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Psychoeducational Program for People with Diabetes (PROPSID): Online Group Intervention for Anxiety and Depression

Programa psicoeducativo para pessoas com diabetes (PROPSID): intervenção em grupo on-line para ansiedade e depressão

Abstract

Introduction: diabetes Mellitus (DM) is a chronic disease characterized by the presence of hyperglycemia due to impaired secretion and/or use of insulin by the body. Studies indicate that the presence of anxiety in people with DM is related to the complications of the disease, unfavorable behaviors to self-care and a higher risk of mortality. In addition, there is an association between depression and anxiety with the worsening of quality of life (QoL) in this population. **Objective:** to investigate the effects of an online intervention group focused on the levels of anxiety and depression in people with diabetes. **Methods:** clinical, quasi-experimental study of repeated measures, using the pre- and post-test design, with a sample of 11 patients, 2 men and 9 women (81.8%), aged between 26 and 65 years (*M*=42.81; *SD*=12.24). The intervention was held in 8 weekly group meetings, where themes about anxiety, depression, medication, self-care and coping strategies were addressed. **Results:** there was a reduction in anxiety, stress and depression scores in the post-test. The magnitude of the effect of the intervention was considered strong for anxiety, depression and stress. Conclusions: it was concluded that there was a significant reduction in symptoms of anxiety, depression and stress, and clinically perceived improvement of self-care and QoL.

Keywords: Diabetes Mellitus; internet-based intervention; group therapy.

Resumo

Introdução: o diabetes melito (DM) é uma doença crônica caracterizada pela presença de hiperglicemia devido ao comprometimento da secreção e/ou do uso da insulina pelo organismo. Estudos apontam que a presença de ansiedade nas pessoas com DM está relacionada com complicações da doença, envolvimento em comportamentos desfavoráveis ao autocuidado e maior risco de mortalidade. Além disso, há associação entre depressão e ansiedade com a piora da qualidade de vida (QV) desse público. **Objetivo:** investigar os efeitos de uma intervenção *on-line* em grupo nos níveis de ansiedade e depressão em pessoas com diabetes. **Métodos:** estudo clínico, quase-experimental de medidas repetidas, utilizando o delineamento pré e pós-teste, com amostra de 11 pacientes, sendo dois homens e nove mulheres (81,8%), com idades entre 26 e 65 anos (*M*=42,81; *DP*=12,24). A intervenção resumiu-se em oito encontros semanais, em grupo, abordando temas sobre ansiedade, depressão, medicação, autocuidado e estratégias de enfrentamento. **Resultados:** houve redução nos escores de ansiedade, estresse e depressão no pós-teste. A magnitude do efeito da intervenção foi considerada forte para ansiedade, depressão e estresse. **Conclusões:** conclui-se que ocorreu redução significativa dos sintomas de ansiedade, depressão e estresse, e melhora clinicamente percebida do autocuidado e QV.

Palavras-chave: diabetes melito; intervenção baseada em internet; terapia de grupo.

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Diabetes Mellitus (DM) is a chronic disease characterized by the presence of hyperglycemia due to impaired secretion and/or insulin use by the body (Punthakee et al., 2018). It is associated with substantial deterioration of the disability-free life-years of individuals (Bardenheier et al., 2016) and requires continued medical care, with multifactorial strategies for risk reduction and glycemic control (American Diabetes Association [ADA], 2021). These strategies focus mainly on diabetes education and its effects, as well as on self-care, whether in individual or group formats. Group interventions have been increasingly used due to their cost-benefit (Noroozi et al., 2017). Factors such as group cohesion, the possibility of sharing the same daily routine difficulties and creating social bonds strengthen the treatment (Burlingame et al., 2018).

