



GPs' perspectives on the management of patients with multimorbidity: systematic review and synthesis of qualitative research

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Table 1. Characteristics of Included Studies

Title: GPs’ perspectives on the management of patients with multimorbidity: systematic review and synthesis of qualitative research

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What this paper adds

Article focus

- Patients with multiple morbidities present unique challenges to healthcare providers. An awareness of these challenges is needed to direct research efforts and intervention design in this field.
- Qualitative studies have explored GPs perceptions of the management of multimorbid patients, but to date these studies have not been systematically reviewed or synthesized.

Key messages

- This systematic review shows that the problem areas for GPs in the management of multimorbidity may be classified into four domains: disorganization and fragmentation of health care; the inadequacy of guidelines and evidence based medicine; challenges in delivering patient centred care; and barriers to shared decision making.
- These domains may be useful targets to guide the development of interventions that will assist and improve the provision of care to multimorbid patients.

Strengths and limitations

- The meta-ethnographic approach used in this review gave a broader understanding of the challenges of multimorbidity than any single study, while still preserving the context of included studies.

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- We focused on the GPs’ perspective on multimorbidity – an understanding of the challenges experience by patients is also required to inform the development of effective interventions.

For peer review only

Abstract

Objective

To synthesize the existing published literature on the perceptions of GPs or their equivalent on the clinical management of multimorbidity and determine targets for future research that aims to improve clinical care in multimorbidity.

Design

Systematic review and meta-ethnographic synthesis of primary studies that used qualitative methods to explore GPs' experiences of clinical management of multimorbidity or multiple chronic diseases.

Data sources

EMBASE, Medline, CINAHL, PsycInfo , Academic Search Complete, SocIndex, Social Science Full Text, and digital theses/ online libraries (database inception to September 2012) to identify literature using qualitative methods (focus groups or interviews).

Review methods

The 7 step meta-ethnographic approach described by Noblit and Hare, which involves cross-interpretation between studies while preserving the context of the primary data.

Results

Of 1805 articles identified, 37 were reviewed in detail and ten were included, using a total of 275 GPs in seven different countries. Four areas of difficulty specific to the management of multimorbidity emerged from these papers: disorganization and fragmentation of health

care; the inadequacy of guidelines and evidence based medicine; challenges in delivering patient centred care; and barriers to shared decision making. A ‘line of argument’ was drawn which described GPs’ sense of isolation in decision making for multimorbid patients.

Conclusions

This systematic review shows that the problem areas for GPs in the management of multimorbidity may be classified into four domains. There will be no ‘one size fits all’ intervention for multimorbidity but these domains may be useful targets to guide the development of interventions that will assist and improve the provision of care to multimorbid patients.

Introduction

Multi-morbidity, the co-existence of two or more long-term conditions in an individual patient, is increasingly the norm in primary care chronic disease management.(1, 2) The management of patients with multiple morbidities presents unique challenges to healthcare providers, and there is evidence that patients with multimorbidity receive a lower quality of care than those with single diseases.(3, 4) Healthcare utilisation, hospitalization rates and total health care costs are higher among multimorbid patients, even in systems where access to secondary care is restricted to referral by a primary care physician. (5), (6), (7) The epidemiology of multimorbidity is thus well described and there is now a need for interventions to improve healthcare in this patient group. (8, 9) A necessary step in the development of interventions is to understand why problems arise and what processes in the delivery of care are amenable to change. Interviews with stakeholders such as healthcare providers can be important sources of this information. (10) To date, qualitative studies from a range of countries have elicited GPs' views on challenges in the clinical management of multimorbidity, with diverse and sometimes conflicting findings. A synthesis of these studies has the potential to achieve a greater conceptual understanding of the challenges associated with multimorbidity than a single empirical study.

Meta-ethnography, one of the most commonly used methods for synthesizing qualitative research studies, employs a process of comparison and cross-interpretation between studies while preserving the context of primary data. (11) Similar to traditional systematic reviews, this process can generate new insights, highlight gaps in our knowledge and show areas of data saturation where no further primary research is required.(12)

An awareness of the overall picture of challenges faced by GPs in multimorbidity is needed to direct research efforts and intervention design in this field. To achieve this, we

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synthesised and analysed the existing literature on the views of GPs on the management of
multimorbid patients and determined targets for future research to improve
multimorbidity care.

For peer review only

Methods

The seven step model of meta-ethnography described by Noblit and Hare was used.(13)

The first step involved *a clear statement of the specific research question* and the contribution it will make to the field.

In step two, *a search strategy* was devised to retrieve papers related to this aim. We focused our search to locate primary studies that used qualitative methods to explore the clinical management of multimorbidity or multiple chronic diseases by GPs or their equivalent. We searched seven databases using database specific search terms and validated methods for retrieving qualitative studies: EMBASE (Elsevier), Medline (Ovid), CINAHL, PsycInfo , Academic Search Complete, SocIndex, Social Science Full Text(all Ebsco) (Appendix 1).(14-17) We supplemented this by searching databases of grey literature and reference lists. The search was not limited by language or dates of publication. The titles and abstracts of retrieved citations were read by one reviewer (CS). Full papers were ordered for all potentially relevant abstracts.(18) These papers were reviewed by two researchers (CS, CB) and were included if they met our inclusion criteria. Studies that examined the management of multimorbidity as part of a wider research question were included. We assessed the quality of included studies using the Critical Appraisal Skills Programme (CASP) for qualitative research.(19) Assessment of study quality was not used to exclude studies that otherwise met the inclusion criteria, but gave useful insights into the methods used for data collection and analysis.

Step three of the meta-ethnographic synthesis involved *reading the studies*. Initially two reviewers (CS and CB) read and re-read the included studies, and independently listed the main findings from each one. Study findings were defined as all data in the results and discussion sections of the included papers – including both the first order interpretations

(views of the participants) and second order interpretations (views of authors). In studies where GPs were interviewed with another health care professional, the analysis was restricted to the views of the GP where possible.

In step four, we *determined how the studies were related* to each other by comparing individual study findings. Four key concepts were chosen which reflected the main findings of all included studies. We also abstracted data on standard fields such as study aims, design, methods, setting and participants (Appendix 3).(20) Data was entered in to QSR International's NVivo 9 software to assist our qualitative analysis and synthesis.(21)

In step five, studies were *translated in to each other* by examining the contribution of each study to a key concept. Within the key concepts, similarities and differences in study findings and contexts were noted, and deviant cases were sought. To address the potential for clinical bias a third reviewer with a non-medical background (SMH) independently read all included papers and cross-checked the derivation and development of the key concepts.

In step six, we *synthesized the translations* in each key concept to develop third order interpretations, or higher levels of abstraction of the data for each key concept. We linked the third order interpretations using a 'line of argument', which represented the overarching perspective of GPs towards multimorbidity.

The final step involved expressing the results of the synthesis, for which we used tables, figures and text. The 'Enhancing transparency in reporting the synthesis of qualitative research' (ENTREQ) statement was used to inform the reporting of our results (Appendix 4).(22) Additionally, a summary of our findings were supplied to the first authors of all included papers, in order to validate our findings as representative of the original sources.

Results

The electronic database search returned 2,005 citations, leaving 1805 citations after removal of duplicates (Figure 1). A further 1768 citations were excluded by reading the title or abstract: 48 did not concern primary care, 891 were not qualitative studies, 769 did not concern multimorbidity, and 60 did not concern the GP's perspective. Full text articles were retrieved for 37 citations. Eleven of these were excluded because they did not use qualitative methods. A further 16 articles were excluded because, although they concerned patients with multiple chronic diseases, their exploration was focused on the management of an index disease. One possible relevant citation was in abstract form only (the study authors were contacted and the full account of this data has not been published yet) (Appendix 2). One additional study was retrieved from reference searching of the nine remaining studies. Ten studies were included in the final synthesis (Table 1).

