dalihan Na Tolu, implementation of the agreement, monitoring and evaluation of activities.

Aspects of dependability regarding the process of implementing the research is carried out step by step. Starting from meeting and determining informants, collecting data on prevention of type 2 diabetes mellitus from various data sources, analyzing data on problems of risk groups before and after the action was carried out. The results show that several problems can be overcome, medication adherence increases, as well as better patient behavior after the action is carried out, until the conclusion that the empowerment of DNT in the prevention of type 2 diabetes mellitus can be implemented. The dependability

aspect is in line with the confirmability aspect.

Aspects of credibility from the model of empowerment of traditional leaders Dalihan Na Tolu in the prevention of type 2 diabetes mellitus can be fulfilled by observing and being together with informants, and triangulation in collecting data. The researcher together with the traditional leaders of Dalihan Na Tolu, Health Officers, built a good relationship so that the groups at risk accepted the researchers and traditional leaders of Dalihan Na Tolu in carrying out mentoring, monitoring and providing education. Triangulation of problem data starts from interviews with health workers, traditional leaders of Dalihan Na Tolu and risk groups, combined with direct observation of the condition of risk groups by conducting home visits which have shown changes for the better, and documentation of the implementation of actions.

The presence of this model is an alternative program to increase efforts to prevent type 2 diabetes mellitus so that later it can reduce the incidence of type 2 Diabetes Mellitus. The application of this model in Padangsidempuan City can provide positive values that can be accepted, felt, and accustomed to by the group. At-risk groups feel the presence of the traditional leaders of Dalihan Na Tolu in providing support for the prevention of type 2 diabetes mellitus. How to prevent type 2 diabetes mellitus.

## CONCLUSION AND RECOMMENDATION

Disease prevention and health promotion activities in Padangsidempuan City are only carried out by health workers by providing education in accordance with existing health programs at the puskesmas, never involving the values of Dalihan Na Tolu's local wisdom. Design a health promotion model in an effort to prevent disease and promote health in

Padangsidempuan City by using the Dalihan Na Tolu approach as a forum for caring and compassion and making it a guideline for establishing social relationships, through mentoring providing advice to always maintain a healthy lifestyle in preventing type DM disease. 2 risk groups. The pattern of implementing health promotion in an effort to prevent type 2 diabetes mellitus through the Dalihan Na Tolu approach is considered effective using the diffusion of innovation, so that there is a behavioral pattern that changes towards healthy behavior by preventing type 2 diabetes mellitus at risk groups in the Mandailing Tribe in Padangsidempuan City. It is recommended to the Padangsidempuan City Health Office to be able to use a participatory approach in carrying out efforts to prevent type 2 diabetes mellitus. This of course can be carried out better through integration and collaboration with local wisdom values in Padangsidempuan City.

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