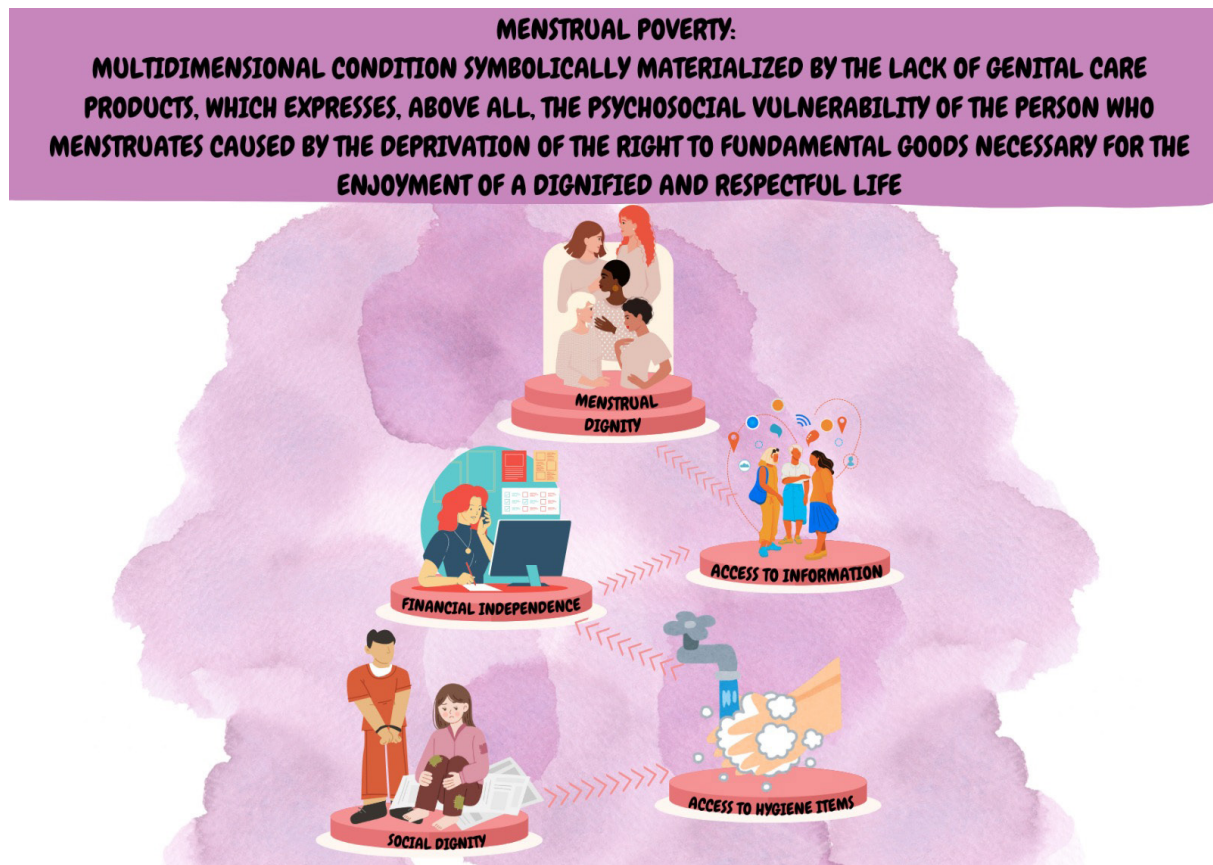


Menstrual poverty: a systematic review to identify vulnerable populations and measurement tools

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Graphical Abstract



Abstract

The objective was to present a synthesis of the literature on the topic 'menstrual poverty'. The search considered the sources PubMed/MEDLINE, LILACS, SCIELO Brazil and Google Scholar site. Pairs of researchers conducted the review steps according to the PRISMA guidelines, and assessed the quality of the evidence using the Mixed Methods Appraisal Tool. A total of 2,457 publications were identified, and 22 of them were included in the review. The concept outlined from this review suggests that "menstrual poverty corresponds to a multidimensional condition symbolically materialized by the lack of genital care products, which expresses, above all, the psychosocial vulnerability of the person who menstruates caused by the deprivation of the right to fundamental goods necessary for the enjoyment of a dignified and respectful life". Age and socioeconomic conditions are the main markers of vulnerability to 'period poverty'. A vast list of questions delves into the subject, primarily exploring aspects such as access, affordability, and availability of hygiene products to use during the menstrual flow period. By synthesizing the concepts and findings provided by the studies included in this review, it was possible to verify that the unfavorable socioeconomic factors are the most important makers of menstrual poverty. Although the menstrual poverty phenomenon is manifestation of essential goods deprivation and lack of human dignity, the research instruments and the solutions focused on access and supply of hygiene products. This reduction gives little visibility to the inequalities and social injustice that underlie the phenomenon of menstrual poverty.

Keywords: Menstrual Poverty. Menstrual Period. Menstruation. Menstrual Health. Menstrual Hygiene.

INTRODUCTION

On November 15, 2022, projections of world population growth reached a milestone of 8 billion inhabitants, with 22.89% representing the number of women in reproductive age (from 15 to 49 years)¹. These numbers express the size of the demand for essential supplies required to address the menstrual needs that accompany women for approximately 40 years of their lives. The lack of access to essential menstrual supplies is a common barrier facing by schoolgirls and women in the workplace, and this both increases the work absenteeism and reduces the school attendance, implicating in perpetuation of the poverty situation².