The included studies were conducted in seven countries: Belgium, England, Germany, Ireland, Scotland, The Netherlands and the United States. A total of 275 GPs were involved; five studies used focus groups and five used interviews with individual GPs. One of the included articles was published in German. The authors were contacted for an English translation and as none was available the article was translated by a native German speaker in collaboration with CS. The overall quality of the 10 included studies was high, with all papers meeting the majority of CASP criteria. The most common weaknesses were related to data saturation (not reported in six studies) (23-28) and reflexivity (not discussed in five studies).(25-27, 29, 30) GPs with academic/research affiliations were over-represented as research subjects in five studies, representing a potential source of bias.(23, 26, 29-31) Six studies primarily focused on multi-morbidity. In these, multimorbidity was defined for study participants as two or more chronic diseases (24, 26, 29, 32) or introduced to

participants using a multimorbid case vignette (30) or an editorial on multimorbidity.(23)

Four studies retrieved by our search did not focus primarily on multimorbidity but were included as multimorbidity emerged as an important issue for study participants; two studies addressed polypharmacy (28, 31) and two explored the role of guidelines in primary care. (25, 27)

Translation of included studies

GPs in all studies reported challenges in multimorbidity, which they faced with “moderate optimism to something close to despair”.(30) Even in the context of deprivation, some participants reported feeling like a “wrung out rag” after complex multimorbidity consultations while others felt “energised” by the “privilege and rewards” that could be obtained from working in such a complex environment.(24) Four key concepts that reflected the principal findings of all included studies were determined. These are reported below and shown in Table 2. Within each key concept, subthemes arose and are highlighted in bold.

Disorganisation and fragmentation of healthcare

The included studies covered a range of different health systems, all of which lacked specific systems for treating patients with multimorbidity. In most studies this lack of organisation hampered care by causing logistical difficulties and excess consultation demands on the patient and their GP. Only one study mentioned that these problems were not serious enough to warrant a change in service organisation.(29)

The prevailing structure of primary health care reduced GPs' ability to respond to the needs of patients with multimorbidity. Insufficient consultation time led to amended or suboptimal approaches in many cases.(23, 24, 29) It was suggested that weighting

consultation lengths to the complexity of multimorbidity would facilitate more effective management. (23, 29)

Fragmented care resulted from “the involvement of several medical specialists, who each emphasize the importance of ‘their’ guideline” (30) and “poor communication from specialists and hospitals to the family physician”(31) which meant that “coordination and overview on medication were hard to maintain”.(32) In some studies, GP’s had a broad sense of responsibility towards overseeing and screening patients’ medications (28, 31, 32); others were unsure about their role in screening prescriptions and felt that a clear line of responsibility was required.(23) It was suggested that specialists did not “consider the wider harms and benefits of organ-specific intervention”, thereby adding to the problems of multimorbidity, in contrast to GPs who had a “holistic” view of the patient; “The cardiologists, you know, don’t mind if they bleed to death”.(26)

Despite these reservations, the input of specialists was desired. A “balance of equals” was called for, that would allow GPs and specialists to discuss complex patients and improve the awareness of complexity in multimorbidity amongst specialists.(23, 31) This would help all doctors involved “to speak with one voice. Different stories provoke distrust”.(30)

The inadequacy of guidelines and evidence based medicine

There was concern among GPs about clinical guidelines, which are “generally written for sole conditions” and do not account for “the unique circumstances of each patient”.(25, 27)

Most GPs felt guidelines were less useful in multimorbidity and that they actually added to the complexity in some cases: “no one can tell you the added benefit of an additional agent for blood pressure if you are already on ten”. (26, 30) However, others felt that using guidelines in multimorbidity ensured patients received the best quality care: “why should

their asthma be treated any differently just because they've got asthma and heart disease and you know osteoporosis or whatever".(29)

GPs doubted if the evidence underpinning guidelines could be extrapolated to patients with multimorbidity: "The guidelines are going to be set for optimum situations, and someone with multiple comorbidities [is] not going to be optimum"(25-27, 31) They also questioned the relevance of disease specific outcomes and guideline recommendations on the use of primary prevention (i.e. antihypertensive or lipid lowering agents) in multimorbidity, preferring to orient management to symptoms or quality of life.(23, 25)

GP's used modified approaches to guidelines, involving for example, the estimation of risk associated with particular diseases/ treatments.(26, 30) However, some felt this modification was in conflict with "best practice" and felt guilt at not implementing guidelines fully.(24, 30) Initiatives that linked physician reimbursement with adherence to guidelines were seen as a threat to GPs' ability to deliver patient centred care.(24, 26)

Challenges in delivering patient-centred care

In response to the many demands of multimorbidity, GP's recognized the importance of delivering patient-centred care, which incorporated two principal concepts: individualised management and a generalist approach.(23-26, 28-32)Delivering patient-centred care was seen as an aid for some but a challenge for others. For instance, some GPs felt that taking a broader view of the patient, incorporating nonmedical or psychosocial issues, increased the level of complexity in their management.(24) However, for others adopting a patient-centred approach was seen as a way of resolving the conflicts and uncertainty that can occur, particularly with co-implementation of multiple sets of guidelines.(24, 32)

In most studies, the longitudinal nature of the patient-GP relationship was seen as a "major facilitator" and "elementary component" of patient-centred care in multimorbidity. (23, 24,

28-32) Within the specific context of deprivation, longitudinal care was “potentially transformative” by giving “time to build relationships with patients” but it was also was a source of problems, by creating dependence and increased demands by patients for consultations.(24) The impact of treatment burden was an important consideration given the greater costs and risk of adverse drug events associated with the use of multiple medications.(23, 29, 32) This burden was compounded by certain patient characteristics such as cognitive or memory problems, poor social supports and finances, and low levels of motivation (23-26, 28, 29) which were likely to affect a patient’s ability to understand and adhere to treatment.(25, 26, 30-32)

Challenges in shared decision making

Shared decision making was considered to be more complicated in the context of multimorbidity due to many of the issues discussed above. The importance of eliciting a patient’s preferences was widely acknowledged, but GPs had difficulties’ doing this in practice.(30, 32) GP’s reported that many patients actively participate in decision making, can prioritize and are “good with trial and error”.(29, 30) However, for certain patients making choices could be a “source of distress” and contributed to them becoming “over the top anxious about their conditions”.(29) Discussing the risks and outcomes associated with treatment options in a way that facilitated patient involvement was particularly challenging, as was discussing the balance between quantity and quality of life.(24-26, 30, 32) In response to difficulties in shared decision making, GPs employed a range of techniques including prioritization of the doctor’s or the patient’s agenda(28, 29, 31), avoidance of decision making(23, 30), drawing on one’s own personal experience(31) or using additional investigations to support a decision.(26)

Enhanced communication skills were seen as necessary in multi-morbidity to facilitate clear and concise discussion with patients on the interplay between their chronic diseases and to help with de-prescribing medications, which if done badly could be interpreted as withdrawing care. (26, 30, 31) GPs felt that they had a pivotal role to play when patients were in the advanced stages of a chronic disease but due to multimorbidity may no longer be receiving specialist input. In this setting, adopting a palliative approach may be useful when making decisions on medications. (30, 32)

Third order interpretations and the 'line of argument'

By synthesizing the individual contributions of each study to the key concepts, third order interpretations were generated and linked using a 'line of argument' (Table 2).

1) Disorganisation and fragmentation of healthcare: The involvement of multiple specialists and the emphasis on single disease care is antagonistic to the 'holistic' goals of GPs. This problem is compounded by poor co-ordination and communication within the health service, leaving GPs feeling excluded from their patients care and with a sense of uncertainty regarding their role.

2) The inadequacy of guidelines and evidence based medicine: Guidelines offer GPs less support in the management of multimorbid patients and may in fact cause additional problems when they try to adhere to them.

3) Challenges in delivering patient centred care: Patient-centredness is an overriding principal for GPs in multimorbidity but trying to achieve this increases the complexity of care in some cases, and can lead the GP into additional conflict with specialist services or evidence based medicine.

