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PREVALENCE AND INCIDENCE OF DEPRESSIVE SYMPTOMS AND DEPRESSION IN COMMUNITY-DWELLING OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

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PREVALENCE AND INCIDENCE OF DEPRESSIVE SYMPTOMS AND DEPRESSION IN COMMUNITY-DWELLING OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

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ABSTRACT

Introduction Faced with the continuous growth in the number of older people at a global level, some concerns are raised about the way people age. Health conditions such as depressive symptoms and depression have a direct or indirect impact on the quality of life of this population segment. The objective of this study is to verify the occurrence of the various presentations of the depressive spectrum in the community-dwelling older population, as well as to analyze the associated and predictive factors.

Methods and analysis This systematic review and meta-analysis protocol follows the recommendation of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols. Searches will be conducted in *PubMed*, *Web of Science*, *Scopus*, *Lilacs*, *Scielo*, and *Cochrane* databases, as well as grey literature. The search strategy involves terms related to aging and the depressive spectrum found in observational studies, either sectional or longitudinal. There will be no language restriction and the material included will be the ones whose publications took place until December 2020.

Ethics and dissemination Formal ethical approval is not required on this research, since it only aims secondary data. Our findings may be disseminated to fill in the gaps and guide the production of more effective public policies aimed at a more adequate care to the older population. The search process began in January 2021 and it is expected that all stages of the review will be completed by November 30, 2021.

Strengths and limitations of this study
• It highlights the importance of measuring data on prevalence and incidence of depressive symptoms and depression in the community-dwelling older global population.

- To the best of our knowledge, this is the first systematic review and meta-analysis to reveal data on incidence data and risk factors of the depressive spectrum in community-dwelling older adults, without temporal limits.
- This research adheres to the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines for protocols (PRISMA-P).
- Heterogeneous data obtained for the depressive spectrum, from clinically significant symptoms of depression obtained by scales and clinical diagnosis of depression, may limit the performance of quantitative meta-analysis.

INTRODUCTION

The number of people aged 65 and over, according to a United Nations report,[1] is expected to increase from 9% in 2019 to 16% in 2050. In addition to these projections, the rapid aging of the population is likely to continue until the middle of the 21st century [2], which entails a greater need for societies to adapt. Such demographic changes demand a better dimensioning of the dynamics of aging, which includes an understanding of the relationship between greater longevity and the qualitative aspect of experiences. Studies show an opposite relationship: the longer one lives, the more difficult life experiences can be due to the progressive loss of physical, mental, and cognitive integrity. [3 4]

It is observed a tendency of growth in the prevalence of multimorbidity with the increase of age,[5] which is related to repercussions in the quality of life and functionality.[6] Little is known about the relationship between multimorbidity and depression. It has been noticed that people with multimorbidity present a two- to three- fold increase in the chance of having depression when compared to people who do not have it [7] and that depression seems to play a central role in the patterns of multimorbidity [8].

Regarding depression, the World Health Organization[9] positions it as the single largest contributor to disability, besides its direct relationship with suicide deaths. Depression in the older population is associated with an increased risk of mortality,[10] along with the impact on functional capacity, fragility[11] and quality of life,[12 13] being considered as the single largest contributor to non-fatal health loss.[9] Among the age groups, a peak in the frequency of depression was detected between the age of 55 and 74 years,[9] which affects 7.5% of women and 5.5% of men, worldwide, a percentage that exceeds the other ages.

Clinical characteristics of depression include both psychological symptoms - sadness, lack of energy or decreased ability to feel pleasure - and physical and neurovegetative symptoms - such as fatigue, changes in sleep and appetite.[14] This range of symptoms is associated with neurochemical changes of a polygenic nature,[15] as well

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as more subjective factors that occur throughout life, such as bereavements and losses, individual coping capacity, social support, and loneliness.[9 16 17] This heterogeneous profile of the clinical manifestation of depression makes its study complex, especially when so many forms of presentation can occur.

