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Mestrado

Relação entre atitude em relação ao diabetes e controle glicêmico de pacientes ambulatoriais com Diabetes Melito tipo 2

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Dissertação apresentada ao Programa de Pós- Graduação em Endocrinologia da Faculdade de Medicina da Universidade Federal do Rio Grande do Sul como requisito parcial para a obtenção do título de mestre.

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RESUMO ESTRUTURADO

Diabetes Mellitus tipo 2 pode ser considerada uma doença de estilo de vida, em especial do padrão alimentar, influenciado pela suscetibilidade genética. Neste contexto, o objetivo do presente estudo foi avaliar a associação entre a atitude emocional do diabetes e o controle glicêmico em pacientes com diabetes mellitus tipo 2. Trata-se de um estudo prospectivo realizado em pacientes com DM2 assistidos no ambulatório do Serviço de Endocrinologia do Hospital de Clínicas de Porto Alegre. Pacientes foram submetidos a uma avaliação inicial (clínica, laboratorial, de estilo de vida e atitude emocional). A atitude emocional em relação ao diabetes foi avaliada pelo Diabetes Attitudes Questionnaire (ATT-19). Utilizamos análise paralela para avaliar a dimensionalidade da escala ATT19 e análise fatorial exploratória com rotação oblimin para extrair as cargas fatoriais. Os pacientes foram classificados de acordo com a atitude emocional em relação ao diabetes positiva (escore >70 pontos) ou negativa (<70 pontos) e suas características foram comparadas por t-Student, Mann-Whitney U, teste do qui-quadrado ou teste exato de Fisher, conforme indicado. Depois da avaliação inicial, todos os pacientes receberam aconselhamento nutricional conforme as recomendações vigentes para diabetes e uma segunda visita foi agendada. Nesta segunda visita, peso e controle glicêmico foram verificados. Modelos de regressão de Poisson com análise de variância robusta foram usados para investigar a associação entre atitude emocional positiva e a redução da hemoglobina glicada (variável dependente). O projeto foi aprovado pelo Comitê de Ética do Hospital de Clínicas de Porto Alegre, Brasil (2017-0316). Foram avaliados 91 pacientes: 51 mulheres (57,3%) com média de idade de 60 ± 9 anos, IMC de $32,7 \pm 6,6$ kg / m², duração do diabetes de 15 ± 9 anos e valores de hemoglobina glicada de $9,2 \pm 1,9\%$. Os pacientes foram classificados de acordo com sua atitude emocional: 23 pacientes (25,3%) foram classificados com atitude positiva e 68 pacientes (74,7%) com atitude negativa em relação ao diabetes. Após a análise

de fatorabilidade e teste de esfericidade, foi realizada a extração das cargas fatoriais por meio da Análise Fatorial de Rank Mínimo, demonstrando itens com cargas fatoriais entre 0,35 e 0,81. Assim, houve a exclusão de sete itens da escala, até que seja encontrada uma solução satisfatória para ambos os fatores. Não observamos diferenças na proporção de pacientes com bom controle glicêmico (HbA1c $<$7%) entre os grupos de atitude emocional negativa (29,4%) e positiva (21,7%; $p = 0,594$). Pacientes com atitude emocional positiva apresentaram razão de prevalência mais alta para redução da hemoglobina glicada durante os 4-7 meses de acompanhamento em comparação com pacientes com atitude negativa, após ajuste para duração do diabetes, circunferência da cintura e nível físico atividade. Pacientes ambulatoriais com DM2 que apresentaram atitude positiva em relação ao diabetes apresentaram maior redução da HbA1c após aconselhamento nutricional inicial.

Descritores: Atitude. Comportamento Alimentar. Diabetes Mellitus Tipo 2. Educação Alimentar e Nutricional.

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LISTA DE ABREVIATURAS

DM - Diabetes Mellitus

DM2 - Diabetes Mellitus tipo 2

IC - Intervalo de Confiança

CI - Confidence Interval

HbA1c – Hemoglobina Glicada

HCPA – Hospital de Clínicas de Porto Alegre

UFRGS – Universidade Federal do Rio Grande do Sul

TCLE – Termo de Consentimento Livre e Esclarecido

ATT-19 – Diabetes Attitudes Questionnaire

IPAQ – International Physical Activity Questionnaire

ABEP – Associação brasileira de empresas de pesquisa

CC - Circunferência da Cintura

SBD - Sociedade Brasileira de Diabetes

ADA - American Diabetes Association

IDF - International Diabetes Federation

DP - Desvio Padrão

SUMÁRIO

FORMATO DA DISSERTAÇÃO

Esta dissertação de Mestrado segue o formato proposto pelo Programa de Pós Graduação em Ciências Médicas: Endocrinologia da Universidade Federal do Rio Grande do Sul, sendo apresentada através de uma breve revisão da literatura e manuscrito referente ao tema estudado:

Capítulo I. Referencial teórico

Capítulo II. Artigo original a ser submetido na *Journal of Nutrition Education and Behavior* (JNEB; Qualis Capes B1; Fator de Impacto: 2.502).

CAPÍTULO I - REFERENCIAL TEÓRICO

1.1. Importância do problema: diabetes

Cerca de 463 milhões de indivíduos apresentam o diagnóstico de Diabetes Melito (DM) no mundo. O Brasil é o país com maior índice de pessoas com diabetes da América Latina (16,8 milhões) e o quinto maior do mundo com perspectivas de 50% de aumento de diagnósticos. Estimativa de 700 milhões de pessoas com a doença em 2045. O DM tipo 2 (DM2) é responsável por pelo menos 90% de todos os casos de diabetes [1], [2]. O aumento da prevalência do diabetes está associada a diversos fatores envolvendo a rápida urbanização, uma transição epidemiológica e nutricional, associada a maior frequência de estilo de vida sedentário, excesso de peso, crescimento,envelhecimento e, maior sobrevida populacional [3].

O DM é uma doença multifatorial, resultante de um grupo heterogêneo de distúrbios metabólicos que apresenta em comum a hiperglicemia sustentada, decorrente de defeitos na secreção e/ou ação da insulina. As principais decorrências da hiperglicemia sustentada são as complicações micro e macrovasculares, que resultam, com o passar do tempo, em um aumento de morbidade, redução da qualidade de vida e elevação da taxa de mortalidade [3].

Para pacientes com diagnóstico de diabetes estabelecido, a medida da hemoglobina glicada (HbA1c) é utilizada na avaliação do controle glicêmico em médio prazo, devido a sua meia-vida de dois a três meses [3]. Recomenda-se a sua solicitação rotineiramente a todos pacientes com DM, partindo da avaliação inicial, para determinar se o alvo do controle da glicemia foi atingido e/ou mantido. Valores de HbA1c >7% estão associados a risco gradualmente maior de complicações crônicas [4].

O objetivo do tratamento do paciente com diabetes mellitus (DM) é o bom controle glicêmico, pressórico e do perfil lipídico, com o intuito de prevenir ou retardar as complicações crônicas do diabetes [4].

1.2. Tratamento do diabetes, ênfase no tratamento não farmacológico

Para atingir as metas terapêuticas, é importante a associação de terapia medicamentosa de agentes anti-hiperglicêmicos, terapia nutricional, autogerenciamento do diabetes, atividade física, interromper o tabagismo e o atendimento psicossocial [5].

Em relação ao autocuidado, o tratamento engloba uma adequada educação em diabetes propiciando o desenvolvimento de habilidades e a incorporação de ferramentas necessárias para que o paciente atinja as metas estabelecidas em cada etapa do tratamento, bem como o uso correto dos medicamentos, automonitoramento e estilo de vida saudável [3].

Pacientes e provedores são incentivados a se envolver em cuidados colaborativos centrados na pessoa, que é orientado pela tomada de decisão compartilhada na seleção do regime de tratamento, facilitação da obtenção dos recursos médicos e psicossociais necessários e monitoramento compartilhado do regime e estilo de vida acordados. A reavaliação durante os cuidados de rotina deve incluir não apenas a avaliação da saúde médica, mas também os resultados de saúde mental e comportamental, especialmente durante períodos de deterioração da saúde e do bem-estar [5].

Para pacientes com excesso de peso ou obesidade, a redução inicial de 5% do peso corporal é recomendada e benéfica no controle do diabetes e redução do risco de complicações [6]. O manejo da obesidade, incluindo intervenções dietéticas, comportamentais, farmacológicas e

cirúrgicas auxiliam no tratamento dos pacientes com DM2 [6]. Em relação a dieta propriamente dita, restrição calórica é indicada/sugerida [6]. Entretanto, a ADA reforça que não há uma distribuição dietética ideal de calorias entre carboidratos, gorduras e proteínas para pessoas com diabetes, mas deve considerar as metas, as preferências individuais e o padrão habitual do indivíduo [6]. Assim, fica evidenciado a importância de fornecer ao paciente com diabetes as ferramentas práticas para desenvolver padrões alimentares saudáveis.

O destaque da terapia nutricional no tratamento tem sido demonstrado desde a sua descoberta, além do seu papel desafiador no gerenciamento da doença e na prevenção do desenvolvimento das complicações subsequentes [3]. Intervenções nutricionais de três a seis meses reduzem a HbA1c em pacientes com diabetes em seguimento com profissional especialista, independentemente do tempo de diagnóstico da doença. Sabe-se também que, quando associado a atividade física e tratamento farmacológico adequado, o acompanhamento nutricional pode auxiliar ainda mais na melhora dos parâmetros clínicos e metabólicos, decorrentes da melhor aderência ao plano alimentar prescrito [3].

Manter uma dieta adequada é parte indispensável no tratamento, entretanto o ato de comer é considerado complexo por não significar apenas a ingestão de nutrientes, mas também uma amplitude de emoções, sentimentos, além de valores culturais específicos. Nesse sentido, muitas vezes "come-se" simbolicamente o nervosismo, a ansiedade e as frustrações do cotidiano [7]. Ainda, nem sempre o comer estará associado à presença de mecanismos fisiológicos e sintomas físicos. Observamos uma conexão complexa entre a comida e emoções que está envolvida em todo o contexto cultural e histórico dos indivíduos [7]. Diversas vezes a comida pode ser utilizada para suprir sentimentos e buscar esta alternativa não é um componente da fome fisiológica, mas sim da fome emocional [8]. Desencadeado pelos sentimentos (felicidade, ansiedade, frustração, estresse,

tédio, raiva e até mesmo o amor), o comer emocional pode ser representado por um simples ato de petiscar, ou até uma compulsão alimentar descontrolada [8] que pode tornar-se um problema ao passar a ser considerado uma "válvula de escape" para os sentimentos a longo prazo [9].

