Journal of Nursing
Revista de Enfermagem
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

# KNOWLEDGE OF INDIVIDUALS WITH DIABETES MELLITUS IN THE FAMILY HEALTH STRATEGY

## CONHECIMENTO DE INDIVÍDUOS COM DIABETES MELLITUS NA ESTRATÉGIA DE SAÚDE DA FAMÍLIA

## CONOCIMIENTO DE LAS PERSONAS CON DIABETES MELLITUS EN LA ESTRATEGIA DE SALUD DE LA FAMILIA

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**ABSTRACT**

***Objective:*** to analyze the knowledge of individuals with type 2 diabetes mellitus in five Family Health Strategy units in a city of Minas Gerais, Brazil. ***Method:*** cross-sectional study, with a quantitative approach, with a stratified sample of 222 individuals. The Diabetes Knowledge Questionnaire was used and, for the descriptive statistics analysis. ***Results:*** a majority, 148 (66.7%), were female; age 62 ± 12 years and disease time 11 ± 8 years. For 181 (81.5%) of the individuals, the scores were higher than eight, indicating satisfactory knowledge regarding the disease. Hypoglycemia (70%), food substitutions (50%) and disease management in specific situations and general principles of disease care were obtained (65%). ***Conclusion:*** despite the satisfactory knowledge about the disease, health promotion actions should be reinforced by the Family Health Strategy professionals with a view to the empowerment of individuals with diabetes mellitus. ***Descriptors:*** Diabetes Mellitus; knowledge; Health Promotion.

**RESUMO**

***Objetivo*:** analisar o conhecimento dos indivíduos com diabetes mellitus tipo 2 em cinco unidades de Estratégia Saúde da Família, em um município de Minas Gerais, Brasil. ***Método*:** estudo transversal, com abordagem quantitativa, com amostra estratificada de 222 indivíduos. Utilizou-se o questionário Diabetes Knowledge Questionnaire e, para a análise, estatística descritiva. ***Resultados*:** a maioria, 148 (66,7%), era do sexo feminino; idade 62 ± 12 anos e tempo da doença de 11 ± 8 anos. Para 181 (81,5%) dos indivíduos, os escores foram maiores que oito, indicando conhecimento satisfatório quanto à doença. Obteve-se alto índice de erros quanto à hipoglicemia (70%), substituições de alimentos (50%) e gerenciamento da doença em situações específicas e princípios gerais dos cuidados da doença (65%). ***Conclusão*:** apesar do conhecimento satisfatório sobre a doença, ações de promoção da saúde devem ser reforçadas pelos profissionais da Estratégia Saúde da Família com vista ao empoderamento dos indivíduos com diabetes *mellitus*. ***Descritores:*** Diabetes Mellitus; Conhecimento; Promoção da Saúde.

**RESUMEN**

***Objetivo:*** analizar el conocimiento de las personas con diabetes mellitus tipo 2 en cinco unidades de Estrategia de Salud de la Familia, en un municipio de Minas Gerais, Brasil. ***Método:*** estudio transversal, con un enfoque cuantitativo, con un muestreo estratificado de 222 personas. Se utilizó cuestionario Diabetes Knowledge Questionnaire, y, para el análisis, estadística descriptiva. ***Resultados:*** la mayoría, 148 (66.7%), era del sexo femenino; la edad de 62 ± 12 años y tiempo de enfermedad de 11 ± 8 años. Para 181 (81.5%) de los individuos, los resultados fueron más de ocho, lo que indica un conocimiento satisfactorio acerca de la enfermedad. Se obtuvo alta tasa de errores, como: hipoglucemia (70%), sustituciones de alimentos (50%) y gerencia de la enfermedad en situaciones específicas y principios generales del cuidado de la enfermedad (65%). ***Conclusión:*** a pesar del conocimiento satisfactorio acerca de la enfermedad, acciones de promoción de la salud deben reforzarse por los profesionales de la Estrategia de Salud Familiar para el empoderamiento de las personas con diabetes mellitus. ***Descriptores:*** Diabetes *Mellitus*; Conhecimento; Promoção da Saúde.

