

Effect of attitudes and empowerment for self-care in diabetes mellitus

Efeito individual das atitudes e empoderamento para o autocuidado em diabetes mellitus

Efecto individual de las actitudes y empoderamiento para el autocuidado en diabetes mellitus

RESUMO

Objetivo: verificar individualmente se as mudanças ocorridas para as variáveis Atitudes Psicológicas e Empoderamento nos participantes em um programa de educação para o desenvolvimento do autocuidado em diabetes podem ser justificadas à intervenção. Método: estudo quase experimental de avaliação pré e pós-intervenção com 72 participantes com Diabetes Mellitus tipo 2. As variáveis dependentes foram Atitudes Psicológicas e Empoderamento e a variável independente, a educação em grupo. Avaliou-se o índice de mudança confiável e a significância clínica, propostos pelo Método JT. Resultados: o índice de mudança confiável para atitude apresentou mudança clínica significativa para 61,1% (44) dos participantes, enquanto para o empoderamento, a melhora ocorreu para apenas 36,1% (26). Quanto à significância clínica não houve melhoras atribuídas à intervenção para atitude e empoderamento. Conclusão: a melhora dos escores das atitudes psicológicas dos participantes foi atribuída à intervenção, indicando que o usuário desenvolve as habilidades para o autocuidado.

DESCRIPTORES: Diabetes mellitus tipo 2; Autocuidado; Atitude; Educação em saúde; Atenção primária à saúde.

ABSTRACT

Objective: to individually verify whether the changes that occurred for the variables Psychological Attitudes and Empowerment in the participants in an education program for the development of self-care in diabetes can be justified by the intervention. Method: a quasi-experimental study of pre- and post-intervention assessment with 72 participants with type 2 Diabetes Mellitus. The dependent variables were Psychological Attitudes and Empowerment and the independent variable, group education. The reliable change rate and clinical significance, proposed by the JT Method. Results: the reliable change rate for attitude showed significant clinical change for 61.1% (44) of the participants, while for empowerment, the improvement occurred for only 36.1% (26). As for clinical significance, there were no improvements attributed to the intervention for attitude and empowerment. Conclusion: the improvement in the participants' psychological attitudes scores was attributed to the intervention, indicating that the user developed the skills to self-care.

DESCRIPTORS: Diabetes mellitus type 2; Self care; Attitude; Health education; Primary health care.

RESUMEN

Objetivo: verificar individualmente si los cambios ocurridos para las variables Actitudes Psicológicas y Empoderamiento en los participantes de un programa de educación para el desarrollo del autocuidado en diabetes pueden ser justificados por la intervención. Método: estudio cuasi-experimental de evaluación pre y post intervención con 72 participantes con Diabetes Mellitus tipo 2. Las variables dependientes fueron Actitudes Psicológicas y Empoderamiento y la variable independiente, Educación grupal. Se evaluó la tasa de cambio confiable y la significación clínica, propuesta por el Método JT. Resultados: la tasa de cambio confiable para la actitud mostró un cambio clínico significativo para el 61,1% (44) de los participantes, mientras que para el empoderamiento, la mejora ocurrió solo para el 36,1% (26). En cuanto a la significación clínica, no hubo mejoras atribuidas a la intervención para la actitud y el empoderamiento. Conclusión: la mejora en los puntajes de las actitudes psicológicas de los participantes se atribuyó a la intervención, lo que indica que el usuario desarrolló habilidades para el autocuidado.

DESCRIPTORES: Diabetes mellitus tipo 2; Autocuidado; Actitud; Educación en salud; Atención primaria de salud

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INTRODUCTION

Type 2 Diabetes Mellitus (DM2) is a prevalent chronic condition with increasing morbidity and mortality worldwide, with 463 million adults with DM in 2019, with an estimate of 700 million for 2045. It has a low rate of adherence to treatment, since it poses challenges for self-care practices.¹

Practicing self-care is an effective way to achieve diabetes control and is not just dependent on knowledge and awareness of the disease, but it also requires active behavior from the individual in performing physical exercise, dietary control and positive mental attitudes in order to maintain life, health and well-being.²