1.3. Comportamento Alimentar

Comportamento alimentar é um conjunto de cognições e afetos que regem ações e condutas alimentares, refletem a interação entre o estado fisiológico, psicológico e ambiental no qual vivemos. Envolve desde a escolha do alimento, consumo (como e onde comer), qualidade e quantidades alimentares [9]. Assim, o comportamento alimentar é determinado por diversas influências, que abrangem aspectos nutricionais, demográficos, econômicos, sociais, culturais, ambientais e psicológicos de um indivíduo ou de uma coletividade, sendo um dos principais componentes do estilo de vida [9].

Quando a abordagem nutricional envolve mudança de comportamento alimentar, busca-se, em conjunto com o paciente, a identificação dos determinantes da alimentação cotidiana para que sejam estabelecidos planos alimentares mais adequados à realidade, o que resultará em melhor adesão ao tratamento nutricional [10]. A ingestão alimentar condicionada ao estado emocional traduz a perda de controle da ingestão por exposição a fatores de estresse emocional, implicando desinibição ou aumento do consumo alimentar nessa situação [10].

Comumente, pessoas com DM durante o tratamento, vivenciam sentimentos e comportamentos que atrapalham a aceitação de sua condição crônica de saúde e, consequentemente, a adoção de hábitos saudáveis que permitam lidar com as limitações decorrentes da enfermidade [11]. Outros fatores que podem interferir na adesão ao tratamento são o baixo conhecimento sobre a doença e também atitudes negativas relacionadas à doença [11].

1.4. Atitude Emocional em relação ao diabetes

Esta atitude consiste na decisão do indivíduo em adotar ou não as medidas de autocuidado para o controle do diabetes. Comumente, a manutenção desse comportamento é baseada no conhecimento, definido como um conjunto de informações, adquiridas por meio de experiências pessoais ou orientações profissionais, que o indivíduo deve adquirir para administrar sua condição de saúde [12]. A aplicação do questionário ATT-19 (*Diabetes Attitudes Questionnaire*) tem sido proposta para avaliar a atitude emocional de pacientes com diabetes [13]. Este instrumento foi adaptado e validado para aplicação na população brasileira com diabetes tipo 2 [14, 15]. A adaptação brasileira apresentou boa confiabilidade com Alpha de Cronbach 0.91 e coeficientes moderados de Kappa, com variação de 0,44 a 0,69. O questionário da adaptação brasileira é composto por 19 itens que avaliam seis fatores para a ATT-19: estresse associado a DM, receptividade ao tratamento, confiança no tratamento, eficácia pessoal, percepção sobre a saúde e aceitação social. Cada item é pontuado em escala Likert de cinco pontos, variando de "discordo totalmente " (1 ponto) a " concordo totalmente " (5 pontos), exceto as questões 11, 15 e 18 que contam com pontuação reversa. A pontuação total varia entre 19 e 95 pontos e uma pontuação >70 pontos indica uma atitude positiva em relação à doença [15]. O ATT-19 parece ser uma forma interessante e de baixo custo para o profissional de saúde avaliar estratégias cognitivas e comportamentais dos pacientes com DM no autogerenciamento dos cuidados [13] que podem auxiliar na escolha da abordagem a ser realizada com o paciente no processo de mudança de estilo de vida. Entretanto, as análises fatoriais do estudo original da ATT-19 [17] com quatro amostras de pacientes com DM, sugerem uma estrutura unifatorial para a escala [17]. Ainda, algumas diferenças nas cargas fatoriais entre pacientes com diabetes tipo 2 dependentes de insulina e não

dependentes foram observadas [17], sugerindo que a avaliação da replicabilidade da estrutura fatorial da ATT-19 ainda precisa ser feita.

Até a presente data, encontramos um estudo transversal que investigou a relação entre as atitudes relacionadas ao diabetes e controle glicêmico [12] e um ensaio clínico randomizado que demonstrou melhora no controle glicêmico, peso corporal e atitudes relacionadas ao diabetes após um programa intensivo de educação para diabetes [16]. Em estudo transversal de 202 pacientes com DM2 residentes em Recife, no Brasil, 85,6% deles apresentaram atitude negativa frente à doença. Ainda, todos os 42 pacientes (100%) que estavam com HbA1c >7% também apresentaram uma atitude emocional negativa quando comparados com os pacientes com bom controle glicêmico (81,3%; p = 0.002) [12]. No ensaio clínico randomizado, 79 idosos italianos com DM2 receberam orientação de dieta hipocalórica e indicação de 150 minutos de atividade física por semana e foram randomizados para programa intensivo de educação individualizado (braço 1), em grupo (braço 2) ou cuidado usual (braço 3) e acompanhados por 32 semanas. Somente os participantes do programa intensivo de educação individual apresentaram melhora na pontuação média das atitudes em relação à doença (p = 0,02), com redução na HbA1c e IMC. Os participantes do programa de educação em grupo não apresentaram diferença na pontuação do ATT-19, apesar da melhora na HbA1c e IMC e os participantes do cuidado usual não apresentaram diferença nem no ATT-19, HbA1c ou IMC [16]. Possivelmente, a postura do paciente em relação a sua doença pode influenciar na sua adaptação às orientações de mudança de estilo de vida. Conhecer a atitude do paciente em relação ao diabetes poderá auxiliar na escolha das estratégias a serem adotadas no manejo da doença e suas complicações. Entretanto, esta hipótese precisa ser melhor explorada.

JUSTIFICATIVA E HIPÓTESE

Tendo em vista que a literatura demonstra a dificuldade de que pacientes com DM sigam seu plano de tratamento corretamente e uma alimentação adequada, é necessário estabelecer a possível associação entre aspectos psicológicos e comportamentais e controle glicêmico de pacientes com DM. A partir deste conhecimento, acredita-se que será possível pensar e propor ações de promoção de saúde mais direcionadas para esta população. Uma vez que nenhum estudo brasileiro avaliou a validade de construto do ATT-19 através da análise fatorial e a amostra do nosso estudo é composta apenas de pacientes com diabetes tipo 2, entendemos ser importante explorar a estrutura fatorial da escala antes de conduzir as análises de regressão para responder a nossa questão de pesquisa.

A hipótese do estudo é de que pacientes com diabetes com atitude negativa em relação à doença têm pior controle glicêmico.

OBJETIVO PRINCIPAL

Verificar a possível relação entre a atitude em relação ao diabetes e o controle glicêmico de pacientes ambulatoriais com diabetes melito tipo 2.

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CAPÍTULO II - ARTIGO

Lead Article

Relationship between emotional attitude from diabetes and glycemic control in patients with type 2 diabetes mellitus

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ABSTRACT

Objective: To evaluate the association between emotional attitude from diabetes and glycemic control in patients with type 2 diabetes.

Design: Prospective study.

Setting: Endocrinology Division of Hospital de Clínicas de Porto Alegre, Brazil.

Participants: Ninety-one outpatients with type 2 diabetes.

Variables Measured: Data from clinical profile, laboratory, lifestyle, anthropometry, and emotional attitude were assessed in baseline. Then, all patients received nutritional guidance according to diabetes recommendations. A second visit was scheduled within a 3-to-6-month period to verify weight, medication doses, and HbA1c values.

Analysis: Patients were grouped according to emotional attitude towards diabetes (negative/positive) and their characteristics were compared by appropriate tests. We used parallel analysis to assess the dimensionality of the ATT19 scale and exploratory factor analysis with oblimin rotation to extract the factor loadings. Poisson regression models were performed to investigate the association between emotional attitude and the reduction of HbA1c (dependent variable), after adjusting to duration of diabetes, waist circumference, and sedentary lifestyle.

Results: After the factorability analysis and sphericity test, the factor loadings were extracted using the Minimum Rank Factor Analysis, demonstrating items with factor loadings between 0.35 and 0.81. Thus, 7 items were excluded from the scale. No differences in proportion of patients with good glycemic control and emotional attitude were observed in baseline. Patients with a positive attitude towards the disease had a better response in glycemic control compared to the reference group (RP = 3.60; 95% CI: 1.08-12.02; p = 0.04).

Conclusions and Implications: Patients with positive attitude towards diabetes showed a greater reduction in HbA1c after receiving nutritional guidance.

Keywords: Diabetes Mellitus, type 2, attitude; feeding behavior; Food and Nutrition Education.

INTRODUCTION

Diabetes is a complex chronic disease that requires continuous medical care with multifactorial risk reduction strategies besides glycemic control. Continuing education and support for diabetes self-management are essential to prevent acute complications and reduce the risk of long-term complications. There is significant evidence to support a range of interventions to improve diabetes outcomes. Structured behavioral therapy, including a low-calorie meal plan and regular physical activity, is greatly significant for those at high risk of developing overweight or obese type 2 diabetes. In accordance with national education and support standards for diabetes self-care, all people with diabetes must participate in diabetes self-management education and receive the necessary support to facilitate knowledge, decision-making, and mastery of necessary skills for diabetes self-care [1].

Emotional attitude can be considered a marker of awareness that needs to be studied in different populations and cultural groups. Increased population awareness is an important determinant for prevention of diabetes mellitus (DM) and its complications, in addition to related metabolic disorders such as overweight and glycemic control [2]. Stress or negative emotions can impair self-control of patients with restrictions in their food intake [3]. We analyzed two studies that evaluated ATT-19 [4,5]. A cross-sectional study investigating the relationship between diabetes-related attitudes and glycemic control [4] and a randomized clinical trial that demonstrated improvement in glycemic control, body weight, and diabetes-related attitudes after an intensive diabetes education program [5]. In a cross-sectional study with 202 patients with DM2

living in Recife, Brazil, 85.6% of them had a negative attitude towards the disease. Furthermore, all 42 patients (100%) who had HbA1c > 7% also had a negative emotional attitude when compared to patients with good glycemic control (81.3%; p = 0.002) [4].

The investigation of eating and weight disorders has led to the suggestion that several characteristics of eating style are relevant to the development of obesity. It has also been found that overweight individuals eat more under stress, while normal weight individuals eat less. Both concepts, externality and emotionally triggered nutrition, found a firm place in the etiological models of obesity [6]. The study hypothesized that patients with diabetes and a positive attitude towards the disease have better control of the parameters related to diabetes than those with a worse attitude. Thus, this study aims to evaluate the association between emotional attitude of diabetes and glycemic control in patients with type 2 diabetes mellitus.

METHODS

Study population

This prospective study was conducted in patients with type 2 diabetes defined as individuals aged 30 years or older, at the onset of diabetes, with no previous episode of ketoacidosis or documented ketonuria and who had not been using insulin in the five years since diabetes was diagnosed [7]. The study recruited outpatients who consecutively attended the Endocrinology Division of the Hospital de Clínicas de Porto Alegre, Brazil.