Adequately dealing with menstruation means having products that absorb or collect menstrual blood, privacy for hygiene, an appropriate place to discard used products, and water and soap to wash the body or parts of it, all with dignity and without discomfort or fear³. However, it is estimated that, each month, approximately 500 million adolescents and women of reproductive age do not have everything they need to deal with menstrual flow in a dignified way². The lack of accessibility and affordability for acquiring of menstrual hygiene products affects women and girls in both rich and poor countries, and rural or urban areas⁴. For example, in the United States of America, 1 in 4 teens and 1 in 3 adults who live in lower-

-income households, face monthly the lack of menstrual hygiene products⁴.

It is essential to look beyond the biological context, since issues related to the menstrual period have individual, cultural, economic, social and institutional facets that have been investigated in various parts of the world⁵. Tax values that reduce the ability to purchase products, the safety and quality of products, and the lack of access to basic supplies are structural axes encompassed in "menstrual equity"⁶. The operationalization of product disposal is dealt with in the environmental axis⁷. The lack of products to deal with the menstrual flow with dignity is in line with the theoretical hypothesis of deprivation of essential goods. For example, food insecurity and lack of access to clean water are related to the phenomenon of "menstrual poverty"⁸.

Although the lack of dignity is at the core of the problem, the offer of menstrual hygiene products is at the top of the list of solutions. Being in situation of menstrual poverty is the same as living in precarious conditions, at risk of acquiring diseases, without social supporting, and facing financial and structural restrictions⁸. Given the negative aspects involved with menstrual poverty, it is crucial to find ways for inspiring solutions. Coping menstrual poverty depends on the commitment of health

policymakers and new laws aiming to reduce the cost of products, ensure their safety and quality, eliminate fees, and increase the access in general^{5,6}.

Thus, this synthesis of literature configures an alternative to meet in the same work different aspects of menstrual poverty, give them visibility, and highlight for crucial issues. With the expectation that a critical integration of

different aspects involving menstrual poverty can broaden the understanding of the problem and help government authorities in the formulation of policies to reduce deprivation, the present study aimed to develop a systematic review to synthesize concepts of menstrual poverty, identify the vulnerable population and the instruments to be used in the process of measuring the phenomenon.

METHODS

This is a systematic review whose protocol was registered at the International Prospective Register of Systematic Reviews (PROSPERO: CRD42021266056). It focuses on 'Menstrual Poverty', that is a phenomenon indicative of deprivation of human rights configuring a social issue, whose current debate opens a window of opportunity to build knowledge and search scientific solution. Considering the multiple facets involved on thematic, this review was designed to contribute for the construction of knowledge. In the context of policy formulation, it is impor-

tant to identify who are vulnerable people and find appropriate measuring instruments. The review was designed to answer the following questions: (i) What are the groups of women who are vulnerable to menstrual poverty situations? (ii) What are the questionnaires or instruments used to measure menstrual poverty? The systematic review was conducted using the narrative synthesis model⁹ and was formatted according to the criteria established by the instrument Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)¹⁰.

Source of information and Descriptors

The review was carried out by consulting the following bibliographic databases: (i) Medical Literature Analysis and Retrieval System Online (MEDLINE/PUBMED) because is considered the most comprehensive biomedical database; (ii) Latin America and the Caribbean Literature on Health Sciences (LILACS) and (iii)

Scientific Electronic Library Online (SCIELO) were consulted to ensuring the reach of publications originating in Latin America countries did not index on MEDLINE/PUBMED. Additionally, a manual search on the Google Scholar website was performed to retrieve grey literature publications.

Search Strategies

The search strategy included the following descriptors: "poverty", "menstruation", "hygiene", "menstrual hygiene", "menstrual health",

"period poverty", "period, menstrual". Table 1 summarizes the strategy that was applied for each bibliographic database:

Table 1 - Database and search strategies used in the systematic review conducted from September to December 2021, Niterói, Rio de Janeiro, Brazil, in accordance with the protocol CRD42021266056 registered in PROSPERO, in 06 august 2021.

Database	Keywords and Boolean Operators
PubMed/Medline*	(menstruation) OR (menstrual hygiene) OR (menstrual health) OR (period, menstrual) OR (period poverty) AND (poverty)
LILACS**	(menstruation) OR (hygiene) OR (menstrual health) OR (period, menstrual) OR (menstrual hygiene)
SCIELO***	(menstruação) OR (hygiene) OR (menstrual hygiene) OR (saúde menstrual) OR (period menstrual) AND (pobreza)

*Medical Literature Analysis and Retrieval System Online. **Latin American and Caribbean Literature in Health Sciences. ***Scientific Electronic Library Online

Eligibility

The main interest was to identify vulnerable groups, questionnaires and instruments used to measure menstrual poverty. In line with the scope of the review, mixed, qualitative and quantitative studies were eligible for inclusion if they provided at least one of the outcomes of interest to the review (vulnerable population or measurement tools). Given the variability in the definition

of menstrual poverty found on scientific literature, we decided to expand the review and to also synthesize ‘concepts’ attributed to the phenomenon “menstrual poverty”. We excluded review studies and publications that did not present results empirically tested. Thus, our interest was in primary studies conducted with data collected in the field, directly from research participants.