Self-care practices, based on empowerment, are supported by problematization for the acquisition of knowledge, skills and attitudes for self-care.^{3,4} This approach focuses on the problem and the person's response, always encouraging reflection for correct conclusions, in a process of exchange and fulfillment of goals for self-care.⁵

In this sense, in Brazil, a randomized clinical trial was carried out with the objective of evaluating the effect of an educational program for the empowerment and self-care of users with DM2.³ With this program, participants in

the intervention group showed a significant improvement in glycemic control compared to the control group. However, the effect of the intervention at the individual level, that is, how much the results (decreased glycated hemoglobin, improvement in the empowerment and attitudes scale) can be attributed to education activities to encourage self-care in DM (educational program) and when these results can be generalized, they were not measured.

For this measurement, mainly aimed at investigating the clinical significance of the results obtained, the proposal by Jacobson and Truax or JT Method stands out.⁶ This method relates the analysis of clinical significance with verification of the reliability of the changes obtained.

The JT Method assumes that the proposed educational intervention is capable of producing reliable and clinically effective change when comparing pre- and post-intervention measures. From this method, questions arise whether for an education program for the development of self-care for users with DM, the reliable change index can be attributed to the program as an intervention or whether it would be an artifact or measurement error. And regarding clinical significance, if the program made a real difference in the user's life, making the intervention relevant

for the development of self-care.^{7-9,6}

In this perspective, this study aims to individually verify whether the changes that occurred for the variables "attitudes" and "empowerment" scale in the participants in an education program for the development of self-care in diabetes can be justified by the intervention.

METHOD

Quasi-experimental study with a pre- and post-intervention evaluation design with an intervention group (IG) of users with type 2 Diabetes Mellitus (DM2) belonging to the Family Health Strategy (FHS) of a city in the Midwest region of Minas Gerais, Brazil.

For this study, the 72 IG participants from a randomized clinical trial by clusters, carried out between January 2015 and January 2016 were analyzed. Users aged between 30 and 79 years, diagnosed with DM2, with visual, hearing and locomotor ability to perform self-care activities such as physical activity and food, availability to attend educational groups and have telephone contact for monitoring the intervention.^{3,10}

The intervention was developed in three cycles, resulting in seven group meetings. The first two cycles the users had three encounters and the last cycle with a single encounter. The work

was based on lifestyle changes and the Behavior Change Protocol in Diabetes Mellitus was used.⁽¹¹⁾ The objective was to stimulate reflection on the problems that prevented the realization of self-care, and thus, develop possible goals to be achieved, enabling better adherence and empowerment for self-care practices.¹⁰

In the first cycle, with three group meetings, the topics discussed referred to users' feelings, problems and meanings about living with diabetes, healthy eating, food frequency, fiber intake and physical activity. In the second cycle, also with three meetings, the complications of diabetes, feelings and meanings of living with a chronic health condition were worked on. The purpose was to identify barriers to self-care. And in the last cycle, with a meeting, a self-assessment of users was carried out in view of the new behaviors developed throughout the cycles.

In all the meetings of the cycles, the group facilitator invited the user to report their experiences, facilities and challenges for the development of self-care with diabetes according to the theme discussed in each meeting. The group dynamics was carried out in the form of dialogue and with the support of illustrative materials that contributed to important reflections by the user as an important part of the educational process to improve psychological attitudes and the development of empowerment for self-care in diabetes.

At the beginning of the second and last cycle, each user was invited to report their experiences after the meetings held, about the changes that had occurred or new challenges for self-care as a way of evaluating the effects of the meetings on the user's life. In addition, at the end of the meetings of each cycle, users were encouraged to build a goal within a care plan inserted in their daily lives. It is noteworthy that the goals were developed by the participants themselves through the stages of the Behavior Change Protocol¹¹ through the analy-

sis of their own lives and barriers that prevented effective self-care practices. The user built a goal by deciding alone on how to perform and achieve it to improve adherence to health care. In the interval between the cycles, the researchers made three telephone contacts, due to the need to maintain the bond with the users and to encourage them to carry out self-care practices based on the established goals.³

The dependent variables were the empowerment scale for self-care and psychological attitudes towards diabetes. Glycated hemoglobin (HbA1c) was also presented before and after the intervention as a measure of the intervention's effect. The independent variable refers to the educational groups in the IG (educational practices in DM2).