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## INTRODUCTION

Diabetes is one of the largest global health emergencies of the century. Each year, more and more people live with this condition that can result in complications in the quality of life. Currently, it is estimated that over 415 million adults have diabetes, 318 million adults with impaired glucose tolerance, which puts them at high risk of developing the disease in the future.[1]

Type 2 diabetes *mellitus* is a genetically heterogeneous condition, characterized by insulin deficiency and / or insulin resistance. The etiology of type 2 diabetes is complex, involving genetic and environmental factors.[2]

Increased body weight, population growth, poor diet and longer life expectancy make diabetes a prominent risk factor. Diabetic mortality is higher than that of the general population. [3]

Only treatment measures are not satisfactory for an effective control of diabetes, and it is necessary to develop strategies for the continuous monitoring of the population that presents the disease.[4]

The essential factor for glycemic control and reduction of the incidence of complications in DM is adherence to treatment, not only for medical treatment, but also for the follow-up of the food plan, physical activities, blood glucose monitoring and foot care, which are self-care practices that they must be present in the daily life of patients.[5]

The high prevalence of complications triggered by diabetes indicates the need to implement actions aimed at health education and therapeutic intervention for the adoption of healthy life habits in order to improve the health conditions of patients with type 2 diabetes *mellitus* and to That there is control of the disease and associated morbidities.[6]

For health professionals in the care of individuals with DM, the most challenging issue is glycemic control. In turn, glycemic control is closely related to adherence to prescribed treatment, which covers both non-medication and drug measures that can be applied alone or in a group.[7]

In this context, professionals working in Primary Health Care, specifically in Family Health Strategies, should systematically assess the knowledge, emotional and / or psychological attitudes towards the disease and the self-care skills of individuals with DM. The evaluation offers elements to reorient the establishment of goals and behaviors that serve the population in an effective way.

In the national literature, there are studies about the knowledge and attitude of individuals with DM,[23,8-10] however, it is still necessary to advance knowledge on this subject in several scenarios of attention to the individual with DM for future comparisons. Thus, this study aims to evaluate the knowledge of individuals with DM regarding disease and feeding, in FHS of a municipality in the Southeast region of Brazil.

## METHOD

A cross-sectional, quantitative approach study carried out in five Family Health Strategy (FHS) units of Itaú de Minas, Brazil, from October 2013 to May 2014.

From the population of 524 individuals diagnosed with DM2 enrolled in the Computerized System of Registration and Monitoring of Individuals with Systemic Arterial Hypertension and Diabetes Mellitus (HIPERDIA), 222 individuals with DM2 were selected from the representative sample of the population that was calculated, considering margin of 5% error and 95% confidence level, through DIMAM 1.0 software. As the number of DM individuals enrolled by FHS is variable, the representative sample of each of the five FHSs was calculated. Inclusion criteria were individuals with a diagnosis of T2DM, who were attended to by the municipal FHS, registered at HIPERDIA, aged 19 years or over. The established exclusion criteria were individuals diagnosed with gestational DM and type 1 diabetes *mellitus* (DM1). Subjects with DM who did not complete the questionnaires or refused to participate in the study were also excluded from the study. Thus, the representative sample consisted of 222 individuals with DM2, enrolled in the five FHS of the municipality of Itaú de Minas - MG.

Individuals with DM2 enrolled in HIPERDIA are followed up at the respective FHS by a multi-professional team. Individual care is carried out by doctors and nutritionists without frequency stipulated. In nutritional care, individuals receive an individualized menu on foods for DM control, considering the anthropometric evaluation, physical examination, preferences, socioeconomic condition, among others.

The group care called Diabetes Quality of Life occurs twice a month in each FHS and is coordinated by the multi-professional team. One of the meetings is coordinated by the nutritionist, who addresses issues of healthy eating and physical activity. The other is coordinated by nurses and physicians, addressing topics such as blood glucose monitoring, use of prescribed medications and

foot care. The group is open and consists of seven to ten individuals with DM.

The instrument Diabetes Knowledge Scale Questionnaire (DKN-A) was used. This instrument is a self-administered questionnaire with 15 multiple choice items on different aspects related to the general knowledge of DM. The questionnaire scores range from 0-15 and each item is measured with a score (1) for correct answer and zero (0) for the incorrect. Items one through 12 require a single correct answer. For items 13 to 15, some answers are correct and all should be checked to get score one (1). A high score indicates greater knowledge about DM, and the established cut-off point was eight. Individuals with a score ≥ 8 were considered with satisfactory knowledge. The questionnaire was translated into Portuguese and validated in Brazil, presenting good reproductivity.[11]

During the data collection, difficulties were observed in understanding the statement of the questions and confusion regarding the choice of answers. This difficulty was also mentioned in other studies,[3,9,12] with the assistance of a professional being stipulated to fill in the questions.

