STUDY PROTOCOL
The experience of financial burden for patients with multimorbidity: A protocol for a systematic review of qualitative research [version 1; peer review: 1 approved, 1 approved with reservations]

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Abstract
Introduction: Multimorbidity is increasingly important due to its high disease burden, prevalence and related high healthcare utilisation. For patients, there is also a high financial burden due to direct and indirect costs arising from their multimorbidity. It is unclear how this financial burden affects patients. This study aims to synthesise qualitative evidence exploring the experience of financial burden from the perspective of patients with multimorbidity.

Methods: The review will be reported using the ENTREQ guidelines. A systematic search of Lilacs, PubMed, CINAHL, EMBASE, PsycINFO, and Applied Social Sciences Index and Abstracts will be conducted using a predefined search strategy. A search of fourteen pre-specified websites will be conducted for grey literature. Forward and backward citation checking of included studies will be conducted also. Studies will be included if they contain primary qualitative research and reference the experience of financial burden from the perspective of adult (≥ 18 years) community dwelling patients with multimorbidity. Studies from any country and in any language will be included. Titles and abstracts of search results will be screened; if a study appears relevant, then full-texts will be screened for eligibility. Study characteristics of included articles will be extracted. Study quality will be evaluated using the critical appraisal skills programme (CASP) checklist for qualitative research. These three processes will be carried out by two reviewers independently. Thematic-synthesis will be used to analyse data. This will be carried out by one reviewer and cross-checked by a second reviewer. The GRADE CERQual approach will be used to assess the overall confidence in the evidence.

Discussion: This review will identify evidence on the experiences of financial burden for patients with multimorbidity and forms part of a project
to support consideration of financial burden for patients in the development of clinical guidelines in Ireland.

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**Keywords**
Multimorbidity, costs, financial burden, qualitative systematic review, protocol

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**Author roles:**
- **Larkin J:** Conceptualization, Methodology, Writing – Original Draft Preparation;
- **Foley L:** Writing – Review & Editing;
- **Smith SM:** Conceptualization, Funding Acquisition, Methodology, Project Administration, Supervision, Writing – Review & Editing;
- **Harrington P:** Conceptualization, Methodology, Supervision, Writing – Review & Editing;
- **Clyne B:** Conceptualization, Methodology, Supervision, Writing – Review & Editing;

**Competing interests:** No competing interests were disclosed.

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**Introduction**

Chronic disease has become one of the biggest challenges for healthcare systems globally\(^1\). This has brought into focus the phenomenon of multimorbidity, the presence of two or more chronic diseases in a patient\(^2\). Multimorbidity is of increasing concern due to the high disease burden and the related high rates of healthcare utilisation. The estimated prevalence of multimorbidity in the general population ranges from 13% to 72%\(^3\). These variations are largely accounted for by differences in settings and age groups across prevalence studies. The prevalence is likely increasing due to the ageing of the population globally\(^4\). Despite this, healthcare systems internationally are primarily single disease focused\(^4\). This single disease focus is reflected in clinical guidelines, which primarily treat diseases in isolation and rarely account for patients with multimorbidity. This creates a significant treatment burden\(^5\) which has several consequences for patients with multimorbidity, including a financial burden.

Financial burden refers to direct medical costs, direct non-medical costs and indirect costs accruing to patients as a result of their multimorbidity. The financial burden of multimorbidity on patients is widespread and can be significant. A systematic review of cost-of-illness studies concluded that multimorbidity was always associated with higher out-of-pocket (OOP) expenditure than single or no chronic conditions\(^3\). Another systematic review found that a greater number of conditions present in a person was associated with higher OOP expenditure on medications\(^6\). This financial burden is of particular concern in terms of equity, as multimorbidity disproportionately affects patients from lower socioeconomic groups\(^7\).

Much of this economic-burden associated with multimorbidity arises from OOP expenditure or direct medical costs but it may also arise from direct non-medical costs including transportation to healthcare appointments and indirect costs including work absences. The economic-burden associated with multimorbidity can have negative effects including reduced medication adherence primarily due to inability to purchase required medication\(^8\), impoverishing spending (i.e., spending that pushes a household below an agreed poverty line)\(^9\), and reduced quality-of-life\(^9\).