When discussing depression in the scientific literature, particularly when conducting epidemiological studies, depression can take on several different presentations. The way depression has been researched entails a great variability in prevalence and incidence data, which makes the comprehension of the presentations important to be addressed. This variability in general is due to methodological differences: 1) how the depressive spectrum can be researched; 2) the housing profile of the older population.

In the first difference, the depressive spectrum is understood as the entire set of depressive categories, from the mildest depressive symptoms to the most severe, such as Major Depression.[18 19] There are two ways to research the depressive spectrum, either by categorization or by dimensional assessment. The categorization is determined by the American Psychiatric Association, in its 5th edition of the Diagnostic and Statistical Manual - DSM V,[14] or by the World Health Organization, by the International Code of Diseases 10th edition, ICD 10[20] in the so-called Depressive Disorders. For dimensionality assessment, depression scales quantify and establish a cut-off point, revealing what is known as clinically significant depressive symptoms (CSDS). This type of assessment of depression seems to have a good representation in its syndromic understanding.[21]

It is important to emphasize that both ways of assessing depression are relevant. Even when evaluating the CSDS, the so-called 'subclinical' depression, there is a tendency to chronicity and recurrence,[11 22] which entails the psychosocial repercussions.[23] In this regard, early detection should be a focus at the Primary Health Care level, with a view to the early establishment of interventions.[23]

As for the housing profile of the older population, it is known that those who live in their own homes have better quality of life indexes[24] and a better level of functionality than the institutionalized[25 26] or hospitalized[27] older adults. Therefore, a systematic review focusing on community-dwelling older adults intends to address a preventive perspective, especially when involving studies of incidence and assessment of predictive factors of depression.

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Notwithstanding the review research carried out in 2003, which sought to evaluate risk factors for depression,[28] there are no updated reviews or meta-analysis whose population focus is community-dwelling adults aged 60 years or over, that particularly bring incidence rates or reveal predictive factors. We hypothesize that sociodemographic factors, health conditions, social support, level of dependence, and stressful events may predict the depressive spectrum in community-dwelling older adults.

The objective of this systematic review will be to ascertain the prevalence and incidence in the various presentations of the depressive spectrum in the community-dwelling older population, as well as to analyze the associated and predictive factors.

METHODS AND ANALYSIS

Study design and eligibility criteria

This research is a systematic review that includes observational studies whose research questions should aim to assess the frequency and/or occurrence of depression within its depressive spectrum and its associated or predictive factors. The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) under the registration number CRD42019121616.

As recommended by PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses,[29] systematic reviews should be guided by the acronym PICO, representing the Participants, Intervention (in our case, we replace it by exposure variables), Comparators, and Outcomes, which can be seen summarized in **table 1.**

Table 1. PICO- description

Abbreviation	Meaning	Characteristics
P	Participants	Community-dwelling adults ≥60 years old
I	Intervention (exposure)	Sociodemographic factors, health conditions, social support, dependency level, stressful events, contextual factors.
C	Comparators	Group without the exposure variables
O	Outcomes	Prevalence/incidence data of depression/Clinically significant depressive symptoms

As defined by the World Health Organization,[30] individuals older than 65 years are considered old in developed countries, while the cut-off point decreases to 60 years old in developing countries. Thus, we will include articles whose population focus should be exclusively older adults, of both sexes, community-dwelling adults aged 60 years or

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older, i.e., living in a home or residence, even if they live in houses with other older people or receive specialized care, and therefore are not institutionalized or hospitalized.

We will include the primary studies that deal with depression or clinically significant depressive symptoms. To embrace the nomenclature used for depressive spectrum, studies that research major depressive episode, major depressive disorder, unipolar depression, dysthymia, minor depression, subclinical depression, and clinically significant depressive symptoms (CSDS) will be included. Studies that include bipolar depression or depression with psychotic symptoms will be excluded. This variable, related to the depressive spectrum, will be treated as the dependent variable or the primary outcome.

When the included studies are longitudinal, the focus will be on the evaluation of the predictive factors of depression which will be considered the dependent variable, even if they bring bidirectional relations with other variables. Regarding language and time, the team will include all studies that meet these eligibility criteria, with no initial restriction for languages or time period.