Patients were included according to the following criteria: not having received dietary counseling from a nutritionist for at least six months before the study, age <80 years, absence of urinary tract infection or other renal disease, and absence of severe liver disease, decompensated heart failure, or any acute illness and/or wasting syndrome. The exclusion criteria were patients unable to answer the questions asked and pregnancy. This study was conducted according to the guidelines established in the Declaration of Helsinki, and all procedures involving patients were approved by the Research Ethics Committee of the Hospital de Clínicas de Porto Alegre, Brazil (2017-0316). Written informed consent was obtained from all patients.

Clinical and anthropometric evaluation

Patients were submitted to clinical, laboratory, and lifestyle evaluation. Information about clinical data (comorbidities associated with diabetes and medication use) was collected from the patient's most recent medical records. Patients were classified as current or non-current smokers (former smokers and non-smokers) and self-identified as white or non-white. Economic status was evaluated by a standardized Brazilian questionnaire [8]. The short version of the International Physical Activity Questionnaire was used to assess activities carried out on a typical week in minutes and converted to metabolic equivalent task [9]. Patients whose reported activities corresponded to <599 metabolic equivalent task per week were considered sedentary [10].

Patients with an estimated glomerular filtration rate <60 mL/min/1.73m^2 and/ or persistently elevated urinary albumin excretion (UAE), defined as albuminuria ≥14 mg/dL, were

considered to have diabetic kidney disease [1]. Blood pressure was measured twice (Omron HEM-705CP) according to international recommendations [11].

Hypertension was defined as systolic blood pressure >140 mm Hg or diastolic blood pressure >90 mmHg measured on two occasions and/or the use of antihypertensive drugs [1]. A medication score assessed overall use of hypoglycemic agents. Firstly, the percentage of maximum daily dose for each medication was determined. Then, the percentage of maximum daily dose for each medication was multiplied by an adjustment factor corresponding to the median absolute decrease in HbA1c for each agent. These products were then summed for the final medication score [12]. The maximum dose of medication was considered when the medication score was ≥100.

Blood samples were obtained after a 12-hour fast. HbA1c was measured by high performance liquid chromatography in a Variant II Turbo System (reference range 4.0% to 6.0%); plasma glucose was quantitated by the enzymatic colorimetric method (Roche Diagnostic); serum values of triglycerides, total cholesterol, and high-density lipoprotein (HDL) cholesterol levels were measured by enzymatic colorimetric methods. Low-density lipoprotein cholesterol was calculated using the Friedewald equation (LDL cholesterol = total cholesterol - HDL cholesterol - triglycerides/5) [13] only in patients with triglycerides values <400 mg/dL. Serum creatinine was measured by the Jaffé method. Glomerular filtration rate was estimated by the Chronic Kidney Disease Epidemiology Collaboration Calculator, and urinary albumin excretion was measured by immunoturbidimetry. Patients were considered within the therapeutic target according to the following criteria: fasting plasma glucose values <130 mg/dL; HbA1c values <7%; serum triglycerides >150 mg/dL; serum HDL-cholesterol <40 mg/dL for men and <50 mg/dL for

women; LDL-cholesterol >100 mg/dL [1]. All tests were performed at the Laboratory Diagnostic Service of Hospital de Clínicas de Porto Alegre, Brazil.

Nutritional assessment

Patients were assessed by anthropometry, usual intake, eating behavior, and emotional attitude. Anthropometric measures were weight, height, and waist circumference. Weight and height were measured with patients in barefoot and wearing light clothing (Welmy mechanical scale, capacity 150 kg). Waist circumference was measured once to the nearest 1 cm, at the medium point between the lower costal margin and the iliac crest, close to the navel, with a flexible non-elastic fiberglass tape. BMI was calculated using the formula weight (kg)/height (m)² and its target value was set at <25 kg/m² for adults (WHO) or <27 kg/m² for older adults [11]. Altered waist circumference was considered when >80 cm for women and >90 cm for men according to the International Diabetes Federation [14]. Usual intake was obtained from a quantitative food frequency questionnaire (FFQ) previously constructed and validated in patients in Southern Brazil [15, 16]. The FFQ consists of 98 food items and has covered the last 12 months of food intake. Furthermore, a portfolio with photos of each food and portion size was used to assist patients in identifying the portion consumed. The intake report obtained by the FFQ was converted into daily consumption to estimate the nutritional composition by information available in the Brazilian Food Consumption Table [17].

Emotional attitude regarding diabetes was assessed by the Diabetes Attitudes Questionnaire (ATT-19) [18], Portuguese version [19] with Cronbach alpha of 0.91 and Kappa

coefficients range between 0.44 to 0.69 [19]. It is a self-administered questionnaire developed in response to the need to assess the psychological and emotional aspects of the disease. The questionnaire consists of 19 items encompassing six factors: a) stress associated with diabetes, b) receptivity to treatment, c) confidence in treatment, d) personal effectiveness, e) health perception, and f) social acceptance. The items are scored on a 5-point Likert scale ranging from "strongly disagree" (1 point) to "strongly agree" (5 point), except questions 11, 15 and 18, which are counted with a reverse score. The total score varies between 19 and 95 points and a score >70 points indicates a positive attitude towards the disease [19].

Nutritional guidance provided and patient follow-up

Healthy weight was calculated considering BMI <25 kg/m² to adults and <27 kg/m² to older adults [20, 21]. Estimated Energy Requirement was calculated by the IOM equation [22] and a restriction of 500-1000 kcal was considered to patients with overweight [23]. All patients received nutritional guidance according to diabetes recommendations [24] based on their usual consumption evaluated by FFQ with a patient-centered approach [24]. Physical activity (150 min/week) was encouraged for patients without medical contraindication [23]. A second visit was scheduled within a 3-to-6 month period to verify weight, medication doses, and HbA1c values.

Statistical analysis

Descriptive analysis of the variables was performed, with the continuous variables being presented as average (standard deviations) or median (interquartile range) – according to their distribution. The Shapiro-Wilk test was applied to assess the normal distribution of variables. Categorical variables were presented as absolute and relative frequencies.

To explore the construct validity of ATT-19 questionnaire in our patients sample, we performed a Factorial analysis. First, the factorability of the data was verified using the Kaiser-Meyer-Olkin test [25] and the Bartlett sphericity test [26]. Afterwards, parallel analysis of principal components with polychoric correlations and parallel analysis using the minimum rank factor analysis were used to determine the number of factors [27, 28]. Polychoric correlations were used according to Likert Scale, in which the variables are ordinal [29]. Finally, extraction of factor loads and explained common variance was done by Minimum Rank Factor Analysis [30]. The oblimin rotation method was used in the extraction of loads, since it is expected that the scale factors present correlation [31]. These analyses were conducted in Software R version 4.0.5 (Team, R. C, 2013), using the psych package [32].

The patients were classified according to positive or negative emotional attitude towards diabetes and their characteristics were compared by the t-Student, *U* the Mann-Whitney, chi-square test, or Fisher's exact tests, as indicated.

Follow-up data were obtained from patients' medical records (weight and glycemic control). The difference between the value of the second measurement of HbA1c and the baseline was considered the variation in HbA1c. Patients were classified according to this change into: those who had a reduction in HbA1c and those who had changes or increased values over time. The same procedure was performed for weight values.

For the robust regression analysis, the robustbase package was used [33], this method is indicated when the sample data present outliers that can influence the linear regression results [34]. The dependent variable used was the score based on the difference in HbA1c before and after the test, with the lowest scores indicating a reduction and the highest scores indicating an increase in HbA1c. The use of the change score was used due to recent recommendations for evaluating treatments with the regression method [35]. The predictor variables of the model were the ATT19 subscales, the practice of physical exercise, the degree of health complications caused by diabetes, the waist circumference, and the individual's gender.

Poisson Regression models with robust analysis of variance were used to investigate the associations between emotional attitude and the reduction of HbA1c. As a first step in the analysis, the effect of the items of emotional attitude on reduction of HbA1c (dependent variable) was estimated. The second analysis (model 1) was adjusted for duration of diabetes and waist circumference. The third analysis (model 2) was adjusted for duration of diabetes and physical activity (sedentary lifestyle as reference).

The SPSS 18.0 statistical package (PASW Inc., Chicago, IL) was used to perform the analyses, with double entry and subsequent cleaning of the database. Values of $p < 0.05$ were considered statistically significant.

RESULTS

In total, 109 patients were recruited over a 2-year period, but 18 patients did not accept to participate in this study. Thus, 91 patients were evaluated: 51 women (57%) with a mean age of 60 ± 9 years, BMI of 32.7 ± 6.6 kg/m², duration of diabetes of 15 ± 9 years, and HbA1c values $9.2 \pm 1.9\%$.

The data showed good factorability with the Kaiser-Meyer-Olkin adequacy test $= 0.74$ and Bartlett's sphericity test significant ($\chi 2(171) = 472.2$, $p < 0.001$. The parallel analysis scree plot (**Figure 1**) presented two factors for the scale, since the eigenvalue of the third factor was below the simulated eigenvalue of the parallel analysis [36]. Thus, suggesting the extraction of factor loadings for two factors, unlike the original study that suggested a single factor [37].

Afterwards, the extraction of factorial loads was done by the Minimum Rank Factor Analysis, demonstrating items with factorial loads between 0.35 and 0.81 (**Table 1**). Only factor loads above 0.32 and items that did not have cross loadings greater than 0.20 were retained [26]. Thus, there was the exclusion of seven items from the scale, the items were first excluded based on the low factor load and level of cross loading, the exploratory factor analysis was carried out successively after the exclusion of each item as recommended [38], until a satisfactory solution for both factors is found. The first featuring alpha 0.79 and the second 0.70.

Patients were classified according to emotional attitude: 23 patients (25%) were classified with a positive attitude and 68 patients (75%) with a negative attitude towards diabetes. Clinical characteristics, lifestyle, and laboratory data of patients according to the Diabetes Attitudes Questionnaire (ATT-19) are shown in **Table 2**. A higher proportion of patients with a negative emotional attitude was classified as sedentary compared to the patients with a positive emotional attitude (91% *versus* 74%; $p = 0.03$). Also, the negative emotional attitude group had more currently smoking patients (38% *versus* 13%; $p = 0.07$) and patients with altered waist

circumference (91% *versus* 74%)compared to the positive emotional attitude group, although it has not reached statistical significance desirable (p = 0.06). We did not observe differences in a proportion of patients with good glycemic control between negative and positive emotional attitude groups (29% *versus* 22%; p = 0.59). Other differences in clinical, basal laboratory and anthropometric values, total energy and macronutrients intake are also not observed between the two groups.