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3 4) Challenges in shared decision making: The patient's input into decision making in
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5 multimorbidity is limited by difficulties in communicating risk-benefit and outcomes in a
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7 field where there is much more uncertainty on these issues.
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10 These key concepts represent four problematic domains in the provision of healthcare in
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12 multimorbidity, as seen by GPs. The line of argument linking these domains suggests that
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14 GPs feel isolated in the management of patients with multimorbidity, a group that they are
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16 specifically tasked with caring for.
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Discussion

The studies presented here used a bottom-up approach to explore the management of patients with multimorbidity. This paper is the first to our knowledge to systemically review and synthesize their findings and demonstrates the diversity in how GPs see this issue. The difficulties that GPs encounter span a number of clinical domains including system factors, the evidence base for chronic disease management and their own communication skills in the context of multiple physician and patient agendas. These findings are important because they highlight the separate but interacting areas of clinical practice that require intervention to improve care in multimorbidity. Thus, this study is additive to the findings of the individual studies reviewed; synthesizing the contributions of existing qualitative investigations in this area has led to a broader description and fuller understanding of the range of challenges that exist. Given the considerable overlap and repetition of data that emerged from the primary studies, it is unlikely that further scoping work on the challenges in multimorbidity will be useful. However, despite the commonalities, the significance of each domain varied between settings. Further research should focus on the reasons why some domains matter more in particular settings and how local factors modify and influence these domains, with a view to exploring what solutions exist and what those solutions may be.(33) There will not be a ‘one size fits all’ intervention to support and improve the quality of care in multimorbidity. However, the domains that have emerged from this review give a useful framework for future work in this field.

Comparison with other research

Disorganisation and fragmentation of care

Integrating patient care across services is important in all aspects of medicine, but there is a pressing need to address this in multimorbidity. Patients attending four or more doctors experience problems such as conflicting medical advice, unavailable test results and duplication of tests more commonly.(34)Our study indicates that, across settings, GPs receive poor communication from other care providers in multimorbidity, leaving them guessing about the course of management. Enhanced use of information technology may support more seamless multimorbidity care, by allowing bi-directional communication and local integration between care providers.

Satisfaction with prevailing health systems also varied between studies. Generalizations relating to a health system cannot be made from one single study, but this divergence is worthy of further exploration. For instance, a comparative analysis, using a multimorbidity perspective, of the strengths and weaknesses between the UK system (which uses explicit quality frameworks for chronic disease management) and a health system without such an approach may help inform policy and the development of interventions at health system level.

The inadequacy of guidelines and evidence based medicine

GPs in the studies reviewed here desired evidence on which to base their management but had mixed feelings on the clinical utility of guidelines as they currently stand. This finding is supported by prior studies showing that, internationally, few guidelines offer modified advice for patients with multimorbidity.(35, 36) To increase the relevance of clinical guidelines for multimorbid patient, our findings thus support the call for greater representation of multimorbid patients in trials and greater involvement of GPs in the writing of guidelines.(37)

Chronic diseases can occur in combinations that are concordant (have synergies in treatment) or discordant (conflicting treatments or interactions).(4) Although the synergies between certain conditions were discussed in the papers reviewed here, examples of specific discordant conditions were rare. It would be useful to explore what discordant combinations commonly occur in practice. This information could be used to inform the development of caveats in guidelines, educational initiatives or prioritization tools that would support safe approaches to competing diseases. (38)

Delivering patient centred care

This domain emerged as an intuitive and over-riding goal of GPs in all studies and interventions in multimorbidity must help GPs deliver on this aspiration. Continuity of care emerged as an important tenet of patient-centredness and should be promoted in any such interventions. Three subtypes of continuity of care have been previously described(39); of these, both informational and management continuity were seen here as necessary for patient safety and cohesive management. However, it was relational continuity that appeared to most facilitate care in multimorbidity, by allowing GPs to foster trust, anticipate preferences, and empower their patients over time. Multimorbid patients that GPs felt required particular assistance are those with cognitive impairment, mental health issues or low social support, and accordingly may require nuanced interventions to support their care.

Challenges in shared decision making

Shared decision making is facilitated by many aspects of primary care. (40-42)Nevertheless, GPs in the studies presented here sought additional skills in shared decision making in multimorbid patients, especially for complex decisions that involve not prescribing or discontinuing medications. It is known that interventions to improve shared decision making

may fail due to barriers such as lack of time and perceived lack of suitability of the patient.(43, 44) Given the overlap between these barriers and those that GPs encounter in multimorbidity, it is likely that special attention is warranted for the development of models of decision making for multimorbid patients. Evaluating existing models of shared decision making, such as the choice talk/ option talk/ decision talk model described by Elwyn and colleagues, in clinical encounters with multimorbid patients may be a useful place to start this process.(45)

Usefulness of meta-ethnography

The systematic approach of meta-ethnography as applied in this study has a number of strengths. It gives a fuller description of multimorbidity care while preserving the important contextual features that are inherent in general practice research. Our themes, developed from the experiences of 275 participants, indicated considerable overlap from each of the primary studies. Nevertheless, different opinions within particular themes gave useful insights into how system factors and context can influence practice.

Robustness of findings

The step by step approach used in our analysis generated themes in a transparent and reproducible way. The robustness of our findings is supported by several features. First, the quality of the studies reviewed was assessed using a published framework and quality levels were uniformly high. Secondly, there was concordance in the themes derived by non-clinical and the clinical reviewers on the research team. Thirdly, the findings from our analysis were disseminated to the authors of the primary studies. In the resulting feedback, the authors felt their results were represented within the findings of the synthesis.

Limitations and challenges

Retrieving qualitative studies from biomedical databases is challenging despite recent advances in the indexing of qualitative literature. We used validated combinations of qualitative search terms to optimize the list of citations returned. (14-17) Furthermore, we also used non biomedical databases to ensure that articles of relevance in the sociology or psychology literature were not missed.(18)

Multimorbidity is not a MeSH term and there is a lack of consensus on what the term means or encompasses with regard to diseases and disease severity.(46) We used a broad but less specific search strategy to account for this (Appendix 1) which resulted in the retrieval of papers with important information on multimorbidity, but whose original focus was not on this issue. Achieving consensus on the definition of multimorbidity will be important for the generalizability of findings and evaluation of future interventions in this field.

The term ‘multimorbidity’ was first discussed in the literature in 1976, however the first article that we found investigating this issue with GPs using qualitative methods was published in 2009.This lag mirrors the recent surge in quantitative research investigating multimorbidity, which may be explained by the increasing prevalence and economic impact of multimorbid patients.(47)

There was no language restriction used for inclusion of studies, and translations of potentially relevant titles and papers were conducted. However, we could have missed papers not listed on English language databases.

Although the quality of included studies was generally good, the over –representation of academic GPs as participants was a potential source of bias and may limit the generalizability of our findings to the overall GP population. Future studies should

endeavour to include GPs outside of the academic field to ensure the full range of clinical challenges is explored.

The primary data in our review originated from focus groups or clinical vignettes, reflecting what clinicians say rather than what they do. It would be valuable to use case based data in future studies, to see for example what specific conflicts arise between guidelines and how shared decision making is currently broached in practice. Such data would also help inform educational programmes in multimorbidity for GPs and GP trainees.

Our findings are limited to the challenges experienced by health care professionals in management of multimorbidity; the patient perspective also requires consideration. Elderly patients report functional decline, poor quality of life, and high health care costs as major consequences of multimorbidity and accordingly these factors should be incorporated into interventions design in this area.(48)

Conclusions

This systematic review shows that the problem areas for GPs in the management of multimorbidity may be classified into four domains: disorganization and fragmentation of health care; the inadequacy of guidelines and evidence based medicine; challenges in delivering patient centred care; and barriers to shared decision making. There will be no 'one fits all' intervention for multimorbidity but these domains may be useful targets to guide the development of interventions that will assist and improve the provision of care to multimorbid patients.