Studies that include blood, molecular or chemical element measurements will be excluded. Studies investigating clinical populations in specific outpatient treatment or presenting specific diseases will also be excluded.

Information source and search strategy

Six health-related databases will be used: PubMed, Web of Science, Scopus, LILACS (Latin-American and Caribbean Literature on Health Sciences), SciELO (Scientific Electronic Library Online) and Cochrane. In addition to these bases, materials from the grey literature will be used, represented by repositories of monographs or theses, publications in Congresses and Google Scholar.

Considering the search strategy, we decided on the association of keywords and descriptors, with no filter, in English, forming an equation that respected the search form and technique in each base, according to **Table 2**.

Table 2- Search strategies for each database

Databases	General search strategy

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PubMed Web of Science Scopus LILACS Scielo Cochrane	((Elder* OR "aged people" OR "older adults") AND ("depressive symptoms" OR "Clinically Significant Depressive Symptoms" OR "depression" OR "major depressive episode" OR "unipolar depression") AND (“longitudinal study” OR “cohort” OR “prevalence study” OR “incidence study”))

The grey literature can be accessed by unfiltered search in some databases through conference proceedings, google scholar, monograph or thesis repositories, grey literature search websites such as the Canadian Agency for Health Technology Assessment,[31] and the references of the included studies. The last date for collecting the material was on the 31st of December, 2020.

Review and selection process of studies

A total of five researchers will participate in this review and the whole process will be accompanied by face-to-face or virtual meetings, weekly or biweekly, for training, adjustments, as well as to dispel disagreements.

After using the aforementioned search strategy, Microsoft Excel will be used in order to make it possible to count the studies per base and remove duplicates. The selection of these studies will begin by paired and independent reading (two members of the group and a third participant will be responsible for dispel any disagreements found and maintaining the alignment of the eligibility criteria). The selection phase will be consisted of two moments sequentially: 1) reading the titles and abstracts; 2) reading the full text, counting the number of studies included for the next phase and those excluded with their justifications. These results will be demonstrated at the time of publication of the systematic review using the flowchart recommended by PRISMA.[29]

Data Extraction

After selecting the studies, data extraction will occur in a paired and independent approach, using a third component to assess disagreements. The data to be extracted will be guided by the purpose of this study, associated with the eligibility criteria. Therefore, it should include data on the country from which the study was developed, population type and location, study design, inclusion and exclusion criteria, observation time,

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sociodemographic characteristics at the first wave, predictive factors, and outcome variable characteristics, such as the nature of the variable, instrument, and values. These data will be arranged in a table, using Microsoft Excel.

Evaluation of quality of the studies

This phase of the study is based on the evaluation of quality of the studies included by the paired process, and thus, the analysis of the risk of bias. For observational studies, it will be verified if they are cross-sectional or longitudinal studies, and for each of these, the quality assessment is guided by the evaluation of the representativeness of the sampling, the form of measurement, the comparison of exposed and unexposed, the observation of values related to the outcomes and the control of confounding factors.

The assessment of quality will be evaluated by the chosen tool called Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.[32] It consists of 14 items, to be also evaluated in a paired process, with a third member to dispel disagreements with 'yes', 'no' or 'other' (which includes 'cannot determine', 'not applicable', or 'not reported').

Biases and heterogeneity

After the quantitative synthesis of the meta-analysis is done, we will evaluate heterogeneity, due to the variety of instruments customarily used to assess the outcome of the depressive spectrum, besides other possible differences in the studies analyzed. The I^2 test will be used, being admitted as heterogeneous if I^2 values are above 50%. In case of heterogeneity, a subgroup analysis will be performed from the selection of certain included studies whose population or data of older people differ, such as countries separated into categories by socioeconomic differences according to the United Nations classification and aggregation methodology.

Graphical techniques such as funnel charts or statistical techniques (depending on the nature of the variable) will be employed to evaluate publication bias.

Summary Data

In this stage, prevalence and incidence data of the depressive spectrum will be presented, as well as the associated factors or risk factors, respectively. This section corresponds to the meta-analysis itself, and if it is not possible, a narrative and qualitative synthesis will be made.

