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Marxismo como referencial teórico-metodológico em saúde coletiva: implicações para a revisão sistemática e síntese de evidências
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Marxism as a theoretical and methodological framework in collective health: implications for systematic review and synthesis of evidence

ABSTRACT
In this study, we discuss the integration in systematic reviews of research developed from a Marxist perspective of knowledge production and their results as evidence in healthcare. The study objectives are to review the assumptions of dialectical and historical materialism (DHM) and discuss the implications of dialectics for a literature review and the synthesis of evidence. DHM is a powerful framework for knowledge generation and transformation of policies and practices in healthcare. It assumes that social contradictions underlie the health–disease process, the fundamental theoretical construction in the field of collective health. Currently, we observe a considerable influence of the critical paradigm, of Marxist origin, in the construction of knowledge in health. Studies based on this critical paradigm incorporate complex methods, which are inherent to the guidelines of dialect, to identify the object and arrive at results that constitute evidence in healthcare. Systematic reviews should address the methodological difficulties associated with entirely integrating these results to healthcare.

DESCRIPTORS
Marxism
Methodology
Evidence-based practice
Public health
Systematic review

RESUMO
O objeto deste estudo é a incorporação em revisões sistemáticas de resultados de pesquisas desenvolvidas na vertente marxista de produção do conhecimento, como evidências em saúde. Os objetivos são: rever os pressupostos do materialismo histórico e dialético (MHD) e discutir as implicações da dialética para a revisão da literatura e síntese de evidências. O MHD constitui um referencial potente para geração de conhecimento e transformação das políticas e práticas em saúde, a partir da explicação de que as contradições sociais estão na base do processo saúde-doença, construção teórica fundamental no campo da saúde coletiva. Atualmente observa-se considerável influência do paradigma crítico, de origem marxista, na construção do conhecimento em saúde. Pesquisas no paradigma crítico apresentam métodos complexos de apreensão do objeto, inerentes às diretrizes da dialética, oferecendo resultados que constituem evidências em saúde. Revisões sistemáticas devem enfrentar a dificuldade metodológica de integrar esses resultados plenamente ao cuidado em saúde.

DESCRIPTORES
Marxismo
Metodología
Práctica clínica basada en evidencias
Saúde pública
Revisão sistemática

RESUMEN
Este estudio tiene por objeto incorporar en revisiones sistemáticas como evidencia en salud, los resultados de investigaciones fundamentadas en la vertiente marxista. Los objetivos fueron: revisar los supuestos del materialismo histórico y dialéctico (MHD) y discutir las implicancias de la dialéctica para la revisión de la literatura y la síntesis de evidencias. A pesar de ser una elección restringida, el MHD es un referencial teórico potente para la generación de conocimiento y la transformación de las políticas y prácticas en materia de salud, pues nace de la explicación de las contradicciones sociales que se encuentran en la base del proceso de salud-enfermedad, construcción teórica fundamental en el campo de la salud colectiva. Actualmente se observa una influencia considerable del paradigma crítico, también de origen marxista, en la construcción del conocimiento en salud. La investigación en el paradigma crítico tiene métodos complejos de aprehender el objeto, inherentes a los lineamientos de la dialéctica, que ofrecen resultados que constituyen evidencias que luego podrán ser agregadas al cuidado de la salud. Las revisiones sistemáticas deben enfrentar la dificultad metodológica de integrar estos resultados en su totalidad.

DESCRIPTORES
Marxismo
Metodología
Práctica clínica basada en la evidencia
Salud pública
Revisión sistemática
INTRODUCTION

This paper examines the problem of summarizing results of health research developed from a Marxist perspective of knowledge construction, also known as dialectical and historical materialism (DHM), in the current context of using scientific evidence in health care, both individual and collective.

This objective is derived from everyday work such as teaching and researching as well as their extensions, which correspond to various types of academic inquiry. To shape and study these is challenging, and in the words of Japias-su(1), researchers must seek to be free from the powers so that they can define themselves critically in relation to scientific institutions and restrictions.

Thus, the objective of this paper was established at the confluence of questions originating in different areas: the teaching of nursing in collective health, the challenge of assembling a research group that embraces several aspects of the health–disease process and health care practices, using the Marxist knowledge construction framework, and the challenge of producing literature reviews to implement research results without regarding evidence as dogma or panacea for issues faced by health systems.

