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SELF-EFFICACY IN PEOPLE WITH TYPE 2 DIABETES MELLITUS: INTEGRATIVE LITERATURE REVIEW

AUTOEFICÁCIA NA PESSOA COM DIABETES MELLITUS TIPO 2: REVISÃO INTEGRATIVA DA LITERATURA

AUTOEFICACIA EN PERSONAS CON DIABETES MELLITUS TIPO 2: REVISIÓN INTEGRADORA DE LITERATURA

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ABSTRACT

Objective: To identify the relationship between self-efficacy and adherence to the therapeutic regimen in the person with type 2 diabetes mellitus.

Method: Integrative literature review according to the Joanna Briggs Institute (JBI) protocol through scientific and electronic database research by the EBSCOhost platform, including articles published in the last five years through the use of Medical Subject Heading (MeSH).

Results: After the survey, 342 articles were initially found, four of which met the defined inclusion criteria. The four articles are cross-sectional studies.

Conclusion: According to the results of the studies included in this integrative literature review, there is statistically significant evidence that self-efficacy is a predictor of behaviors of adherence to the therapeutic regimen.

Keywords: Adherence Therapy Regimen; Diabetes Mellitus Type 2; Self-Efficacy.

RESUMO

Objetivo: Identificar a relação entre a autoeficácia e a adesão ao regime terapêutico na pessoa com diabetes *mellitus* tipo 2.

Métodos: Revisão integrativa da literatura segundo o protocolo Joanna Briggs Institute (JBI) através de pesquisa em base de dados científica e eletrónica pela plataforma EBSCOhost, sendo incluídos artigos publicados nos últimos cinco anos, através da utilização dos *Medical Subject Heading* (MeSH).

Resultados: Após a pesquisa realizada foram encontrados inicialmente 342 artigos dos quais quatro deram resposta aos critérios de inclusão definidos. Os quatro artigos são estudos transversais.

Conclusão: De acordo com os resultados dos estudos incluídos na revisão integrativa da literatura, existe evidência estatisticamente significativa que a autoeficácia é um preditor de comportamentos de adesão ao regime terapêutico.

Palavras-chave: Adesão ao Regime Terapêutico; Autoeficácia; Diabetes *Mellitus* Tipo 2.

RESUMEN

Objetivo: Identificar la relación entre la autoeficacia y la adherencia al régimen terapéutico en la persona con diabetes mellitus tipo 2

Métodos: Revisión integradora de literatura según el protocolo del Instituto Joanna Briggs (JBI) a través de la investigación científica y electrónica de bases de datos a través de la plataforma EBSCOhost, y los artículos publicados en los últimos cinco años se incluyen a través del uso de la partida médica (MeSH).

Resultados: Después de la investigación, se encontraron inicialmente 342 artículos de los cuales cuatro cumplían los criterios de inclusión definidos. Los cuatro artículos son estudios transversales

Conclusión: Según los resultados de los estudios incluidos en la revisión integrativa de literatura, hay evidencia estadísticamente significativa de que la autoeficacia es un predictor de comportamientos de adherencia al régimen terapéutico.

Descriptores: Adherencia al Régimen Terapéutico; Autoeficacia; Diabetes Mellitus Tipo 2.

INTRODUCTION

Diabetes mellitus is a long-term, chronic condition that occurs in the existence of high levels of glucose in the blood[1].

It represents a public health problem that has reached alarming levels, there are approximately ½ billion people around the world living with the disease[1]. It is estimated that in 2019, 463 million people have diabetes, with projections for 2030 of 578 million and 700 million for 2045, which corresponds to an increase of 51%. In Europe the projections for 2045 correspond to an increase of 15%, with 68 million people being affected[1].

Based on data for 2017, the prevalence of diabetes for the Portuguese population is 9.9% compared to the 6.4% average of the Organization for Economic Cooperation and Development (OECD) countries, with Portugal presenting the fourth worst register[2].

Type 2 diabetes mellitus (DM2) occurs when the pancreas does not produce enough insulin or the body cannot effectively use the insulin produced, a situation called insulin resistance. The diagnosis occurs around the age of 40 and may occur in a timely manner due to factors related to obesity and sedentariness[1,2].