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Different meta-analyses will be performed for the quantitative data from prevalence and incidence studies and according to the variability of the depressive spectrum, using aggregate data. For each study included in the meta-analysis, we will use the inverse-variance weighting method. It will be critical to assess the impact of heterogeneity, especially since there are so many ways to evaluate the depressive spectrum.

The data will be analyzed by the software R Project and displayed in tables, which will contain the measures of frequency and effect, whether continuous or dichotomized, with exposure of the relative risk, odds ratio, or mean differences in case the depressive variable is presented in a continuous form. Furthermore, forest plot graphics may be presented.

Reliance on the evidence found

The assessment of the quality of the evidence that will be included should be addressed by The Grading of Recommendations Assessment, Development and Evaluation (GRADE), which makes it possible to classify into reliable levels, evaluating whether the effect estimates are close to reality.

Patient and Public Involvement: No patient involved.

ETHICS AND DISSEMINATION

Formal ethical approval is not required on this research, since published studies with non-identifiable data will be used.

Amendments: After approval of the protocol, any important amendments will be documented in the final publication; and if necessary, these amendments will be registered with PROSPERO.

Contributorship statement: Conceptualization: LEEB, DLBdeS and JJ. Data analysis: LEEB, DLBdeS and JJ. Methodology and Project administration: LEEB, DLBdeS, JJ. ALP and MYM. Reading and final revision of the text; LEEB, DLBdeS, JJ, ALP and MYM. Research: all. Writing of the scientific paper: LEEB, DLBdeS, JJ, ALP and MYM.

Competing interests: None declared.

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PRISMA-P 2015 checklist: recommended items to include in a systematic review protocol			
Section/topic	**Number item**	**Checklist item**	**Checking**
Title			
• Identification	1a	Identify the report as a protocol of a systematic review	Checked
• Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not necessary
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number	PROSPERO CRD42019121616
Authors			
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	Checked
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	Checked
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Checked
Support			
• Sources	5a	Indicate sources of financial or other support for the review	Checked
• Sponsor	5b	Provide name for the review funder and/or sponsor	
• Role of sponsor/ funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	Checked
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	Checked
METHODS			
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	Checked
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	Checked
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Checked
Study records			
• Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	Checked
• Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	Checked
• Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	Checked
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	Checked
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	Checked
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	Checked
Data	15a	Describe criteria under which study data will be quantitatively synthesized	Checked

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Synthesis	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I2, Kendall's tau)	
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	Checked
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	Checked

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INCIDENCE OF DEPRESSION, DEPRESSIVE SYMPTOMS AND ITS PREDICTIVE FACTORS IN A COMMUNITY-DWELLING OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

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INCIDENCE OF DEPRESSION, DEPRESSIVE SYMPTOMS AND ITS PREDICTIVE FACTORS IN A COMMUNITY-DWELLING OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS PROTOCOL

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ABSTRACT

Introduction Faced with the continuous growth in the number of older people at a global level, some concerns are raised about the way people age. Health conditions such as depressive symptoms and depression have a direct or indirect impact on the quality of life of this population segment. The objective of this study is to verify the incidence of the various presentations of the depressive spectrum in the community-dwelling older population, as well as to analyze the predictive factors.

Methods and analysis This systematic review and meta-analysis protocol follows the recommendation of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols. Searches will be conducted in *PubMed*, *Web of Science*, *Scopus*, *Lilacs*, *Scielo*, and *Cochrane* databases, as well as grey literature. The search strategy involves terms related to aging and the depressive spectrum found in observational studies. There will be no language restriction and the material included will be the ones whose publications took place until December 2020.

Ethics and dissemination Formal ethical approval is not required on this research, since it only aims secondary data. After publishing the results in a scientifically supported journal, our findings may be disseminated to fill in the gaps and guide the production of more effective public policies directed at a more adequate care to the older population at a global level. The search process began in January 2021 and it is expected that all stages of the review will be completed by November 30, 2021.