The data analysis was performed in the Statistical Package for Social Science (SPSS), version 15. The data was presented, mostly, in a descriptive way, in frequencies and percentages. Quantitative variables, such as age and time of diagnosis, were presented as mean and standard deviation. The total questionnaire score was presented in mean and standard deviation and dispersion charts, but also categorized according to the cutoff point of the questionnaire.

The project was approved by the Ethics Committee (CEPE) of the University of Franca, CAAE: 21072413.4.0000.5495. All participants signed the Informed Consent Term.

## RESULTS

Of the 222 individuals with DM2 enrolled in the five FHS of the municipality, the mean age of the individuals with T2DM was 62 ± 12 years, with a minimum of 17 years and a maximum of 91 years. The time of diagnosis of individuals with T2DM was 11 ± 8 years, with a minimum of one year and a maximum of 40 years. Regarding the gender variable, there was a predominance of females, with 148 (66.7%). Only ten (4.5%) had no prescription for oral antidiabetics and insulin.

The mean DKN-A score was 11, ranging from two to 15 points. It was observed that 181 (81.5%) of individuals with DM2 had scores greater than eight, indicating satisfactory knowledge regarding the disease (Figure 1).

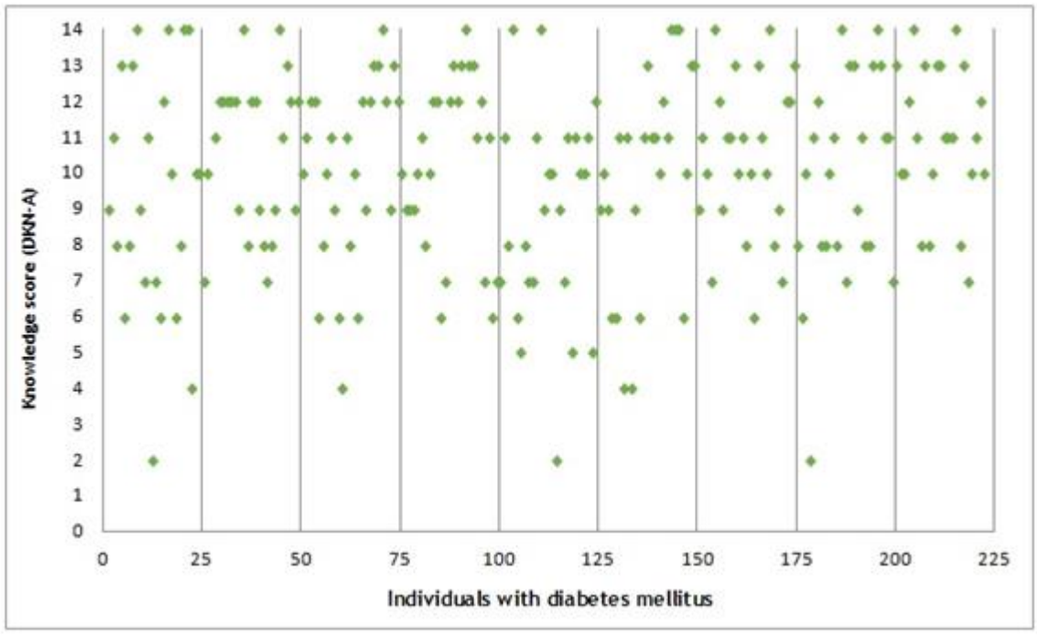


**Figure 1.** Scores obtained in the DKN-A questionnaire regarding the knowledge of the disease by the individuals with DM2, registered in the five FHS. Franca (SP), Brazil, 2014.

The questions related to the physiological and hypoglycemia dimensions are described in table 1. It can be observed that the biggest errors were related to the cause of hypoglycemia (73%), and the minor ones, to the variation of glucose (14%).