Overall the prevalence of DM2 is high and increasing in all regions corresponding to 90% of total diabetes cases[1,2]. Increased prevalence is driven by population aging, increased sedentary lifestyle and consumption of unhealthy foods associated with obesity[3,4].

As far as the impact of the disease in terms of mortality is concerned, it is estimated that approximately 4.2 million people between the ages of 20 and 79 died as a result of diabetes in 2019. Diabetes is estimated to be associated with 11.3% of total deaths in people aged 20-79 years[1].

Regarding the economic impact, the direct costs have been progressively increasing in 2007, 727 billion dollars were spent worldwide and in 2019 it is predictable that 760 billion dollars will be spent, representing an increase of 4.5%.

The approach to be taken in the treatment of diabetes presupposes an active process, supported by a set of tasks to be performed. The accomplishment of these tasks has as objective, the metabolic control and the prevention of late complications, through an adequate adherence to the therapeutic regime[5].

Adherence to the therapeutic regimen refers to the active participation of the person and the existence of patterns of collaboration and interaction regarding health care. It requires adherence to the recommendations provided by health professionals and implies the active and voluntary participation of the individual, who shares the responsibility for the treatment with a team of health professionals[6,7].

The rate of adherence to the therapeutic regimen for DM2 is inadequate, obtaining higher values for medication and adherence to the diet and lower values for monitoring and foot care[8,9].

Adherence to the therapeutic regimen is strongly influenced by the level of literacy[10-13]. Specific educational plans and interventions, focusing on individual beliefs, reveal better results[10,13,14]. The reasons for not adhering to the therapeutic regimen are related to demographic factors, time of evolution of the disease, associated comorbidities, side effects of the medication and its cost[12].

Individuals with good adherence to the drug regimen as part of the therapeutic plan have a 10% lower hospitalization rate and a 28% lower mortality rate compared to individuals with poor adherence[15].

Self-efficacy can serve as a mediator of the relationship between DM2 and adherence to therapeutic registration[10,14,16,17].

Because DM2 is a chronic disease, and adherence to the complex therapeutic regime, the motivational factor assumes a key role in its management. It presents itself as a behavior directed towards a goal. It is supported through the expectations, relatively to the anticipated results of the actions of each individual and their perception of self-efficacy, in their execution[18].

The objective defined for this revision was:

- Identify the relationship between self-efficacy and adherence to the therapeutic regimen in the person with type 2 diabetes mellitus.

METHODS

An integrative literature review was carried out, with research on the subject, on the electronic research platform EBSCOhost, taking into account the availability of full text with publication in the last five years

Ethical aspects

The Ethics Committee was not asked to give an opinion, as this was a secondary study. The researchers were concerned to comply with the principles of integrity in research. The principles of clarity, precision and objectivity were respected in the formulation of the problem, considering that the results should contribute to the resolution of health problems and should fit with the excellence foreseen in the quality standards of nursing care. The rigor of the methodological procedures was ensured, aiming at the validity of the study and the respect for the results obtained by the researchers involved in the studies under analysis. The reference of the authors was in line with good academic and scientific practices.

Research question

The research question was formulated according to the PICO methodology – Population, Intervention, Comparison and Outcome, present in Table 1↗, giving rise to the following question: What is the relationship between self-efficacy and adherence to the therapeutic regimen, in adults with DM2?

Methodological procedures

The inclusion criteria for the research were: the use of quantitative studies having as participants people with DM2 diagnosis aged 18 years or older. The studies included are present in peer-reviewed scientific journals and the eligible languages were English, Portuguese and Spanish.

As exclusion criteria, systematic literature reviews addressing the subject under analysis and the unavailability of full text for consultation were considered ineligible.