Extraction of data and variables of interest

Two researchers were responsible for study selection and data collection. A form for recording data was prepared, considering the main characteristics of the study and the questions of interest. In cases where there was a lack of consensus on the inclusion of studies, a third researcher analyzed the study and made the decision on its inclusion or not. The third researcher is epidemiologist, and coordinator of the study, and supervised all the research procedures. The review was conducted in steps. Step 1: Reading of title/abstract

in an independent way considering the approach of at least one of the three review pillars; 2) Checking of agreements/disagreements between pairs of researchers; 3: Removing of duplicates; 4) Reading of full texts considering inclusion and exclusion criteria; 5) Extraction of the following data: (i) publication characteristics (authorship, year, country, study classification); and (ii) structuring aspects of the review (concepts of menstrual poverty, people considered vulnerable and measurement instruments).

Assessment of the quality of included studies

The quality of the studies was evaluated by pairs of researchers using the instrument named “Mixed Methods Appraisal Tool” (MMAT)¹¹,

which was chosen in view of its ability to evaluate virtually all types of empirical study designs. This stage was conducted in a blinded way,

supervised by the Research Coordinator who was responsible by pointing out inconsistencies and resolving them. Despite the careful evaluation procedures, it is important to consider that MMAT is a critical appraisal tool that requires

experience to interpret its domains¹¹. To reduce inconsistencies and avoid that flaws influence the synthesis of findings, it is recommended that users seek help from experts trained in critical appraisal¹¹.

Ethical aspects

This study follows the Brazilian recommendations for research involving human beings, and all measures were taken to guarantee the privacy and confidentiality of data from individuals included in the primary studies selected by this review. In accordance with Article 26

of Resolution No 674, May 6, 2022, research carried out exclusively with scientific texts to review scientific literature, without direct contacting with research participants is exempt from consideration by the Research Ethics Committee.

RESULTS

Results of the operationalizing of the review

This review identified 2,457 publications in the bibliographic databases: (i) Medical Literature Analysis and Retrieval System Online (MEDLINE/PUBMED) (n = 2,368), (ii) Latin America and the Caribbean Literature on Health Sciences (LILACS) (n = 19), (iii) Scientific Electronic Library Online (SCIELO) (n = 02). The manual search performed via Google Scholar retrieved 68 publications. After reading the title and abstract, 2,387 publications did not meet the scope of the review and were discarded in the initial phase of scrutiny for the following reasons: out of the review focus (n = 2,344) and duplicates (n = 43).

There were 70 eligible publications for full text reading. In this phase, 48 texts were discarded for the following reasons: not approaching the theme (n = 24, being 7 studies of review and 17 empirical studies), and ineligible design (n = 24, being publications without empirically tested results as 'commentary', 'forum', 'point of view', 'letters', 'reflection', 'editorial', 'debate', 'reports' and 'protocol', even that they have approached menstrual poverty). A total of 22 studies were included in this review. The process of identification and selection of studies is summarized in Chart 1.