Several qualitative studies have examined patients' lived experience of multimorbidity\(^4\). Many of these studies have a brief focus on experience of financial burden. By synthesising these studies, a broader picture of this experience can be provided. It has been suggested that by synthesising many studies the patient is given a greater voice\(^10\). The authors therefore sought to synthesise qualitative research exploring experience of financial burden for patients with multimorbidity.

**Research questions**

What are the experiences of patients with multimorbidity of financial burden?

How does financial burden affect interactions between patients with multimorbidity and the healthcare system?

How does financial burden impact on treatment burden for patients with multimorbidity?

**Methods**

**Design**

There are recognised challenges in upholding the complexity and context of primary qualitative research when conducting a qualitative systematic review. However, patients' views and experiences should inform decision making\(^11\) and these can be ascertained using qualitative methods\(^11\). By providing a systematic review and synthesis of this research, policy-makers can be more comprehensively informed\(^11\).

This review will be conducted and reported using the ENTREQ guidelines\(^12\). The review protocol is written in accordance with the PRISMA-P guidelines (reporting guidelines\(^13\)).

**Search strategy**

The following databases will be searched: Lilacs, PubMed, CINAHL, EMBASE, PsycINFO, and Applied Social Sciences Index and Abstracts. Additionally, forward and backward citation checking of included studies will be conducted. Content experts will be contacted requesting information on any articles the content experts feel are relevant. For the grey-literature search a list of websites considered relevant by the research team were chosen (extended data\(^19\)). Databases will be searched from inception using combinations of Mesh terms and key-words (extended data\(^19\)).

**Screening**

Search results will be exported to Endnote X8 and Covidence, and duplicate entries removed. Initially, titles will be screened by a single reviewer (JL) to remove entries that are clearly unrelated to the research question. Then, two reviewers (JL, LF) will screen titles and abstracts independently; according to the inclusion criteria (Table 1). Any disagreements will be resolved through discussion. If this does not lead to agreement, then a third reviewer will decide on inclusion for full-text review. The same screening and conflict resolution processes will be carried out for full-text articles for inclusion in the analysis stage.

**Eligibility criteria**

Only studies using a qualitative design, with primary data collection, referencing experiences of financial burden, and examining community-dwelling adults (≥ 18 years) with multimorbidity will be included (Table 1). Studies examining patients with non-specific chronic disease will be included if they include patients with multimorbidity and do not have a single condition focus. Qualitative design refers to studies which use a method of data collection and data analysis which are recognised qualitative methods\(^10\), for example interviews, focus groups, thematic analysis, and content analysis. Financial burden refers to the direct medical costs, direct non-medical costs and indirect costs experienced by patients. It is expected that the focus of studies will not exclusively be financial burden. Therefore, papers with broader focuses, such as the experience of multimorbidity, will be reviewed for inclusion. Also, many studies concerning financial burden and multimorbidity...
Table 1. Inclusion and exclusion criteria based on modified PICoS15.

<table>
<thead>
<tr>
<th>PICoS</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
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</thead>
<tbody>
<tr>
<td>Population</td>
<td>Identified as patient with multimorbidity</td>
<td>Single condition focus</td>
</tr>
<tr>
<td></td>
<td>≥ 2 chronic diseases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community dwelling adults (≥ 18 years old)</td>
<td></td>
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<tr>
<td>Phenomenon of Interest</td>
<td>Financial burden for patients</td>
<td></td>
</tr>
<tr>
<td>Context</td>
<td>Any country</td>
<td>Residential healthcare facilities</td>
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<tr>
<td></td>
<td>Primary and secondary care</td>
<td></td>
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<tr>
<td>Study Type</td>
<td>Qualitative</td>
<td>Quantitative</td>
</tr>
<tr>
<td></td>
<td>Original research (e.g., interviews or focus groups)</td>
<td></td>
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<td></td>
<td>Mixed methods</td>
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</table>

Data extraction and analysis

Two reviewers will extract study characteristics independently using a proforma (see extended data15) under the following headings: setting, country, year of publication, methodology, participants (age, gender, socioeconomic status, conditions), sampling strategy, data-analysis technique, and definition of financial burden. Conflicts will be resolved by a third reviewer (BC).

