(Re)conceptualizing vulnerability in health under the syndemics perspective: a scoping review

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Background

- The concept of health vulnerability, initially focused on exploring individual susceptibility to develop specific medical conditions, has expanded to include social contexts, conjunctural circumstances, lifetime trajectories, individual risk factors, and conditions impacting health outcomes.
- Syndemics theory has been increasingly applied by researchers in the medical and social sciences to explain interactions between environmental, zoonotic, and social factors impacting disease trajectories. This perspective explores synergistic interactions between two or more diseases that, under specific social or/and environmental circumstances, negatively affect the mutual course of said diseases.
- The bio-social interface of the syndemic interaction, constituted by the intersections between social and environmental circumstances and disease occurrence that exacerbate their negative impacts, has traditionally been studied in relation to vulnerability.

Objetive and research questions (RQ)

This review aimed to systematically explore factors included in the bio-social interface of syndemics described in relation to COVID-19.

- RQ1. Which social and environmental arrangements (determinants, factors, dynamics, and aspects) were described in syndemics' research around COVID-19?
- RQ2. How were those arrangements conceptualized and studied (methodological approaches)?
- RQ3. What were the main contributions of the syndemics perspective to the study of vulnerability in health in the context of the pandemic?

Methods

A scoping review was conducted following the PRISMA-ScR guidelines. The initial protocol was published in October 2022 (https://f1000research.com/articles/11-1156).

Given our interest in how the medical field applied the syndemics concept in the context of the pandemic, the primary data source was PubMed.

Four inclusion criteria were considered:

1. Types of publication: original research, opinion pieces, or review articles.
2. Timeframe: published between December 2019 and October 2022.
3. Screening strategy: include the words syndemics, vulnerability, and COVID-19 in the title, abstract, or keywords.
4. Full text review: publications included must elaborate on issues of vulnerability within the body of the text.

Table 1. Data extraction template

Heading	Subheading
General information	Journal
	Year of publication
	o 2019
	o 2020
	o 2021
	o 2022
	Kind of article
	o Review
	o Original research
	o Opinion pieces
	First author
	Affiliation(s)
Setting and study characteristics	Study aim(s)
	Location
	Data collection methods
Syndemic perspective	Syndemic being described
	Type of interactions described
	o Bio-Bio
	o Bio-Social
	o Bio-Socio-Environmental
Bio-Social interaction	Conceptualization (e.g., theoretical foundations, factors, indicators)
	Methods (e.g., design, disciplines involved, types of data collected)
Bio-Socio-Environmental interaction	Conceptualization (e.g., theoretical foundations, factors, indicators)
	Methods (e.g., design, disciplines involved, types of data collected)
Vulnerability perspective	Conceptualization (e.g., groups, factors, methods described)
Recommendation	Research, policy and practice suggest about both perspectives
Comments	Information and suggestions of the reviewers related to the articles

Additional records were identified through manual searches in the lists of references.

The data processing was conducted by four researchers using COVIDENCE (https://www.covidence.org/).

Results

Search findings and paper description

- **Figure 1** presents the data extraction chart. Our search strategy yielded a total of 97 articles, 50 records identified from PubMed and 45 from the list of references and special issues. Three duplicates were removed in Mendeley before importing the database to COVIDENCE and 47 excluded in different steps. A final total of 45 articles were considered for data extraction.
- Among the records included, 22 were opinion pieces, 13 were original research, and 10 were reviews articles (**Table 2**).
- Around half of the articles were published in 2021 in journals with an inter/transdisciplinary scope (e.g., Frontiers in Public Health; One Health; International Journal of Environmental Research and Public Health).
- Most papers were led by authors with American affiliations. For original research, data was collected in high (USA, Canada, and United Kingdom), upper-middle (Brazil, China, South Africa) and lower-middle income (India) countries.

Figure 1. PRISMA flowchart

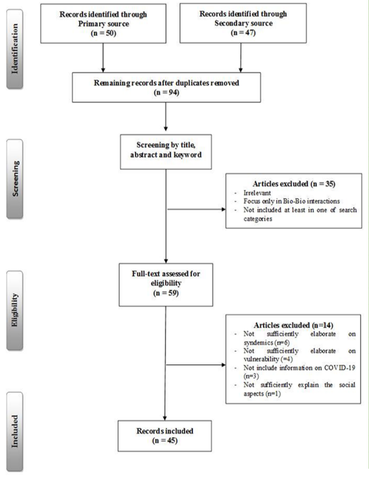

Table 2. Characteristics of the articles

Articles' characteristics	N	%
Type of publication		
Opinion pieces	22	48.9%
Original research	13	28.9%
Reviews	10	22.2%
Journal scope		
Biomedical	13	28.9%
Social sciences	4	8.9%
Inter/transdisciplinary	28	62.2%
Year of publication		
2020	8	17.8%
2021	23	51.1%
2022	14	31.1%
First author´s affiliation		
University	36	80.0%
Institute	5	11.1%
Hospital	2	4.4%
Others	2	4.4%
First author´s country of affiliation		
USA	22	48.9%
Brazil	4	8.9%
Canada	4	8.9%
UK	3	6.7%
Australia	2	4.4%
Others	10	22.2%
Setting/Location of study		
Global	19	42.2%
Specific country	23	51.1%
Several countries	3	6.7%

Categories of syndemics

Social factors were described around four framings of syndemics:

1) Social factors impacting or impacted by interactions between COVID-19 and one or several medical conditions: a) COVID-19 and non-communicable diseases; b) COVID-19 and HIV; c) COVID-19 and Tuberculosis; d) COVID-19 and Mental illness).
2) Interactions between pre-existing conditions and impacts of COVID-19 on particular populations.
3) Interactions between specific spatial configurations and COVID-19.
4) Interactions between COVID-19 and social factors.

