Dalihan Natolu Counseling As An Application Of Transcultural Nursing In Efforts To Improve Self-Care For People With Prediabetes

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ABSTRACT

Background: In global perspective, the prevalence of type 2 diabetes mellitus keeps increasing and rising in all regions. The occurrence of DM is invariably preceded by the occurrence of prediabetes. The increasing number of prediabetes cases and the resulting increase in the incidence of diabetes mellitus necessitate the efforts to prevent the occurrence of complications. One effort that can be made is to work up self-care behavior in people with prediabetes, one of which is through dalihan natolu counseling.

Objective: This study aims at observing the efforts to improve prediabetes self-care using dalihan natolu counseling.

Method: This study is a quantitative study with a nonequivalent control group quasi-experimental design with a sample size of 66 which consists of a control group and an intervention group. Data collection procedure was conducted using the Summary of Diabetes Self Care Activity (SDSCA) questionnaire with the recall method for the previous 7 days. The intervention carried out on the respondents in the intervention group was in the form of counseling and assistance by Dalihan Natolu for 3 months, which aimed to improve self-care for people with prediabetes. Data analysis was performed using a paired t-test for the intervention group and a Wilcoxon test for the control

group. Further, a Mann-Whitney test was utilized to compare the control group and the intervention group.

Findings: The Mann-Whitney test performed on the control and intervention groups yielded a p-value of 0.000, indicating that dalihan natolu counseling is effective in improving self-care behavior in people with prediabetes.

Conclusion: Dalihan Natolu counseling is effective as the effort to improve self-care among people with prediabetes. This becomes a concrete example of transcultural nursing theory, which incorporates cultural and kinship elements into the process of caring for family members with prediabetes.

Keywords: Self-Care Prediabetes, Dalihan Natolu Counseling, Transcultural Nursing.

INTRODUCTION

In global perspective, the prevalence of type 2 diabetes mellitus keeps increasing and rising in all regions. This increase is driven by population aging, economic development, and increasing urbanization, which leads to greater exposure towards type 2 diabetes risk factors, including a more sedentary lifestyle, consumption of sugary drinks, processed and red meat, unrefined grains, and other unhealthy foods associated with obesity, and greater exposure to air pollution. Yet, the beneficial outcomes of early detection and more effective treatment in helping people with type 2 diabetes to live longer, which also contributes to the increase of the prevalence of type 2 diabetes mellitus (1).

Prediabetes is a serious health condition where blood sugar levels are higher than normal, but not high enough to be diagnosed as type 2 diabetes (2–4). Prediabetes, usually defined as higher blood glucose concentrations than normal but lower than the threshold for diabetes, is a high-risk condition for the diabetes development. Diagnostic criteria for prediabetes have changed over time and vary depending on the originating institution (4). Prediabetes broadly refers to the transitional phase between the completely normal glucose levels and type 2 diabetes, including IFG and Impaired Glucose Tolerance (IGT). IGT and IFG are associated with an increased risk of developing type 2 diabetes in the future (1). DM is invariably preceded by prediabetes. The prevalence of DM based on doctor's diagnosis and symptoms increases with age (5). The high prevalence of DM indicates an increase in the incidence of prediabetes. Consequently, the factors associated with prediabetes must be identified early on. The risk factors for prediabetes are: obesity, age over 45 years, unhealthy lifestyle, and a family history of DM (6–8). In 2021, an estimated 541 million adults, or 10.6% of adults worldwide, was predicted to have impaired glucose tolerance (IGT). By 2045, this number is projected to increase to 730 million adults, or 11.4% of all adults. In 2021, an estimated 319 million adults, or 6.2% of the global adult population, was predicted to have impaired fasting glucose (IFG). It is projected that an estimated 441 million adults, or 6.9% of the global adult population, to have IFG by 2045 (9,10).

The growing number of prediabetes cases and the resulting rise in diabetes mellitus incidence necessitate the efforts to prevent the occurrence of complications. One such effort is to improve self-care behaviors among people with prediabetes. Self-care activities for clients with DM consist of a series of tasks that include lifestyle modifications (diet, exercise, weight control), self-monitoring of blood sugar levels, foot care, recommendations for medication and self-care, administration of oral medication and insulin injections. Blood sugar control is the condition in which glucose in the blood is within the normal range (11–13).