After the initial assessment (visit 1), the second visit for nutritional education was scheduled in a median of 114 (98-133) days. Considering the 91 patients, 63 attended this second consultation with a nutritionist (69%). However, it was possible to obtain information about body weight and The difference between the value of the second measurement of HbA1c and the baseline was considered the variation in HbA1c. in the medical records of 25/28 missing patients (89%) for follow-up analyses. In an exploratory analysis, 21 patients with a negative attitude (32%) did not return for the second visit while only four patients with a positive (17%) did not return, without statistical significance (p = 0.17). Regarding the changes in HbA1c in a median of 143 (119-209) days, a smaller proportion of patients with a negative attitude (44%) had a reduction in HbA1c values compared to the positive attitude group (71%; p = 0.03). Regarding the weight changes in a median of 115 (98-134) days, we did not observe differences between the groups: patients with negative attitudes (59%) *versus* patients with positive attitudes (38%, p = 0.10). We did not observe differences in the score of medication for diabetes between the emotional attitude groups in the period (p = 0.89).

The regression diagnoses did not indicate any problem involving the collinearity of the measures and the variance inflation factor (VIF) presented a value < 2 for all the variables in the model. However, the value of Cook's distance indicated the presence of influential outliers **(Figure**

1 in supplementary material). The exclusion of outliers was not considered as there was no problem with the measurement of individuals and it is believed that the exclusion of these cases may underestimate the true variability presented by the study sample. Thus, the analyses were conducted using a robust regression method [34] and is shown in **Table 3**. The general model presented an R^2=0.13, indicating that higher levels of positive attitudes related to diabetes (Thinking in relation to the factor) were associated with lower values of HbA1c after the intervention (p <0.01), and that people with a higher degree of obesity (indicated by waist circumference) had higher levels of HbA1c after the intervention. The second factor of the ATT-19, physical style active, the participant's gender and having or not complications due to diabetes did not emerge as significant predictors in the model.

Poisson regression models were performed to assess the possible association between the reduction of HbA1c (as a dependent variable) and the emotional attitude towards diabetes (**Table 4)**. After adjusting for the duration of diabetes, waist circumference and level of physical activity, patients with a positive emotional attitude (RP = 3.60; 95%CI: 1.08-12.02; p = 0.04) have higher prevalence ratios to reduction in HbA1c during the 4-7 months of follow-up compared to patients with negative emotional attitude.

Table 1. Factor loadings of the Exploratory Factor Analysis of ATT-19 items

Item	Factor 1	Factor 2
Q1. If I didn't have diabetes, I would be a very different person		0.71
Q3. Having diabetes was the worst thing that happened in my life		0.65
Q4. Most people have difficulty adapting to having diabetes		0.35
Q6. It seems like there's not much I can do to control my diabetes	0.61	
Q7. There is little hope of leading a normal life with diabetes	0.69	
Q8. Proper diabetes control involves a lot of sacrifice and inconvenience		0.46
Q9. I try not to let people know that I have diabetes	0.69	
Q10. Being diagnosed with diabetes is the same as being sentenced to a lifetime of illness		0.81
Q16. There's nothing you can do if you have diabetes	0.71	
Q17. There is no one I can talk to openly about my diabetes	0.79	
Q18. I believe I live well with my diabetes		0.41
Q19. I usually think it's unfair that I have diabetes and other people have very good health	0.62	
Eigenvalue	2.97	2.19
Common Variance Explained	58%	42%

Table 2. Sociodemographic, clinical and nutritional characteristics of patients with type 2 diabetes considering negative or positive Emotional Attitude to Diabetes by ATT-19 [21] (n = 91)

	Emotional Attitude to Diabetes		P
	Patients with positive attitude	Patients with negative attitude	
n	23	68	
Age, y	58 ± 7	61 ± 9	0.32[1]
Females (%)	11 (47.8%)	41 (60.3%)	0.29[2]
Whites	17 (73.9%)	51 (75%)	0.91[2]
Economic status: middle class	17 (73.9%)	41 (60.3%)	0.24[2]
Years of study	9 ± 4	7 ± 4	0.61[1]
Diabetes duration, y	11 ± 8	16 ± 9	0.20[1]
Insulin and oral hypoglycemic drugs	21 (91.3%)	57 (83.8%)	0.37[2]
Medication effect score (MES)	20 (87.0%)	60 (88.2%)	0.87[2]
Hypertension	16 (72.7%)	55 (80.9%)	0.41[2]
Diabetes kidney disease, %	14 (60.9%)	37 (54.4%)	0.59[2]
Current smoking	3 (13%)	26 (38.2%)	0.07[3]
Physical activity: low level	17 (73.9%)	62 (91.2%)	0.03[2]
Nutritional guidance	12 (52.2%)	25 (67.6%)	0.19[2]
Anthropometric assessment			
BMI (kg/m²)	31.7 ± 6.7	33.1 ± 6.6	0.63[1]
Overweight: BMI >25 kg/m²	20 (87%)	65 (95,6%)	0.14[2]
Altered waist circumference (%)	20 (87%)	65 (97%)	**0.06**[2]
Basal Metabolic Rate (kcal)	2162.3 ± 354.3	2098.1 ± 369.8	0.67[1]
Food consumption (FFQ)			
Total caloric value	2206.3 ± 720.5	2107.1 ± 1019.2	0.35[1]
Carbohydrates, % VCT	52.1 ± 9.1	54.5 ± 6.3	0.24[1]
Total lipids, % VCT	27.8 ± 6.1	24.7 ± 5.4	0.44[1]
Proteins, % VCT	20.1 ± 4.3	20.9 ± 3.7	0.48[1]
Laboratory values			
Fasting plasma glucose, mg/dL, mg/dL	161 ± 58	176 ± 70	0.35[1]
HbA1c, %	9.4 ± 2.3	9.1 ± 1.7	0.15[1]
Total cholesterol, mg/dL	170 ± 42	171 ± 46	0.71[1]
HDL-cholesterol, mg/dL	42 ± 13	42 ± 12	0.89[1]
LDL-cholesterol, mg/dL	81 ± 39	86 ± 39	0.85[1]
Triglyceride, mg/dL	215 (160-261)	177 (120-245)	0.14 [4]

Data presented as mean ± SD, median and interquartile range or number of patients for total cases (%). [1] Test t of Student; [2] Chi-square test; [3] Fisher's exact test, [4] U of Man-Whitney test; Low level of physical activity was considered when patients performed <599 metabolic equivalent task per week of physical activities [7]; Altered waist was considered when waist >80 cm for women and >90 cm for men [18]; HbA1c = glycated hemoglobin.

Table 3. Predictors of change in glycated hemoglobin (as dependent variable). Regression linear model.

Factors	Non-standardized coefficient	Standard error	t-value	p-value
Constant	-1.21	1.01	-1.19	**0.23**
ATT-19 Factor 1	-0.06	0.01	-3.15	**<0.01**
ATT-19 Factor 2	-0.01	0.02	-0.84	**0.40**
Physical style active	0.12	0.25	0.50	0.61
Woman	-0.02	0.26	-0.11	0.91
Waist circumference (cm)	0.024	0.008	2.86	**<0.01**
Diabetes complications	0.061	0.25	0.24	0.81

Physical style active = Dummy coded (0= sedentary, 1= active). Gender= Dummy coded (0 = men, 1= woman). Complications = health complications due to diabetes, Dummy coded (0= no complications, 1 = some complications)

Table 4. Poisson regression models performed to reducing glycated hemoglobin (as a dependent variable) and emotional attitude in patients with type 2 diabetes (n = 82)

Glycated hemoglobin reduction		Positive emotional attitude
Crude Model	Prevalent Ratio (95% CI)	**3.15 (1.08-9.21)**
	P-value	**0.04**
Model 1*	Prevalent Ratio (95% CI)	**3.38 (1.05-10.89)**
	P- value	**0.04**
Model 2**	Prevalent Ratio (95% CI)	**3.60 (1.08-12.02)**
	P- value	**0.04**