Methodological approaches

- Data supporting syndemic interactions described in original papers were of different kind (**Table 3**).
- Research reporting primary data used mainly surveys digitally administered by means of existing surveillance mechanisms.
- Three groups of authors reported collection of qualitative data through open-ended survey questions or interviews.

Table 3. Kind of data supporting original articles

Kind of data	Articles detail	Syndemic
Primary data	Cokley 2022	COVID-19, racial injustice
	Neto 2022	Sexual and gender minorities; vulnerability and COVID-19
	Rogers 2021	Sex workers, COVID-19 and HIV risk
	Jenkins, 2021	Mental Health impacts and COVID-19
	Wildman 2022	COVID-19, CDs and social circumstances.
	Singh 2021	CDs, coping strategies, and socio-economic impacts
Secondary data	Chung 2021	COVID-19, socio-economic inequalities in CDs and the SDOH
	Daboin, 2022	COVID-19, pre-existing diseases and social vulnerabilities
	Islam 2021	COVID-19, chronic diseases and social inequalities
	Lee 2022	Geography of COVID-19 incidence rates, and SDOH
Primary and secondary data	Jenkins 2022	Mental health, COVID-19, structurally vulnerable population
	Duby 2022	COVID-19 interactions and pre-existing mental health stressor
	Siegal, 2022	COVID-19 and structural racism

Conceptualizations of vulnerability: The syndemics framework was used to describe a relationship in which COVID-19 'increases', 'visualizes', 'hinders', 'deepens', 'exacerbates', 'reinforces', 'perpetuates' or 'generates reciprocal effects with' vulnerabilities due to pre-existing biomedical conditions and social dynamics, or COVID-19-related emerging vulnerabilities. Although different levels of experience and impact of COVID-19 were described, the risk of infection, illness, death, and the potential for more serious consequences resulting from control measures, were the most concrete forms of vulnerability explored.

Discussion

- Most authors included in this review advocated for the use of the syndemics perspective as an application of systemic thinking when analyzing vulnerability associated with COVID-19.
- The systemic nature of syndemic interactions, however, was interpreted from substantially different lenses: a) as bidirectional interactions between factors; b) as overlapping health conditions; c) as syndemic-exposome interactions; d) The 'syndemic' of COVID-19.
- Exploring unequal health outcomes, particularly clustering of cases or deaths in populations or geographical spaces emerged as the most often claimed arguments to apply a syndemics framework during the pandemic.
- Under these framings, vulnerability was described as a wide range of heterogeneous levels of risk around COVID-19 effects. As a rule, social and environmental factors were mentioned by the authors to elaborate on both syndemics and vulnerability.
- This review revealed multiple angles to understand the impact of pandemic control measures on population and the profound implications of thinking of them just as 'non-pharmaceutical intervention'. COVID-19 control measures reinforced and engendered new vulnerabilities and provided a clear example of the social ramifications of these measures beyond health-related spheres.
- Extending the use of the term 'syndemic' to all the effects of the pandemic can actually limit the extent to which the syndemic perspective can help clarify the interactions that matter in the midst of an emergency such as COVID-19.
- Studying social definitions of health under disciplinary approaches derived from social sciences could substantially enrich syndemics and vulnerability thinking. In this review, we identified efforts to work and publish in an interdisciplinary manner. However, integration of data seems still incipient.

LIMITATIONS AND STRENGTHS OF THE REVIEW:

- We limited our search to publications registered in PubMed. However, we were particularly interested in understanding the use that the biomedical field makes of concepts and ideas rooted in the social sciences while trying to understand and manage an emergency of this scale. Because of the implications of such conceptualizations in the management of COVID-19, we considered this limited scope justified.
- The high number of opinion pieces limited our claims about the theoretical and methodological limitations of syndemics thinking in the pandemic context.
- Primary data collection was less feasible and required more time to fulfil and share the results in a context characterized by immediacy, the boom of calls for papers, and the opportunity to tackle this emergency and global health problem from a transdisciplinary lens. However, it is a fact that the low amount of original research in this regard could be a barrier to close the gaps related to the operationalization of these concepts and their potential introduction into public health policies and practices.

Conclusions

Our results show that syndemics thinking has provided biomedical research not only with a perspective but also with a language to describe the multifactorial, multiscale, intricate, and multidirectional pathways involved in the complex health and disease process. In general, socio-environmental arrangements were treated as 'social' risk factors and explored as far as they increased the burden of disease. The way those arrangements were grouped and classified make difficult to disentangle the mechanisms under which they interact among them and enhance, create or generate vulnerabilities in a particular syndemic.