Table 1. Distribution of individuals with DM2, enrolled in the five FHS, according to the number of hits and errors of the knowledge questionnaire (DKN-A), on basic physiology and hypoglycaemia. Franca (SP), Brazil, 2014.

| Attributes | n | % |
|---|---|---|
| Blood sugar values when DM is uncontrolled | | |
| Normal | 12 | 5.4 |
| High | 186 | 83.8 |
| Low | 9 | 4.1 |
| Do not know | 15 | 6.8 |
| The normal range of glucose in the blood | | |
| 70 - 110 mg / dl | 19 | 86.0 |
| 70-140 mg / dl | 16 | 7.2 |
| 50-200 mg / dl | 7 | 3.2 |
| Do not know | 8 | 3.6 |
| Decision making against hypoglycemia | | |
| Take insulin or oral hypoglycemic immediately | 19 | 8.6 |
| Lie down and rest immediately | 32 | 14.4 |
| Eat or drink something sweet immediately | 136 | 60.3 |
| Do not know | 35 | 15.8 |

Table 2 shows that 50% of individuals did not or did not know the responses related to food substitutions, mainly, carbohydrates. The issues with the lowest errors were related to the food groups (20%).

Table 2. Distribution of individuals with DM2, enrolled in the five FHS, according to the number of hits and errors of the knowledge questionnaire (DKN-A), on food groups and their substitutions. Franca (SP), Brazil, 2014.

| Artributes | n | % |
|---|---|---|
| Butter group | | |
| Proteins | 26 | 11.7 |
| Carbohydrates | 13 | 5.9 |
| Fats | 179 | 80.6 |
| Minerals and vitamins | 2 | 0.9 |
| Do not know | 2 | 0.9 |
| Rice group | | |
| Proteins | 23 | 10.4 |
| Carbohydrates | 155 | 69.8 |
| Fats | 8 | 3.6 |
| Minerals and vitamins | 5 | 2.3 |
| Do not know | 31 | 14.0 |
| Food released to individuals with DM | | |
| Apple | 27 | 12.2 |
| Lettuce and Watercress | 177 | 79.7 |
| Meat | 1 | 5 |
| Honey | 17 | 7.7 |
| Do not know | - | - |
| A pound equals | | |
| One unit of weight | 119 | 26.8 |
| Equal to 1000 grams | 118 | 40.8 |
| One unit of energy | 23 | 5.2 |
| A little more than two grams | 7 | 1.6 |
| Do not know | 114 | 25.7 |
| Correct substitutions | | |
| One French loaf is equal to four salt water crackers | 147 | 33.1 |
| One egg equals one serving of ground meat | 95 | 21.4 |
| A glass of milk equals a glass of orange | 42 | 9.4 |
| A noodle soup equals a vegetable soup | 27 | 6.1 |
| Do not know | 133 | 29.9 |
| French bread substitution | | |
| Four salt water crackers | 177 | 39.9 |
| Two loaves of medium cheese | 56 | 12.6 |
| A slice of cheese | 96 | 21.6 |
| Forget about it | 9 | 2 |
| Do not know | 106 | 3.9 |

The issues related to DM management dimensions in the intercurrence of some other disease and general principles of disease care are described in Table 3. It was observed that

the majority (73%) of the individuals did not or did not know to take conduct against the high rate Blood sugar or urine, as well as the presence of ketones.

Table 3. Responses of individuals with DM2, enrolled in the five FHS, regarding the management of DM in the occurrence of some other disease and general principles of care of the disease. Franca (SP), Brazil, 2014.