In data collection, performed before and after the intervention, for the empowerment variable, the DM empowerment scale of self-care (DES-SF) was used, which refers to training for diabetes care.¹² The questionnaire has eight statements which are scored using the five-point Likert scale. The respondent demonstrates his agreement according to the alternatives "strongly disagree" (one point) to "strongly agree" (five points). The final score is calculated through the average of the scores of each of the eight statements, considering the range between 3.8 – 5.0 points, average 2.4-3.7, and low, 1-2.3.

Psychological attitude was measured using the ATT-19 instrument, consisting of nineteen items that describe emotional responses to diabetes. Each item is answered using a five-point Likert scale from "strong disagreement" to "strong agreement". The score is from 19 to 95 points. However, a positive attitude towards the DM is considered to be the respondent who manages to achieve a minimum score of 70 points.¹³

In order to verify if the changes that occurred individually in the IG can be justified by the group intervention and the variables attitudes and empowerment showed clinical significance, it is

relevant to analyze whether the result of individual clinical response is reliable and clinically relevant. Therefore, the changes were analyzed individually allowing the user to be compared with his own performance. For this, the JT Method by Jacobson and Truax was chosen, which allows a comparative analysis between pre- and post-intervention scores to assess whether the differences between them represent reliable changes and whether they are clinically significant.^{9,6}

The JT Method is represented by the Reliable Change Index (RCI) and Clinical Significance (CS), operationalized and calculated based on criteria that include standard error, standard deviation and reliability of the measurement instrument, called internal consistency.⁷

The RCI makes it possible to verify whether the pre- and post-intervention variation can be considered a reliable change, useful as a measure of internal validity to determine whether the changes are not due to a measurement error.⁶ The BMI makes it possible to verify whether the pre- and post-intervention variation can be considered a reliable change, useful as a measure of internal validity to determine whether the changes are not due to a measurement error.^{9,6}

A clinically significant change is considered when the individual's initial score changes after the intervention, from being a member of a dysfunctional population to a functional population.⁶⁻⁹

Thus, Jacobson and Truax propose three criteria to analyze whether a change can be considered clinically significant: A- normative data are available for a non-clinical population. A change will be considered clinically relevant if the difference between pre- and post-intervention is at least two standard deviations above the pre-intervention mean. In this criterion, the individual is placed outside the dysfunctional population distribution; B- there is provision

of normative data on the distribution of scores in the functional population.

It is considered a clinically relevant change when the post-intervention score displaces the individual within the functional population. Their post-intervention scores are within the range that begins at the cut-off point represented by the mean minus two standard deviations of this population and; C- after an intervention a clinically relevant change brings the individual closer to the functional distribution. From the final score, the individual is situated above the point defined by the mean plus two standard deviations of the dysfunctional population and also above the mean minus two standard deviations of the dysfunctional population. 6

In this sense, when analyzing the results by the criteria of the JT Method, the average of the users of the scores obtained by the IG users in the pre-intervention for attitude (M= 62.1; SD=11.2) and empowerment (M= 3.67; SD=0.45). When calculating the difference between pre- and post-intervention for each of the variables, two standard deviations above the pre-intervention mean were obtained. Based on this analysis, criterion C was used to calculate the clinical significance cut-off point, which categorizes normative data from the distribution of scores for the functional and dysfunctional population (positive indicators will be above the cut-off point and negative indicators, below it).

Thus, the analysis of changes in the intervention group was performed individually with 72 users represented in scatter plots, with the x-axis scores referring to the pre-intervention and the y-axis scores from the post-intervention.

In the graph, the area of intersection of the vertical and horizontal tracings was considered to be a clinically significant change. Microsoft Office Excel and the SPSS program (Statistical Package for the Social Science), version

20.0, were used for tabulation and data processing.

This study was approved by the Ethics Committee under registration CAAE 22372013.2.0000.5149 and the participants signed an informed consent form.