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Strengths and limitations of this study
• To the best of our knowledge, this is the first systematic review and meta-analysis to reveal data on incidence and risk factors of the depressive spectrum in community-dwelling older adults.
• This research adheres to the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines for protocols (PRISMA-P).
• Heterogeneous data obtained for the depressive spectrum, may limit the performance of quantitative meta-analysis.
• Our choice not to limit time or language makes the data that will be obtained important from a public health perspective.

INTRODUCTION

The number of people aged 65 and over, according to a United Nations report,[1] is expected to increase from 9% in 2019 to 16% in 2050. In addition to these projections, the rapid aging of the population is likely to continue until the middle of the 21st century [2], which entails a greater need for societies to adapt. Such demographic changes demand a better dimensioning of the dynamics of aging, which includes an understanding of the relationship between greater longevity and the qualitative aspect of experiences. Studies show an opposite relationship: the longer one lives, the more difficult life experiences can be due to the progressive loss of physical, mental, and cognitive integrity. [3 4]

It is observed a tendency of growth in the prevalence of multimorbidity with the increase of age,[5] which is related to repercussions in the quality of life and functionality.[6] Little is known about the relationship between multimorbidity and depression. It has been noticed that people with multimorbidity present a two- to three- fold increase in the chance of having depression when compared to people who do not have it [7] and that depression seems to play a central role in the patterns of multimorbidity [8].

Regarding depression, the World Health Organization[9] positions it as the single largest contributor to disability, besides its direct relationship with suicide deaths. Depression in the older population is associated with an increased risk of mortality,[10] along with the impact on functional capacity, fragility[11] and quality of life,[12 13] being considered as the single largest contributor to non-fatal health loss.[9] Among the age groups, a peak in the frequency of depression was detected between the age of 55 and 74 years,[9] which affects 7.5% of women and 5.5% of men, worldwide, a percentage that exceeds the other ages.

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Clinical characteristics of depression include both psychological symptoms - sadness, lack of energy or decreased ability to feel pleasure - and physical and neurovegetative symptoms - such as fatigue, changes in sleep and appetite.[14] This range of symptoms is associated with neurochemical changes of a polygenic nature,[15] as well as more subjective factors that occur throughout life, such as bereavements and losses, individual coping capacity, social support, and loneliness.[9 16 17] This heterogeneous profile of the clinical manifestation of depression makes its study complex, especially when so many forms of presentation can occur.

When discussing depression in the scientific literature, particularly when conducting epidemiological studies, depression can take on several different presentations. The way depression has been researched entails a great variability in prevalence and incidence data, which makes the comprehension of the presentations important to be addressed. This variability in general is due to methodological differences: 1) how the depressive spectrum can be researched; 2) the housing profile of the older population.

In the first difference, the depressive spectrum is understood as the entire set of depressive categories, from the mildest depressive symptoms to the most severe, such as Major Depression.[18 19] There are two ways to research the depressive spectrum, either by categorization or by dimensional assessment. The categorization is determined by the American Psychiatric Association, in its 5th edition of the Diagnostic and Statistical Manual - DSM V,[14] or by the World Health Organization, by the International Code of Diseases 10th edition, ICD 10[20] in the so-called Depressive Disorders. For dimensionality assessment, depression scales quantify and establish a cut-off point, revealing what is known as clinically significant depressive symptoms (CSDS). This type of assessment of depression seems to have a good representation in its syndromic understanding.[21]

It is important to emphasize that both ways of assessing depression are relevant. Even when evaluating the CSDS, the so-called 'subclinical' depression, there is a tendency to chronicity and recurrence,[11 22] which entails the psychosocial repercussions.[23] In this regard, early detection should be a focus at the Primary Health Care level, with a view to the early establishment of interventions.[23]

As for the housing profile of the older population, it is known that those who live in their own homes have better quality of life indexes[24] and a better level of functionality

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than the institutionalized[25 26] or hospitalized[27] older adults. Therefore, a systematic review focusing on community-dwelling older adults intends to address a preventive perspective, especially when involving studies of incidence and assessment of predictive factors of depression.