Contributions:

CS designed the study, undertook the systematic review, carried out data extraction, analysis and interpretation and wrote the manuscript.

SMH provided guidance on qualitative research methods, participated in the analysis and interpretation of results and reviewed the manuscript.

JB participated in the design of the systematic review and critical review of the manuscript.

CB participated in the design of the review, analysis and interpretation of results and critical review of the manuscript.

CS is guarantor.

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The sponsors of the study had no role in the study design, data collection, data analysis, data interpretation, writing of the report, or in the decision to submit the paper.

Prior presentations

This work was presented as a poster of ‘work in progress’ at the North American Primary Care Research Group Annual Meeting, New Orleans, December 2012 and as an oral presentation at the Society of Academic Primary Care, Nottingham, July 2013.

Word Count for the text

4209 words (excluding title page, abstract, references, tables and figures)

Number of included figures/tables: 3

1 Figure (Figure 1: Flow diagram of search)

2 tables (Table 1: Characteristics of Included Studies, Table 2: Translations and Synthesis)

Number of appended documents: 5

Appendix 1: Search Terms, Appendix 2: Excluded Studies, Appendix 3: Data Extraction

Template, Appendix 4: ENTREQ statement, Appendix 5: Table listing subthemes within key concepts

Data Sharing

Additional data on the assessment of quality of included papers is available from
csinnott@ucc.ie

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Competing interest statement

All authors have completed the Unified Competing Interest form and declare: no support from any organisation for the submitted work; no financial relationships with any

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organisations that might have an interest in the submitted work in the previous three years, and no other relationships or activities that could appear to have influenced the submitted work.

Ethical Approval

Ethical approval was not required for this study as it was a systematic review and synthesis of previously published work

Table 1. Characteristics of Included Studies

First Author	Objective	Data Collection	Participants (n)	Qualitative methodology / analysis	Country	Year of pub
Smith ²³	To explore the views and attitudes of GPs and pharmacists managing patients with multimorbidity in primary care.	Focus group with topic guide; participants were given a published editorial on multimorbidity before hand	GPs (13) & pharmacists. GPs were tutors to undergraduate medical students, worked in a mix of rural/urban, deprived/affluent practice and varied by gender and years of experience	Framework	Ireland	2010
O'Brien ²⁴	To understand GPs and practice nurses' experiences of managing multimorbidity in deprived areas and elicit views on what might help.	Individual semi-structured interview facilitated by researched topic guide	GPs(15) & nurses, working in areas of high deprivation in Scotland	Constant comparison	Scotland	2011
Steinman ²⁵	To investigate clinician attitudes about the usefulness of heart failure guidelines in patients of various ages/morbidity	Telephone based interview using Likert scales followed by open ended questions	Primary Care Practitioners (48/58) and Internists (10/58) responsible for sub-optimally managed patients with heart failure.	Content analysis	USA	2012
Fried ²⁶	To explore clinicians' perspectives of and experiences with therapeutic decision making for older persons with multiple medical conditions	Focus groups with broad discussion initially then focused questions on polypharmacy, side effects, and evidence based medicine in multimorbidity	GPs (36) purposively sampled to vary on academic, community and Veteran Affairs settings	Content analysis	USA	2011
Solomen ²⁷	To explore the relationship between prescribing guidelines and patient-partnership by exploring the attitudes of patients, GPs and PCT prescribing advisors	Semi-structured interviews	GPs (8) sampled using maximum variation by location, gender, single vs. group practice	Framework	England	2012
Anthierens ²⁸	To describe GPs' views and beliefs on polypharmacy	Semi-structured interviews	65 GPs working in mixed rich/poor urban environment	Content Analysis	Belgium	2010

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Bower ²⁹	To explore GP and nurse perceptions of multimorbidity and the influence on service organization and clinical decision making	Individual semi-structured interview using topic guide with questions and case vignettes.	GPs (15) & nurses, working in a pay for performance system (NHS). Purposively sampled from research network, to vary on list size and deprivation.	Framework	England	2011
Schuling ³⁰	To explore how experienced GPs feel about deprescribing medication in older patients with multimorbidity and to what extent they involve patients in these decisions.	Focus groups	GPs (29) split into 3 groups. All were GP trainers of at least 5yrs experience 'used to reflecting on their practice'	Thematic	Netherlands	2012
Marx ³¹	To explore the 'dilemma of polypharmacy' in primary care	Focus groups	GPs (21) 3 Focus groups with a mix of fulltime GPs, junior and senior academic GPs. Conducted at an academic GP conference.	Mind maps and grounded theory	Germany	2009
Luijckx ³²	To explore GPs' considerations and main aims in the management of multimorbidity, and factors influencing this management in daily practice.	Focus groups using an interview guide	Purposively sampled GPs (25), with/out involvement in training/academia, in five focus groups.	Constant comparison	Netherlands	2012

Table 2. Translations between studies with third order interpretation and line of argument formation

First Author	Disorganisation & Fragmentation of healthcare	The inadequacy of guidelines & evidence based medicine	Challenges in patient centred care	Challenges in shared decision making
Smith ²³	<i>'lines of communication need time and nobody appears to have time'</i> <i>'collusion of anonymity, which is, you know, this is not my patient, not my patient'</i>	<i>'the paradox faced by conscientious GPs in attempting to balance the potentially competing demands of health promotion, evidence-based medicine, and the use of multiple medications'</i>	<i>'a focus on function and quality of life was preferable to considering specific disease outcome measures'</i>	<i>'...decision making very difficult to achieve.'</i> <i>'decisions were linked to the theme of avoidance of complex issues which...can appear to become increasingly problematic and unsolvable'</i>
O'Brien ²⁴	<i>'adaptation of existing practice systems, particularly appointment length, relationship continuity, and referral systems for resources outside primary care, may improve services from the perspectives of professionals'</i>	<i>'need .. to demonstrate that we are interested in (patients) as a person, not someone who has heart failure'</i>	<i>'wanted to develop relationships with patients because she thought that greater understanding of their circumstances would help her get to the root of (medical) problems'</i>	<i>'there was a need to address 'a bit of the patient's agenda and our agenda' within consultations'</i>
Steinman ²⁵	-	<i>'...those with multiple comorbid conditions were more likely to experience harm from aggressive guideline based treatments'</i> <i>'guidelines represent a criterion standard of evidence-based care....regardless of patient age or comorbid burden'</i>	<i>'Each patient is a unique situation and is not going to be the same as another patient.... We have to go by the individual patient, by the patient's comfort, how is he feeling, and how is he doing.'</i>	<i>'a suggested approach to decision making for older adults that provides guidance on prioritizing care, accounting for comorbid conditions, and factoring in the role of estimated life expectancy'</i>
Fried ²⁶	<i>'fragmentation of care for patients who receive care for their multiple conditions from many physicians.'</i> <i>'the limitations imposed by current reimbursement systems, which fail to acknowledge the complexities of caring for older persons with multiple conditions'</i>	<i>'If they cannot manage... I am not going to complicate it further by adding something to get to the goal range.'</i> <i>'other clinicians believed that guideline-directed care would produce the best outcomes'</i>	<i>'Tailoring their approach ...from a consideration of such factors as patients' cognition and availability of social support'</i>	<i>'...conflicts between what they wanted to do for the patient and what the patient wanted'</i> <i>'...patients' and families' inaccurate understanding of harms and benefits, and they described performing testing to help patients understand their risk.'</i>
Solomen ²⁷	-	<i>'there was a perception that real patients differ from those recruited to the trials that inform guidelines'</i>	<i>'Many GPs felt they needed to be able to interpret guidelines in the context of individual patients'</i>	<i>'to reach a compromise by following guidelines and accommodating patient factors, such as patient preferences or the patient's ability to tolerate medicines'</i>
Anthierens ²⁸	<i>'The coordination of the medication regime of different disciplines is a tough job...'</i>	<i>'preventive aims are often minimal considering their age and polyopathy, which is in contrast with guidelines talking about one specific disease.'</i>	<i>'As a GP you have a broader view of your patient. You look at him/her from his own life.'</i>	<i>'They have a holistic view of the patient because of the long standing doctor-patient relationship..... a very tough job for GPs with major implications for their workload'</i>