The survey was conducted in December 2019, using the descriptors "Medical Subject Headings" (MeSH), Self-Efficacy; Patient Compliance; Diabetes Mellitus, Type 2. In the field to be researched, no research limiters were used. The Boolean operator "AND" was used to define the search string. The conjugation used is Self-Efficacy "AND" Patient Compliance "AND" Diabetes Mellitus, Type 2. A total of 342 articles were obtained on the EBSCOhost electronic research platform, after the removal of the duplicates it originated 158 articles.

After the selection of the articles and their validation, the methodological evaluation of the studies was carried out and their level of evidence was determined according to JBI standards, applying the Critical Appraisal Checklist for Analytical Cross Sectional Studies (Table 2↗) and the JBI Levels of Evidence document.

Based on the JBI Grades of Recommendation document the degree of recommendation of the 4 articles was determined. The Table 3↗ presents the levels of evidence and degree of recommendation of all articles included. The Table 4↗ presents the synoptic of the studies analyzed.

RESULTS

With the application of the inclusion criteria 41 articles were identified. Of these 41 articles, 31 were provided by the CINAHL Complete database, seven articles belonging to Academic Search Complete, one article from Psychology and Behavioral Sciences Collection and finally two articles from SPORTDiscus with Full Text.

From the 41 articles, 21 articles were later excluded after reading the title and abstract. After the full reading of the content presented in each of the 20 articles, 4 articles were included for the integrative literature review.

Fig. 1↗ describes the selection process of the articles, described above using the PRISMA Flow Diagram.

DISCUSSION

The objective of the study was to identify the relationship between self-efficacy and adherence to the therapeutic regimen, in relation to average levels of self-efficacy, the results obtained in the study of Adam and Folds[19] were 6.6 on a scale from 0 to 10. This scale works through a questionnaire with 8 items that assess the average level of confidence of participants in diabetes management activities[19].

Study participants were asked about their participation in 12 diabetes-related activities through the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire[23]. Each item has a scale that varies between 0 and 7, the average level of adherence was 4.21 for diet, 2.39 for exercise, 5.21 for monitoring glycemia through digital puncture, 4.8 for foot care and 6.31 with medication.

Regarding the relationship between self-efficacy and depressive symptoms in individuals with DM2, there was an inversely significant relationship between depressive symptoms and self-efficacy (r = -0.461, p <0.0001). When depressive symptoms increase self--efficacy decreases[11,24,25].

The results obtained show a significant relationship, inversely, related to adherence to the diet (r = -0.313, p = 0.020) and exercise (r = -0.87, p = 0.034). As the depressive symptoms increase, the participants show greater difficulty in following the recommended diet and exercise regimen.

There was also a statistically significant relation to self-efficacy and adherence to diet (r = 0.701, p < 0.0001), exercise (r = 0.649, p < 0.0001) and smoking habits (r = -0.291, p = 0.031).

Greater self-efficacy leads to greater adherence to the diet[25-27], exercise[25,27] and cessation of smoking habits[25].

In the study by Walker *et al*[20], Self-efficacy for diabetes was assessed through the Perceived Diabetes Self-Management Scale (PDSMS) which represents a valid and reliable measure, showing good reliability (Cronbach alpha = 0.83). Scores range from 8 to 40, with high scores indicating high self-efficacy.

In assessing the association between self-efficacy, as measured by the PDSMSA scale, for medication adherence (r = -0.352, p < 0.001), glycemic control (r = -0.250, p < 0.001), diet (r = 0.420, p < 0.001), exercise (r = 0.220, p < 0.001) and mental health-related quality of life (r = 0.137, p < 0.001) modest correlations were found. However, when performing a multiple linear regression analysis to determine the independent association between self-efficacy and therapeutic compliance, metabolic control, diet, exercise and quality of life related to mental health, the authors found that self-efficacy was significantly associated with medication compliance (β = -0.067, 95% confidence interval [CI]): -0.90-0.044), physical exercise (β = 0.113, 95% CI: 0.065-0.161) metabolic control (β = -0.104, 95% CI: -0.157-0.051), diet (β = 0.150, 95% CI: 0.108-0.191) and quality of life related to mental health (β = 0.112, 95% CI: 0.051-0.173). It was observed that individuals with higher scores for self-efficacy in DM2 showed better metabolic control with lower levels of glycated hemoglobin (HbA1c)[29,30].