Notwithstanding the review research carried out in 2003, which sought to evaluate risk factors for depression,[28] there are no updated reviews or meta-analysis whose population focus is community-dwelling adults aged 60 years or over, that particularly bring incidence rates or reveal predictive factors. We hypothesize that sociodemographic factors, health conditions, social support, functional disability, and some contextual factors may predict the depressive spectrum in community-dwelling older adults.

The objective of this systematic review will be to ascertain the incidence in the various presentations of the depressive spectrum in the community-dwelling older population, as well as to analyze the predictive factors.

METHODS AND ANALYSIS

Study design and eligibility criteria

This research is a systematic review that includes observational studies whose research questions should aim to assess the incidence of depression within its depressive spectrum and its predictive factors. The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) under the registration number CRD42019121616.

As recommended by PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses,[29] systematic reviews should be guided by the acronym PICO, representing the Participants, Intervention (in our case, we replace it by exposure variables), Comparators, and Outcomes, which can be seen summarized in **table 1.**

Table 1. PICO- description

Abbreviation	Meaning	Characteristics
P	Participants	Community-dwelling adults ≥60 years old
I	Intervention (exposure)	Sociodemographic factors, health conditions, social support, functional disability, contextual factors.
C	Comparators	Group without the exposure variables
O	Outcomes	Prevalence/incidence data of depression/Clinically significant depressive symptoms

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As defined by the World Health Organization,[30] individuals older than 65 years are considered old in developed countries, while the cut-off point decreases to 60 years old in developing countries. Thus, we will include articles whose population focus should be exclusively older adults, of both sexes, community-dwelling adults aged 60 years or older, i.e., living in a home or residence, even if they live in houses with other older people or receive specialized care, and therefore are not institutionalized or hospitalized.

We will include the primary studies that deal with depression or clinically significant depressive symptoms. To embrace the nomenclature used for depressive spectrum, studies that research major depressive episode, major depressive disorder, unipolar depression, dysthymia, minor depression, subclinical depression, and clinically significant depressive symptoms (CSDS) will be included. This variable, related to the depressive spectrum, will be treated as the dependent variable or the primary outcome. Studies that include bipolar depression or depression with psychotic symptoms will be excluded.

The evaluation of the predictive factors of depression or depressive symptoms will be considered the independent variable and have been summarized in **table 1**. These variables can be further broken down into others and will depend on the articles included at the end of the Systematic Review. The factors hypothesized here to be predictive of the depressive spectrum have been studied over time. For example, female gender and age group within the older adults population among the *sociodemographic variables*, comorbidities/multimorbidities or sphincter alterations as *health conditions*, lack of ties with friends, family or loneliness as *social support*, losses or bereavements as *contextual factors*, and, impairment in functionality as *functional disability*, which translates the level of dependence.[9 16 25 31]

Regarding language, the team will include all studies that meet these eligibility criteria, with no initial restriction for languages. considering that it could compromise the more global intent of this systematic review protocol. Therefore, for articles whose languages are not within the team's domain, the first attempt would be to look for translators whose material is reliable. If this is not possible, the languages will include articles in English, Spanish, Portuguese, and French, being recognized as a limitation of the systematic review.

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Studies that include blood, molecular or chemical element measurements will be excluded. Studies investigating clinical populations in specific outpatient treatment or presenting specific diseases will also be excluded.

Outcome measures

The primary outcome can be subdivided into 1) Incidence of depression, by means of measures of incidence rate or cumulative incidence of a major depressive episode or of clinically significant depressive symptoms. If scales are used to measure the depressive variable, they must be validated, and the final values can be displayed in a dichotomous or continuous manner. Self-report measures of depression will not be accepted; 2) Predictive factors of the depressive spectrum may be arranged in dichotomous values, to be analyzed by measures of association with 95% CI (confidence interval).

Furthermore, as a secondary outcome, longitudinal articles will be searched, whose objectives seek to evaluate the trajectory of the depressive spectrum, through the follow-up of symptom severity (measured with scales) or depression, by means of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) and International Classification of Diseases, 10th revision (ICD-10), and its associated variables.