RESULTS

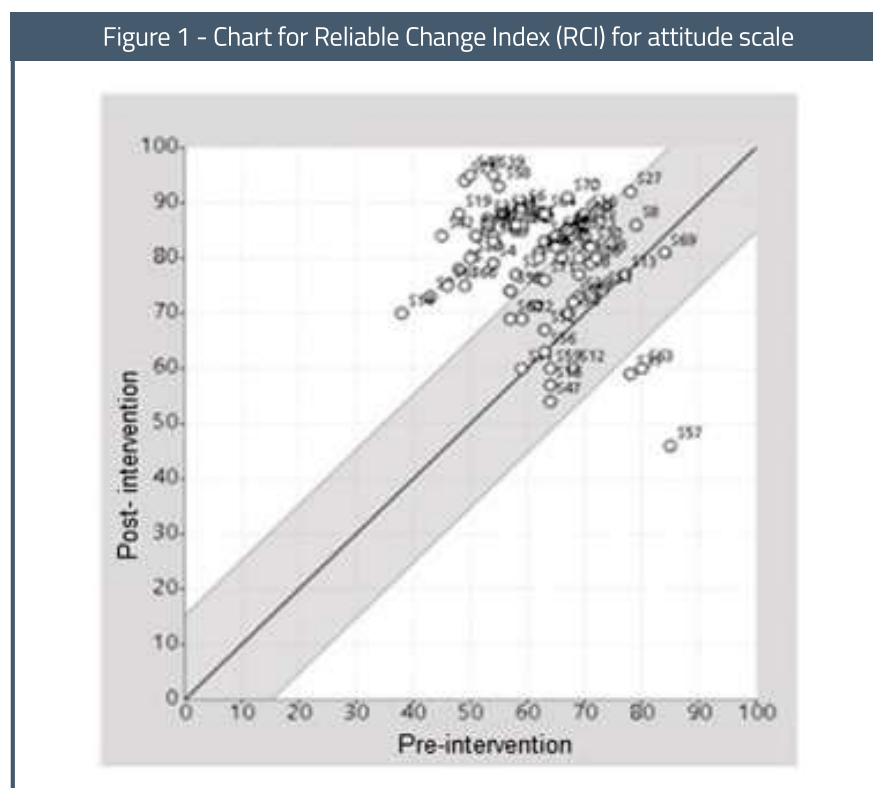
In the analysis with inferential tests for groups (parametric and non-parametric), a statistical significance of HbA1c was identified among the participants of the IG (HbA1c initial time= 8,3% and HbA1c final time= 7,3%). The reduction in HbA1c demonstrates that the intervention improved the users' ability to perform self-care with improved glycemic control and increased scores on the psychological attitudes (ATT-19) and empowerment (DES-SF) scales. This analysis considers the average improvement of the group and not the individual improvement.

According to the stated objectives, in order to individually verify if the changes that occurred in the IG can be justified by the intervention and if these variables also presented clinical significance, the RCI and CS of the variables attitudes and empowerment were verified.

The attitudes of the intervention participants had a mean of 62.1 at the start time and 78.72 at the end time, with SD 11.2 and standard deviation error (EPdif) 7.1.

Regarding the Reliable Change Index (RCI), 61.1% (44) are above the upper diagonal line and show improvement that can be attributed to the intervention, 4.2% (3) are below the upper diagonal line and show worsening that can be attributed to the intervention, 34.7% (25) are located between the upper and lower lines of the bisector and no claims of improvement or worsening due to the intervention can be made (Figure 1).

Figure 1 - Chart for Reliable Change Index (RCI) for attitude scale



Source: Authors, 2022

Regarding clinical significance, all participants were already considered to be a functional population, as they had a score for attitudes with a value above the mean plus two standard deviations, as shown in Figure 2.

For the empowerment scale, the participants had an average of 3.67 at the initial time and 4.07 at the end time, with SD 0.45 and EPdif 0.29.