CI = Confidence interval. *adjusted for diabetes duration and altered waist circumference [18]; **adjusted for diabetes duration and sedentary physical activity level according to International Physical Activity Questionnaire - IPAQ [11].
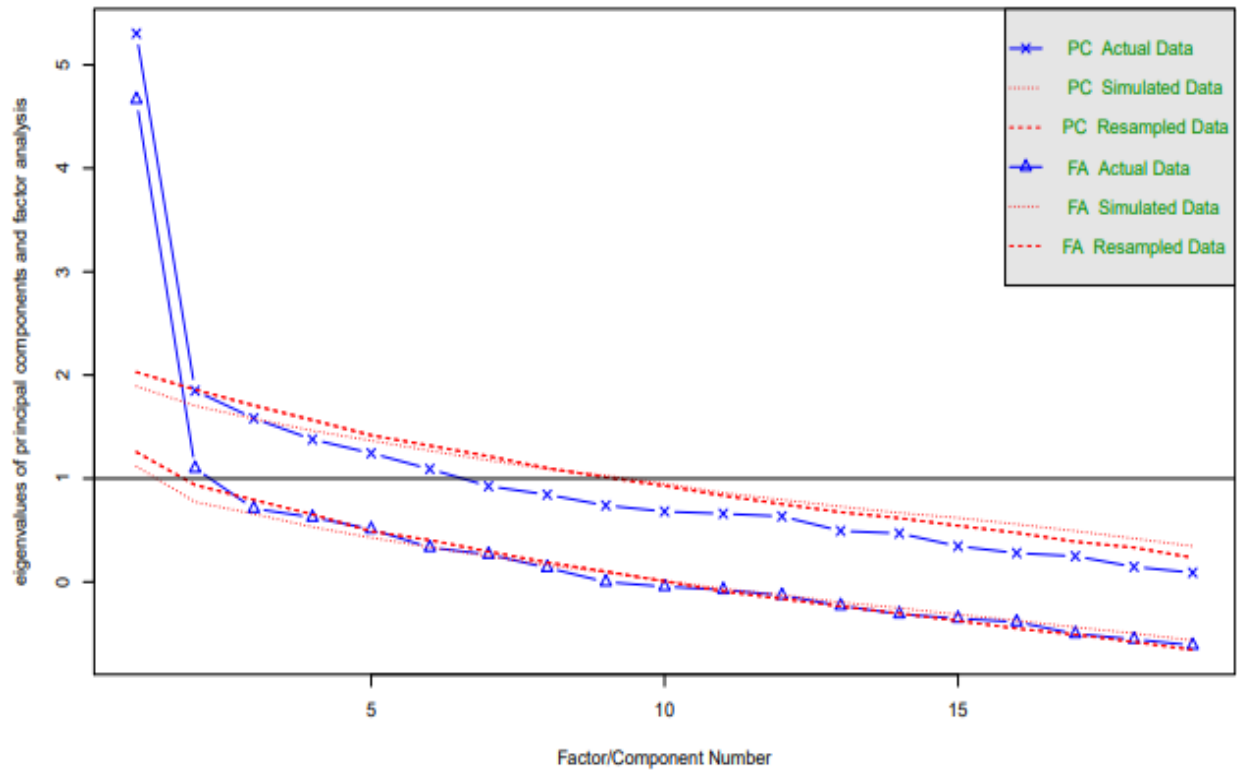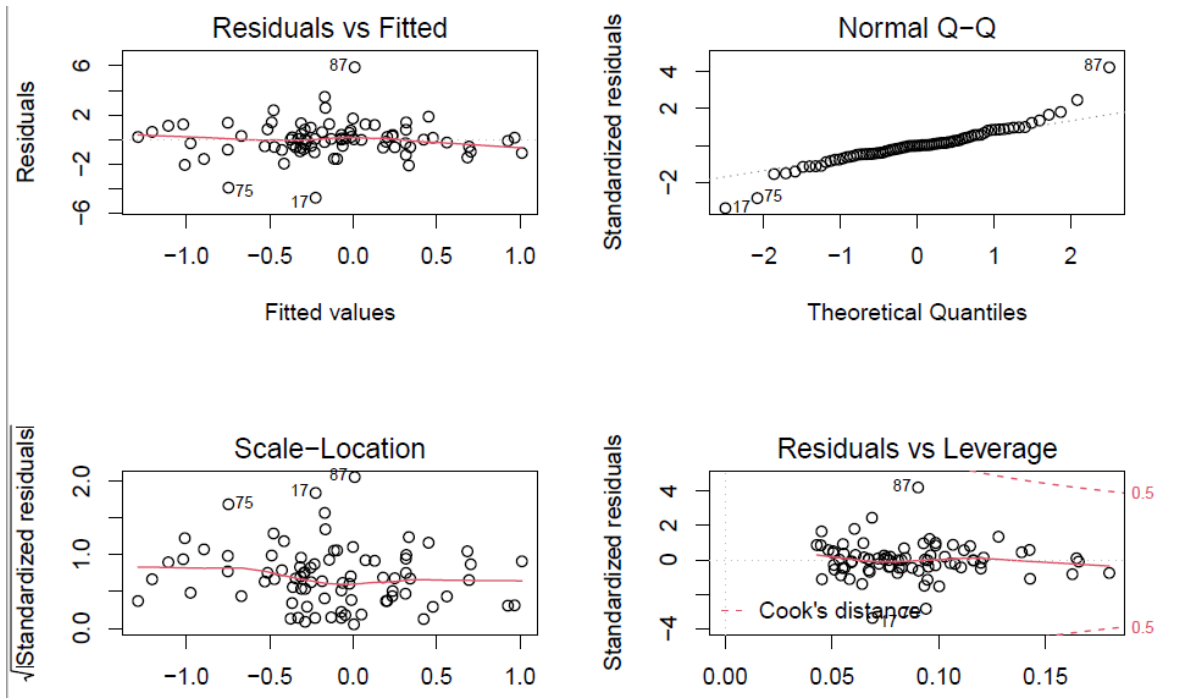
Figure 1. Parallel Analysis

Figure 1 Supplementary material. Regression Diagnostic

DISCUSSION

In this sample of outpatients with type 2 diabetes, we observed a difference of 0.3% in HbA1c baseline between patients with positive and negative attitudes from diabetes (**Table 2**), despite not reaching the desired statistical significance. In exploratory analyses, when evaluating the response of patients after counseling, we observed that those with a positive attitude and able to resist delicious foods have at least three more chances to reduce the HbA1c compared to patients with a negative attitude. For this study, we used validated questionnaires to evaluate emotional attitudes towards diabetes.

In our study, unlike other authors [4], we do not observe differences in a proportion of patients with good glycemic control between negative and positive emotional attitude groups, maybe due to our sample size. However, we observed a difference of 0.3% in HbA1c baseline between patients with positive and negative attitudes towards diabetes, despite not reaching the desired statistical significance ($p = 0.15$). Although in exploratory analyses regarding the changes in HbA1c, we observed an association between the reduction of HbA1c and the positive attitude towards diabetes after nutritional education started, as a minor influence of medication dose or physical activity. We did not find a prospective study similar to ours, which hampers the results comparison. Nevertheless, in a clinical trial with Italian older adults with type 2 diabetes, those who were randomized to an intensive individualized education program improved their average score of attitudes towards the disease and obtained a reduction in HbA1c and BMI [5], suggesting that the emotional level affects the attitude towards the disease, which can promote a positive metabolic response after education for self-care. In our study, patients started to participate in the

nutritional education process. This hypothesis still needs to be explored in other populations based on randomized clinical trials with adequate sample size.

We used parallel analysis to assess the dimensionality of the ATT-19 scale and exploratory factor analysis with oblimin rotation to extract the factor loadings. We did not find studies evaluating the dimensionality of this scale for comparison with the literature. Factor 1 shows us social support and the perception of diabetes as something controllable, facing the shame of having diabetes, not saying you have the disease, thinking you have nothing to do and not having someone to talk to. Factor 2 is related to individuals' perceptions of how diabetes has changed their lives. The item "Diabetes is not a problem" was suggested to be removed for not passing the factorial criteria for patients with type 2 diabetes, but it would possibly pass well for patients with type 1. Which makes perfect sense, since those who are dependent on insulin will likely spend more work on the disease and see it as a much bigger problem.

Findings show that higher basal waist circumference was a predictor of higher HbA1c at second visit. The ATT-19 is an instrument with several items that are placed in continuity, and we respect the variability of respondents more. Individuals who promote the effects of attitudes on the lowest HbA1c depend on the waist circumference and blood glucose levels at visit 1. The study indicates that these attitudes influence the outcome in the expected direction, that is, whoever scores the highest on the scale has the greatest reduction in HbA1c. However, we need to explore and understand how this influences, so future studies can try to identify these mediating variables.

Moreover, we observed that those who have a positive attitude were four times more likely to reduce HbA1c values after nutritional guidance. There is little literature exploring the relationship between style, attitude, and metabolic control, which makes our study interesting. However, we cannot fail to consider that not dealing well with diabetes interferes with self-care

and the prognosis of the disease. Also, patients with a negative attitude seem to more often miss appointments with nutritionists. Therefore, the exploratory associations of emotional attitude described in our study should be evaluated in different samples from patients with diabetes.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The findings support that a positive attitude was associated with a greater reduction in HbA1c after nutritional guidance compared to patients with a negative attitude towards the disease. Knowing the attitudes often chosen by patients could guide educational actions for patients during the process of nutritional education for self-care. The effectiveness of this strategy needs to be tested in different populations in well-designed randomized clinical trials.

CONFLICTS OF INTEREST:

None

AUTHORSHIP:

TFCSA collected, analyzed and interpreted the data and wrote the manuscript; JPP collected data and assisted in the design of the study; BPR and ABCM analyzed and interpreted the data, CCRR collected data and JCA designed and supervised the study, analyzed and interpreted the data, critically and revised the manuscript.

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APÊNDICE A – TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO (TCLE)

Título do Projeto: "Relação entre o comportamento alimentar, atitude emocional e o controle glicêmico de pacientes com Diabetes Melito tipo 2"

Você está sendo convidado a participar de uma pesquisa cujo objetivo é verificar a relação entre o comportamento alimentar, seu sentimento em relação à diabetes e o controle glicêmico (níveis adequados de açúcar no sangue). Esta pesquisa está sendo realizada pelo Ambulatório de Nutrição e Diabetes do Hospital de Clínicas de Porto Alegre (HCPA).

Se você concordar com a participação na pesquisa, os procedimentos envolvidos consistem de uma consulta com a nutricionista no Centro de Pesquisa Clínica do HCPA, na qual você responderá a questionários sobre hábitos de alimentação para conhecer seu padrão alimentar, suas atitudes e seu comportamento em relação aos alimentos e à diabetes. Além disso, serão realizadas avaliações de peso e altura. Essa consulta terá aproximadamente 40 minutos de duração. Nós solicitamos autorização para acesso ao seu prontuário de informações dos últimos três meses em relação aos níveis de glicose. Caso você não tenha nenhum exame disponível nesse período, será realizada uma coleta de sangue (7 mL, equivalente a 2 colheres de chá) para verificação dos níveis de glicose. Esses exames serão realizados no Centro de Pesquisa Clínica do HCPA em uma data posterior a da consulta com a nutricionista, a ser definida na consulta.

Não são conhecidos riscos associados à pesquisa, mas podem ocorrer desconfortos com a possível coleta de sangue (como dor e hematoma, mancha roxa, no local da picada da agulha). Podem ocorrer também desconfortos pelas perguntas realizadas e o tempo para responder aos questionários. Você não terá um benefício direto ao participar desta pesquisa, mas ao término do estudo, receberá orientações alimentares individualizadas. Além disso, essa pesquisa pretende contribuir para o conhecimento sobre o sentimento que os pacientes têm em relação às diabetes.

Sua participação na pesquisa é totalmente voluntária, ou seja, não é obrigatória. Caso você decida não participar, ou ainda, desistir de participar e retirar seu consentimento, não haverá nenhum prejuízo ao atendimento que você recebe ou possa vir a receber na instituição. Não está previsto nenhum tipo de pagamento pela sua participação na pesquisa e você não terá nenhum custo com respeito aos procedimentos envolvidos.

Caso ocorra alguma intercorrência ou dano, resultante de sua participação na pesquisa, você receberá todo o atendimento necessário, sem nenhum custo pessoal. Os dados coletados durante a pesquisa serão sempre tratados confidencialmente. Os resultados serão apresentados de forma conjunta, sem a identificação dos participantes, ou seja, o seu nome não aparecerá na publicação dos resultados.

Caso tenha dúvidas, você poderá contatar a pesquisadora responsável Profa Dra Nut Jussara Carnevale de Almeida pelo telefone (51) 3359.8127, a pesquisadora Jéssica Pinto Polet pelo email jessicappolet@gmail.com ou o Comitê de Ética em Pesquisa do HCPA pelo telefone (51) 3359.8304 (atendimento das 8 às 17 horas).

Esse Termo é assinado em duas vias, sendo uma para o participante e outra para os pesquisadores.