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Table 2. Translations between studies with third order interpretation and line of argument formation

Bower ²⁹	'clash between services and the needs of patients was most salient in terms of logistics and inconvenience'	'...ambivalence about the need to consistently change clinical practice to reflect multimorbidity'	<i>'Weighing up what that patient can manage on the conditions they have, as to what it actually says to do.'</i>	'Dealing with multiple competing agendas in multimorbidity was important.'
	'Difficulties in information sharing between professionals meant that patients often had to co-ordinate care'	<i>'...why should their asthma be treated any differently just because they've got asthma and heart disease and you know, osteoporosis or whatever'</i>	'benefits of continuity of care in patients with multimorbidity'	'limited impact of multimorbidity on clinical decision making'
Schuling ³⁰	'...medication lists of the doctors involved are not exchanged and are consequently inconsistent.'	<i>'guidelines are kind of a hindrance. At the moment they do not cater for older patients.'</i>	'GPs report to support the concept of a patient-centred management as best practice'	'the importance of exploring patient preferences about treatment goals, in practice GPs appear hesitant.'
	'...several healthcare providers are involved in a patient's treatment and communication is sometimes poor'	<i>'I have difficulty not following the guidelines if I don't have good reasons to do so.'</i>	<i>'take her quality of life into account and ask myself will she live long enough to benefit from this (preventive) drug? '</i>	'... GPs tend to avoid discussing withdrawal of preventive medication with their elderly patients'
Marx ³¹	'poor communication from specialists and hospitals to the family physician'	'The desire of family doctors to deliver the best possible patient care quickly leads to polypharmacy, if guidelines are used'	'conflict arose in the actions of GPs trying to deliver personalized care to individuals and trying to delivering guideline orientated care'	'uncertainty could be counteracted by good communication between the doctor and patient.'
	'highlights the need for professional discussion on the one hand and avoiding unnecessary medication by "multiple prescribers on the other hand.'			'the patient and the doctor are in an interactive process, which necessitates careful negotiation'
Luijks ³²	'in multimorbidity, fragmentation of care is a pitfall.... stimulated by disease-centred reimbursement systems'	'adhering to standard regimens or strict guidelines was unwanted, as it contradicts their integrated perception of a unique person with a specific combination of diseases'	'A personal patient–doctor relationship was considered a major facilitator in the management of multimorbidity'	'GPs agreed that they want to involve their patients' perspectives and preferences into the decision-making process'
	'impeding multimorbidity management... insufficient time and compensation'		'patient-centredness can be regarded as 'tool' to counteract multimorbidity's potential pitfalls'	
Third Order Interpretations	The involvement of multiple specialists each operating on a single disease paradigm without an overview of the 'whole patient' leads to fragmented care in patients with multimorbidity. Single disease care is antagonistic to the goals of GPs in primary care. This problem is compounded by poor co-ordination and communication within the health service, leaving GPs feeling excluded from their patients care and with a sense of uncertainty regarding their role.	GPs have reservations about the outcomes and risk-benefit of guidelines in multimorbid patients. Although useful as a template, GPs feel that guidelines offer them less guidance or support for multimorbid patients and may in fact cause additional problems when they try to adhere to them.	Patient-centred care is an overriding principal for GPs in multimorbidity and incorporates the principles of individualization and generalism. Trying to achieve this aim increases the complexity of care in some cases, and can lead the GP into additional conflict with specialist services or EBM.	While GPs recognize the importance of involving patients in decision making process, they have difficulties in doing so. Communicating risk and outcomes in way that will engage patients in the decision making process is an area that GPs feel unskilled in, thereby limiting the patients influence as factor that would help the decision making process

Italicized extracts represent first order interpretations (views of participants in included studies). Non-italicized extracts represent second order interpretations (views of authors of included studies).

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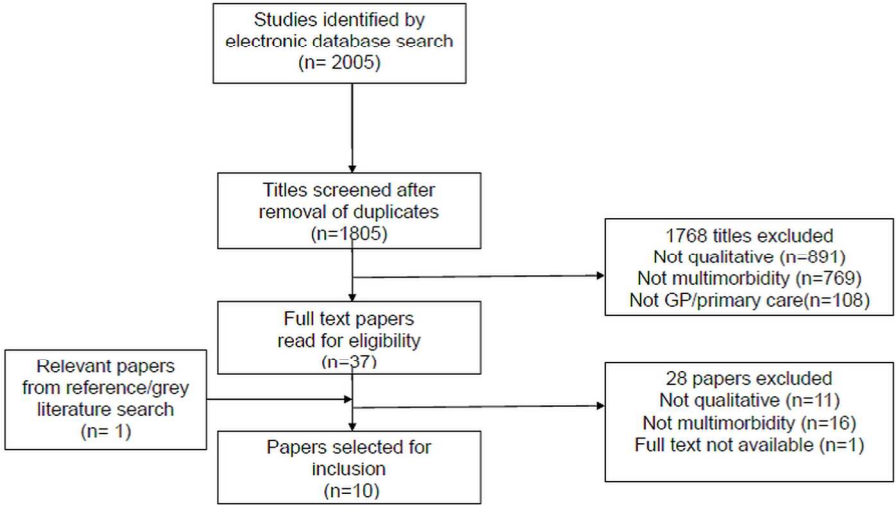


Figure 1. Flow chart of article screening process

Figure 1. Flow chart of article screening process
232x145mm (300 x 300 DPI)

Appendix 1. Search Terms

i) Locating relevant studies

The following databases were searched using database specific search terms and validated methods for retrieving qualitative studies (Appendix 1)(21, 22,23, 24): EMBASE (Elsevier), Medline (Ovid), CINAHL, PsycInfo , Academic Search Complete, SocIndex, Social Science Full Text(all Ebsco). Search was last updated on 21st September 2012.

Supplementary search

The database search was supplemented by searches of

1. References for the included articles (which yielded 1 relevant article)
2. Grey literature databases including WORLDCAT via the Online Computer Library Center (OCLC),Proquest, PapersFirst via OCLC, ASSIA (Applied Social Sciences Index and Abstracts), Directory of Open Access Books (DOAB)and Ebrary.

1. Search Terms for Database Embase, Platform: Elsevier

#1.1: interview*:ab,ti

#1.2: 'health care organization'/exp

#1.3:experiences:ab,ti

#1.4:'qualitative research'/exp

#1: #1.1 OR #1.2 OR #1.3 OR #1.4

#2.1: comorbid*:ab,ti

#2.2: morbid*:ab,ti

#2.3: (multi* NEXT/3 (disease* OR ill* OR condition*)):ab,ti

#2.4: pluripathology:ab,ti

#2.5: (chronic NEXT/3 (disease* OR ill* OR condition* OR disorder* OR health OR medication* OR syndrome* OR symptom*)):ab,ti

#2.6: multimorbid*:ab,ti

#2.1 OR #2.2 OR #2.3 OR #2.4 OR #2.5 OR #2.6

#2: #2.1 OR #2.2 OR #2.3 OR #2.4 OR #2.5 OR #2.6

#3: 'prescription'/exp OR 'inappropriate prescribing'/exp OR 'clinical decision making'/exp OR 'medical decision making'/exp OR 'polypharmacy'/exp OR 'clinical practice'/exp OR 'medical practice'/exp

#4.1:'general practice'/exp

#4.2:'general practitioner'/exp OR 'general practitioners'/exp

#4.3:'family medicine'/exp

#4.4:'family health'/exp

#4.5:'primary health care'/exp
#4.6: 'primary medical care'/exp
#4.7:'ambulatory care'/exp
#4.8:'community care'/exp
#4.1 OR #4.2 OR #4.3 OR #4.4 OR #4.5 OR #4.6 OR #4.7 OR #4.8
#4: #4.1 OR #4.2 OR #4.3 OR #4.4 OR #4.5 OR #4.6 OR #4.7 OR #4.8

#5: #1 AND #2 AND #3 AND #4

#6: #5 AND ('clinical trial'/de OR 'cohort analysis'/de OR 'controlled clinical trial'/de OR
'controlled study'/de OR 'cross-sectional study'/de OR 'randomised controlled trial'/de OR
'retrospective study'/de OR 'case control study'/de OR and 'statistical model'/de)

#7: #5 NOT #6

The date and results for this are below.