It is known that, in addition to the difficulties caused by the chronic clinical condition of DM, the presence of mental disorders further enhances the functional disability of individuals, preventing the autonomy of those affected regarding their personal care. Research on mental disorders in people with DM has indicated the presence of cognitive damage, depression and anxiety, with the latter two having a ratio 2 to 3 times stronger in comparison to the general population (Briganti et al., 2018; Raupp et al., 2021). Depression is associated with poor glycemic control and functional disability, which can lead to increased complications related to diabetes (Bădescu et al., 2016). Individuals with a higher level of depressive symptoms, besides presenting a worse quality of life (Qol), also display a high level of emotional distress and more complications of DM (Ohno, 2017). The presence of anxiety in people with DM is associated with complications of diabetes, involvement in unfavorable behaviors to self-care and a higher risk of mortality (Smith et al., 2018; Naicker et al., 2017). Anxiety can be caused by the necessary changes in habits and lifestyle, which raises the patient's level of stress. In more severe cases, it is relatively common for anxiety symptoms to overlap with those of hypoglycemia, which makes it difficult to identify the appropriate therapeutic approach (Silva, 2018). There is an association between depression and anxiety with the worsening of QoL in this public (Jing et al., 2018). It is also possible to observe how stress affects individuals with diabetes (Zanchetta et al., 2016). High levels of stress in the body activates the hypothalamic-pituitary-adrenal (HPA) axis, stimulating the release of hormones that desensitize the serotonin receptor, thus raising levels of anxiety and depression. When the activation of this axis is excessive, we observe intensified hypertension, insulin resistance and high blood glucose levels (Joseph & Golden, 2017).

Although evidence proves the existence of personal and social damages and financial costs that burden of the health system, it is not common for diabetic patients to receive adequate attention to psychic problems, often associated with this clinical framework (Sartorius, 2018; Lloyd et al., 2018). Treatment in these cases needs to involve aspects of psychotherapy that may or may not be associated with the use of psychotropic drugs. The efficacy of psychological interventions to improve glycemic control in people with DM2 was summarized by González-Burboa et al. (2019) in a systematic review. The evidence found in this study indicates that this type of intervention contributes to the reduction of glycated hemoglobin, self-regulation, and a greater awareness about the disease. The common aspects in these interventions concern the educational contents that address the relationship between depression and diabetes, coping strategies (such as techniques for assertive communication, search for social support and problem solving) and awareness of dysfunctional thoughts. In addition, they use behavioral reinforcement, modeling and assigned homework (Pibernik-Okanovic et al., 2015; Sajatovic et al., 2017).

Web-based interventions are a promising additional treatment option that offer several advantages, such as reaching individuals who have not been treated for many years and better cost-benefit compared to face-to-face therapies (Andersson & Titov, 2014; Nobis et al., 2015). The studies regarding this kind of intervention use mainly cognitive-behavioral therapy (CBT), an evidence-based approach that has been shown to be a valuable tool in public health, since it has generated scientific evidence to support the efficacy of many programs and interventions that are appropriate to patients' reality (Silva et al., 2011). These interventions showed dropout rates between 13% and 42% and an effect size for the graduates ranging from 0.70 to 0.90 (Franco et al., 2018).

The intervention based on the web *GET.ON Mood Enhancer Diabetes* (GET.ON MED), conducted in two separate studies (Nobis et al., 2015; Ebert et al., 2016) was effective in reducing symptoms of depression over 2 to 6 months among individuals with type 1 and type 2 diabetes mellitus and comorbid depression. Similarly, Onuoha, et al. (2021) demonstrated that patients with diabetes who received psychoeducation had significantly lower depressive symptoms compared to those in the control group. For the most part, the results of these interventions are effective in reducing depressive symptoms and the specific emotional distress of diabetes (Nobis et al., 2015; Newby et al., 2017).

Although the literature shows the high prevalence of anxiety in people with diabetes, there are still few specific intervention protocols targeted to the problem (Bickett & Tapp, 2016). Mindfulness-based interventions have indicated clinical and statistically significant benefits in reducing depressive, anxious, and stress symptoms. However, the results are more inconsistent with regard to glycemic control (Noordali et al., 2015).

In the context of lack of studies focused on the relationship between anxiety, depression and diabetes, the present study aimed to evaluate the impacts of an online group intervention on anxiety and depression levels in people diagnosed with diabetes.

METHOD

The present study is characterized as a clinical study, quasi-experimental with pre- and post-test measures, conducted through the Internet (online).