_____

(Nome do participante)

_____

(Assinatura do participante)

_____

(Nome do pesquisador)

_____

(Assinatura do pesquisador)

Local e data: _____

ANEXO A – QUESTIONÁRIO DE ATITUDE

Versão Brasileira do Questionário de Atitudes ATT - 19

INSTRUÇÕES: este questionário contém 19 perguntas para ver como você se sente sobre a diabete e o seu efeito em sua vida. Coloque um X na opção que corresponde à sua resposta

1. Se eu não tivesse diabete, eu seria uma pessoa bem diferente
( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

2. Não gosto que me chame de diabético
( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

3. Ter diabete foi a pior coisa que aconteceu na minha vida
( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

6. Parece que não tem muita coisa que eu possa fazer para controlar minha diabete
( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

7. Há pouca esperança de levar uma vida normal com diabete
( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

8. O controle adequado da diabete envolve muito sacrifício e inconvenientes
( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

4. A maioria das pessoas tem dificuldade em se adaptar ao fato de ter diabete

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

5. Costumo sentir vergonha por ter diabete

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

9. Procuro não deixar que as pessoas saibam que tenho diabete

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

10. Ser diagnosticado com diabete é o mesmo que ser condenado a uma vida de doença

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

11. Minha dieta de diabete não atrapalha muito minha vida social

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

12. Em geral, os médicos precisam ser muito mais atenciosos ao tratar pessoas com diabete

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

16. Não há nada que você possa fazer, se você tiver diabete

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

17. Não há ninguém com quem eu possa falar abertamente sobre a minha diabete

(   ) Não concordo de jeito nenhum
(   ) Discordo
(   ) Não sei
(   ) Concordo
(   ) Concordo totalmente

13. Ter diabete durante muito tempo muda a personalidade da pessoa

( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

14. Tenho dificuldade de saber se estou bem ou doente

( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

15. Diabete não é realmente um problema porque pode ser controlado

( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

18. Acredito que convivo bem com minha diabete

( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

19. Costumo achar que é injusto que eu tenha diabete e outras pessoas tenham uma saúde muito boa

( ) Não concordo de jeito nenhum
( ) Discordo
( ) Não sei
( ) Concordo
( ) Concordo totalmente

ANEXO B – QUESTIONÁRIO IPAQ

Pratica exercício físico regularmente? ( ) sim   ( ) não*

* Se NÃO faz exercícios físicos regularmente:

Por que não pratica exercício físico?

( ) Restrição Médica

( ) Não gosta

( ) Não conhece/ Não sabe fazer ( ) Não tem condições financeiras ( ) Não tem tempo.

( ) Não se sente bem para a prática

( ) Outros, descreva: _____

Nós estamos interessados em conhecer as atividades físicas que fazem parte do seu dia a dia em uma semana comum. As perguntas estão relacionadas ao tempo que você gasta fazendo atividade física na ÚLTIMA semana. As perguntas incluem as atividades que você faz no trabalho, para ir de um lugar para outro, por lazer, por esporte, por exercício ou como parte das atividades em casa ou no jardim. Por favor, responda cada questão mesmo que considere que não seja ativo.

---

* atividades físicas **VIGOROSAS** são aquelas que precisam de um grande esforço, que cansam e fazem respirar MUITO mais forte do que o normal.

SEÇÃO 1* atividades físicas **-** *ATIVIDADE FÍSICA NO TRABALHO***MODERADAS** são aquelas que precisam de algum esforço físico e que fazem respirar UM

POUCO mais forte que o normal.

Para responder as perguntas pense somente nas atividades que você realiza por pelo menos 10 minutos contínuos de cada vez.

1a. Em quantos dias da última semana você CAMINHOU por pelo menos 10 minutos contínuos em casa ou no trabalho, como forma de transporte para ir de um lugar para outro, por lazer, por prazer ou como forma de exercício?

_____dias por SEMANA   ( ) Nenhum

1b. Nos dias em que você caminhou por <u>pelo menos 10 minutos contínuos</u> quanto tempo no total você gastou caminhando por dia?

Horas: _____ Minutos: _____

2a. Em quantos dias da última semana, você realizou atividades MODERADAS por pelo menos 10 minutos contínuos, como por exemplo, pedalar leve na bicicleta, nadar, dançar, fazer ginástica aeróbica leve, jogar vôlei recreativo, carregar pesos leves, fazer serviços domésticos na casa, no quintal ou no jardim como varrer, aspirar, cuidar do jardim, ou qualquer atividade que fez aumentar moderadamente sua respiração ou batimentos do coração (NÃO INCLUA CAMINHADA)

_____dias por SEMANA   ( ) Nenhum

2b. Nos dias em que você fez essas atividades moderadas por <u>pelo menos 10 minutos contínuos</u>, quanto tempo no total você gastou fazendo essas atividades por dia?

Horas: _____ Minutos: _____

3a. Em quantos dias da última semana, você realizou atividades VIGOROSAS por pelo menos 10 minutos contínuos, como por exemplo, correr, fazer ginástica aeróbica, jogar futebol, pedalar rápido na bicicleta, jogar basquete, fazer serviços domésticos pesados em casa, no quintal ou cavoucar no jardim, carregar pesos elevados ou qualquer atividade que fez aumentar MUITO sua respiração ou batimentos do coração.

_____dias por SEMANA   ( ) Nenhum

3b. Nos dias em que você fez essas atividades vigorosas por <u>pelo menos 10 minutos</u> <u>contínuos</u>

quanto tempo no total você gastou fazendo essas atividades por dia? Horas: _____ Minutos: _____

Estas últimas questões são sobre o tempo que você permanece sentado todo dia, no trabalho, na escola ou faculdade, em casa e durante seu tempo livre. Isto inclui o tempo sentado estudando, sentado enquanto descansa, fazendo lição de casa visitando um amigo, lendo, sentado ou deitado assistindo TV. Não inclua o tempo gasto sentado durante o transporte em ônibus, trem, metrô ou carro.

4a. Quanto tempo no total você gasta sentado durante um dia de semana?

Horas: _____ Minutos:_____

4b. Quanto tempo no total você gasta sentado durante em um dia de final de semana?

Horas: _____ Minutos:_____

	Segunda	Terça	Quarta	Quinta	Sexta	Sábado	Domingo
Manhã							
Tarde							
Noite							

Data	Caminhada		Moderada		Vigorosa		Classificação IPAQ
	F	D	F	D	F	D	

Interpretação:_____

Meta: _____

ANEXO C – ABEP

CRITÉRIO DE CLASSIFICAÇÃO ECONÔMICA **BRASIL**

ABEP associação brasileira de empresas de pesquisa

SISTEMA DE PONTOS

Variáveis

	Quantidade				
	0	1	2	3	4 ou +
Banheiros	0	3	7	10	14
Empregados domésticos	0	3	7	10	13
Automóveis	0	3	5	8	11
Microcomputador	0	3	6	8	11
Lava louca	0	3	6	6	6
Geladeira	0	2	3	5	5
Freezer	0	2	4	6	6
Lava roupa	0	2	4	6	6
DVD	0	1	3	4	6
Micro-ondas	0	2	4	4	4
Motocicleta	0	1	3	3	3
Secadora roupa	0	2	2	2	2

Grau de instrução do chefe de família e acesso a serviços públicos

Escolaridade da pessoa de referência	
Analfabeto / Fundamental I incompleto	0
Fundamental I completo / Fundamental II incompleto	1
Fundamental II completo / Médio incompleto	2
Médio completo / Superior incompleto	4
Superior completo	7

Serviços públicos		
	Não	Sim
Água encanada	0	4
Rua pavimentada	0	2

Cortes do Critério Brasil

Classe	Pontos
A	45 - 100
B1	38 - 44
B2	29 - 37
C1	23 - 28
C2	17 - 22
D-E	0 - 16

ANEXO D – CARTA DE APROVAÇÃO DO PROJETO – CEP

UFRGS - HOSPITAL DE CLÍNICAS DE PORTO ALEGRE DA UNIVERSIDADE FEDERAL

Plataforma Brasil

PARECER CONSUBSTANCIADO DO CEP

DADOS DA EMENDA

Título da Pesquisa: Relação entre o comportamento alimentar, atitude emocional e o controle glicêmico de pacientes com Diabetes Melito tipo 2

Pesquisador: Jussara Carnevale de Almeida

Área Temática:

Versão: 2

CAAE: 70657017.6.0000.5327

Instituição Proponente: Hospital de Clínicas de Porto Alegre

Patrocinador Principal: Hospital de Clínicas de Porto Alegre

DADOS DO PARECER

Número do Parecer: 2.645.642

Apresentação do Projeto:

Em 19/04/2018 foi encaminhada ao CEP emenda que visa prorrogação do prazo de encerramento do projeto.

Objetivo da Pesquisa:

O objetivo da presente emenda é atualizar o cronograma do estudo.

Avaliação dos Riscos e Benefícios:

Não altera a previsão de riscos e benefícios anteriormente realizada.

Comentários e Considerações sobre a Pesquisa:

Trata-se de emenda de atualização do projeto com pedido de prorrogação do estudo com a seguinte justificativa:

Eu, Jussara Carnevale de Almeida, solicito a prorrogação do prazo de execução do projeto de pesquisa intitulado "Relação entre o comportamento alimentar, atitude emocional e o controle glicêmico de pacientes com Diabetes Melito tipo 2", registrado no GPPG sob nº 170316, para data de término 30/07/2020, conforme cronograma de atividades em anexo.

Justifico minha solicitação, pois até o momento foram coletados 26 indivíduos, dos 105 previstos no projeto inicial. Assim, a velocidade da entrada de pacientes elegíveis ao projeto foi menor do

Endereço: Rua Ramiro Barcelos 2.350 sala 2229
Bairro: Santa Cecília   **CEP:** 90.035-903
UF: RS   **Município:** PORTO ALEGRE
Telefone: (51)3359-7640   **Fax:** (51)3359-7640   **E-mail:** cep@hcpa.edu.br

Página 01 de 03

Continuação do Parecer: 2.645.642

que a planejada inicialmente. Desta forma, há necessidade de alterar o cronograma previsto inicialmente. Ainda, iremos aumentar a equipe de pesquisa para otimizar a captação e coleta de dados.

Em anexo, encaminho também o relatório parcial de atividades referente ao período de vigência do projeto.

Considerações sobre os Termos de apresentação obrigatória:

Foram incluídos os seguintes documentos:

Carta de justificativa da emenda

Novo cronograma do estudo

Relatório parcial

Recomendações:

Nada a recomendar.

Conclusões ou Pendências e Lista de Inadequações:

A emenda não apresenta pendências e está em condições de aprovação.