Thus, this paper proposes a review of the goals and assumptions of Marxist research as a perspective of knowledge construction and discusses the implications of dialectical methodology for both literature review and a summary of evidence.

MARXISM AS A PERSPECTIVE OF KNOWLEDGE CONSTRUCTION

DHM has been discussed and adopted by collective health(2), a field that is the starting point for this discussion. It is a scientific perspective because it articulates all the dimensions required for the construction of knowledge: epistemology, theory, and methodology(3).

In the epistemological scope, Marxism presents a distinct structure, which indicates that knowledge is constructed as a result of its historical dependency on unequal relationships in society. The base for knowledge is the reality that is socially determined by historical events and ideologies of a given era. Furthermore, it depends on the stages of production in society as a whole(4).

In the theoretical scope, Marxism offers a fundamental explanation of knowledge of reality. The concepts that constitute the general theoretical framework (mode of production, relations of production, and types of standardization required to maintain opposing relationships) facilitate an understanding of the elements that comprise social structures and the dynamics that set its transformations in motion(5).

In the methodological scope, Marxism uses dialectic to reveal the connections among the sections of a given phenomenon as well as the connections between these sections and the social totality, thus studying how the movement is produced and seeking techniques and instruments to expose as completely as possible objects that are detached from reality(6,7).

Marxism in science produces knowledge on reality in order to transform it. Hence, understanding reality becomes an incentive to drive the historical process, which cites constant reformulation as the source of Marxism in the concrete, historical world(8). However, knowledge is not a sufficient condition for transformation; it must be articulated with the corresponding practical process, which enables it to escape the condition of an idealized project. Furthermore, the arrangement of subjects is necessary to make it a practical project for transformation. Owing to these characteristics, Marxism constitutes a philosophy of praxis(9). It is a theoretical and practical perspective that does not idealize science; it defines it as a social practice and a task inserted in the production process, thus making science a part of social and economic development(10).

Marx is considered a classical author in sociology, even though his contribution transcends disciplinary fragmentation, as he was concerned with creating connections among the phenomena of reality in order to clarify social totality(11). He regarded as objects general transformations of social structures (tradition, slavery, feudalism, capitalism), which are constantly in motion due to internal contradictions.

Marxism considers that it is class conflict, a product of contradictions among social classes, that initiates transformations in societies(12). As a critic of science, he proposed a different means of understanding reality, indicating connections between the part and the whole and attempting to bring the essence of reality to the plane of consciousness, the totality. In Marxism, totality refers to the relationships among the parts that exert multiple determinations. In accordance with this, the mode of production exerts a fundamental determination over society(13).

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(1) Researchers who defined the field include the following: from Brazil, Sergio Arouca, Maria Cecilia F. Donnangelo, Ricardo Bruno Mendes Gonçalves, Sonia Fleury Teixeira, and Everardo Nunes, and from other Latin American countries, Juan Cesar Garcia, Asa Cristina Laurell, Jaime Breith, and Edmundo Granda.

(2) In Marxism, a subject of various dimensions of research is addressed by different areas of knowledge. A summary of these ideas, in accordance with their application in collective health, is found in, for example, Salum MJL, Queiroz VM, Soares CB. Social research in health: general lessons in methodology: the creation of the research plan as a specific moment in the theoretical-methodological trajectory [Guidance educational document for Research Methodology students in Collective Health]. São Paulo: EEUSP; 1999.
Marxism advocates that to know reality, it is necessary to understand the essence of the problem under study, which requires recognition of the following from the researcher:

- there is no neutrality in science; access to knowledge depends on the subject’s social standing[4]. Therefore, the interests of research derive from the relevant subjects’ social standing. According to Pires[2], the interests and social conditioning of subjects prevent them from seeing things as they really are and thus produce a loss of interest and even a preference for the status quo.

- objectivity, defended by natural sciences and positivism, imprisons reality. Employing the methods of natural sciences in the social world offers a fragmented view of the problem under study and captures reality in stasis, thus hiding the dynamics that indicate the framework of determination of what is being studied in the conscience plane.