Participants

This study aimed to assess adults, selected by convenience, diagnosed with diabetes that presented anxious and/or depressive symptoms. The initial sample consisted of 46 patients with diabetes diagnose. The inclusion criteria were: having a diagnosis of diabetes mellitus (any type); over 18 years of age; being a Brazilian native; meet the criteria for depression and/or anxiety by the MINI; present scores above 8 in the HADS; and have access to the network connection (internet). Those who presented suicidal ideation, classified as having medium to high risk, and those who were going through mourning process were excluded. Of the participants eligible for the intervention, 29 started and 11 (37.93%) finished the treatment. Thus, the final sample consisted of 2 men and 9 women (81.8%), aged between 26 and 65 years (*M*=42.81; *SD*=12.24).

INSTRUMENTS

Primary Measures

Data questionnaire

Designed to collect personal information such as name, gender, age, schooling, and marital status. Clinical data such as type of diabetes, treatment regimen, presence of clinical complications (oral, cardiac, among others), severity of the complications, and presence of other health issues were also gathered.

Hospital Anxiety and Depression Scale (HADS)

HADS is used to investigate the presence of anxiety and depressive symptoms in patients participating in non-psychiatric hospital services. It has 14 items that focus on the evaluation of symptoms related to anhedonia, with less emphasis on physical symptoms. It's in the format of a Likert scale, ranging from 0 to 3, with seven items for anxiety and another seven for depression, with maximum score of 21 points for both dimensions. Scores higher than nine points in each dimension indicate the presence of depression and anxiety, according to the original authors of the scale (Zigmond & Snaith, 1983). For the Brazilian context, values of 11.6 and 11.9 were the mean scores for clinical cases of anxiety and depression, respectively (Botega et al., 1995). In the present study, *Hads Cronbach's* alpha was 0.61.

Mini International Neuropsychiatry Interview (MINI)

MINI is a brief standardized diagnostic interview, composed of 19 modules that explore 17 DSM-IV axis I disorders, suicide risk and antisocial personality disorder (Amorim, 2000). Initially, we chose to select this version of the instrument since the most recent one (7.0.2 already based on diagnostic criteria according to the DSM-V) is not yet adapted for Brazil.

Depression Anxiety Stress Scale-21 (DASS-21)

DASS is a self-report instrument that assesses the levels of anxiety, stress and depression from sensations and behaviors experienced in the lather week. It consists of 21 items, divided into three subscales with 7 items each, which are answered by means of a 4-point Likert scale, ranging from 0 (not applied at all) to 3 (applied a lot, or most of the time). The scores are obtained from the sum of all items in each subscale, then the results are multiplied by two. The instrument was adapted to Brazil by Vignola and Tucci (2014), and Cronbach's trifactorial structure and *alphas* were confirmed ranging from 0.86 to 0.92. In the present study, the alphas ranged from 0.60 to 0.68 in the subscales and were 0.77 for the total scale.

SECONDARY MEASURES

Quality of life and diabetes specific suffering

Medical Outcomes Study 36 - Item Short - Form Health Survey (SF-36)

The SF-36 is widely used in health research and has been translated and adapted to the Brazilian population (Ciconelli et al., 1999). It is a multidimensional questionnaire, composed of 36 items encompassed in eight scales or components: functional capacity, physical aspects, pain, general health status, vitality, social aspects, emotional aspects, mental health, and another set of questions comparing evaluations between current and previous health conditions. It evaluates both negative (disease or illness) and positive aspects (well-being) concerning the patient's health status. It has a score from 0 to 100, in which zero corresponds to the worst overall state of health and 100 to the best state. In the present study, *Cronbach's* alpha was 0.73.

Questionnaire to assess diabetes-related problems (PAID)

It assesses the impacts of diabetes and its treatment on patients' lives. The instrument has 20 questions that address the aspects of quality of life and emotional problems (specific stress) related to living with type 1 or type 2 diabetes. It is a 4-point Likert type scale (ranging from "no problem" to "serious problem") that produces a total score ranging from 0 to 100, where higher scores indicate a higher level of emotional distress. The Brazilian version (B-PAID) was developed by Gross (2004) and presented an alpha of 0.93. In the present study, the alpha was 0.97.