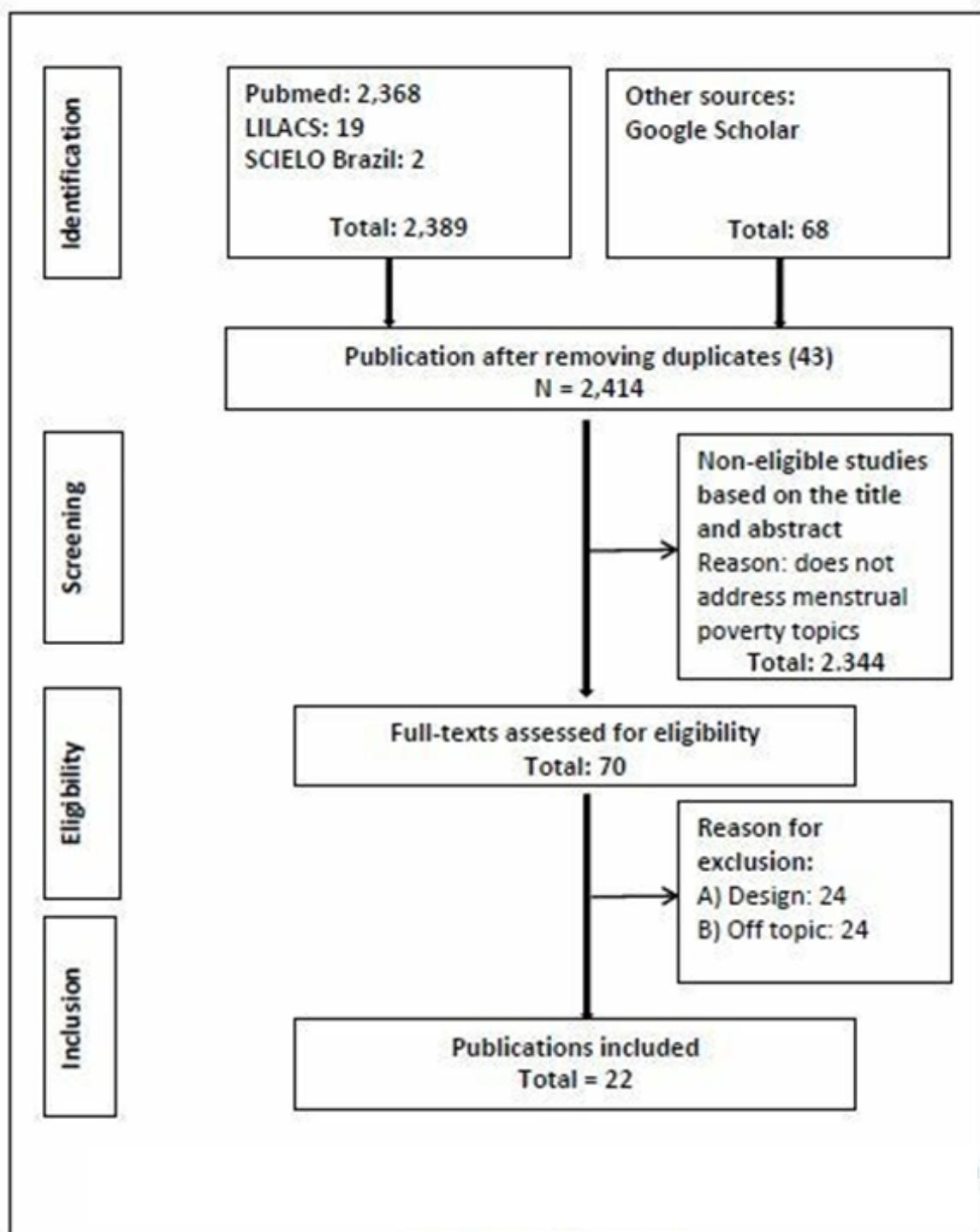


Chart 1 - Flow diagram of the steps that were followed during the selection and inclusion of studies.

The characterization of the studies included in the review ($n = 22$), indicated that the majority ($n = 12$) was carried out in Africa. The United States documented three studies and two were performed in Brazil. One study is multi-centric.

Eleven studies were based on quantitative data only; three studies had a mixed approach (qualitative and quantitative) and eight studies had a qualitative approach only. Table 2 summarizes the characteristics of the included studies.

Table 2 - Characterization and the thematic axis of the studies included in systematic review conducted from September to December 2021, Niterói, Rio de Janeiro, Brazil, in accordance with the protocol CRD42021266056 registered in PROSPERO, in 06 August 2021.

Author	Study Qualification			Thematic Axis		
	Year	Country	Type	Definition	Vulnerable Population	Tools
Austrian K <i>et al.</i> ¹²	2021	Kenya	Quantitative ^a	no	no	yes
Montgomery P <i>et al.</i> ¹³	2016	Uganda	Quantitative ^a	no	no	yes
Parajuli SB <i>et al.</i> ¹⁴	2021	NEPALI	Quantitative ^b	yes	no	yes
Olawade DB <i>et al.</i> ¹⁵	2021	Nigeria	Quantitative ^b	no	no	yes
Krenz A & Strulik H ¹⁶	2021	Burkina Faso	Quantitative ^b	no	no	yes
Soeiro RE <i>et al.</i> ¹⁷	2021	Brazil	Quantitative ^b	yes	yes	yes
Armendáriz NP ¹⁸	2021	Espanha	Quantitative ^b	yes	no	yes
Rossouw L & Ross H ¹⁹	2021	Multicountry	Quantitative ^b	no	no	yes
Cardoso LF <i>et al.</i> ²⁰	2021	The USA	Quantitative ^b	yes	no	yes
Keiser V <i>et al.</i> ²¹	2020	The USA	Quantitative ^b	yes	yes	yes
Alam MU <i>et al.</i> ²²	2017	Bangladeshi	Quantitative ^b	no	no	yes
Brito MAP ²³	2021	Brazil	Qualitative	yes	no	no
Ennis A <i>et al.</i> ²⁴	2021	Inglaterra	Qualitative	yes	no	no
Wall LL <i>et al.</i> ²⁵	2018	Ethiopia	Qualitative	no	yes	no
Rheinländer T <i>et al.</i> ²⁶	2018	Ghana	Qualitative	yes	yes	no
Girod C <i>et al.</i> ²⁷	2017	Kenya	Qualitative	no	no	yes
Hennegan J <i>et al.</i> ²⁸	2017	Uganda	Qualitative	no	no	yes
Secor-Turner M <i>et al.</i> ²⁹	2016	Kenya	Qualitative	no	no	yes
Crichton J <i>et al.</i> ³⁰	2013	Kenya	Qualitative	yes	no	no
Sebert Kuhlmann A <i>et al.</i> ³¹	2019	The USA	Mixed	no	yes	no
Ndlovu E & Bhala E ³²	2016	Zimbabwe	Mixed	no	yes	no
Boosey R <i>et al.</i> ³³	2014	Uganda	Mixed	no	no	yes

^aRandomised /Quasi-randomised study. ^bDescriptive study

Declarations about conflicts of interest were found in 14 studies, incentives for the development of the work were cited by 10 studies and approval by research ethics committees was cited in 8

studies. The quality assessment established by the MMAT showed that (i) the qualitative studies were better assessed; (ii) the data completeness was acceptable for the two randomized studies; (iii) the

measurements were appropriate for all nine descriptive studies; and (iv) the use of the mixed methods as well as the integration of qualitative and quantitative components were justified (Chart 2).