Qualitative search terms were taken from Walters LA, Wilczynski NL, Haynes RB; Hedges Team.
Developing optimal search strategies for retrieving clinically relevant qualitative studies in EMBASE.
Qual Health Res. 2006 Jan;16(1):162-8

2. Search Terms for Database CINAHL, Platform: EBSCO

- S1 Qualitative research OR AB qualitative OR TI Qualitative
- S2 SU attitude* of health personnel
- S3 SU questionnaire* or AB questionnaire* OR TI questionnaire*
- S4 'nursing methodology research'
- S5 AB interview* OR TI interview* OR SU interview*
- S6 AB focus group* OR TI focus group* OR SU focus group*
- S7 SU multimorbidity OR TI multimorbidity OR AB multimorbidity
- S8 SU multimorbid* OR TI multimorbid* OR AB multimorbid*
- S9 SU multi# morbid* OR TI multi# morbid* OR AB multi# morbid*
- S10 SU (multiple chronic N3 (disease* OR illness* OR condition*)) OR TI (multiple chronic N3 (disease*OR illness* OR condition*)) OR AB (multiple chronic N3 (disease*OR illness* OR condition*))
- S11 SU (chronic N3 (disease* OR illness* OR condition*)) OR TI (chronic N3 (disease*OR illness* OR condition*)) OR AB (chronic N3 (disease*OR illness* OR condition*))
- S12 SU pluripathology OR TI pluripathology OR AB pluripathology
- S13 SU comorbidity OR TI comorbidity OR AB comorbidity
- S14 SU comorbid* OR TI comorbid* OR AB comorbid
- S15 S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14
- S16 S1 or S2 or S3 or S4 or S5 or S6
- S17 SU 'family medicine' OR TI 'family medicine' OR AB 'family medicine'
- S18 SU 'family practice' OR TI 'family practice' OR AB 'family practice'
- S19 SU general practice' OR TI 'general practice' OR AB 'general practice'
- S20 SU general practitioner*' OR TI 'general practitioner*' OR AB 'general practitioner*'

- S21 SU family physician* OR TI family physician* OR AB family physician*
 S22 SU primary care OR TI primary care OR AB primary care
 S23 SU primary health care OR TI primary health care OR AB primary health care
 S24 SU primary medical care OR TI primary medical care OR AB primary health care
 S25 SU ambulatory care OR TI ambulatory care OR AB ambulatory care
 S26 S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25
 S27 S15 and S16 and S26
 S28 SU Decision making OR TI Decision making OR AB Decision making
 S29 SU health care delivery OR TI health care delivery OR AB health care delivery
 S30 SU Prescribing OR TI Prescribing OR AB Prescribing
 S31 SU polypharmacy OR TI polypharmacy OR AB polypharmacy
 S32 SU ((inappropriate OR appropriate OR suboptimal OR under OR over OR optimal) N3
 (prescribing OR prescription OR medication* or drug*)) OR TI ((inappropriate OR
 appropriate OR suboptimal OR under OR over OR optimal) N3 (prescribing OR
 prescription OR medication* or drug*)) OR AB ((inappropriate OR appropriate OR
 suboptimal OR under OR over OR optimal) N3 (prescribing OR prescription OR
 medication* or drug*))
 S33 SU (multi* N3 (drug* OR medication* OR prescription*)) OR TI (multi* N3 (drug* OR
 medication* OR prescription*)) OR AB (multi* N3 (drug* OR medication* OR
 prescription*))
 S34 SU clinical practice OR TI clinical practice OR AB clinical practice
 S35 S28 or S29 or S30 or S31 or S32 or S33 or S34
 S36 S27 and S35
 S37 TI interview OR AB interview
 S38 SU audiorecording OR MW audiorecording
 S39 MW qualitative stud* OR TI qualitative stud* OR AB qualitative stud*
 S40 S37 or S38 or S39
 S41 TI morbidity OR AB morbidity OR MW morbidity
 S42 S15 or S41
 S43 S26 and S35 and S40 and S42

Qualitative terms taken from Wilczynski NL, Marks S, Haynes RB. Search strategies for identifying qualitative studies in CINAHL. Qual Heal Res. 2007 May;17(5):705-10. See line 37/38/39. The earlier search lines were not used (S1-S6)

3. Search terms for Database Medline, Platform OVID.

1. interview:.mp.
2. experience:.mp.
3. qualitative.tw.
4. exp Qualitative Research/
5. 1 or 2 or 3 or 4
6. exp Family Practice/ or exp General Practice/
7. exp General Practitioners/

- 8. exp Family Practice/ or family medicine.mp.
- 9. exp Primary Health Care/
- 10. exp Physicians, Family/
- 11. exp Physicians, Primary Care/
- 12. exp Ambulatory Care/
- 13. 6 or 7 or 8 or 9 or 10 or 11 or 12
- 14. co-morbid::ti. or co-morbid::ab. or comorbid::ti. or comorbid::ab. or co morbid::ab. or co morbid::ti.
- 15. morbid::ti. or morbid::ab.
- 16. (multi: adj3 (ill: or disease: or condition:)).ab,ti.
- 17. pluripathology.ab,ti.
- 18. (chronic adj3 (disease: or ill: or condition: or disorder: or health or medication: or syndrome: or symptom:)).ab,ti.
- 19. (multimorbid: or multi morbid: or multi-morbid:).ab,ti.
- 20. 14 or 15 or 16 or 17 or 18 or 19
- 21. exp Decision Making/
- 22. exp Professional Practice/
- 23. exp Physician's Practice Patterns/
- 24. exp Inappropriate Prescribing/
- 25. exp Drug Prescriptions/
- 26. exp Polypharmacy/
- 27. 21 or 22 or 23 or 24 or 25 or 26
- 28. 5 AND 13 AND 20 AND 27

Qualitative search terms taken from Wong SS, Wilczynski NL, Haynes RB; Hedges Team. Developing optimal search strategies for detecting clinically relevant qualitative studies in MEDLINE. Stud Health Technol Inform. 2004;107(Pt 1):311-6.