Evaluation of the intervention

Patients' Satisfaction with Mental Health Services Scale - Abbreviated Form (SATIS-BR, Bandeira & Silva, 2012)

SATIS-BR evaluates the satisfaction of patients, family members and professionals with mental health services. Its abbreviated version has 12 questions arranged on a 5-point Likert scale (1 indicates the lowest degree of satisfaction with the service and 5 the highest degree) and three qualitative questions that assess what the patient thought was best and worse in the service, and what he thinks could be improved. It is divided into three subscales: 1) competence of the team and understanding of patient needs (7 items); 2) help provided and welcome received (3 items); and 3) physical facilities and comfort of the center evaluated (2 items). To assess patient satisfaction, the mean number of responses obtained in all items of the scale is calculated, and the closer to one, the lower the level of satisfaction and the closer to 5, the higher the degree of satisfaction with the service. The internal consistency, evaluated by Cronbach's alpha coefficient in the Brazilian adaptation, presented values of 0.85 for the first factor, 0.61 for the second, 0.74 for the third and 0.88 for the global scale. In the present study, items on physical facilities of the service were excluded since the intervention was conducted on an online environment and presented alphas of 0.92 and 0.70 for the two scales used.

Research and Ethics Procedures

The present article is an unfolding of another study named Assessment and Cognitive-Behavioral Intervention for Depression in Diabetic Patients, approved by the Research Ethics Committee of the Federal University of Minas Gerais (process 45217015.9.0000.5149). The consent of the participants was documented through the Free and Informed Consent Form (TCLE) and the procedures recommended by the resolution of the National Health Council (nº 196/96) were fulfilled.

Participants were recruited via advertisements in social media pages, e-mail, and other media outlets. In addition, an active telephone search was made for patients who participated in Ohno's master's degree research (2017). The evaluation was carried out through video conference (Google Meet) that was recorded with the authorization of the participants.

Data collection was divided into three stages. In the first, the participants were screened, and the measures of primary results (depressive and anxious symptoms) were collected, which were added to the baseline of the patients selected for the intervention. In the next stage, before the beginning of the first meeting of the group, the measures of secondary outcomes (QoL and specific suffering of diabetes) were collected, which were also added to the baseline of the study. Immediately after the end of the intervention, all primary and secondary measures were collected again.

Shortly after the initial screening interview, participants received a verbal return with preliminary results saying whether they were eligible for the intervention. Eligible people were asked to wait for a new contact. For the ineligible participants who needed and were interested in receiving psychotherapeutic intervention, a list was provided with contact of professionals and institutions.

The intervention: Psychoeducational Program for People with Diabetes (PROPSID)

The Program took place over the course of 8 weeks. The weekly group meetings had an approximate duration of 90 minutes. The eight meetings were grouped into five modules that addressed: (1) the cognitive models of anxiety and depression, focusing on the implications and consequences that the symptomatology of these disorders have on patient's routine and diabetes treatment; (2) the use of psychiatric medication, some consequences of drug interaction in the patient's QoL, the importance of diabetes self-care and the need to seek psychological care as well as any other medical specialties; and (3) strategies to deal with diabetes and regulate emotions. All meetings, except for the first one, followed a standard format in which it begins by reviewing the theme presented in the previous meeting, clarifying the possible doubts that emerged throughout the week. After that, a brief exhibition and discussion on the theme of the session is held accompanied by practical and interactive activities to improve understanding and reinforce the content worked. At the end, an evaluation of the meeting is made, paying attention to the doubts and suggestions of the patients (see details in Table 1). PROPSID was developed by Ohno et al. (In press).

The intervention was delivered in online format, by videoconference, using the Zoom platform. The group was led by two psychologists (therapist and co-therapist), with experience and training in CBT and knowledge about diabetes. A clinical physician, a psychiatrist and a nutritionist also participated in specific meetings. Participants received a digital copy (in PDF format) of the Patient's Handbook. All sessions were recorded, with prior consent of the participants.