Data (quotes, themes and author interpretations) will be extracted verbatim from the results section of included studies. This process will be conducted by a single reviewer (JL), and then cross-checked by a second reviewer (LF) to increase confirmability. Only data considered relevant to the research questions will be extracted. If information is unavailable from the full-text, then the corresponding author will be contacted for clarification. If there is no reply, then a follow-up email will be sent one week later and if no reply is received within one week of the second email then a decision will be made on inclusion based on information available.

Thematic-synthesis, as described by Thomas and Harden16, will be used. Thematic-synthesis is an inductive approach which is often used for studies with ‘thin’ data and analysis16. It is also used to draw inference based on common themes from studies with different designs and perspectives17. Thematic-synthesis consists of a three step process; step one consists of line-by-line coding of the data of included studies. The second step involves organisation or grouping these codes into related areas to construct ‘descriptive’ themes. In step three, the descriptive themes will be iteratively examined and compared to refine the relationship between them and generate analytical themes that is, themes that go beyond the descriptive themes to provide new insights related to the review question. Data will be coded using NVIVO version 12. Following multiple readings of the included papers data-analysis will be carried out by a single reviewer (JL) following the three steps outlined above. In order to increase confirmability of the analysis, all studies will be independently read by a second reviewer (LF) to crosscheck the coding structure and themes developed. This process will be overseen by a third reviewer (BC). In order to increase the credibility of the findings, an overview of the results will be brought for discussion to a panel of public and patient representatives with experience of multimorbidity.

Quality-appraisal of included studies

The critical appraisal skills programme (CASP) checklist for qualitative research18 will be used to assess the methodological quality of all included studies. Two reviewers (JL and LF) will independently evaluate each study and any differences will be resolved through discussion. If this does not lead to agreement, then a third reviewer (BC) will adjudicate. Studies will not be excluded based on quality-appraisal. Quality-appraisal will be used a means of discussing the quality of the included studies and to inform the GRADE CERQual (Confidence in the Evidence from Reviews of Qualitative research) assessment of confidence in the review findings18.

Assessing the quality of the body of evidence

The review is intended to form part of a project which will inform how the specific needs of patients with multimorbidity are considered within clinical guidelines in Ireland. Therefore, the GRADE CERQual approach will be used to summarise our confidence in the evidence19. Four components contribute to an assessment of confidence in the evidence for an individual review finding: methodological limitations, relevance, coherence, and adequacy of data. Confidence in the evidence will be graded as high, moderate, low, or very low. This assessment will also be conducted in duplicate (JL and LF) and discussed amongst the research team.

Reflectivity. It is important to consider all findings in the context of research team members’ personal worldviews and experiences. Three authors have a background in social science;
Discerning the impact of financial burden on multimorbidity.

Introduction

The review will add to the knowledge base of how financial burden affects patients with multimorbidity as well as informing potential policy and practice interventions for patients with multimorbidity. This review also forms part of a project which, as a whole, will contribute to developing guidance of how the specific needs of patients with multimorbidity are considered within clinical guidelines in Ireland, and internationally. The review will inform the development of a national survey that will quantify economic burden for patients with multimorbidity in Ireland. Limitations include the potential paucity of data in included studies.

Data availability

Underlying data
No data are associated with this article.

Extended data


This project contains the following extended data:

- Proforma.docx (a proforma with all headings under which study characteristics will be extracted)
- Medline (OVID) Search strategy.docx (The mix of key words and mesh terms that will be used to search Medline and that will be transferred to other databases for searchers)
- Grey literature search.docx (the list of websites that will be searched for grey literature using a variation of the Medline search strategy)

Reporting guidelines


Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CCO 1.0 Public domain dedication).

Grant information

Health Research Board Ireland [CDA-2018-003]

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

References

12. Tong A, Flemming K, Milsome E, et al.: Enhancing transparency in reporting

http://www.doi.org/10.17605/OSF.IO/PN42R

Reference Source

PubMed Abstract | Publisher Full Text | Free Full Text

PubMed Abstract | Publisher Full Text | Free Full Text

Reference Source

18. Critical Appraisal Skills Programme. CASP Qualitative Checklist. [Internet]. 2018; [cited 11 February 2019].
Reference Source

PubMed Abstract | Publisher Full Text | Free Full Text
Is the rationale for, and objectives of, the study clearly described?