The efforts done to improve self-care for prediabetes are carried out through education. Education is conducted to increase efforts to promote healthy living in the prevention and management of DM holistically. DM education is education and training on the knowledge and skills for DM patients in order to support behavioral change, increase patients' understanding of their disease, thereby achieving optimal health, psychological adjustment, and improved quality of life (14). The approach employed in health education interventions is counseling. Education based on planned behavior theory, by holding face-to-face meetings and following up samples after the educational intervention, can promote a healthy lifestyle for women with prediabetes.

Therefore, designing and implementing similar interventions for all individuals with prediabetes appears to be required (15). Other studies also reflect that raising diabetes risk awareness among high-risk groups and increasing counseling for high-risk groups by doctors/healthcare providers can be the key in preventing diabetes (16). In implementing nursing care carried out as an effort to improve self-care for prediabetes, there are several factors that influence the success of nursing care, one of which is cultural factors (17). One of the theories that can be used to support the success of comprehensive nursing is the transcultural nursing theory developed by Madeleine Leininger (18). Nurses are required to accept patients' cultural practices when providing care, as exemplified by its application in the community. Culture is something unique and a belief of patients that can affect health behavior during treatment. The community still applies regional cultures that are contrary to health, such as the use of leaves or traditional plants on diabetic foot wounds without experts' guidance or advice. However, there are some communities that practice positive cultures, such as the application of spirituality in their health practices (19,20).

This Transcultural Nursing Theory pronounces that nurses cannot separate their views on social factors and cultural beliefs or practices, whether in terms of health, illness, or care, from culture, because these factors are interrelated and closely connected. Cultural factors and social structures included in this theory are technology, religion, family and kinship, politics, cultural beliefs and practices, economics, physical conditions, and biological factors that influence care and affect health and well-being patterns (21,22). Referred from the perspective of kinship and cultural practices, the city of Padangsidimpuan has Dalihan Natolu culture element that is closely related to daily life practices. Dalihan natolu is analogous to three stoves, which are usually stones used to support pots or cauldrons when cooking. The distance between the three stoves is equal, allowing them to firmly support the cooking utensils placed on top. The pot or pan rests on all three stoves together and receives equal weight pressure. The pot can be interpreted as a shared responsibility, or as joint work, commonly referred to as horja. Therefore, Dalihan Natolu is symbolized by three stoves, aiming to reflect the equal roles, responsibilities, and rights of the three elements in Dalihan Natolu (23,24). Dalihan Natolu becomes a framework that encompassed blood relations and marital relations that connected one group (25).

METHODS

This study is a quantitative research with a quasi-experimental nonequivalent control group design consisting of a control group and an intervention group (26,27). The population in this study was people with prediabetes in Padangsidimpuan City. The sample in this study consisted of 33 respondents as the control group and 33 respondents as the intervention group, selected using purposive sampling technique. Data collection was carried out using several questionnaires, including a questionnaire on respondent characteristics consisting of age, gender, education, occupation, and socio-economic status. Then, for the variables of this research, the Summary of Diabetes Self Care Activity (SDSCA) questionnaire was used with the Recall method for the previous 7 days (28,29). The intervention done on the intervention group respondents consisted of counseling and assistance by Dalihan Natolu for 3 months, aimed at improving self-care for people with prediabetes. Counseling for prediabetes patients and the application of transcultural nursing from the aspects of kinship and culture in the southern Tapanuli region can be combined with the elements of Dalihan Natolu, which consist of Mora, Kahanggi, and Anak Boru. In this study, it is referred to as "Dalihan Natolu Counseling." Data analysis was performed using a paired t-test for the intervention group and a Wilcoxon test for the control group (30). A Mann-Whitney test was also conducted to compare the control group with the intervention group.

RESULTS

Respondents' Characteristics

The following are the characteristics of respondents based on gender, education, occupation, socio-economic status, and age.