The results obtained also indicate that self-efficacy is associated with the quality of life related to mental health[11,24].

In the results obtained by Tovar *et al*, 2015[22] The average self-efficacy score was 20.4. The self-efficacy scale used was taken from the Multidimensional Diabetes Questionnaire (MDQ-SE)[31], comprises 7 items, each of the 7 items has been classified by participants on an ordinal scale, ranging from 1 = "Not at all" to 4 = "Very confident". The values obtained on the scale can range from 7 to 28, higher scores are indicative of a higher degree of effectiveness related to self-care in DM2. Cronbach's alpha for this scale was 0.86 in this sample, indicating a good reliability of the scale used.

Regarding the DM2 self-care recommendations was evaluated through The Diabetes Activities Questionnaire (TDAQ)[32] through a scale composed of 13 items belonging to diet, exercise, medication and other self-care behaviors. Each item was classified by participants on a scale ranging from 1 = "Never" to 4 = "Always". The full scale score is the sum of the individual item scores, with a possible range of 13 to 52, higher scores indicate a higher degree of adherence. Cronbach's alpha for this sample was 0.82 indicating good reliability of the scale used.

The results obtained[22] showed that self-efficacy is assumed as predictive of behaviors of adherence to the therapeutic regime[10,14,16,17].

The presence of depressive symptoms was evaluated through the Center for Epidemiologic Studies-Depression (CES-D) scale[33] The scale is composed of 20 items, which are designed to measure depression mood and psychophysiological indicators of depression.

The total score has the potential to vary from 0 to 60, with higher scores indicating a higher degree of depressive symptoms. Cronbach's alpha for the CES-D scale for this sample was 0.90 indicating good reliability.

The results[22] show that 38% of the sample had high depressive symptoms and about 28% were taking medication for depression.

There is a very strong indirect effect between depression and adherence to the therapeutic regime through self-efficacy as a mediator ($p < 0.0001$).

These findings allow to contribute to the affirmation of self-efficacy as a strong mediator of the well-established relationship between depressive symptoms and adherence to self-care related to DM2[11,24,25].

Regarding the analysis of Amer *et al*[21], data was collected on HbA1c levels from study participants n = 392. The data collection was performed using the Diabetes Management Self-Efficacy Scale (DMSES)[34] composed of 20 items divided into several domains, and developed based on the self-care activities required to manage DM2. The scale thus assesses the extent to which the individual is confident about managing blood sugar levels, foot care, medication management, diet, level of physical activity, and health care demand. The score ranges from 0 to 10 for each item and the total sum between 0 and 200 with high scores indicating high levels of self-efficacy. Cronbach's alpha for the DMES scale for this sample was 0.81 indicating good reliability.

The average score obtained in relation to self-efficacy in diet management (contemplates 10 items) 67.8, physical exercise and weight control (contemplates 3 items) 18.6 and medication (contemplates 2 items) 18.0. The average score for self-efficacy in DM2 management obtained through the sum of the three domains was 136.8.

Of all the individuals interviewed, 191 (48.7%) were classified as having high self-efficacy in all areas to manage DM2.

The participants with a high level of self-efficacy in diet management, exercise, weight control, and medical treatments were 188 (48.0%), 199 (50.8%) and 281 (71.7%) respectively.

The multi-factorial analysis revealed that levels of education higher than nine years and the reception of formal educational content, through health education, present a statistically significant association with self-efficacy levels in the management of DM2[13,27].

The participants who presented higher levels of self-efficacy in the management of diet, physical activity and medication, proved to be more adherent in each of the domains compared to individuals with low efficacy[26].

Of all the interviewees, 87 (22.2%) reached the target therapeutic goal and considered the disease controlled. The only variable that presents itself as a predictor of DM2 control was self-efficacy. The 55 participants (28.8%) with high self-efficacy showed better control of the disease compared to the 32 participants (15.9%) with low self-efficacy[29,30].