| Attributes | n | % |
|---|---|---|
| The individual on insulin who has high blood sugar or urine and presence of ketones should: | | |
| Increase insulin | 67 | 30.2 |
| Decrease insulin | 19 | 8.6 |
| Keep the same amount of insulin and the same diet, and take a blood and urine test later | 82 | 36.9 |
| Do not know | 54 | 24.3 |
| The individual using insulin, when he or she is sick or unable to ingest the prescribed diet: | | |
| You should stop using insulin immediately | 20 | 9 |
| You should continue to take insulin | 102 | 45.9 |
| You should use oral hypoglycemic for diabetes instead of insulin | 29 | 13.1 |
| Do not know | 71 | 32 |
| Which statement below is true | | |
| It does not matter if diabetes is not controlled as long as you do not fall into a coma. | 4 | 1.8 |
| It is best to have a little sugar in the urine to avoid hypoglycaemia | 19 | 8.6 |
| Poorly controlled diabetes control may result in a greater chance of late complications | 181 | 81.5 |
| Do not know | 18 | 8.1 |
| The presence of ketones in the urine is a: | | |
| Good sign | 10 | 4.5 |
| Bad signal | 87 | 39.2 |
| Normal for those who have diabetes | 35 | 15.8 |
| Do not know | 90 | 40.5 |
| What complication below is not usually related to diabetes: | | |
| Changes in vision | 21 | 9.5 |
| Kidney changes | 13 | 5.9 |
| Changes in lungs | 150 | 67.6 |
| Do not know | 38 | 17.1 |

## DISCUSSION

The results indicate that the researched population has, for the most part, satisfactory knowledge about DM. When compared to the other studies, the score was equal to or greater[8-9], and found unsatisfactory knowledge in 64.6% of individuals with DM, when the DKN-A questionnaire was applied. The authors acknowledge that knowledge about DM is a relevant resource to direct the multi-professional team to make clinical decisions for the treatment of the disease, as well as to prepare it to educate users for knowledge and adherence to self-care.[9]

A study of 123 users with DM2 in a Basic District Health Unit in the city of Ribeirão Preto, SP, Brazil, investigating the relationship between knowledge and the attitude of users with DM2 with schooling and time showed similar results, 82 (66 , 67%) of users with DM2 had unsatisfactory knowledge about the disease. In this study, the authors reinforce that health professionals need to overcome the vertical care model, directing their attention beyond the aspects related to the established therapy. Thus, they should contemplate other implications involved in the care of the person with DM, such as the cultural aspects, particularly the beliefs that underpin the attitudes and maintain the behaviors of the individual.[3]

Researchers, when verifying the knowledge and the attitude of individuals with DM2, in the Family Health Strategy in the interior of Minas Gerais, showed that the most, 104 (58.4%), of the individuals had scores less than or equal to eight in the questions related to the questionnaire DKN- A, implying an unsatisfactory result about the knowledge and understanding about the disease.[10]

The satisfactory knowledge obtained by the individuals of this study may be, in part related to the care provided by the multi-professional team of the FHTs, offering educational activities twice a month, with a view to the empowerment of individuals with DM. A study carried out in a university

research and extension center in Brazil, showed, that after an education program for self-care in DM, with 82 adults with DM, 78.05% had adequate knowledge and understanding about the disease.[13]

Intervention studies reinforce this strategy's positive results. A study that investigated the knowledge of 54 patients with DM in a DM education program for 12 months showed that there was a significant increase in DM knowledge, with emphasis on general disease topics related to the concept, patho-physiology and treatment of DM. [8] Educational actions should address DM knowledge to users with DM in order to provide them with tools for self-care and autonomy in disease control. Therefore, educational actions, in which one of the central elements is health education, are experiences materialized in organized and systematized activities, inherent in the health care project at all levels of attention, which enable the appropriation of knowledge, quality of life of the population, reduction of problems and damages due to diseases and critical reflection of the actions necessary to solve these problems, involving users of the system and health professionals, especially, nurses.[10]

Another study, comparing group and individual education strategies in the educational program in diabetes using a knowledge questionnaire (DKN-A) before and after intervention, showed that there was a statistically significant increase in the knowledge of individuals with DM on the management of the disease after Six months of follow-up.[9] Even with a high score (9.2 ± 2.8) obtained for the knowledge at the beginning of the study, the score increased significantly to 10.6 ± 2.3 at the end of the intervention. We can see how relevant it is to the acquisition of knowledge in the provision of educational strategies in the health services.[9] However, it should be emphasized that this study is a cross-sectional study that makes it impossible to determine the causes that led to the achievement of scores that point satisfactory knowledge about DM of the study population.

In addition to obtaining satisfactory general knowledge, some issues deserved attention because of the high number of wrong answers or answered as not known. When considering that the empowerment of individuals about the disease is fundamental in the readiness for self-care, future studies are necessary to identify possible difficulties regarding the care performed by the professional team. The difficulties favor the reassessment and redirection of strategies to address the main aspects of DM.