Chart 2 - Quality appraisal of the studies included in the review according to Mixed Methods Appraisal Tools (MMAT)

Author	Randomized Quantitative Study ^a					Descriptive Quantitative Study ^b					Qualitative Study ^c					Mixed Study ^d				
	RANDOMIZATION	COMPARABILITY	COMPLETENESS	CONCEALMENT	ADHERENCE	SAMPLING	REPRESENTATIVENESS	MEASUREMENT	NORESPONSE	STATISTICS	SUITABILITY	DATA COLLECTION	DATA ANALYSIS	INTERPRETATION	COHERENCE	JUSTIFICATION	INTEGRATION	INTERPRETATION	DIVERGENCES	SPECIFIC QUALITY
Austrian <i>et al.</i> ¹²	●	●	●	○	●	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Montgomery <i>et al.</i> ¹³	○	○	●	○	○	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Parajuli <i>et al.</i> ¹⁴	x	x	x	x	x	○	○	●	○	●	x	x	x	x	x	x	x	x	x	x
Olawade <i>et al.</i> ¹⁵	x	x	x	x	x	●	●	●	●	○	x	x	x	x	x	x	x	x	x	x
Krenz & Strulik ¹⁶	x	x	x	x	x	●	●	●	○	●	x	x	x	x	x	x	x	x	x	x
Soeiro <i>et al.</i> ¹⁷	x	x	x	x	x	●	●	●	○	●	x	x	x	x	x	x	x	x	x	x
Aemendáriz ¹⁸	x	x	x	x	x	○	○	●	●	○	x	x	x	x	x	x	x	x	x	x
Rossouw & Ross ¹⁹	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x	x	x	x	x	x
Cardoso <i>et al.</i> ²⁰	x	x	x	x	x	●	○	●	○	●	x	x	x	x	x	x	x	x	x	x
Keiser <i>et al.</i> ²¹	x	x	x	x	x	○	○	●	●	●	x	x	x	x	x	x	x	x	x	x
Alam <i>et al.</i> ²²	x	x	x	x	x	●	●	●	○	●	x	x	x	x	x	x	x	x	x	x
Brito ²³	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Ennis <i>et al.</i> ²⁴	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Wall <i>et al.</i> ²⁵	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Rheinländer <i>et al.</i> ²⁶	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Girod <i>et al.</i> ²⁷	x	x	x	x	x	x	x	x	x	x	●	●	●	●	○	x	x	x	x	x
Hennegan <i>et al.</i> ²⁸	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Secor-Turner <i>et al.</i> ²⁹	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Crichton <i>et al.</i> ³⁰	x	x	x	x	x	x	x	x	x	x	●	●	●	●	●	x	x	x	x	x
Sebert-Kuhlmann <i>et al.</i> ³¹	x	x	x	x	x	x	x	x	x	x	x	x	x	x	●	●	○	○	○	○
Ndlovu & Bhala ³²	x	x	x	x	x	x	x	x	x	x	x	x	x	x	●	●	○	○	○	○
Boosey <i>et al.</i> ³³	x	x	x	x	x	x	x	x	x	x	x	x	x	x	●	●	○	○	○	○

● Criteria met. ○ Criteria not fully met. X- Not Applicable

^aQuality criteria (mixed Methods Appraisal Tools) applied in quantitative randomized controlled trials: 1. Is randomization appropriately performed? 2. Are the groups comparable at baseline? 3. Are there complete outcome data? 3. Are outcome assessors blinded to the intervention provided? 5. Did the participants adhere to the assigned intervention?

^bQuality criteria (mixed Methods Appraisal Tools) applied in quantitative descriptive designs: 1. Is the sampling strategy relevant to address the research question? 2. Is the sampling representative of the target population? 3. Are the measurements appropriate? 4. Is the risk of nonresponse bias low? 5. Is the statistical analysis appropriate to answer the research question?

^cQuality criteria (mixed Methods Appraisal Tools) applied in qualitative studies: 1. Is the qualitative approach appropriate to answer the research question? 2. Are the qualitative data collection methods adequate to address the research question? 3. Are the findings adequately derived from the data? 4. Is the interpretation of results sufficiently substantiated by data? 5. Is there coherence between qualitative data sources, collection, analysis and interpretation?

^dQuality criteria (mixed Methods Appraisal Tools) applied in mixed approaches: 1. Is there an adequate rationale for using a mixed designs to address the research question? 2. Are the different components of the study effectively integrated to answer the research question? 3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted? 4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed? 5. Do the different components of the study adhere to the quality criteria of the each tradition of the methods involved?

Results of the thematic axes of the review

In line with the questions that guided the review, nine studies outlined concepts/definitions of menstrual poverty, six highlighted the delimiting characteristics of vulnerable populations and fifteen

provided the criteria (questions, scales, questionnaires) used to measure the phenomenon of menstrual poverty. Only two^{17,21} studies simultaneously, explained the three thematic axes of this review.

a) Concepts/definitions of menstrual poverty

The nine studies that outlined definitions of the term “menstrual poverty” approached the problem mainly from the perspective of the lack of resources to pay for the purchase of products that women need to deal with menstruation with comfort and dignity, throughout their lives^{14,17,18,20,21,23,24,26,30}. Having needs of menstrual hygiene but “did not have money to buy them”²¹ or “cannot afford menstrual health products”²⁰ are in line with financial restrictions only. The expression “period poverty” was used in aligning with the Royal College of Nursing referring to “lack of access to sanitary products due to financial constraints”^{14,24}. Besides financial limitations, the lack of access to quality education is highlighted by studies that are based on gender issues²³ and on the lack of knowledge and invisibility of the problem¹⁸. The term “menstrual poverty” is still considered less known and, for some, it means “lack of access to sanitary products, menstrual education and

bathrooms”, in addition to the inadequate disposal of the used products¹⁸.