CONCLUSION

According to the results of the studies included in the integrative literature review, there is statistically significant evidence that self-efficacy is a predictor of behaviors of adherence to the therapeutic regimen. Self-efficacy together with knowledge has been shown to be effective in metabolic control due to better self-management of DM2 through adherence to the therapeutic regimen.

In terms of contributions to the practice, there is a need to prevent lifestyle-related diseases. Being highly productive the understanding of factors affecting metabolic control in adults with DM2.

As limitations for the research, in the studies included the sample obtained, it was a sample for convenience, not being able to generalize the data obtained and the scales used to assess self-efficacy are different.

We propose randomized controlled studies to measure with less risk of bias the effect of self-efficacy in adherence to the therapeutic regimen in DM2.

Authors Contributorship

JC: Study design and coordination, data collection, storage and data analysis, review and discussion of results.
RF: Study design and coordination, data collection, data analysis, review and discussion of results.
MAF: Study design and results discussion.
CF: Study design, review and results discussion.
SC: data collection, review and results discussion.
All authors read and agreed with the published version of the manuscript.

Ethical Disclosures

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Table 1 – PICO strategy.

PICO	
Person/Population/Problem	Adults with DM2
Intervention	Self-efficacy
Context	–
Outcome	Adherence to the therapeutic regime

Table 2 – Checklists Critical Appraisal Tools for Analytical Cross Sectional Studies application result.↖

Article	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	X%
Adam & Folds[19]	Y	Y	Y	Y	N	N	Y	Y	75
Walker, Smalls, Hernandez-Tejada, Campbell, & Egede[20]	Y	Y	Y	Y	Y	Y	Y	Y	100
Amer, Mohamed, Elbur, Abdelaziz, & Elrayah[21]	Y	Y	Y	Y	Y	Y	Y	Y	100
Tovar, Rayens, Gokun, & Clark,[22]	Y	Y	Y	Y	Y	Y	Y	Y	100
Y%	100	100	100	100	75	75	100	100	–

Table 3 – Classification of studies included by levels of evidence and degree of recommendation.↖

Study	Year	Level of Evidence	Degree of Recommendation
Adam & Folds[19]	2014	4.b – Cross sectional	Strong
Walker *et al*,[20]	2014	4.b – Cross sectional	Strong
Amer *et al*,[21]	2018	4.b – Cross sectional	Strong
Tovar *et al*,[22]	2015	4.b – Cross sectional	Strong

Table 4 – Synoptic of the analyzed studies.

Authors/Year	Type of study	Duration	Country	Study objective	Participants	Results
Adam & Folds, 2014[19]	Cross sectional	2 months	United States of America	Identify the relationship between depressive symptoms, self--efficacy and adherence to the therapeutic regimen in people with DM2.	n=55 25 Men 30 Women	There was a statistically relevant inverse relationship, compared to symptoms of depression and self-efficacy; A statistically significant relationship was found between self-efficacy and adherence to diet, exercise, and smoking habits.
Walker *et al*, 2014[20]	Cross sectional	3 months	United States of America	Examine the effect of self-efficacy on glycemic control, self-care behaviors and quality of life.	n=378 116 Men 262 Women	It has been shown that self-efficacy in diabetes has a statistically relevant association with metabolic control, medication adherence, physical exercise, diet and quality of life related to mental health.
Amer *et al*, 2018[21]	Cross sectional	12 months	Sudan	Identify the influence of self-efficacy in adherence to daily activities of metabolic control and treatment of DM2 patients.	n=392 212 Men 180 Women	Individuals who have shown high self--efficacy rates for managing food, nutrition, physical activity and medication are more adherent to diet in general, physical activity and taking medication, respectively, compared to those with low efficacy for managing these domains. Self-efficacy in diabetes management was the only predictor found regarding metabolic control.
Tovar *et al*, 2015[22]	Cross sectional	11 months	United States of America	Analyze self-efficacy and social support as mediators in the relationship between depressive symptoms and adherence to the therapeutic regime in people with DM2.	n=201 67 Men 134 Women	Self-efficacy is predictive of adhesion (diet exercise, medication among others). The study demonstrated that self--efficacy is a strong mediator of the relationship between adherence to activities related to self-care in DM2.