Yes.
The rationale for the study is described. Something the authors may wish to consider is that the scope of the review is global, but the aim is to inform Irish guidelines: the review will include research from both Upper Income Country and Low and Middle Income Country settings. While the ambitious scope may potentially add value to the review, the authors could discuss how they plan to take account or acknowledge differences in setting, health care systems and access to healthcare.

Is the study design appropriate for the research question?

Yes.
This report is a protocol for a systematic review of qualitative research providing data on the experience of financial burden of patients with multiple morbidity. A completed PRISMA-P checklist for a systematic review protocol is attached and appropriately completed. There is a PROSPERO database registration which should facilitate publication of the completed review.

The methods are well described and appropriate but I do have a few questions and in places perhaps there could be further explanation/exposition.

A proposed search is clearly described in the supplementary materials but, given the broad scope of multimorbidity and its contexts, it would have been good to see more about how this search strategy was developed. Were scoping strategies used? Also, will the validity of the search be considered and if necessary adapted? Will the example search for Medline be tested and if necessary adapted for other databases?

A minor point is that a little more detail could be given on the inclusion criteria at the full text stage. I assume that all citations selected on the basis of title and abstract will undergo full text screening by two
reviewers, with resolution by a third, this is not precisely the same as the citation screening process where one reviewer removes clearly irrelevant citations. A sentence explicitly stating the full text inclusion process would be helpful.

The suggested thematic analysis is appropriate, as is the process for generating codes and themes with validation from a second reviewer. Will first order data (direct quotations etc) be distinguished from second order data (author's interpretations) in reporting of the results? As you will potentially be including data from UMCs and LMICs and from settings with health systems that may differ markedly regarding co-payments and access to healthcare, how will you deal with these differences in the analysis. You might, for example, want to consider a thematic framework approach.

Is the rationale for, and objectives of, the study clearly described?
Yes

Is the study design appropriate for the research question?
Yes

Are sufficient details of the methods provided to allow replication by others?
Yes

Are the datasets clearly presented in a useable and accessible format?
Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Research relevant to this review: Systematic review including metasynthesis, chronic and medically complex conditions in childhood.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.
few comments.

**Introduction:**
1. The authors state that variations in estimated prevalence of multimorbidity are due to differences in settings and age groups. This is true but it is also due to differences in methods of measurement.

2. Clinical guidelines are largely disease focussed but it would be worth mentioning the NICE multimorbidity guidelines 2016 ([https://www.nice.org.uk/guidance/ng56](https://www.nice.org.uk/guidance/ng56)) which mentions treatment burden.

3. There are several groups who have explored treatment burden in multimorbidity and it would be worth citing these:

   Eton DT, Ridgeway JL, Egginton JS, Tiedje K, Linzer M, Boehm DH *et al.*: Finalizing a measurement framework for the burden of treatment in complex patients with chronic conditions. *Patient Relat Outcome Meas* 2015, 6: 117-126.1


**Methods:**
1. Have the authors considered publishing the protocol on PROSPERO?

2. Using one reviewer for initial exclusion during title screening should be acknowledged as a limitation, as this risks bias. One option would be to allow one reviewer to include studies at this stage but ideally two should be involved in exclusion.

3. Will postal questionnaires be excluded? This should be added to the criteria.

4. There is a potential for a large amount of papers to be full paper screened and included due to the fact that information on financial burden may be ‘hidden’ in studies with other objectives e.g. those that aim to explore the experience of multimorbidity more generally. It may be useful to have a clear cut off for inclusion e.g. if there is one item of data on financial burden in a paper and the rest is irrelevant, will this paper be included?

5. The methods for data analysis and quality appraisal appear very robust.

**References**
2. Tran VT, Barnes C, Montori VM, Falissard B, Ravaud P: Taxonomy of the burden of treatment: a


**Is the rationale for, and objectives of, the study clearly described?**
Yes

**Is the study design appropriate for the research question?**
Yes

**Are sufficient details of the methods provided to allow replication by others?**
Yes

**Are the datasets clearly presented in a useable and accessible format?**
Not applicable

**Competing Interests:** I have published in the areas of treatment burden and multimorbidity.

**Reviewer Expertise:** Treatment burden, multimorbidity, stroke.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.