4. Search terms for Database PsycInfo, Platform EBSCO

- S1 SU multimorbidity OR TI multimorbidity OR AB multimorbidity
- S2 SU multimorbid* OR TI multimorbid* OR AB multimorbid*
- S3 SU multi# morbid* OR TI multi# morbid* OR AB multi# morbid*
- S4 SU (multiple chronic N3 (disease* OR illness* OR condition*)) OR TI (multiple chronic N3 (disease*OR illness* OR condition*)) OR AB (multiple chronic N3 (disease*OR illness* OR condition*))
- S5 SU (chronic N3 (disease* OR illness* OR condition*)) OR TI (chronic N3 (disease*OR illness* OR condition*)) OR AB (chronic N3 (disease*OR illness* OR condition*))
- S6 SU pluripathology OR TI pluripathology OR AB pluripathology
- S7 SU comorbidity OR TI comorbidity OR AB comorbidity
- S8 SU comorbid* OR TI comorbid* OR AB comorbid
- S9 S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8
- S10 SU 'family medicine' OR TI 'family medicine' OR AB 'family medicine'
- S11 SU 'family practice' OR TI 'family practice' OR AB 'family practice'
- S12 SU general practice' OR TI 'general practice' OR AB 'general practice'

- S13 SU general practitioner*' OR TI 'general practitioner*' OR AB 'general practitioner*'
 S14 SU family physician* OR TI family physician* OR AB family physician*
 S15 SU primary care OR TI primary care OR AB primary care
 S16 SU primary health care OR TI primary health care OR AB primary health care
 S17 SU primary medical care OR TI primary medical care OR AB primary health care
 S18 SU ambulatory care OR TI ambulatory care OR AB ambulatory care
 S19 S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18
 S20 SU Decision making OR TI Decision making OR AB Decision making
 S21 SU health care delivery OR TI health care delivery OR AB health care delivery
 S22 SU Prescribing OR TI Prescribing OR AB Prescribing
 S23 SU polypharmacy OR TI polypharmacy OR AB polypharmacy
 S24 SU ((inappropriate OR appropriate OR suboptimal OR under OR over OR optimal) N3
 (prescribing OR prescription OR medication* or drug*)) OR TI ((inappropriate OR
 appropriate OR suboptimal OR under OR over OR optimal) N3 (prescribing OR
 prescription OR medication* or drug*)) OR AB ((inappropriate OR appropriate OR
 suboptimal OR under OR over OR optimal) N3 (prescribing OR prescription OR
 medication* or drug*))
 S25 SU (multi* N3 (drug* OR medication* OR prescription*)) OR TI (multi* N3 (drug* OR
 medication* OR prescription*)) OR AB (multi* N3 (drug* OR medication* OR
 prescription*))
 S26 SU clinical practice OR TI clinical practice OR AB clinical practice
 S27 SU experience level OR TI experience level OR AB experience level
 S28 SU morbidity OR TI morbidity OR AB morbidity
 S29 S9 or S28
 S30 S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27
 S31 S19 and S29 and S30
 S32 TI experiences OR AB experiences
 S33 TI interview* OR AB interview*
 S34 TI qualitative OR AB qualitative
 S35 S32 or S33 or S34
 S36 S31 and S35
 S37 CC 3410
 S38 CC 3430
 S39 CC 3400
 S40 S37 or S38 or S39
 S41 S30 or S40
 S42 S19 and S29 and S41
 S43 S35 and S42

Qualitative search terms taken from McKibbin KA, Wilczynski NL, Haynes RB. Developing optimal search strategies for retrieving qualitative studies in PsycINFO. Eval Health Prof. 2006 Dec;29(4):440-54.

Search terms used for Academic Search Complete; Social Sciences Full Text (H.W. Wilson); SocINDEX with Full Text, Platform Ebsco

S1 Qualitative research OR AB qualitative OR TI Qualitative

S2 SU attitude* of health personnel

S3 SU questionnaire* or AB questionnaire* OR TI questionnaire*

S4 'nursing methodology research'

S5 AB interview* OR TI interview* OR SU interview*

S6 AB focus group* OR TI focus group* OR SU focus group*

S7 SU multimorbidity OR TI multimorbidity OR AB multimorbidity

S8 SU multimorbid* OR TI multimorbid* OR AB multimorbid*

S9 SU multi# morbid* OR TI multi# morbid* OR AB multi# morbid*

S10 SU (multiple chronic N3 (disease* OR illness* OR condition*)) OR TI (multiple chronic N3 (disease*OR illness* OR condition*)) OR AB (multiple chronic N3 (disease*OR illness* OR condition*))

S11 SU (chronic N3 (disease* OR illness* OR condition*)) OR TI (chronic N3 (disease*OR illness* OR condition*)) OR AB (chronic N3 (disease*OR illness* OR condition*))

S12 SU pluripathology OR TI pluripathology OR AB pluripathology

S13 SU comorbidity OR TI comorbidity OR AB comorbidity

S14 SU comorbid* OR TI comorbid* OR AB comorbid

S15 S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14

S16 S1 or S2 or S3 or S4 or S5 or S6

S17 SU 'family medicine' OR TI 'family medicine' OR AB 'family medicine'

S18 SU 'family practice' OR TI 'family practice' OR AB 'family practice'

S19 SU general practice' OR TI 'general practice' OR AB 'general practice'

S20 SU general practitioner* OR TI 'general practitioner*' OR AB 'general practitioner*'

S21 SU family physician* OR TI family physician* OR AB family physician*

S22 SU primary care OR TI primary care OR AB primary care

S23 SU primary health care OR TI primary health care OR AB primary health care

S24 SU primary medical care OR TI primary medical care OR AB primary health care

S25 SU ambulatory care OR TI ambulatory care OR AB ambulatory care

S26 S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25

S27 S15 and S16 and S26

S28 SU Decision making OR TI Decision making OR AB Decision making

S29 SU health care delivery OR TI health care delivery OR AB health care delivery

S30 SU Prescribing OR TI Prescribing OR AB Prescribing

S31 SU polypharmacy OR TI polypharmacy OR AB polypharmacy

S32 SU ((inappropriate OR appropriate OR suboptimal OR under OR over OR optimal) N3 (prescribing OR prescription OR medication* or drug*)) OR TI ((inappropriate OR appropriate OR suboptimal OR under OR over OR optimal) N3 (prescribing OR prescription OR medication* or drug*)) OR AB ((inappropriate OR appropriate OR suboptimal OR under OR over OR optimal) N3 (prescribing OR prescription OR medication* or drug*))

S33 SU (multi* N3 (drug* OR medication* OR prescription*)) OR TI (multi* N3 (drug* OR medication* OR prescription*)) OR AB (multi* N3 (drug* OR medication* OR prescription*))

S34 SU clinical practice OR TI clinical practice OR AB clinical practice

S35 S28 or S29 or S30 or S31 or S32 or S33 or S34

S36 S27 and S35

S37 morbidity OR TI morbidity OR AB morbidity

S38 S15 or S37
S39 S16 and S26 and S35 and S38

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Appendix 2. Excluded studies

When screening titles by title/abstract, I first looked at whether it was clearly not qualitative research (a randomised control trial or guidelines). If this was unclear from the title, then I considered if it was clearly not dealing with multimorbidity (ie title contained other disease focus such as prostatic disease or asthma). If the citation was still not excludable, I then considered if I was primary care based or concerned the GPs perspective. For foreign language titles, Google translate was used to ascertain if the title was applicable.

EMBASE

Of the 1105 that remained after excluding duplicates, 1082 were excluded by reading titles / abstracts, leaving 23 citations.

- Excluded because not primary care based : 34 (pharmacy/hospital/dentistry)
- Excluded because not qualitative: 577 (guidelines/editorials/ reviews/ quan research/ opinions/recommendations/education related)
- Excluded because not concerning MM: 447 (asthma/COPD/ psychiatric disease/ abs/gout/cv disease)
- Excluded because no related to Dr or decision making: 24

Of the 23 remaining, the following 18 were excluded after reading the full texts:

1. Ampt AJ, Amoroso C, Harris MF, McKenzie SH, Rose VK, Taggart JR. Attitudes, norms and controls influencing lifestyle risk factor management in general practice. [Internet]. BMC family practice. 2009. Concerns lifestyle modification in the management of chronic disease, but does not incorporate multimorbidity.
2. Balla, 2012 #5087; Balla J, Heneghan C, Thompson M, Balla M. Clinical decision making in a high-risk primary care environment: A qualitative study in the UK. BMJ Open [Internet]. 2012;2(1). Concerns decision making and out of hours care.
3. Boyd, 2005 #5697; Boyd CM, Darer J, Boulton C, Fried LP, Boulton L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA. 2005 Aug 10;294(6):716-24. Review of one case vignette/policy analysis.
4. Davidson, 1995 #6059; Davidson, W, Molloy, W, Bedard, M. Physician characteristics and prescribing for elderly people in New Brunswick: Relation to patient outcomes Canadian Medical Association Journal. 1995. 152. 8. Quantitative analysis only.
5. Demirkol, 2003 #5826; Demirkol A, Ritchie JE, Craig P. Providing healthcare for people with chronic illness: the views of Australian GPs. Med J Aust. 2003 Sep 1;179(5):269. Not concerning multimorbidity.
6. Fortin, 2007 #5577; Editorial
7. Horne, 2001 #5943; Horne R, Mailey E, Frost S, Lea R. Shared care: a qualitative study of GPs' and hospital doctors' views on prescribing specialist medicines. Br J Gen Pract. 2001

Mar;51(464):187-93. Concerns GPs perceptions of shared care between primary and secondary care.