In collective health, the theoretical framework chosen by the researcher indicates its position, and the researcher should seek a methodology that combines ways of comprehending various aspects of the object under study and place in evidence its multiple determinations.

Marxism is a theory and a method that aims to explain and comprehend reality using analysis categories. This process is confirmed by research. Marxism comprises flexible resources dependent on the reality of which they seek to be an expression, as reality is not static but historical[5].

In collective health, social classes constitute the subjects[6] because unequal class distribution of subjects and their differing life conditions have varying effects on their body. In other words, the health of workers depends on their social class. Therefore, it is necessary to ascertain the social classes by using operating variables capable of identifying various social groups in a given reality. This requires a method capable of realizing the theoretical abstraction of classes. More specifically, in the case of capitalism, classes can be captured by capitalist relations of production, while in other social structures, they are captured by its characteristic relations of production.

In the field of social sciences, Marxism, or DHM, suffered criticism regarding its insufficiency in comprehending the complexity of social and economic structures of modern society. This criticism was expressed in the critical paradigm, or critical theory, which comprises frameworks such as neo-Marxism, materialism, Frankfurt School, and Freireanism[7]. These perspectives were later joined by the feminist current, which integrated gender[2].

The critical paradigm emphasizes objective knowledge for comprehending reality and utilizes quantitative (provided by the material causality of reality) and qualitative (provided by the intentional and interpretive causality of subjects) measurement. Moreover, it values emancipatory knowledge, which enables transformation[2].

In collective health, knowledge of critical epidemiology[8] facilitates the comprehension of unequal manifestations of subjects’ health-disease by quantifying the material conditions of social reproduction. These conditions allow the construction of epidemiological profiles, which are operationalized by, for example, the Social Reproduction Index[9]. The heterogeneity of these profiles constitutes the basis for emancipatory work in health, unlike that which is preferred by the epidemiology of risks (the average of already-present health issues)[2].

To comprehend the influence of subjects on the phenomena under study, the analysis of qualitative data will cover theoretical categories such as the category of everyday representations[10]. The comprehension and transformation of practices requires participatory research, which involves action by the subjects and promotes the awareness of reality[4].

Marxist research analyzes an object (or a phenomenon) that is detached from reality, proving that the explanation of the concrete world is coherent. Marxist dialectics regard as evidence the essential aspects of totality, which determine the object under analysis[4].

Marxism influenced the production of knowledge. It was primarily introduced as a response to the strong criticism against positivist markers of the bourgeois science that followed illuminism[9]. Similarly, social sciences utilized Marxism to construct knowledge that would emphasize, using quantitative methods and historical data, the material causality of social problems[2].

In the field of health, Minayo’s effort to summarize qualitative research is significant[11]. Minayo distinguishes Marxism from other lines of thought and defines DHM, equating historical materialism to theoretical grounds for explaining reality and dialectics to a methodological reference.

Today, the most important perspectives in social sciences are post-positivism, critical theory, and interpretivism. These are known as paradigms, conceptualized as a world vision that guides research and practices in a given field[9].

For this study, critical theory is important; it represents the closest reference to Marxism in social sciences, known as neo-Marxism, and is often applied to the theories of the Frankfurt School[7].

The Frankfurt School, renowned for its critical theory, was established in 1937 by Max Horkheimer. The term critical theory, which replaced the term materialism, reflected the dialectical criticism of political economy. This change in expression did not indicate a rupture within Marxism; rather, it underlined the critical perspective of the Marxist paradigm. Horkheimer reiterated the human characteristic of regarding society as the object of production of knowledge, announcing that the critical theorist’s vocation is the struggle to which his thought belongs. Marcuse, one of the first and most important members of the Frankfurt
School, emphasized the significance of integrating traditional Marxism\(^\text{(16)}\).

From the time of Habermas, in the 1960s, critical theory suffered an inflection toward the criticism of traditional aspects of Marxism, especially in terms of replacing the category of work (which deals with intentional concrete actions toward transformation) with the category of communicative action (which deals with symbolically mediated interactions). Habermas replaced the contradiction of classes, a primary category in Marx’s theory of structure and dynamics of social structuring, with conflicts generated in relationships between the social system and the world of life\(^\text{(16)}\).