In addition to definitions that relate “menstrual poverty” to “lack of personal hygiene products, inadequate access to safe, clean and private bathrooms”¹⁷, the multifactorial origin and psychosocial deprivations were directed to the term “menstrual poverty”. In this sense, the concept was summarized as “the combination of multiple practical and psychosocial deprivations experienced by menstruating girls and women in poor-resource settings”²⁶, as well as referring to “the multiple material and psychosocial deprivations experienced by menstruating girls and women in poor-resource settings”³⁰. This concept was expanded to investigate the full range of ‘hygiene poverty’, defined as the practical as well as the emotional and social challenges of managing sanitation, hygiene and menstruation, as it is experienced by senior school girls (SSGs) in southern Ghana²⁶.

b) Vulnerable populations

Six studies^{17,21,25,26,31,32} have outlined some characteristics considered common to people experiencing menstrual poverty, which can help identify vulnerable populations. Early menstruation, understood as having the first menstruation as early as 8 years of age can be an important aspect for defining the vulnerable population, since the early commencement of the physio-

logical event also has repercussions on the start of economic and psychosocial issues related to menstruation, thereby prematurely and negatively influencing girls’ lives³².

Having still the age as reference, another vulnerable group is composed by girls who progress from the junior school to senior high school. This time coincides with the expected moment for

menarche occurrence and other changes related to puberty and adolescence phases²⁶. Despite having access to interacting with health professionals, women who need clinical treatment for substance abuse (licit or illicit) are also vulnerable to menstrual poverty. Attending clinics for addicted people does not guarantee access to products for menstrual hygiene, nor guidance on reproductive health²¹.

Sexual and reproductive health is also a normally neglected issue in emergency and humanitarian contexts¹⁷. According to these authors, adolescents and young women who are migrants or refugees, non-legally documented, or living in humanitarian settings are vulnerable people because they do not have their menstrual needs adequately met.

c) Tools for measuring menstrual poverty

Fifteen studies^{12-22,27-29,33} provided information on the questions used to measure “menstrual poverty”. The measurement process included the use of isolated questions, as well as the use of instruments composed of both closed and open questions. The products used during the last menstrual period were investigated in order to structure a binary variable indicating if the respondent had/did not have access to sanitary pads. Besides, the question “While managing your menstrual hygiene, was the place: clean, private, safe, able to be locked, supplied with water and with soap”. Another binary variable was created indicating if the respondent had access to adequate places or not¹⁹). The cost and tax were investigated using two questions¹⁴: 1) Do you think sanitary pads/ tampons/ menstrual cups etc. should cost less money than they do at present? 2) Do you think the tax currently put on sanitary pads/ tampons/ menstrual cups etc. should be removed by the government?

Affordability and access to menstrual hygiene products were investigated during the COVID-19 pandemic¹⁵. The study used questions that inquired about the replacement of the used product by another unused one, the access to subsidies to alleviate the financial burden imposed by the purchase of products and anxiety during the menstrual period.

Shifting the focus from school to workpla-

ce, the “work absenteeism” was investigated via the answer to the question¹⁶: “Due to your last menstrual period, were there any work days in the last month that you did not attend?” The one-time use of pads (advanced MHM method) versus other was investigated using the question “During your last menstrual period, what did you use to collect or absorb your menstrual blood?”

In addition to the biological aspects, a questionnaire consisting of 30 questions divided into 5 dimensions inquired about (i) participant characteristics, (ii) menstrual education, (iii) stigmas and myths, (iv) conditions of bathrooms and supply of products in the school, and (v) access to menstrual care products¹⁸. Questionnaire items addressed topics that guided information collection by interview. The guiding items included “menstrual experiences”, “menstrual practices”, “perceptions of menstruation at school and other girl's experiences”, “sources of menstrual information/support”²⁸.

Well-being related to menstruation was explored by a quasi-randomized cluster controlled trial that tested the sanitary pad and puberty education offer and compared it to a control group. The authors applied two questions: “During your MP [menstrual period], do you feel ashamed? Or do you feel the same as when you are not on your MP [menstrual period]?”

to capture shame and insecurity associated with menstruation¹³.

Austrian *et al.*¹² developed a cluster randomized controlled trial involving 140 schools and 3,489 girls distributed in four groups. An instrument composed of 6 dimensions was used. The 'menstrual management' dimension was investigated using 2 questions: (i) "Having enough sanitary pads to comfortably manage menstruation", and (ii) "having leaked blood at school during menstruation". The 'reproductive health attitudes' dimension had 12 questions that aimed to investigate attitudes towards menstruation.

The meaning of menstruation was approached with the question "How is menstruation for you?"¹⁷. These authors also used a Likert-type scale named Menstrual Practice Needs Scale (MPNS-36) which was designed by Hengnan *et al.*²⁸. This scale explores the extent to which the participant perceives that her needs regarding the last menstrual period were met with respect to aspects related to the management of menstruation.

Having enough money to buy products that are used in the management of menstruation in the last twelve months was considered as a means of measuring menstrual poverty²¹. The question used was "In the past 12 months, how often was there a time when you needed menstrual hygiene products (e.g., pads, tampons) but did not have enough money to buy them?" The response options (almost every month, some months, only once or twice, never) guided the categorization of menstrual poverty (yes=any positive response; no=never).