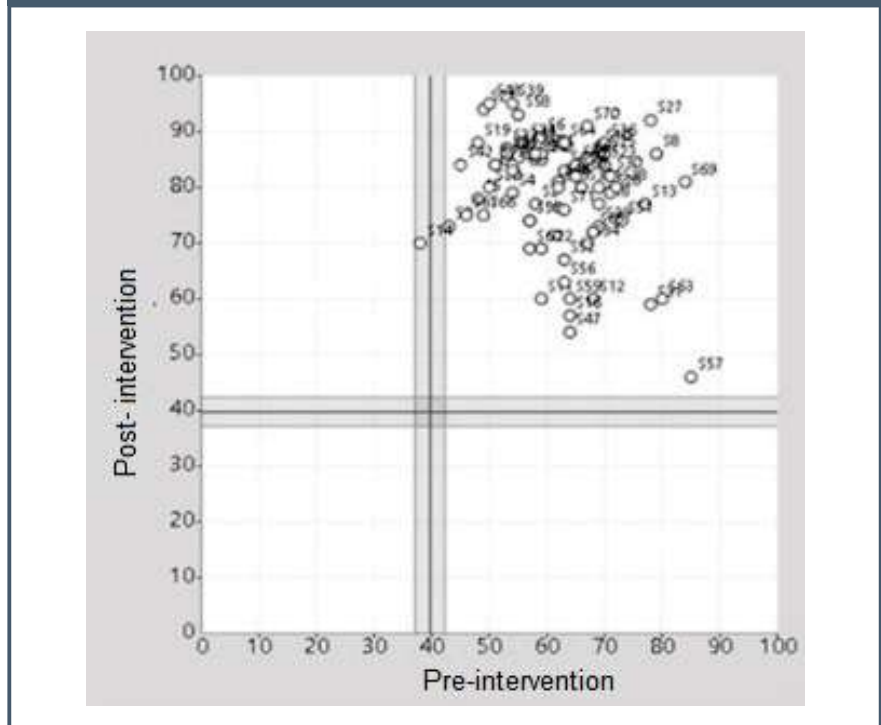
Regarding the Reliable Change Index (RCI), 36.1% (26) are above the upper diagonal line and show improvement that can be attributed to the intervention, 2.8% (2) are below the upper diagonal line and show worsening that can be attributed to the intervention, 61.1% (44) are located between the upper and lower lines of the bisector and no claims of improvement or worsening due to the intervention can be made (Figure 3).

Regarding clinical significance, 98.6% (71) participants were already considered to be a functional population, as they had a score for attitudes with a value above the mean plus two standard deviations. Nothing can be said about change in clinical status for subject S16 (1.4%), as he is in the range of uncertainty, as shown in Figure 4.

DISCUSSION

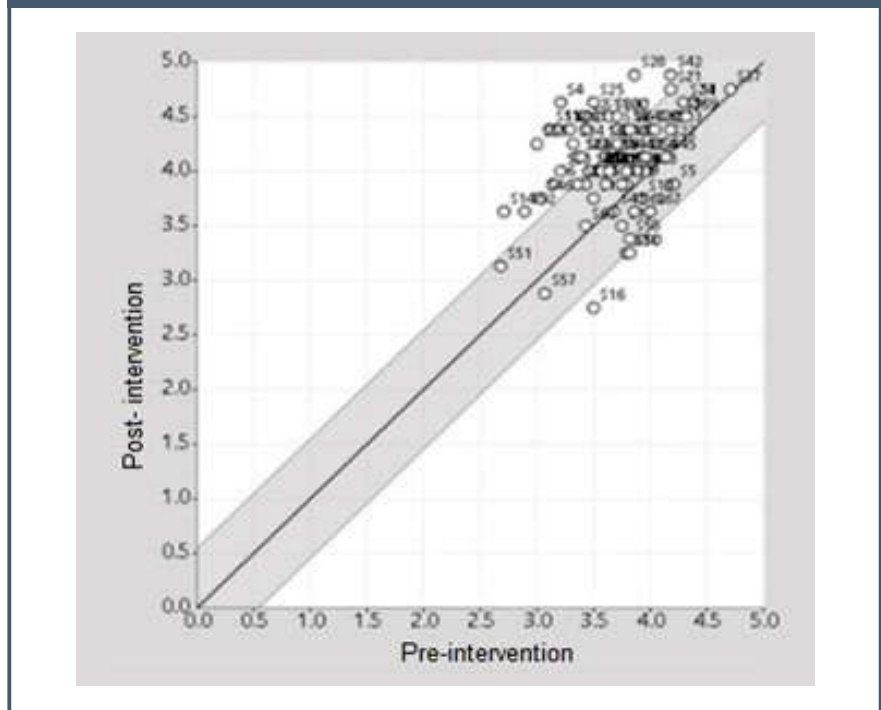
The intervention program increased the ATT-19 and DES-SF scale scores among IG participants.¹⁰ Although statistically reliable, these results show the general progress observed in the intervention group, and it is not possible to assess the extent of individual change and whether it could be attributed to the program's intervention. For this questioning, the JT Method made it possible to check whether the improvement in these scales presented reliable and effective changes, evaluated separately by RCI and CS, to the point of reaching expected standards of improvement with the health of each participant in the IG. The results achieved by the intervention program are useful