In international literature on research paradigms, there is a strong presence of the critical paradigm, which includes various focuses derived from Marxism. However, qualitative studies are proportionately more common in the interpretive and constructionist paradigm and less used by the remaining paradigms, leading scholars who combine qualitative and quantitative methods to often undervalue the issues highlighted by the Marxist approach\(^\text{(17)}\).

**SYSTEMATIC REVIEWS AND DIALECTICAL METHODOLOGY**

Reliable evidence (data, information, experiences, and observations) for decision making should come from scientific research that utilizes systematic methods. Their applicability and effectiveness, however, varies according to context. The best evidence in a given reality may be irrelevant or without the possibility of implementing in another reality. The identification of evidence is crucial for the creation of public policies; therefore, policy creators must consider both scientific and local evidence (population data, requirements, values, costs, and resource availability) while making decisions\(^\text{(18-19)}\).

Systematic reviews are retrospective studies that use quantitative or qualitative approaches to suggest practices by summarizing knowledge in a specific field. They employ systematic methods to identify and critically evaluate primary studies\(^\text{(20-21)}\).

The systematic review of quantitative evidence addresses a research question by summarizing the results of quantitative studies. It should have a well-defined question and perform a broad search across all relevant works, up to the point of saturation of data, thus ensuring that the validity of the review is not compromised. When the results of the research derive from such procedures, they facilitate a statistical analysis (meta-analysis) that compares and analyzes the results of each study with the purpose of obtaining a precise final result. The studies considered to be of low quality are excluded from the review\(^\text{(20)}\).

Studies that use the quantitative methods are predominantly affiliated with the positivist and/or post-positivist paradigm, exhibiting characteristics inherent to the paradigm: mathematical establishment of cause–effect relationships, variable control, and sample representation\(^\text{(23)}\).

On the other hand, in the qualitative evidence review, the guidelines of qualitative research should be followed. In this case statistical representativeness is not a requirement for data collection, and the result is based on the evaluation of the balance between the methodological quality and the weight of the content. Works below a certain quality threshold are not necessarily rejected\(^\text{(20)}\). The degree of concordance between researchers is less important, as the nature of discordance and the knowledge that the discussion of alternative interpretations can provide are also considered\(^\text{(20)}\).

The various functions of the qualitative methodology do not render the quantitative methodology as less important. In the field of health, resources available for studying phenomena are multiple and not necessarily mutually exclusive, as combinations of methods have been increasingly used by prominent international research institutes\(^\text{(24)}\).

To contemplate these studies, integrative reviews and comprehensive systematic reviews were proposed. These would enable the review and critical analysis of empirical studies from various perspectives, encompassing quantitative and qualitative evidence\(^\text{(22,25-26)}\).

The integrative review allows inclusion and analyzes studies using different methodologies, empirical and theoretical studies, results from other reviews and methodological issues, in order to broadly understand a phenomenon. The results of this type of review allow evidence-based practices to build strong if the rigor of the method is observed\(^\text{(25)}\).

Literature review centers that are traditionally recognized for summarizing results of studies affiliated with the positivist and post-positivist paradigm already present a considerable set of summaries of results of studies affiliated with various paradigms that use qualitative methodologies\(^\text{(18,22,27)}\). The JBI\(^\text{(22)}\) recommendations, for example, underline that studies affiliated with the critical paradigm are capable of emancipating knowledge and practice and transforming reality, as opposed to those affiliated with the interpretive paradigm, which prioritizes understanding knowledge by means of the subject’s vision.

Besides the dominant paradigm, health-related studies include the production of knowledge from the Marxist perspective. This is the case of critical epidemiology, which utilizes the quantitative approach for the structural understanding of the health-disease process. This affiliation with the Marxist perspective in qualitative studies aims to break from the mathematics-only models to analyze the dialectical opposition production-consumption\(^\text{(10,28)}\). Hence, it is crucial for the construction of knowledge and the transformation of practices in health that the results of studies in this paradigm be included in systematic reviews.
The review centers are devoted to developing, monitoring, and evaluating systematic reviews; implementing the results in the practice of various fields of knowledge; and formulating directives for producing systematic reviews. At the same time, the theoretical aspects that comprise the foundation of the research are not captured in a systemic fashion—neither by characteristics of the instruments used to capture data and data analysis nor by the non-existence of descriptions in primary studies.