Table 1. Characteristics of Respondents Based on Gender, Education, Occupation, Socio-economic Status, and Age (N = 66)

Characteristic	Control Group		Intervention Group	
	f	**%**	**f**	**%**
Gender				
Male	13	39.3	13	39.3
Female	20	61.7	20	61.7
Education				
Junior High School	4	12.1	3	9.1
Senior High School	21	63.7	25	75.8
University	8	24.2	5	15.1
Occupation				
Housewife	9	27.3	4	12.1
Farmer	9	27.3	8	24.2
Private Sector Employee	7	21.2	7	21.2
Trader	5	15.1	9	27.3
Civil Servant/Police Officer/State-owned Company Employee	3	9.1	5	15.1
Socio-Economic Status				
Low	19	57.6	15	45.4
Middle	7	21.2	15	45.4
High	7	21.2	3	9.1
	Mean	**SD**	**Mean**	**SD**
Age	47.36	824	47.33	7.51

Source: Primary Data, 2024

Table 1 indicates that the majority of respondents' gender in both the control and intervention groups were female, namely 20 respondents (61.7%) in both groups. The majority of respondents' education in the control group was a high school level, namely 21 respondents (63.7%), while in the intervention group, 25 respondents (76.8%) had a high school education level. In terms of occupation, the majority of respondents in the control group were housewives (9 respondents, or 27.3%) and farmers (9 respondents, or 27.3%), while the majority of respondents in the intervention group were traders (9 respondents, or 27.3%). The majority of respondents in the control group had a low socio-economic status, namely 19 respondents (57.6%), while in the intervention group, the majority had a low socioeconomic status, namely 15 respondents (45.4%), and 15 respondents (45.4%) had a medium socio-economic status. The average age in both the control and intervention groups was 47.3 years.

Self-Care for Prediabetes
The following is self-care for people with prediabetes in the control group and intervention group before and after the intervention in the form of counseling from dalihan natolu and assistance from dalihan natolu.

Table 2. Self-Care in Prediabetes Patients in the Control Group and Intervention Group Before and After Intervention in the Form of Counseling and Assistance from Dalihan Natolu (N = 66)

Self-Care	Mean	$\Delta\bar{x}$	SD	Min	Max	P value
Control Group						
Pre	49.63	3.64	16.49	30.00	75.00	0.000
Post	53.27		16.24	34.00	80.00	

Intervention Group						
Pre	56.91	19.33	19.19	25.00	92.00	0.000
Post	76.24		17.64	44.00	110.00	

Source: Primary Data, 2024

Table 2 demonstrates that the average self-care score of respondents in the control group before the intervention was 49.63 (poor category), and after 3 months of self-care measurement, the average self-care score was 53.27 (poor). There was an increase in self-care behavior of around 3.64, and when the Wilcoxon test was conducted on the control group, the p-value was 0.000, which means that there was a change in self-care behavior in the control group from before and after the intervention. Similar condition was found in the intervention group, where there was an increase in self-care behavior scores before and after the dalihan natolu counseling intervention. At the beginning, the self-care score was 56.91 (poor), but there was an increase of 19.33 so that after the Dalihan Natolu counseling intervention, the self-care score was 76.24 (good). Further, when a paired t-test was performed on the intervention group, a p-value of 0.000 was obtained, indicating that dalihan natolu counseling was effective in improving self-care behavior in people with prediabetes.

The Effectiveness of Dalihan Natolu Counseling on Prediabetes Self-Care
The following are the results of the Mann-Whitney test on self-care in prediabetes patients in the control group and intervention group after intervention in the form of Dalihan Natolu counseling and assistance from Dalihan Natolu.

Table 3. The Results of the Mann-Whitney Test on Self-Care in Prediabetes Patients in The Control Group and Intervention Group After Intervention in The Form of Dalihan Natolu Counseling and Assistance from Dalihan Natolu (N = 66)

Self-Care	Mean	$\Delta\bar{x}$	SD	Min	Max	P value
Post Intervention Self-Care						
Control group	53.27	22.97	16.24	34.00	80.00	0.000
Intervention group	76.24		17.64	44.00	110.00	

Source: Primary Data (2024)

Table 3 points out that there was a difference in the average self-care scores between the control and intervention groups after the intervention in the form of dalihan natolu counseling. In the control group, the self-care score after 3 months was 53.27 (poor), and in the intervention group, the self-care score was 76.24 (good), with an average difference in self-care scores of 22.97 between the control and intervention groups. When the Mann-Whitney test was performed on the control and intervention groups, a p-value of 0.000 was obtained, indicating that dalihan natolu counseling was effective in improving self-care behavior in people with prediabetes.