Figure 2 - Chart for Clinical Significance (CS) for attitude scale



Source: Authors, 2022

Figure 3 - Chart for Reliable Change Index (RCI) for empowerment scale



Source: Authors, 2022

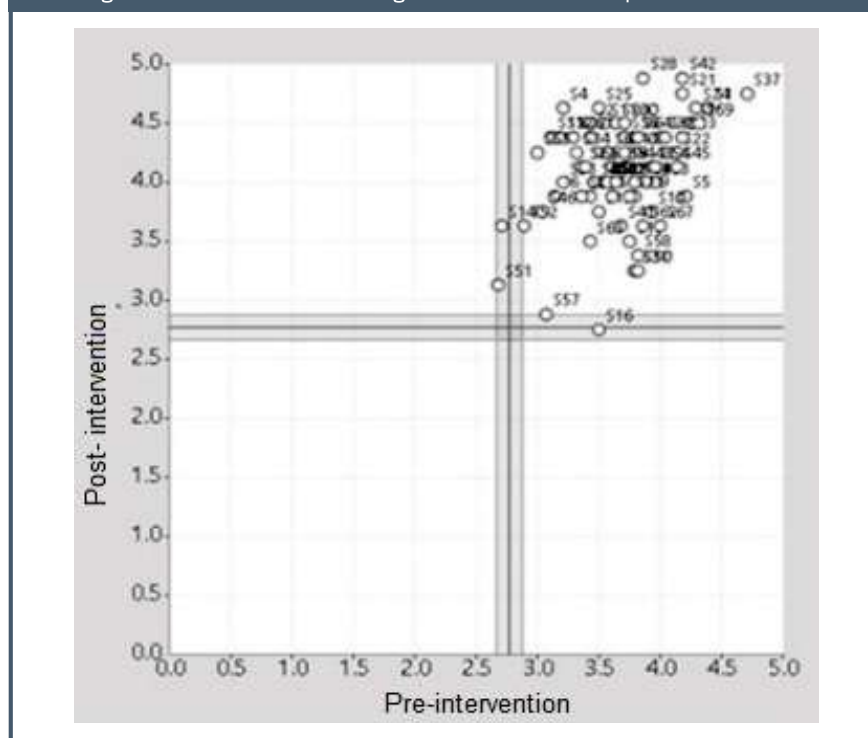
to offer assertive answers to the health needs of users with diabetes, when considering how the impacts of psychological attitudes and empowerment for self-care help in glycemic control.

Experimental studies that had positive group responses in educational interventions for diabetes control when assessing the attitude and empowerment of the user with diabetes mellitus highlight that participants show greater receptivity to treatment, confidence and improved ability to take care of themselves after participating in the educational program.¹⁴⁻¹⁶ This fact demonstrates that educational groups can contribute to the advancement of knowledge of strategies used to encourage users with diabetes in order to help them assume beneficial attitudes and empower themselves in the face of treatment to achieve self-care.