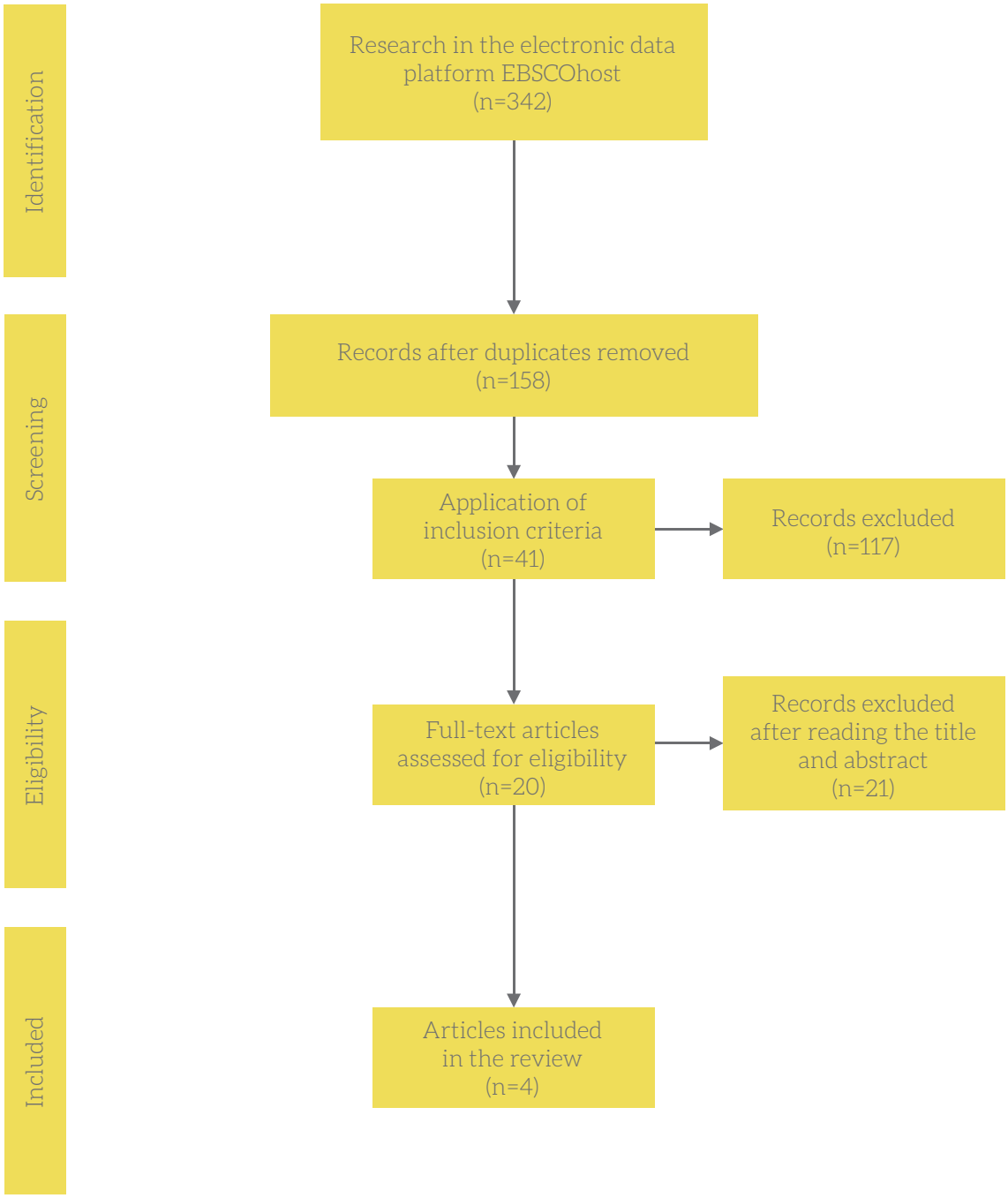

Figure 1 – Research methodology: PRISMA flow diagram.