DISCUSSION

Respondents' Characteristics
The findings of this study, it was reflected that the characteristics of respondents varied in terms of gender, education, occupation, socio-economic status, and age. Several studies also mention that the characteristics of diabetes patients are predominantly female, with an education level of junior high school to high school, under 60 years of age, and from low to middle socio-economic status (31). However, in the practice, female diabetes patients are also better able to maintain their quality of life compared to the male patients (32). Other studies indicate that women are significantly associated with the incidence of prediabetes. Women are 0.4 times more likely to

experience prediabetes (33). Women of childbearing age are less susceptible to cardiovascular disease due to the protective effects of estrogen. Estrogen generally lowers the circulating triglyceride and LDL-C levels, while increasing HDL-C levels. However, some studies mention the development of cardiovascular disease in women with lower blood glucose levels than men (34,35). Gender has a concrete impact on diabetes self-care. It has been stated that female clients demonstrate better diabetes self-care behaviors compared to male clients. Diabetes self-care activities should be carried out by both male and female diabetes clients, but in reality, women appear to be more concerned about their health, so they make optimal efforts to have self-care for their condition (17). The findings of this research indicated that the socio-economic status of the majority of respondents was low to middle. Socio-economic status affects diabetes self-care. The correlation that can be seen is a positive way, whereby clients with a high socio-economic status will have better diabetes self-care behavior. Diabetes mellitus is a chronic disease that requires costly treatment. If a client's economic status is inadequate, it will lead them to have difficulty in visiting health care centers regularly, making it difficult to monitor the development of their health status and increasing their tendency to experience diabetes complications (36,37).

Prediabetes Self-Care

Prediabetes is a window of opportunity where modifiable risk factors, such as overweight/obesity, high-energy diets, and physical inactivity, can be targeted to prevent or delay the development of type 2 diabetes (38). Lifestyle interventions in individuals with prediabetes can also have beneficial effects toward the progression of cardiovascular disease, microvascular complications, as well as cardiovascular and all long-term cause mortality. Lifestyle interventions in people with impaired glucose tolerance delay the onset of type 2 diabetes and reduce the incidence of cardiovascular occurrence, microvascular complications, cardiovascular and all-cause mortality, and increase life expectancy. These findings provide strong justification for continuing to implement and expand the use of these interventions to curb the global epidemic of type 2 diabetes and its consequences (38,39). Prediabetes self-care is a program or action that must be carried out throughout the client's life and becomes the full responsibility of each diabetes client. The activities included in diabetes self-care encompass dietary management, physical exercise, blood glucose monitoring, medication, and foot care (40).

Pre-diabetes management in individuals with pre-diabetes should focus on returning to normoglycemia rather than simply maintaining pre-diabetes status. Previous research in the Middle East found that the progression of diabetes was significantly lower in individuals who returned to normoglycemia than in those who consistently maintained pre-diabetes. This was caused by the increased insulin sensitivity and pancreatic β-cell function during the intervention. This study also demonstrated that the proportion of individuals who became normoglycemic was significantly higher in the intervention group compared to the control group. Assuming that this reversal is temporary, the risk of individuals with prediabetes developing Type 2 diabetes mellitus is certainly reduced (41,42). Prediabetes management cannot be done by the patients alone, but also requires the assistance and support from other parties. As found in previous studies, people with prediabetes often need encouragement to discuss the responsibilities, choices, and behaviors they follow to support self-care to enhance their health and well-being (43).

The Effectiveness of Dalihan Natolu Counseling on Prediabetes Self-Care

Prediabetes patients are at high risk of developing other complications, such as diabetes mellitus, cardiovascular problems, and so on. Prediabetes is positively correlated with the risk of all-cause mortality and the incidence of cardiovascular outcomes, coronary heart disease, stroke, chronic kidney disease, cancer, and dementia (44). From psychological perspective, high levels of distress are also found in people with diabetes. Thus, it is crucial for patients, their families, and medical teams to pay special attention to the incorporation of distress evaluation as part of routine procedures in diabetes care and to recommend that doctors adopt a comprehensive approach to diabetes management (31,45). The approach that can be taken is Transcultural Nursing, which involves several factors in efforts to improve self-care behavior in people with prediabetes. Cultural and social structural factors included in this theory are technology, religion, family and

kinship, politics, cultural beliefs and practices, economics, physical conditions, and biological factors that influence care and affect health patterns and well-being (29,40). Out of the varied socio-cultural factors exist, kinship and cultural practices are among the factors that can be modified by establishing a counseling method. Counseling is a personal relationship conducted face-to-face between two people, between the counselor (who provides counseling) with their special abilities, providing a learning situation, and the counselee (who receives counseling) who is helped to understand themselves, their current situation, and the possibility of future circumstances that they can create by using their potential, for the sake of personal and community welfare, and further learn how to solve problems and discover future needs (46).