Having resources to purchase products was also inquired using three questions²⁰. The first was "In the past 12 months have you struggled to afford menstrual products (such as sanitary pads or tampons)?" The affirmative answer directed the interest to the monthly frequency of the problem ("Do you struggle to afford menstrual products every month?"). In the final part of the survey, a last question was directed to people with affirmative answers for any period ("Have you done any of the following because you did not have enough money to purchase menstrual products?") in order to identify the

solutions explored due to lack of products.

The inability to attend classes ("Did you miss any class during menstruation in the last three months?") was probed to constitute the dependent variable in a study with students in Bangladesh²². The affirmative answer was followed by the investigation of the average days absent from school in the last three months. Attitude and knowledge about menstruation, reason for missing school during menstruation, and menstruation-related practices were assessed by open-ended responses and multiple-choice questions which were published by authors in an online supplementary file.

Girod *et al.*²⁷ expanded the investigation using focus groups and the application of a questionnaire directed to students of both sexes and teachers, which covered (i) knowledge (5 questions), (ii) personal experience with menstruation (5 questions), (iii) behaviours during menstruation (4 questions), and (iv) closing questions/recommendations (4 questions). The instrument was proposed by UNICEF to be used in the data collection of the WASH in schools empowers girls project³⁴.

A guide was proposed to capture experiences with methods for coping with menstruation among Kenyan youth²⁹. The open questions covered eight points of interest ["(1) Please tell me your age and what class you are in at school; (2) Can you think back and tell me about the first time you experienced having your period?; (3) How did you learn about menstruation?; (4) What are some of the rules in your community about menstruation?; (5) What challenges do you face when you are menstruating?; (6) What is helpful to you when you are menstruating?; (7) How do you feel when you are menstruating?; (8) How do people treat you when you are menstruating?"].

A comprehensive list of questions was used in a research conducted in six public primary schools in rural Rukungiri district, Uganda³³. The questions covered socioeconomic conditions, knowledge about menstruation, reasons related to absenteeism during menstruation, and access to disposable pads. The characteristics of the school bathrooms were considered important and investigated through 24 questions.

DISCUSSION

This review sought articles regarding concepts, vulnerable population and instruments related to “menstrual poverty” and found 22 studies that dealt with these topics. In summary, “menstrual poverty” corresponds to a multidimensional condition symbolically materialized by the lack of genital care products, which expresses, above all, the psychosocial vulnerability of people who menstruate caused by the deprivation of the right to fundamental goods necessary for the enjoyment of a dignified and respectful life. Populations that are vulnerable to menstrual poverty share an important aspect: the lack of financial resources. Although many other factors are involved in the contexts of experiencing this problem, most of those who suffer from menstrual poverty are from economically disadvantaged groups. People who menstruate can experience intersectionality contexts of oppression and, therefore, experience different forms of menstrual poverty^{29,32}. A common vulnerability marker is the factor age. Both the very early onset, around 8 years of age, and the physiological age for menarche impact the lives of girls who are in many ways unprepared to deal with menstrual blood loss.

Substances abusers, migrants and/or refugees, and residents of shelters that support humanitarian emergencies are also victims of menstrual poverty^{8,17}. Women who live under water scarcity are subjected to structural precariousness and are forced to choose where to spend in order to fulfill their basic needs, inevitably neglecting their own personal hygiene in favor of other needs²⁵. The process of measuring menstrual poverty was basically done by investigating the ability to buy and access menstrual hygiene items^{20,21}. The alternatives used to replace pads and tampons, the evaluation of the conditions of bathrooms and access to water, the quantification of absenteeism from the work environment and school activities, as well as knowledge about menstruation were aspects inquired by the authors who investigated menstrual poverty^{18,22,33}.

Despite the importance of the problem, the

term “menstrual poverty” was not found in the database of health sciences descriptors on the platform Biblioteca Virtual em Saúde³⁵ (BVS) (<https://decs.bvsalud.org/sobre-o-decs/>). The exercise of formulating concepts is challenging, but essential when the multidimensionality of the problem is little approached in the existing definitions. Putting this exercise into practice can bring to light aspects that are neglected and show that “Menstrual period”, “Menstruation”, “Menstrual hygiene”, and “Menstrual health” are terms that guide research towards organic menstrual problems, with little alignment with the psychosocial factors that affect the well-being of people experiencing menstrual poverty. The possibility of inconsistency of the nomenclature highlights a gap, and may result in ineffective retrieval of publications and hinder understanding of the problem, its causes, and therefore the proposition of solutions.

Low socioeconomic conditions^{19,36}, culture rooted in societies^{25,37} and religious preferences³⁸ are at the core of menstrual poverty. It is important to recognize that these are complex circumstances related to non-modifiable factors, in the short and medium term. In the intervention agenda, propositions and solutions permeate a multisectoral scope, including the confrontation of gender inequalities³⁹. These authors emphasize the idea of “employ zero tolerance to dirty jokes about menstruation”. With regards to multisectoral actions, the example of the global movement aimed at ending marriage involving children indicates that the construction of a common conceptual model based on strong evidence can help in understanding the problem, the contexts of affected groups and delimit roles and responsibilities applicable to different sectors, as well as civil society⁴⁰.

Cultural aspects supported by taboos, stigmas and prejudices shame people and silence their voices, need to be deconstructed so that coping initiatives do not incur lack of engagement and wither due to lack of continuity or social sustainability³⁹. Even well-established legislative programs can suffer deviations from

their initial purposes. For example, the legislative movement for menstrual equity in New York City (USA) targeted homeless people, correctional institutions and schools. However, well-structured bathrooms in some school establishments which had menstrual hygiene items that could be freely accessed remained locked during part of the school shifts, thus not promoting the policy as intended by its formulation⁴¹.