Information source and search strategy

Six health-related databases were used: PubMed, Web of Science, Scopus, LILACS (Latin-American and Caribbean Literature on Health Sciences), SciELO (Scientific Electronic Library Online) and Cochrane. In addition to these bases, materials from the grey literature will be used, represented by repositories of monographs or theses, publications in Congresses and Google Scholar.

Despite the possibility of using filters tools in advanced searches in the various databases, the authors have decided not to include in the search strategy step the filters of document types, languages, and types of studies, since the search was intended to be exhaustive. We have established the best possible search strategy so that more relevant studies could emerge within the theme, using several combinations of descriptors and key words in the equation. Regarding the use of the associated terms 'prevalence study' OR 'incidence study', compared to the search strategy that used only 'incidence study', no

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considerable difference was observed between the results of the different searches in the quantity of articles per database. Thus, we have opted to use the first association, anticipating that the differentiation between cross-sectional and longitudinal studies would be left to be done in the peer review phase.

Considering the search strategy for this study, literature search strategies were developed using medical subject headings (MeSH) and text words related to the population, depressive spectrum, and the type of study, forming an equation that respected the search form and technique in each base, according to **Table 2**.

Table 2- Search strategies for each database

Databases	General search strategy
PubMed Web of Science Scopus LILACS Scielo Cochrane	((Elder* OR "aged people" OR "older adults") AND ("depressive symptoms" OR "Clinically Significant Depressive Symptoms" OR "depression" OR "major depressive episode" OR "unipolar depression") AND (“longitudinal study” OR “cohort” OR “prevalence study” OR “incidence study”))

In the spirit of including as much relevant material as possible, studies that answer the research question and are listed in their references will be included in the screening. For papers that may not be found in their complete form, we will establish communication with each lead author so that the material can be properly evaluated according to the eligibility criteria.

The grey literature can be accessed by unfiltered search in some databases through conference proceedings, google scholar, monograph or thesis repositories, grey literature search websites such as the Canadian Agency for Health Technology Assessment,[32] and the references of the included studies. The last date for collecting the material was on the 31st of December, 2020.

Review and selection process of studies

A total of seven researchers will participate in this review and the whole process will be accompanied by face-to-face or virtual meetings, weekly or biweekly, for training, adjustments, as well as to dispel disagreements.

After using the aforementioned search strategy, Microsoft Excel will be used in order to make it possible to count the studies per base and remove duplicates. The

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selection of these studies will begin by peer review and independent reading (two members of the group and a third participant will be responsible for dispel any disagreements found and maintaining the alignment of the eligibility criteria). The selection phase will be consisted of two moments sequentially: 1) reading the titles and abstracts; 2) reading the full text, counting the number of studies included for the next phase and those excluded with their justifications. These results will be demonstrated at the time of publication of the systematic review using the flowchart recommended by PRISMA.[29]

Data Extraction

After selecting the studies, data extraction will occur in a paired and independent approach, using a third component to assess disagreements. The data to be extracted will be guided by the purpose of this study, associated with the eligibility criteria. Therefore, it should include data on the country from which the study was developed, population type and location, study design, inclusion and exclusion criteria, observation time, sociodemographic characteristics at the first wave, predictive factors, and outcome variable characteristics, such as the nature of the variable, instrument, and values. These data will be arranged in a table, using Microsoft Excel.

Evaluation of quality of the studies

This phase of the study is based on the evaluation of quality of the studies included by peer review, and thus, the analysis of the risk of bias. The quality assessment will be guided by the evaluation of the representativeness of the sampling, the form of measurement, the comparison of exposed and unexposed, the observation of values related to the outcomes and the control of confounding factors.

The assessment of quality will be evaluated by the chosen tool called Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.[33] It consists of 14 items, to be also evaluated in a peer review, with a third member to dispel disagreements with 'yes', 'no' or ‘other’ (which includes ‘cannot determine’, 'not applicable', or 'not reported').