However, these results do not rule out that experimental studies conducted under health care conditions in the form of a group have questions related to the internal validity of the variability of results among participants in the same intervention. Although many investigations assess the effectiveness of interventions, in general, the analyzes are based on inferential statistical measures, which does not allow assessing whether the pre- and post-intervention variation could be considered a reliable change, useful as a measure of validity.^{16-18,6}

Thus, through the analysis of the JT Method, the RCI of the ATT-19 scale showed a significant clinical change, with the same result not being observed for the DES-SF scale. This improvement indicates, in the context of diabetes, that the user has developed their potential to make healthy decisions to perform self-care behaviors for glycemic control.¹⁹ Commonly, this behavior is attributed to knowledge, feelings, acceptance of treatment, and, above all, how much health professionals involved in clinical management are able to stimulate the user's autonomy, helping

Figure 4 - Chart for Clinical Significance (CS) for empowerment scale



Source: Authors, 2022

him to overcome the challenges experienced in daily life for self-care with diabetes.^{19,5} It is possible that the RCI was better for attitude than empowerment, because the latter is related to a process of developing the user's ability to seek solutions to solve daily problems as their autonomy in the ability to take care of their own health increases.²⁰ This implies that in an educational program with a start and end date for carrying out its activities, it may not favor the time that each user needs to develop skills to effectively assume responsibility for their own care, that is, to become empowered for self-care.

On the other hand, when analyzing the CS of the changes to attitude and empowerment, the educational program allowed positive use by most of the participants for the ATT-19 and DES-SF scales. This analysis requires caution, as most of the sample was already functional, that is, they were between minus two and plus two standard

deviations, which in this study is considered random, since participation in the study was randomized. This fact is consistent with the theory proposed by Jacobson and Truax^(9,6), which explain that the same set of pre- and post-intervention data may present statistically significant differences that will not be considered as reliable or clinically relevant changes. Therefore, the improvement in the participants' attitude can be considered a reliable change, useful as a measure of internal validity and cannot be attributed to a measurement error.

The potential of the intervention program was the use of validated ATT-19 and DES-SF scales that allowed participants to reflect and realize that appropriate decisions and healthy behaviors help to control blood glucose, as proven in the reduction of HbA1c.¹⁰ These results are relevant to public health, as they present real-life data, presented in the way users performed self-care before the intervention and

how behavioral changes reflected on glycemic control. And yet, it shows a possible strategy to be carried out in the context of health education for diabetes self-care once it addressed a large number of users, from different health units in Primary Health Care.

Experimental studies in the health area that used the JT Method to assess reliable and clinically significant change with results that were based on scores evaluated by scales, recommend this method for its potential to measure the individual effectiveness of the intervention.^{7,21-23} The work and monitoring of people with diabetes demand the proposition of goals and strategies that facilitate adherence to treatment, as well as the management of emotions and attitudes that contribute to the self-care of this condition.^{24,25}

The study has limitations, with emphasis on participants being functional for the average attitude and empowerment scores, even with high HbA1c. It is also noteworthy that this type of in-

tervention does not allow controlling the participants' contact with the media and contact with alternatives that somehow influence their improvement in attitudes and empowerment for DM self-care. Mainly for empowerment, the longer duration of the program could favor the development of this aspect. As a way to alleviate these limitations, validated scales were used (ATT-19 and DES-SF) as recommended in the application of the JT Method^{8,9,6}, participation in the study was randomized and prior to participation in this study, none of the clusters had participated in this type of research and intervention.

In the context of diabetes, this type of assessment proposed by the JT Method, analyzing the reliability of changes between pre- and post-intervention scores, suggests that health professionals employ specific educational strategies for each user, as a complementary tool in clinical management as a user who has low scores on the ATT-19 and DES-SF scales. For the user, it is an

opportunity to improve scores and to increase their chances of assuming reliable and clinically significant behaviors during treatment for glycemic control.

CONCLUSION

It is recognized that the intervention proposal is necessary because it offers assertive options for the control of blood glucose for users who live with the difficulty of self-care of diabetes. However, the JT method demonstrates an important investigational alternative to group interventions and individual analyses. It is hoped that the present work will contribute to highlight the potential of this type of analysis in the context of users with diabetes in Primary Health Care. And yet, help the health professional to carry out an individual clinical practice of educational intervention capable of lasting throughout the user's life by helping him to develop positive psychological attitudes and thus empowering himself for the self-care of diabetes.

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