Certain meta-synthesis methods resulting from qualitative systematic reviews were developed and used for this purpose. The JBI provides software with an option for including studies from the critical perspective for the production of qualitative reviews.

Studies that utilize the critical theory have been included in these reviews when their results are provided as findings; this is largely found in studies using content analyses affiliated with the various approaches that utilize qualitative research. The results of combined methodology studies do not easily fit into typical review methodologies.

The findings of qualitative research in the interpretive paradigm relate to the meanings people attribute to a given problem. They are presented as themes that summarize the subject’s descriptions of the phenomenon. Conversely, the results of Marxist research relate to the expressions of subjects that, when analyzed according to theoretical categories, fall into empirical categories (that summarize the researcher’s analysis of the subject’s expressions). Therefore, if the review considers the summary of meanings regarding a specific phenomenon as an object, it embraces only research results from the interpretive paradigm.

However, there are doubts concerning reducing to findings, for example, the dialectical analyses produced by Engels in the nineteenth century regarding the conditions of England’s working class. He performed a highly complex study that used observation; oral narratives; statistics about urban life at the beginning of industrialization; and primarily, analysis categories such as totality, contradiction, process, history, and social classes, which were adopted by the Marxist theoretical reference.

Dialectics is a methodology that involves the collection and analysis of an object of study from the categories of thesis, antithesis, and synthesis, which represent the movement of contradictions and their overlaps. The following is an example: a subject becomes a father (thesis situation: new personal historical reality of the father), and the child, in order to walk, holds the father’s hands. When he manages to stand (antithesis situation), he refuses the father’s help, overcoming the previous reality. As an adult, he will have overcome the reality of the father, who will become increasingly dependent on the child, as the father is the reality that is ultimately overcome. The new synthesis is the result of the conflict between these two realities.

Research in the dialectical perspective begins with the systematic observation of elements that contextualize and compose the phenomenon under study with the aim of assimilating it (thesis). These elements should be simultaneously analyzed in terms of their specific characteristics (their appearance) and the connections they establish between themselves and the phenomenon. These connections should be inferred and collated with the historical reality of the social structure, enabling the researcher to understand (gain awareness of) the conflicts concerning the appearance of the phenomenon (antithesis). This comprehension underlines the essence of the object. The analysis (using a strong theoretical category to explain the phenomenon) produces the synthesis, which exposes the contradictions at the base of the conflicts concerning the phenomenon. This abstraction should propose formulations that will be empirically ascertained, thus determining their contribution toward the transformation of a given reality, a notion which influences the researcher’s choice of object to study.

In other words, in the dialectical method, the researcher comprehends the object of study from a concrete basis in the social reality; analyzes the parts that comprise the object by means of abstraction, discovering its variants, connections, and determinants; proceeds to the synthesis, still by means of abstraction; and finally reinserts the object of study into the social reality.

The dialectic guides the entire research process, because it is a methodology for understanding the object in its multiple determinations. A part of this methodology involves collecting data pertaining to the phenomena. For this purpose, we use techniques and instruments that science legitimizes owing to their capacity of identifying characteristics in an object. The analysis categories facilitate an understanding of the data as parts of the phenomena under investigation, articulating them with each other and the context within which they appear. Thus, there exist methods that can measure data and those that can capture relationships, dynamics, expressions, and beliefs. To apply the dialectical methodology, participatory methods were constructed, implying the presence of the subjects involved in the study, including the reality studied, and underlining the possibilities of transforming this reality.

The recommendation to integrate in literature reviews research findings from different theoretical perspectives demands protection of the integrity and thoroughness of the construction of knowledge that fundaments nursing care.

Meta-ethnography is recommended for summarizing the results of qualitative studies. According to it, the reviewer can reinterpret the data, allowing for the interpretation of a specific datum as descriptive of reality and of another as explicative. Thus, meta-ethnography can be utilized to synthesize data. It allows the researcher to evaluate the scope of the findings and facilitates the overcoming of homogenization identified in synthesis which compiles findings.
from research that have various purposes and methodolo-
gies and that are affiliated with different perspectives.

Similarly, meta-aggregation\(^{(22)}\) could be performed in
stages, categorizing the findings of studies from the same
perspective in temporary synthesis that reflect the differing
nature of the goals of each perspective and that, when
articulated, lead to a new synthesis.