Data analysis

All data were analyzed in the SPSS 25.0 (*Statistical Package for Social Sciences* 25.0) program. At first, descriptive analyses of means, standard deviations and percentages of sociodemographic variables and scores of scales and subscales were performed. Analyses were conducted to verify data normality using the Shapiro-Wilk test. Although some variables presented normal distribution ($p>0.05$), we chose to use a nonparametric test since the sample is small ($n<30$) and to seek more conservative conclusions (assumptions). Thus, the comparison of the measurements obtained in the pre-test, and post-test was made with the *Wilcoxon signed-rank test*. The magnitude of the intervention effect was calculated using the

Table 1. PROPSID structure and topics

Module	Meeting	Topics of each meeting
1. Strengthening the bond	I. Getting to know the group and their routine	→ Presentation of participants → Definition of rules → Discussion on expectations and doubts
2. Depression and anxiety	II. Addressing depressive symptoms	→ Psychoeducation about depression: concepts, symptoms, and everyday implications → Psychoeducation: association between depression and diabetes → Validation of depressive symptoms and their consequences on the patient's life
	III. Addressing anxious symptoms	→ Psychoeducation on anxiety: concepts, symptoms, and everyday implications → Psychoeducation: association between anxiety and diabetes → Validation of anxious symptoms and their consequences on the patient's life → Fear and anxiety about diabetes complications
3. Treatment	IV. Medication	→ Psychoeducation on psychiatric medication → Drug interaction and its impact on quality of life
	V. Diabetes treatment	→ Treatment of diabetes: patient's involvement in the process (active x passive patient) → Self-care supported → Psychological support: when, how and where to seek → Other specialties: when how and where to seek
4. Coping	IX. Working difficulties	→ Difficulties in controlling the disease → *Coping strategies*
	X. Facing difficulties	→ Emotional consequences of diabetes → Emotional regulation → Problem solving: how to better live with diabetes → Dealing with slips and relapses
5. Closure	XI. Ending of the program	→ Changes in participants and maintenance of improvements → *Feedback* and closure

Formula Z/VN, using null (0.00-0.10), weak (0.11-0.29), moderate (0.30-0.49) and strong (>0.50) (Cohen, 1988) cut-off points. Protocol and clinical change analyses were also performed.

RESULTS

It was found that 11 of the 29 patients who participated in the intervention completed the 8 sessions of the program, resulting in a participation rate of approximately 38%. Among those who left the program, 5 left after the first meeting, 5 participated in 2 meetings, 3 stopped in the third, 2 in the fourth and 1 in the sixth. Most of them interrupted the participation due to incompatibility of schedule, difficulties in rescheduling work or classes in college, for having obtained a new job, and for personal problems. In order to explore the possible existence of key differences between those who completed the program and those who didn't, we compared the demographic and clinical characteristics of the participants who concluded the 8 meetings versus those who participated in fewer meetings. However, there were no significant differences in the measurements, except for vitality (assessed by the SF-36), indicating that in the group that completed the entire program (8 meetings) patients had lower scores (M=23.40; SD=16.21) in comparison to non-completers (M=38.25; SD=21.88). in the group that completed the program, nine were married (81.8%), and had higher education (n=9; 81.9%), eight with DM2 and 4 with DM1. Regarding the treatment regimen, six used only oral antidiabetics, four used regular insulin (injectable) and only one used the insulin pump. Regarding the complications resulting from diabetes, two participants had eye problems and two other foot problems. Also, problems like obesity (n=3) and hypertension (n=2) were present.

Even though they did not complete the program, all participants (n=11) responded to the reassessment form. In the pre-test, 7 patients (63.6%) had current Major Depressive Episode (MD) and 11 (100%) Generalized Anxiety Disorder (GAD), and in the post-test, only 3 (27.3%) had scores for MD and GAD. Another result that drew our attention was that two patients presented risk of mild suicide and Post Traumatic Stress Disorder (PTSD) in the post-test, although in the pre-test only one patient presented a risk of mild suicide and no PTSD. Analyzing these results qualitatively, it was found that this patient experienced significant personal losses in the interval between the two measurements.