Considerações Finais a critério do CEP:

Emenda submetida em 19/04/2018 aprovada. Altera o cronograma do estudo.

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_1117717_E1.pdf	19/04/2018 12:57:40		Aceito
Outros	prorrogacao_assinada.pdf	19/04/2018 12:52:15	Jéssica Pinto Polet	Aceito
Outros	relatorio_de_pesquisa.pdf	19/04/2018 12:51:43	Jéssica Pinto Polet	Aceito
Outros	solicitacao_prorrogacao_pesquisa.docx	19/04/2018 12:48:50	Jéssica Pinto Polet	Aceito
Cronograma	CRONOGRAMA_novo.docx	19/04/2018 12:46:45	Jéssica Pinto Polet	Aceito
Outros	delegacao_funcoes.pdf	29/06/2017 13:32:10	Jéssica Pinto Polet	Aceito
TCLE / Termos de	TCLE.pdf	29/06/2017	Jéssica Pinto Polet	Aceito

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Assentimento / Justificativa de Ausência	TCLE.pdf	13:31:35	Jéssica Pinto Polet	Aceito
Projeto Detalhado / Brochura Investigador	projeto_jessicapoletplataforma.pdf	29/06/2017 13:30:43	Jéssica Pinto Polet	Aceito
Folha de Rosto	folha_rosto.pdf	29/06/2017 13:30:02	Jéssica Pinto Polet	Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

PORTO ALEGRE, 09 de Maio de 2018

_____

Assinado por:
Marcia Mocellin Raymundo
(Coordenador)

ANEXO E – NORMAS DA REVISTA JOURNAL OF NUTRITION EDUCATION AND BEHAVIOR

Research Articles

Research Articles are concise reports of original research on any aspect of nutrition education and/or behavior. Papers based on the results of preliminary research are not acceptable.

In *Research Articles*, a structured abstract of 200 words or less organizes information with descriptive headings that begin flush with the left margin. Incomplete sentences are acceptable in a structured abstract for the sake of brevity. To facilitate selective electronic searches, structured abstracts include the following subheadings (verbatim), bolded and presented in the order shown here:

• **Objective:** Specifies the primary purpose or objective(s) of the study and/or hypotheses tested.

• **Design:** Describes the basic research design, methods used to collect data, timing and sequence of intervention, and data collection.

• **Setting:** Describes the study setting. This subheading may not be appropriate for secondary data analyses and can be omitted.

• **Participants:** States the number of participants or subjects/objects of observation by group and subgroup, describes how they were selected, specifies the response rate for participants, summarizes key demographic characteristics for each study group and subgroup, and describes the extent to which they represent the population from which they were drawn (may not be appropriate

for secondary data analyses). More or less information relating to participants may be included, depending on word count limits and the need for more space in the "Results" section.

• **Intervention(s):** Describes the essential features of the intervention(s), including setting, methods, and duration. If no intervention was conducted, omit this subheading from the abstract.

• **Main Outcome Measure(s):** Specifies dependent and independent variables and describes how each variable was measured. In the case of descriptive research, replace this subheading with "Variables Measured." In the case of qualitative research, replace this subheading with "Phenomenon of Interest."

• **Analysis:** Summarizes how data were analyzed quantitatively and/or qualitatively and specifies the level used to determine statistical significance of quantitative results.

• **Results:** Summarizes primary results reported in the manuscript, including the number of participants (if it differs from what was described in the "Participants" section), direction of change, and variance and level of statistical significance for each quantitative result, as well as confidence intervals or effect sizes wherever appropriate. Qualitative themes should be reported.

• **Conclusions and Implications:** Specifies study conclusions directly supported by results reported in the abstract and specifies implications for research and practice or policy, when appropriate.

Research Articles include the following major sections:

• **Introduction:** Concisely describes the issue addressed in the manuscript, explains its importance in relation to existing literature, describes the theoretical or conceptual foundation on which the study is based, states the objectives of the article, and specifies the hypotheses tested.

• **Methods:** Describes the research design, sampling methods, recruitment strategies, measurement instruments, methods used to test instruments for validity and reliability, data collection procedures, and statistical analyses in enough detail for replication. The Methods section specifies the level used to determine statistical significance for each test. Confidence intervals and standard errors of the mean, effect sizes, or other statistical results that may be used for post hoc analyses comparing program results are encouraged. For general statistical guidelines, go to Guidelines for Statistical Methods for *JNEB*. However, if authors are using t tests and more than 2 t tests are being conducted with a data set, in addition to testing for normality, they should also use a Bonferroni adjustment or other adjustment that is supported with reference. For example, if authors used t tests to measure pre-post differences after an intervention for calcium knowledge, calcium-related behavior, sodium knowledge, self-efficacy to lower sodium, and fruit and vegetable intake, then they have used 5 t tests and should use the Bonferroni adjustment or other adjustment, which is available in both SPSS and SAS software packages. This adjustment will decrease the probability that authors find a significant effect by chance. There are exceptions to this, but authors must justify such an exception within their methods.

The Methods section provides rationale for analyzing data by race or ethnicity (if applicable).

• **Results:** Outlines results clearly and systematically, mentioning or highlighting—but not duplicating—information displayed in tables, and specifies the direction and magnitude of each statistically significant difference reported. Carefully designed tables and figures are encouraged to showcase results.

• **Discussion:** Provides an in-depth interpretation of results reported, compares and discusses results in relation to those from similar studies reported in the literature and in relation to theory, outlines limitations of the study, describes how study limitations influence interpretation of results, and offers alternative explanations for the findings. The Discussion section should not represent a summary of results.

• **Implications for Research and Practice:** Specifies how researchers and practitioners, and policy makers when appropriate, could apply results to future work.

Research Articles may include second-level sections to clarify or enhance readability within major sections. At times, *Research Articles* may require second-level sections that are specific to the research being reported. The following second-level sections are generally recommended, if necessary, for these major sections:

• **Methods:** Study Design, Participants and Recruitment (includes descriptions of sampling methodology and ethical approval/human subjects' consent), Instruments, Measures, Procedures, and/or Data Analysis

• Discussion: Limitations

JNEB Style and Form General style and form and writing style

Adheres to the style recommendations outlined in the American Medical Association Manual of Style, 11th edition (http://www.amamanualofstyle.com/). Manuscripts should be written in good scientific English (American or British usage is accepted, but not a mixture of these). Authors who feel their manuscript may not conform to correct scientific English may wish to use the English Language Editing service available from Elsevier (https://webshop.elsevier.com/language-

editing-services/language-editing/) or use another science editing service.

Please note the following additional style requirements and format manuscripts accordingly before submission:

• Abbreviations, acronyms, and initialisms should be spelled out on first use, with the shortened versions immediately following in parentheses. Example: Supplemental Nutrition Assistance Program (SNAP). Manuscripts should be limited to a total of five acronyms, abbreviations, and initialisms to limit reader confusion. Beyond this, all terms must be spelled out. A list of approved terms that may be used in their abbreviated forms on first use is available here.

• Behavior theories or models mentioned frequently in a manuscript should be abbreviated whenever possible. Example: Social Cognitive Theory (SCT).

• "N" and "n" should be used as follows: "N" indicates a whole population or an epidemiological study; "n" indicates a sample or subpopulation.

• Sentences in unstructured abstracts or in the body of a manuscript may not begin with a numeral. Example: "Four hundred thirty-five parents were surveyed […]" not "435 parents were surveyed […]" Sentences in structured abstracts may begin with a numeral (as structured abstracts often contain sentence fragments).

• Decimals should be used only to 1 degree more than the unit of measurement. For whole numbers, decimals need to be rounded to tenths; if precision of measurement is in the tenths, you may use hundredths (eg, with weight measured to the tenth of a pound, means may be expressed as hundredths). Please be sure of your precision: while most software will express results greater than the precision, it is not appropriate to use these figures in tables (eg, 34.1 mg niacin). The exception to this is percentages concerning people. For fewer than 100 people, please round

to the nearest whole percentage, eg, 95% of participants (n = 80), rather than 95.3% of participants (n=80).

The past tense of verbs is used to discuss methods and results, as well as existing literature, with the exception of Research Methods, where the future tense should be used. Present tense is only used to refer to general truths and to state conclusions. Active voice is preferred. Jargon and sexist language should be avoided.

Use of Inclusive Language and Person-First

Language JNEB supports using inclusive language; that is language that does not offend and is sensitive to diversity, conveys respect to all people, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader and contain nothing that might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability, education, income, or health condition. Authors should ensure that writing is free from bias, stereotypes, slang, a reference to a dominant culture, and/or cultural assumptions.

JNEB supports gender neutrality by using plural nouns (clinicians, educators, participants) as default wherever possible and avoid using "he, she," or "he/she" but rather "they." According to the AMA, "sex refers to the biological characteristics of males and females. Gender includes more than sex and serves as a cultural indicator of a person's personal and social identity." Recognition of the diversity within gender self-identity is important for researchers and practitioners in nutrition education and behavior. Methodology for collecting data related to gender and sex should be transparent within the Methods section, including but not limited to data that are: self-reported in an open-ended response option, or a choice format that allows for multiple selections, a single

selection, or no response. A rationale for data analyses for sex or gender should be clear in the study design and objectives. If sex and gender data are collected only for the description of the sample and are not part of the design, this should also be clear in the results.

Person-first language refers to writing in which the person is first rather than identity-first (participants with diabetes rather than diabetic; a person with obesity rather than obese people). This is usually preferred for any health condition although some groups may prefer identity-first language (autistic children). JNEB asks authors to use person-first language unless they offer a rationale for using identity-first (the target group prefers identity-first). JNEB also prefers person-first for descriptors of income (participants from low-income environments) and education (participants with college degrees).

Concerning age, the point is to not offend and also to communicate age-defined groups accurately. So, whereas preschoolers may not be offensive, "the elderly" may be. When possible, use age as the descriptor instead of the label (children aged 4 to 5 years; adults aged 55 to 65 years).

In terms of race and ethnicity, authors should be consistent throughout and respectful to the sample's wishes as much as possible. Authors should reflect on the race and ethnicity data collected and its purpose in their analyses in order to select appropriate terms. Authors should be consistent throughout the manuscript.

"Specifying persons' race or ethnicity can provide information about the generalizability of the results of a specific study. However, because many people in ethnically diverse countries such as the United States, Canada, and some European, South American, and Asian nations have mixed heritage, a racial or ethnic distinction should not be considered absolute, and it is often based on a person's self-designation" (American Medical Association Manual of Style). It is suggested that authors consider including the category options provided to participants to self-classify (example):

"Race or ethnicity was self-reported by the parents of the children from a list including non-Hispanic White, non-Hispanic Black, Hispanic, Asian or Pacific Islander, Native American (including Alaskan), biracial or multiracial (specify), or other (specify)." The researcher should defer to the community's preference in situations where multiple descriptors could be used, such as Latino/a/x rather than Hispanic; African American rather than Black, or by tribal or native names.