**CLOSING THOUGHTS**

Collective health is a field of knowledge and practices
that is affiliated with Marxism in order to embrace the
collective as an object (social classes) and to transform
the reality of health into a social reality. It has undergone
a process of questioning Marxism’s limitations in terms of
explanations and as a method for comprehending the role
of subjectivity and micro-social relationships, which is an
important concern of comprehensivist currents.

The experience accumulated from health research, how-
ever, indicates that Marxism has the potential to explain and
comprehend these relationships, as it includes analytical
categories and methodologies that can identify the dynam-
ics of micro-space and relate them with the social structure
while enabling the analysis of social relations established
in daily life and the ways in which subjects interpret reality.

The results of Marxist research constitute evidence of a
different nature as compared with those obtained by
research affiliated with the post-positivist and interpretive
paradigms. They reveal the relationships of the problem
under study, exposing its contradictions and indicating
transformations to health practices. Such evidence enriches
health care either through objective knowledge, obtained
by quantifying variables that characterize collective health
(classes and social groups), or by comprehending subjects’
expressions regarding the phenomena, which are analyzed
according to theoretical categories and examined as a criti-
cism and reconstruction of health practices in emancipating
participatory studies.

Considering that studies on the Marxist perspective for
production of knowledge produce evidence originating in a
complex methodology, which is inherent to the directives of
the dialectic for comprehension of an object, the methods
and patterns for evaluating inclusion in systematic reviews
and summaries of evidence cannot force the simplification
of this complexity, which would homogenize findings de-
erived from diverse epistemological constructions.

**REFERENCES**

1. Japiassu H. Como nasceu a ciência moderna e as razões da

2. Pires A. Sobre algumas questões epistemológicas de uma
metodologia geral para as ciências sociais. In: Poupart J,
Deslauriers JP, Groulx, Laperrière A, Mayer R, Pires AP,
organizadores. A pesquisa qualitativa: enfoques epistemológicos

3. Viana N. A consciência da história: ensaios sobre materialismo

4. Lebfevre H. Lógica formal e lógica dialética. São Paulo:
Civilização Brasileira; 1975.


6. Vázquez AS. Ética e marxismo. In: Borón AA, Amadeo J,
Gonzalez S. A teoria marxista hoje: problemas e perspectivas
[Internet]. 2007 [citado 2013 Jun.16]. Disponível em:
http://biblioteca.clacso.edu.ar/clacso/formacion-
virtual/20100715073000/boron.pdf

7. Willis JW. Foundations of qualitative research: interpretive


9. Lacaz FAC. O sujeito n(d)a saúde coletiva e pós-modernismo.

Ed. UNESP; 1991.

11. Trapé CA. A operacionalização do conceito de classes sociais
em epidemiologia crítica: uma proposta a partir da categoria
reprodução social [tese doutorado]: São Paulo: Escola de
Enfermagem, Universidade de São Paulo; 2011.

12. Fujimori E, Borges ALV, Sato APS, Trapé CA, Yonekura T.
Epidemiologia e saúde coletiva. In: Soares CB, Campos CMS,
organizadores. Fundamentos de saúde coletiva e o cuidado

13. Soares CB, Santos VE, Campos CMS, Lachtm SAF, Campos
FC. Representations of everyday life: a proposal for capturing
social values from the Marxist perspective of knowledge
production. Rev Esc Enferm USP [Internet]. 2011 [cited 2013

14. Cordeiro L, Soares CB, Campos CMS. Pesquisa ação na perspectiva
da saúde coletiva: relato de experiência da formação de Agentes
Comunitários da Saúde para o enfrentamento do consumo

15. Minayo MCS. O desafio do conhecimento: pesquisa qualitativa

16. Therborn G. Do marxismo ao pós-marxismo? São Paulo:
Boitempo; 2012.

18. Pearson A. Balancing the evidence: incorporating the synthesis of qualitative data into systematic reviews. JBI Reports. 2004;2(2):45-64.


20. Booth A. Cochrane or cock-eyed? How should we conduct systematic reviews of qualitative research? [Paper presented at the Qualitative Evidence-based Practice Conference, Taking a Critical Stance; 2011 May 14-16; Coventry University].