The Wilcoxon test showed that anxiety scores in HADS (Z=-2.38; p<0.05), stress (Z=-2.00; p<0.05) and DASS depression (Z=-2.20; p<0.05), functional capacity (Z=-2.20; p<0.05) and social aspects of the SF-36 (Z=-2.01; p<0.05) soon after the intervention were lower than those presented pre-intervention. For the other measurements, there was no statistically significant difference. The magnitude of the intervention effect was considered strong for anxiety, depression, stress, functional capacity, social aspects, mental health, and foot care (values between 0.55 and 0.71), the other measures had values considered

moderate, weak, or null. Table 2 presents all the results of the pre-test and post-test measures of the intervention related to depressive, anxious, stress and quality of life symptoms.

Regarding the evaluation of the intervention, as measured by SATIS-BR, the average overall satisfaction observed was 3.85 indicating a moderate level of satisfaction with the competence, understanding, help and welcome of the team. The patients pointed out that the themes worked were good (*M*=4.63; *SD*=0.50) and important (*M*=4.72; *SD*=0.65), that the team was good (*M*=4.81; *SD*=0.40), they felt good participating in the program (*M*=4.45; *SD*=0.52), stating that the program helped them to accept and understand diabetes, improve self-care, pay more attention to what they felt and thought, became more confident and learned to ask for help if necessary.

DISCUSSION

The main objective of the present study was to investigate the existence of improvements in depressive and anxious symptoms, Quality of Life (QoL) and diabetes treatment adherence after participating in an online-based CBT program called PROPSID. The results indicated that there was a decrease in depressive symptoms, being consistent with other studies in the area (Nobis et al., 2015; Newby et al., 2017). There was also a reduction in anxiety and stress levels after the intervention. The high level of these symptoms in the pre-test may have been due to the presence of concerns and difficulties caused by diabetes, but also due to the social isolation imposed by the pandemic of the new coronavirus (COVID-19), which had a significant impact on this population. This is because individuals with chronic diseases have a higher risk for the development of severe forms of COVID-19 as pointed out by Wang et al. (2020). The aspect that raises this risk is related to poor glycemic control and/or dysregulations in the immune system (Guo et al., 2020). This theme was frequent during the meetings and properly addressed, which may explain the reduction of these scores. By decreasing the level of stress in the body, it is possible to regulate serotonin levels that are also related to anxiety and depression (Prabhakar et al., 2015; Zanchetta et al., 2016).

Table 2. Comparisons between primary and secondary pre-test and post-test measures.

Measure		Pretest	Test	Z	d
		Average (SD)			
Hads	Anxiety	12,28 (1,90)	9,00 (3,65)	-2,38*	0.71[d]
	Depression	8,82 (3,34)	8,30 (3,30)	-1,18	0.36[c]
DASS	Stress	23,27 (4,12)	16,20 (10,04)	-2,00*	0.60[d]
	Anxiety	14,54 (6,01)	11,40 (9,38)	-1,19	0.36[c]
	Depression	16,54 (7,54)	10,80 (9,53)	-2,20*	0.66[d]
QAD	General power	5,72 (3,74)	6,80 (3,82)	-0,93	0.28[b]
	Specific feeding	9,54 (4,18)	8,00 (3,39)	-1,41	0.42[c]
	Physical activity	4,00 (2,86)	4,80 (3,11)	-1,39	0.42[c]
	Blood glucose monitoring	9,00 (5,20)	8,40 (5,03)	-0,68	0.20[b]
	Watch your feet	8,91 (5,50)	13,60 (6,31)	-1,87	0.56[d]
	Medication	16,91 (5,41)	17,80 (3,42)	-0,36	0.11[b]
MAT	Adhesion	5,15 (0,58)	5,35 (0,53)	-0,93	0.28[b]
PAID	Problems	54,70 (26,77)	43,40 (23,34)	-1,19	0.36[c]
SF-36	Functional capacity	58,18 (22,05)	40,80 (21,00)	-2,20*	0.66[d]
	Limitation by physical aspects	45,45 (40,02)	20,60 (31,77)	-1,52	0.46[c]
	Pain	41,72 (24,77)	23,10 (16,92)	-1,68	0.51[c]
	General health status	39,54 (24,74)	34,52 (28,66)	-0,84	0.25[b]
	Vitality	27,27 (23,49)	23,40 (16,20)	-0,83	0.25[b]
	Limitation by social aspects	54,54 (34,12)	35,05 (34,44)	-2,03*	0.61[d]
	Limitation by emotional aspects	21,21 (34,23)	15,63 (26,99)	-0,42	0.13[b]
	Mental health	41,81 (19,54)	33,70 (21,56)	-1,84	0.55[d]