These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Statistical Methods

For general statistical guidelines, please read Guidelines for Statistical Methods for JNEB. When presenting P values in text, tables, or figures, P values greater than 0.01 should be reported to 2 decimal places (eg, P = 0.03, P = 0.02, P = 0.07) and those between 0.01 and 0.001 to 3 decimal places (eg, P = 0.002, P = 0.007). P values less than 0.001 should be reported as P < 0.001. While a significance level can be set at a value (eg, P < 0.05), the significance of data should not be stated as P < 0.05, but rather the exact P value. All P values (whether significant or not) should be listed in narrative, tables, and figures. For example, authors may have significance set at P < 0.05 in their methodology; when expressing the data for vegetable intake between two samples, for example, write "group A mean intake was 2.0 ± 0.3 vs group B mean intake of 0.5 ± 0.7, P = 0.02". The P values for all predictor variables in regression should be listed in tables.

The rationale for this decision is derived from input from our statistical reviewers, who believe that the P value is a continuous measure that expresses the compatibility between the study

hypothesis and the observed data. Reporting or interpreting P value < 0.05 as statistical significance with individual data represents a loss of information.

Abstract should include significant values as described above but may reflect nonsignificant data as nonsignificant without a P-value.

Quantitative and Qualitative Research

Authors have access to reviewer guidelines for both quantitative and qualitative research.

Key words

All structured and unstructured abstracts are accompanied by a list of 3 to 5 key words for indexing. Key words are selected from the listing of Medical Subject Headings (MeSH) outlined by MEDLINE (http://www.nlm.nih.gov/mesh/MBrowser.html) that are used for indexing in PubMed. To maximize the likelihood that your paper will be identified appropriately by other researchers, educators, and administrators, it is important to choose MeSH key words whenever possible. Choosing non-MeSH terms will make it more difficult for your article to be appropriately cited.

Tables

For submission, each table should be saved and uploaded as a separate file. Number tables consecutively in accordance with their appearance in the text. If there is only one table, then no number is assigned (eg, "Table").

Format tables as follows:

Title: Provide a table number and a descriptive title. Words in the title are capitalized. The title

should describe the type of data included and give the sample size (n) unless it varies by measure/variable (in which case, n should be included within the table content).

Example of unacceptable table title: "Descriptive Demographics"

Example of acceptable table title: "Anthropometric and Socioeconomic Data for Adults Enrolled in Healthy Eating Programs (n = 40)"

Content: Not all data included in tables needs to be reported within the text of the manuscript. The most important results should be included in the narrative (text), but repeating results that will not be discussed further is discouraged. Bullets should not be used within a table. For qualitative tables, indentation of text may also be used within a section. Footnotes: The order of items within the footnote is as follows: abbreviations, then statistical significance, then statistical test used. Any abbreviation used in the table should be spelled out in the footnote. If not included in the table content, statistical significance should be identified with an asterisk (eg, *P < 0.05; P < 0.01; P < 0.001; or *Significance based on 95% CI).

Statistical test used (eg, chi-square, logistic regression) and statistical adjustments made to models should also be identified.

The table title, data/content, and footnotes should be complete enough to understand without referring to related text.

Statistics: Report means and standard deviations if the data have a normal distribution; report the interquartile range (IQR) and the median if the data are not normally distributed. Standard error of the mean (SEM) should only be used if multiple samples are gathered (eg, groups of schools). Confidence intervals (CIs) should be included if relative risk or odds ratios are given in the table. The statistical significance (P) may be included as the number (eg, P < 0.05) or indicated by an

asterisk and footnote (see Footnotes section, above). Superscripted lowercase letters may be used if differences among several groups are to be shown. Differences between 2 or more groups should include a column for P or an asterisk to indicate significance, where appropriate. Refer to the "General style and form and writing style" section above for guidance on the number of decimals places or significant digits to show in tables.

Figures and artwork

For submission, each figure should be saved and uploaded as a separate file. Number figures consecutively in accordance with their appearance in the text. If there is only one figure, then no number is assigned (eg, "Figure"). Format figures as follows: Caption: Figure captions should be presented at the end of the manuscript just after the references (captions should not be attached to the figures themselves). Captions constitute a distinct section of the manuscript and should start on a new page. Ensure that each illustration has a caption. A caption should consist of a brief title and a description of the illustration. Figure captions should be written in sentence format.

Example of unacceptable caption: "Body Mass Index (BMI) versus calories." Example of acceptable caption: "Body Mass Index (BMI) versus calories consumed after 3-month intervention with 10- to 12-year-olds."

Figure captions should also explain any abbreviations or statistical tests (eg, chi-square, logistic regression). Keep text in figures to a minimum; instead, use figure captions to explain all symbols and abbreviations used.

Content: Lettering and data symbols must be clear and consistent on each figure. Use uniform lettering and size your original artwork consistently. Only use the following fonts in illustrations:

Arial, Courier, Helvetica, Times New Roman, and Symbol. Titles, explanations, and definitions of abbreviations must be noted in the legends, not on the figures themselves.

A detailed guide on electronic artwork is available at https://www.elsevier.com/artworkinstructions. If figures do not meet these guidelines and do not appear to be clearly reproducible, they will be returned to authors with a request for new figures at any stage of publication.

Consort diagrams should be used to explain recruitment/enrollment/retention of subjects for any intervention (see Williams-Piehota et al. JNEB 2009;41:398-405). Other appropriate figures include maps (see Stone. JNEB 2011;43:S148-S151), scatter grams for continuous data, bar graphs for categorical data (eg, body mass index by gender), and diagrams for spatial and conceptual relationships, such as the Social Ecological Model.

For GEMs, it is preferred that authors use 1 to 2 figures that enhance the GEM description (photos should meet this requirement and not simply show authors or participants). Figures must also be referred to within the text. For recognizable photo(s), you must have release form(s) from the subject(s).

In order to maintain a clear separation between the author and any other agency, the editors require that all figures, tables, and photographs be submitted directly by the contributing author and no other source.

References

Each new reference introduced in the text is numbered sequentially. The reference number appears superscripted immediately following related text. The reference list is double-spaced and numbered to correspond with citations in text. Reference style follows the system described in

the American Medical Association Manual of Style, 11th edition, except that issue numbers are not included in journal references. MEDLINE abbreviations are used for periodical titles. If a standard abbreviation is not available on MEDLINE, cite the full title. Note that the format of journal references is flexible if authors include a DOI within the citation in the references section. Examples of different reference types follow:

Journal Article

Olson CM. Tracking of food choices across the transition to motherhood. J Nutr Educ Behav. 2005;37:129-136.

Book

Glanz K, Rimer BK, Lewis FM, eds. Health Behavior and Health Education: Theory, Research, and Practice. 3rd ed. San Francisco, CA: Jossey-Bass Publishers; 2002.

Book Chapter

Baranowski T, Perry CL, Parcel GS. How individuals, environments, and health behavior interact. In: Glanz K, Rimer BK, Lewis FM, eds. Health Behavior and Health Education: Theory, Research, and Practice. 3rd ed. San Francisco, CA: Jossey-Bass Publishers; 2002:165-184.

Government Documents

Government documents are referenced no matter how well-known they may be to readers (eg, Dietary Guidelines for Americans). To cite a government document, provide the following information in this order and format: Name(s) of author(s) if specified in the document. Title of document. Place of publication: name of the issuing bureau, agency, or department; date of publication. Publication number (if any) and series number (if any).

Published, peer-reviewed sources are always preferred, but Internet (web) resources may be used,

especially in cases in which government documents are more readily available online than in print.

All web links and URLs, including links to the authors' own websites, should be given a reference number and included in the reference list rather than within the text of the manuscript. To cite an online source, provide the following information in this order and format: Name of author/agency. Title of document. URL. Accessed month and date, year. Abstracts are not suitable as references, even if they have been published, since they do not contain enough information to provide suitable support as a reference.

Web site

National Cancer Institute. Cancer Health

Disparities. http://www.cancer.gov/cancertopics/types/disparities. Accessed September 15, 2008. If the URL links to a PDF owned by the author(s), the PDF may be submitted as supplementary material (see the "Supplementary Data" section, below).

Unpublished material and personal communications are cited in text only with the source and date indicated in parentheses immediately following related material. Examples: (J. A. Doe, unpublished data, 2007); (J. A. Doe, oral communication, 2007).

Dissertations and theses are not to be included in reference lists; they may be managed within text (J.A. Doe, dissertation, 2007).

Software used for data analysis should be cited in text only. Citations should include the software's name and developer, the developer's location, and the year the version used was released. Example: (SPSS version 15.0, SPSS Inc., Chicago, IL, 2007) or SurveyMonkey Pro (SurveyMonkey.com, LLC, Palo Alto, CA).

Likewise, equipment used in data collection should be cited in text only. Citations should include the equipment's model name and developer, the developer's location, and the year the model used

was released. Example: stadiometer (SECA model 222, SECA Corp., Hamburg, Germany, 2008).

For non-English references, the original language is left in the reference and the English translation is after it in brackets. If the original language cannot be included (eg, because it is in a symbol-based language), the reference should use the English translation and then state the reference's original language in brackets after the English translation. Example: [in Japanese]. Authors are responsible for the accuracy of references. References should be up to date (with the exception of older, seminal sources) and readily available to readers. Avoid secondary sources. The Digital Object Identifier (DOI) may be used to cite and link to electronic documents. The DOI consists of a unique alpha-numeric character string that is assigned to a document by the publisher upon the initial electronic publication. The assigned DOI never changes. Therefore, it is an ideal medium for citing a document, particularly "articles in press" because they have not yet received their full bibliographic information. A correctly formatted DOI takes the form http://dx.doi.org/10.1016/j.jneb.2013.01.025, where the prefix "10.1016/" identifies the publisher (in this case, the Society for Nutrition Education and Behavior) and the suffix "j.jneb.2013.01.025" is the unique article identifier. The prefix is preceded by http://dx.doi.org to make the complete DOI into a permanent URL to locate the document online. When you use a DOI to create links to documents on the web, the DOI is guaranteed to never change.

Relevant JNEB references should be included in citations. Search http://www.jneb.org for specific topics.

Footnotes

Footnotes are not permitted except in tables. In tables, footnotes are superscripted; lowercase

letters (or other common designators) are used to indicate significant differences within rows (see the "Tables" section, above).