The main problems of knowledge about the disease were related to the decision making regarding the episode of hypoglycemia, DM management and food substitutions. Most people were unaware of the cause of hypoglycemia. This lack of knowledge may be related to the difficulties faced by health professionals and users regarding the communication of technical terms used in individual guidelines or group work. When considering DM is a complex disease, requiring changes in the lifestyle and behavior of people with DM, success in coping with the routines and treatments depends on many factors, including effective communication between users and professionals. It is known that the available scientific knowledge about DM is a relevant resource to assist the multi-professional team to make clinical decisions regarding the treatment of the disease, as well as to prepare it to educate individuals with DM for knowledge and adherence to self-care .[13]

Moreover, competent communication presupposes the daily practice of strategies, where the professionals involved in the communicative process seize the proper use of verbal and non-verbal interactions in order to contribute to a more effective communication. The ability of communication is One of the main factors that lead to the effectiveness of the educational practice.[16-17] The individuals with DM also presented a lack of knowledge related to the management of DM in the intercurrence of some other disease. Most were unaware of what to do when they were using insulin and had high blood sugar or urine levels and high ketones. The need for follow-up and development of educational activities can sensitize individuals with DM and health professionals in the commitment to self-care. The actions of control and prevention of complications are related to information received and readiness for lifestyle change and development of self-care skills.[18]

The use of educational practices as a strategy in the treatment of DM, aims to improve the individual's knowledge about DM and its accompaniment, as well as lead to healthy life habits, which improve the quality of life, increasing their autonomy in the face of the disease. [17]

In the dimension related to the general principles of disease care, most individuals were unaware of the clinical significance of ketones in the urine. The presence of ketones in the blood or urine is usually an emergency

and is cause for concern. Ketoacidosis in DM2 is uncommon, and when it happens, it usually, caused by infection or injury. Lastly, difficulties have been encountered with regard to adequate substitutions of foods, which are essential for obtaining a good glycemic control. In analyzing the two substitution questions, half of the individuals with DM were unaware of the foods they could use to make the substitutions. It should be remembered that individuals are attended individually and in groups once a month. These substitution issues should be reinforced at each meeting. Regarding the quantity and quality of the carbohydrate, it is known the importance of this macronutrient in the diet of the individual with DM. A study comparing the oral administration of 20 grams of glucose and 20 grams of carbohydrate present in milk and orange juice concluded that fructose present in milk and milk galactose are as effective as glucose to promote adequate glucose increase Blood.[19]

DM knowledge of the individuals investigated is a relevant resource to direct the multi-professional team to make clinical decisions when prescribing the therapeutic plan and in the development of strategies for adherence to self-care in diabetes. The FHS teams should focus on effective educational actions aimed at improving the population's health conditions, especially those in situations of social vulnerability, without compromising attention to those with better living conditions.[20] The health professional must understand that overcoming The difficulties of the person with DM, to engage in behavior change, will only happen with the transformation of the way information about the disease and treatment are offered. The available scientific knowledge about DM is a relevant resource to direct the multi-professional team to make clinical decisions regarding the treatment of the disease, as well as to prepare it to empower people with DM for knowledge and adherence to self-care.[13]

In another study, the authors describe that, for the health professionals who perform the educational practices for users with DM, the theoretical knowledge about the patho-physiology of the disease, nutrition and the practice of physical activities was paramount in order to achieve this activity.[17]

Thus, it is understood that the participation of a multidisciplinary team in the group activities makes possible the integrality of health care, since it favors the contact and access to the knowledge of different health professionals.[21]

In this aspect, health education, is now considered a social process, which represents any and all influence suffered by the individual, capable of modifying his behavior. It is related to the implementation of problematizing actions of health professionals, who value the daily experience of individuals and social groups and encourage the active participation of the student in the educational process.[22]

## CONCLUSION

The knowledge of individuals with DM attended at FHS was satisfactory. However, information such as food substitutions, guidelines on insulin and medication management in certain clinical situations, and DM complications still deserve attention and reinforcement by the multi-professional team. In this direction, increased knowledge can favor empowerment and become a valuable tool for achieving good metabolic control in individuals with DM.

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Submission: 2016/07/11
Accepted: 2017/06/15
Publishing: 2017/07/01

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