Counseling for people with prediabetes and the application of transcultural nursing from the aspects of kinship and culture in the southern Tapanuli region can be combined with the elements of Dalihan Natolu, which consist of Mora, Kahanggi, and Anak Boru. Each of these elements is interconnected and cannot be separated. The term Dalihan Natolu is known as a three-legged cooking stove which is used as a symbol of the social order of the Batang Angkola community in South Tapanuli, namely that everyone has equal role, everyone feels the same, and everyone has their own responsibilities in the Batak Angkola community in South Tapanuli. Dalihan Natolu is known for its elements of hula-hula, mora, and anak boru (47,48). In this study, it is referred to as "Dalihan Natolu Counseling." This study found that Dalihan Natolu counseling was effective in enhancing self-care behavior in people with prediabetes. Other studies also state that the prevention of Type 2 Diabetes Mellitus must involve the family members to achieve social goals and realities as well as analyze social life perspectives, in the concept of Dalihan Natolu. The role of dalihan natolu is related to the culture of sharing roles, mutual assistance, positive and negative customs, the use of fruits, foods, and beverages 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 gifts, the culture of material assistance, and the culture of responsibility (49). The Dalihan Natolu kinship system is still adhered to by the people of South Tapanuli, despite the shifts that have occurred (41).

Counseling for people with prediabetes is a lifestyle counseling. In this study, counseling and assistance were provided by Dalihan Natolu, who was a relative and close friend of the respondents. Another study mentioned that lifestyle counseling is time-consuming. Therefore, it is necessary to increase the role of mid-level health care providers, such as nurse practitioners, physician assistants, nutritionists, or sports physiologists. Another option is to implement group counseling sessions to educate and address patient issues more efficiently (50). Other studies also mention that people who participate in counseling activities in the management of their disease show greater awareness of the risks of diabetes and diabetes-related complications compared to those who do not participate in counseling (51,52) In Finland, lifestyle counseling has been integrated into general practice and is mostly carried out by practice nurses. Therefore, nurses need to learn how to facilitate personal change in patients. They need to understand various models and theories designed to make it easier and more realistic for patients in implementing health-related behavioral changes. In addition, nurses must redouble their efforts to also pay attention to setting shared goals, which has been adopted as a counseling priority in Finland's type 2 diabetes prevention program (53–55). Barriers of prediabetes care include prediabetes patients' noncompliance with self-care management and the lack of awareness of the importance of health. Leininger states that research and translation are required for evidence-based nursing practice, developing nursing courses and curricula to prepare culturally competent nurses so that people from any culture can accept the paradigm shift from traditional to modern practices in healthcare, especially for prediabetes (40).

CONCLUSION

Dalihan Natolu counseling is effective as an effort to improve self-care for people with prediabetes. This becomes a concrete form of transcultural nursing theory, which involves cultural and kinship elements in the process of caring for family members with prediabetes. It is hoped that the Padangsidimpuan City government, especially the Health Office, will make greater efforts to improve public health behavior, particularly in the prevention of non-communicable diseases

and their complications. It is expected that cultural elements, particularly Dalihan Natolu, will be more involved in promotional and preventive efforts so that they are closer to the community.

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AUTHOR'S CONTRIBUTION STATEMENT
All authors contributed to this research and have read, approved, and are responsible for the entire content of this article.

CONFLICTS OF INTEREST
The authors declare that they have no conflicts of interest regarding the research, writing, and publication of this article.

ETHICAL CLEARANCE
This study has obtained Ethical Clearance from the Research Ethics Committee of the Faculty of Public Health, Hasanuddin University, Makassar, with Number 1796/UN4.14.1/TP.01.02/2024.

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