Biases and heterogeneity

After the quantitative synthesis of the meta-analysis is done, we will evaluate heterogeneity, due to the variety of instruments customarily used to assess the outcome

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of the depressive spectrum, besides other possible differences in the studies analyzed. The I^2 test will be used, being admitted as heterogeneous if I^2 values are above 50%. In case of heterogeneity, a subgroup analysis will be performed from the selection of certain included studies whose population or data of older people differ, such as countries separated into categories by socioeconomic differences according to the United Nations classification and aggregation methodology.

Graphical techniques such as funnel charts or statistical techniques (depending on the nature of the variable) will be employed to evaluate publication bias.

Summary Data

In this stage, incidence data of the depressive spectrum will be presented, as well as the risk factors. This section corresponds to the meta-analysis itself, and if it is not possible, a narrative and qualitative synthesis will be made.

Different meta-analyses will be performed for the quantitative data incidence studies and according to the variability of the depressive spectrum, using aggregate data. For each study included in the meta-analysis, we will use the inverse-variance weighting method. It will be critical to assess the impact of heterogeneity, especially since there are so many ways to evaluate the depressive spectrum.

The data will be analyzed by the software R Project and displayed in tables, which will contain the measures of frequency and effect, whether continuous or dichotomized, with exposure of the relative risk, odds ratio, or mean differences in case the depressive variable is presented in a continuous form. Furthermore, forest plot graphics may be presented.

Reliance on the evidence found

The assessment of the quality of the evidence that will be included should be addressed by The Grading of Recommendations Assessment, Development and Evaluation (GRADE), which makes it possible to classify into reliable levels, evaluating whether the effect estimates are close to reality.

Patient and Public Involvement: No patient involved.

ETHICS AND DISSEMINATION

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Formal ethical approval is not required on this research, since published studies with non-identifiable data will be used. It is known that a systematic review and meta-analysis follow a series of steps, respecting methodological rigor and synthesizing scientific evidence reliably. After publication of the final report of this material in a scientifically supported journal, the results can provide a global picture of the depressive spectrum in the community-dwelling older adults population, highlighting similarities between the different locations, as well as the differences. The epidemiological aspects found may fill current gaps and encourage the development of public policies focused on the health of older adults, especially for the group with lower vulnerability. Moreover, with the dissemination of the results, more studies can be done with the intention of understanding the impact of the insertion of new tools in health care for older adults.

Amendments: After approval of the protocol, any important amendments will be documented in the final publication; and if necessary, these amendments will be registered with PROSPERO.

Contributorship statement: JJ is the guarantor. Conceptualization: LEEB, DLBdeS and JJ. Data analysis: LEEB, DLBdeS and JJ. Methodology and Project administration: LEEB, DLBdeS, JJ. ALP and MYM. Reading and final revision of the text; LEEB, DLBdeS, JJ, ALP and MYM. Research: all. Writing of the scientific paper: LEEB, DLBdeS, JJ, ALP and MYM.

Competing interests: None declared.

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PRISMA-P 2015 checklist: recommended items to include in a systematic review protocol			
Section/topic	**Number item**	**Checklist item**	**Checking**
Title			
• Identification	1a	Identify the report as a protocol of a systematic review	Page 1, lines 1-3
• Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not necessary
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number	Page 4, line 18-20
Authors			
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	Page 1, line 5-24
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	Page 10 lines 16-20
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Page 10, line 12-14
Support			
• Sources	5a	Indicate sources of financial or other support for the review	Page 10, line 22-26
• Sponsor	5b	Provide name for the review funder and/or sponsor	
• Role of sponsor/ funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	Page 2 (line 3) to Page 4 (Line 8)
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	Page 4, line 8-13
METHODS			
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	Page 4 (line 16) to Page 6 (line 3)- summarized information table 1
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	Page 6 (line 19) to Page 7 (line 19)
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Table 2 (Page 7)
Study records			
• Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	Page 7 (line 20) to Page 8 (line 8)
• Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	Page 7 (line 20) to Page 8 (line 8)
• Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	Page 8 (line 9-17)
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	Page 5, lines 7-24
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	Page 6, Line 5-17
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	Page 8 (line 29) to page 9 (line 6)

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Data Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	Page 9, Line 9-22
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I2, Kendall's tau)	
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	Page 9, line 7,8
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	Page 9, line 23-27

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