Based on the Sustainable Development Goals (SDG) listed in the agenda 2030⁴², the moment is opportune to discuss menstruation and menstrual poverty, but in a context of dignity, not reduced to the act of providing sanitary products such as pads and tampons³⁶. The problem of menstrual poverty is related to at least 10 of the 17 objectives of the agenda 2030 SDG (1. no poverty; 2. zero hunger; 3. good health and well-being; 4. quality education; 5. gender equality; 6. clean water and sanitation; 7. affordable and clean energy; 8. decent work and economic growth; 9. industry, innovation and infrastructure; 10. reduced inequalities)⁴².

Authors highlight that "... overcoming menstrual poverty is far more nuanced and complicated than simply providing cheap or free sanitary pads"⁴³. In line with these thoughts, it is essential to demystify the theme, overcome invisibility, deconstruct misconceptions and advance the conversation towards the field of human rights and social justice^{36,43,44}. Education plays a role in overcoming this problem, and is paramount to establishing sustainable social change and empowering people⁴⁵.

Menstrual poverty manifests itself by deprivation of access to menstrual hygiene products, basic sanitation and safe and clean places to manage menstruation, both at home and in school and work environments. But, beyond that, the issue is also characterized by the lack of adequate education and the psychosocial and political helplessness that affect people who menstruate. The people in most need of help are captured by the shame, stigma and taboos surrounding menstruation. It is the role of education to enable girls and boys to understand menstruation biologically, but above all, equip them to deal with menstruation with

dignity, safety and comfort and not being penalized for the simple fact of belonging to the group of people who have menstrual flow⁴⁵.

One issue that cannot be left unaddressed is that we did not find studies whose vulnerable populations were people deprived of liberty, homeless people, and transgender men. These three segments of society suffer the same or greater impact from menstrual poverty, either by socioeconomic status or by social marginalization⁸.

The lack of standardization of tools for measuring issues involving menstrual health is a barrier that makes it difficult not only to approach organic menstrual symptoms, but above all, obtaining information related to cultural perceptions about menstrual health³.

This review dealt with a theme of social relevance which is the phenomenon of "menstrual poverty". However, the work had some limitations. First, the fact that the term "menstrual poverty" does not appear *ipsis litteris* in the health descriptors database (DeCs/MESH)³⁵ may have negatively impacted the retrieval of publications. Thus, we combined several related terms in an effort to minimize this limitation. Besides this, of the 22 studies retrieved in this review, fifteen provided the questions used to measure facets related to the menstrual poverty phenomenon. Given the diversity of tools and question formatting, we declined to qualitatively express the advantages and disadvantages captured from each of the measurement processes. Finally, we parsimoniously summarized the measurement instruments of "menstrual poverty" in view of the diversity of questions, the size of the applied instruments and the multiplicity of outcomes in focus. Bearing in mind the multidimensionality of the menstrual poverty construct, future studies designed to optimize measurement processes via the development of valid and reliable instruments are essential for the context of investigating the menstrual poverty in a standardized way. Considering the period in which the review was implemented (September to December, 2021), the results regarding to the measurement tools should be interpreted with caution.

CONCLUSION

Synthesizing the different conceptions of the problem, it was possible to outline the concept that “menstrual poverty corresponds to a multidimensional condition symbolically materialized by the lack of genital care products, which expresses, above all, the psychosocial vulnerability of the person who menstruates caused by the deprivation of the right to fundamental goods necessary for the enjoyment of a dignified and respectful life”. A common factor that characterizes vulnerable population it is unfavorable socio-economic condition, a situation that markedly impacts on people’ lives, especially girls and women living in precarious conditions both in poor and rich countries. This feature

was evaluated in all the studies included in the review.

Girls who have very early menarche, still in childhood; teenagers who have not been properly prepared to understand and sustain the costs of menstruation; people who use substances, migrants and refugees are vulnerable social groups that need space on the agenda aimed at reducing social inequalities. Finally, the diversity of questions used in the investigation of the problem suggests that it is a multidimensional construct and that the development of instruments covering its different facets is opportune and can help to measure the phenomenon of menstrual poverty more precisely.

CRedit author statements

Conceptualization: Nascimento, MI; Costa, ALM; Maia, PB. Methodology: Nascimento, MI; Silva, GLP; Jesus, KS; Lemes, MCO. Validation: Nascimento, MI; Costa, ALM; Maia, PB; Silva, GLP; Jesus, KS; Lemes, MCO. M. Research: Nascimento, MI; Costa, ALM; Maia, PB; Silva, GLP; Jesus, KS; Lemes, MCO. M. Resources: Nascimento, MI. Preparation of the original draft: Nascimento, MI; Costa, ALM; Maia, PB. Writing-review and editing: Nascimento, MI; Costa, ALM; Maia, PB; Silva, GLP; Jesus, KS; Lemes, MCO. Visualization: Nascimento, MI; Costa, ALM; Maia, PB; Silva, GLP; Jesus, KS; Lemes, MCO. Supervision: Nascimento, MI. Project administration: Nascimento, MI.

All authors have read and agreed to the published version of the manuscript.

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Received: 30 april 2024.

Accepted: 12 september 2024.

Published: 02 october 2024.