Note. HADS: Hospital Anxiety and Depression Scale; DASS: Depression Anxiety Stress Scale 21; QAD: Self-Care Activities Questionnaire with Diabetes; MAT: Measure of Treatment Adhering; PAID: Questionnaire to assess the problems related to Diabetes; SF-36: *Medical Outcomes Study 36 - Item Short - Form Health Survey*
a: null effect; b: weak effect; c: moderate effect; d: strong effect
*p<0.05

Two instruments were used to assess anxiety and depression (HADS and DASS-21). However, it was found that there was a significant difference after the intervention in the anxious symptoms measured by HADS, but not by the DASS-21. The same pattern was seen with depression, which was significantly high in DASS-21, but not in HADS. These results can be interpreted based on how instruments measure these constructs. Despite measuring theoretically equivalent concepts, the differences between the anxiety and depression subscales of both instruments go beyond simple words. The structure of the questions in DASS is aimed at exploring the occurrence of negative emotional symptoms throughout the previous week, while the questions in HADS explore both negative and positive symptoms. It is known that the answers to questions of this type are influenced by several factors, such as the way the questions were elaborated, the format of the questionnaire and the context in which it is applied (Truijens et al., 2021).

Regarding QoL, there was a reduction in the aspects of functional and social capacity of those who participated in the intervention. A similar result was found by Faria et al. (2013) in a study that evaluated QoL in people with DM before and after participation in a five-month educational program. Despite the patients' reports of improvement in self-care, there was no statistically significant difference in the instruments used to evaluate this construct. This result may be related to the fact that changes in attitudes vary from person to person and may require more time to consolidate in self-care attitudes that improve glycemic control and, consequently, the QoL of the patient (Faria et al., 2013). Future studies with larger samples and follow-up evaluations may answer whether this hypothesis is true.

Generally, dropout rates in internet interventions range from 2% to 83%, with an average of 31% (Melville et al., 2010). Thus, the rate of 38% of the participants in the present study, considering a moderate dropout rate, is similar to those found in other programs (Franco et al., 2018). Several factors can influence this aspect, from the therapeutic relationship to the absence of a silent place to participate in the intervention, as pointed out by Melville et al. (2010). To increase treatment adherence, for example, Nobis et al. (2015) used as an additional resource daily motivational phone calls, however, the number of participants who left the group with the phone calls, about 31, was higher than the control group (only 16).

The qualitative data obtained in the study suggest that there was clinically significant improvement in social skills, increased behavioral repertoire, greater acceptance of the disease and the well-being of the participants. These results relate to subjective perceptions and are therefore not susceptible to generalization. Studies indicate that CBT group interventions provide significant improvement in interpersonal aspects (Neufeld, 2011).

The patients also reported the importance of the multidisciplinary approach in PROPSID meetings, which contributed to the demystification of the disease and, thus, felt more confident to be active in their own treatment and take better care of themselves. These reports are consistent with what has already been pointed out in the literature that multiprofessional actions with these patients, involving psychotherapy and psychiatry in the management of psychic aspects, together with other health professionals, increases diabetes care (Sartorius, 2018, Lloyd et al., 2018).

CONCLUSION

After finishing the intervention, it was perceived by quantitative and qualitative data that there was a significant decrease in symptoms of anxiety, depression and stress, and clinically perceived improvement of self-care and QoL. Because it is a quasi-experimental study, some limitations should be emphasized. The first one is that the sample is too small and mostly composed of women. Moreover, the study design did not allow the control of other variables that may have interfered in the results. There was also no control or comparison groups with other interventions already known in the literature due to the low sample size, nor follow-up of the participants. However, despite these limitations, the preliminary results found in this study are promising. Future studies should be conducted to state the efficacy of PROPSID. To date, few studies have addressed aspects of anxiety in people with DM, and our study is one of the firsts in the national scenario to associate these aspects with depressive symptoms and their impacts on QoL and self-care in patients with diabetes.

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