8. Hudon, 2012 #5041; Hudon C, Fortin M, Haggerty J, Loignon C, Lambert M, Poitras ME. Patient-centered care in chronic disease management: A thematic analysis of the literature in family medicine. *Patient Educ Couns*. 2012 Aug;88(2):170-6. Epub 2012 Feb 22. Analysis of existing literature rather than primary data.
9. Kadam, 2012 #5012; Editorial
10. Loeb, 2011 #5197; Loeb DF, Bayliss EA, Binswanger IA, Candrian C, Degruy FV. Primary care physician perceptions on caring for complex patients with medical and mental illness. *J Gen Intern Med*. 2012 Aug;27(8):945-52. Epub 2012 Feb 28. Topic guide focused interviews on the interaction between mental and physical illness, making mental illness an index illness.
11. Mangin, 2012 #5048; Editorial.
12. Martin, 2002 #5918; Martin C, Rohan BG. Chronic illness care as a balancing act. A qualitative study. [Internet]. *Australian family physician*. 2002. Concerns models of care rather than delivery of care/actual patient management.
13. May, 2004 #5795; May C, Allison G, Chapple A, Chew-Graham C, Dixon C, Gask L, Graham R, Rogers A, Roland M. Framing the doctor-patient relationship in chronic illness: a comparative study of general practitioners' accounts. *Sociol Health Illn*. 2004 Mar;26(2):135-58. Re-analysis of previously gathered qualitative data to examine the doctor –patient relationship.
14. Salisbury, 2012 #5057; Editorials
15. Saltman, 2004 #5794; Editorials
16. Shepherd, 2012 #5036; Letter in response to Mercer article.
17. Webster, 2000 #5951 Letter.
18. Weiner M, Wells S, Kerse N. Perspectives of general practitioners towards evaluation and treatment of cardiovascular diseases among older people. *J Prim Health Care*. 2009 Sep;1(3):198-206. Although reported as mixed methods, the qualitative component was just 'narrative comments' at the end of a quantitative/likert questionnaire.
19. Abstract only: Limm, 2012 #5088; Study authors contacted – Dr C Boyd – and full account not yet published.

4 were included after reading fulltexts

- 1) Bower, 2011 #5145;
- 2) Smith, 2010 #5300;
- 3) O'Brien, 2011 #5227;
- 4) Marx, 2009 #5434.

Challenges in the management of multimorbidity: A meta-ethnography of the GPs perspective

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CINAHL.

59 citations reviewed after duplicates removed. 55 excluded by reading the titles/abstracts, leaving 4 full papers to be reviewed.

- 14 excluded as not qualitative papers
- 32 excluded as not concerning multimorbidity (COPD + mental health issues predominantly)
- 9 excluded as did not concern the GPs perspective/ decision making. (patient perspective).

Four full papers reviewed – 3 excluded, one included.

- 1) Falling on stony ground? A qualitative study of implementation of clinical guidelines' prescribing recommendations in primary care.(includes abstract); Rashidian A; Eccles MP; Russell I; Health Policy, 2008 Feb; 85 (2): 148-61. GP assessment of the process in development and use of CPGs
- 2) Interactions between practitioners and patients with chronic illnesses.(includes abstract); Kupka NJ; Rush University, College of Nursing, 2003; D.N.Sc. (108 p) (doctoral dissertation – research) Are motivational techniques used by GPs in managing CD?
- 3) Mutual influence in shared decision making: a collaborative study of patients and physicians. By: Lown, Beth A.; Hanson, Janice L.; Clark, William D. Health Expectations. Jun2009, Vol. 12 Issue 2, p160-174. 15p. Concerns characteristics of the DrPt relationship and SDM.
- 4) Fried: included.

Medline

364 citations read : 360 excluded by title abstract:

- Excluded because not primary care based : 12 (pharmacy/hospital/dentistry)
- Excluded because not qualitative: 185 (guidelines/editorials/ reviews/ quan research/ opinions/recommendations/education related)
- Excluded because not concerning MM: 153 (asthma/COPD/ psychiatric disease/ abs/gout/cv disease)
- Excluded because no related to Dr or decision making: 10

Full texts retrieved for 4 citations. The following were excluded:

- 1) Müller-Engelmann M, Keller H, Donner-Banzhoff N, Krones T. Shared decision making in medicine: the influence of situational treatment factors. Patient Educ Couns. 2011 Feb;82(2):240-6. Concerns what situations shared decision making is an appropriate approach.
- 2) (Harries, Forrest et al. 2007) Really focuses on management of angina and has only one line on MM in qual section.
- 3) Solomon: included.

4) Luijks: included.

PsycInfo

137 citations read. 134 excluded by title abstract, leaving three full texts for review.

- Excluded because not primary care based : 0 (pharmacy/hospital/dentistry)
- Excluded because not qualitative: 48 (guidelines/editorials/ reviews/ quan research/ opinions/recommendations/education related)
- Excluded because not concerning MM: 72 (asthma/COPD/ psychiatric disease/ abs/gout/cv disease)
- Excluded because no related to Dr or decision making: 14

Full texts retrieved for 3 citations. The following were excluded:

- 1) Physicians' view of primary care-based case management for patients with heart failure: A qualitative study. Peters-Klimm, Frank Olbort, Rebecca Campbell, Stephen Mahler, Cornelia Miksch, Antje Baldauf, Annika Szecsenyi, Joachim ; International Journal for Quality in Health Care, Vol 21(5), Oct, 2009. pp. 363-371. Concerns the evaluation of the implementation of a case management programme for heart failure.
- 2) (Chew-Graham and Hogg 2002). Concerns the management and diagnosis of depression in patients with chronic physical disease
- 3) Steinman was included.

Academic Search Complete / Social Science Full Text/

140 citations read. 137 excluded by title abstract:

- Excluded because not primary care based : 2 (pharmacy/hospital/dentistry)
- Excluded because not qualitative: 67 (guidelines/editorials/ reviews/ quan research/ opinions/recommendations/education related)
- Excluded because not concerning MM: 65 (asthma/COPD/ psychiatric disease/ abs/gout/cv disease)
- Excluded because no related to Dr or decision making: 3

Full texts retrieved for 3 citations. One was excluded

- 1) GPs' decision-making--perceiving the patient as a person or a disease. By: André, Malin; Andén, Annika; Borgquist, Lars; Edvard Rudebeck, Carl. BMC Family Practice. 2012, Vol. 13 Issue 1, p38-43. 6p. Concerns things that influence gradual or immediate decision making in primary care, and used a quantitative questionnaire.
- 2) Hunt excluded as although does deal with multiple chronic diseases, (DM and HTN) does not deal with the presentation of these in tandem as multimorbidity.
- 3) Schuling included

	Citations	Duplicates within this database and in comparison to other databases*	After removal of duplicates	Excluded by title/abstract	Not Primary Care	Not Qualitative Research	Not Multimorbidity	Not Dr's perspective	Full text read	Not Primary Care	Not Qualitative Research	Not Dr's perspective	Included	Full text not available	Excluded by Full text	
EMBASE	1121	16	1105	1082	34	577	447	24	23	0	11	0	4	1	19	
CINAHL	65	6	59	55	0	14	32	9	4	0	0	0	1	0	3	
PsycInfo	184	47	137	134	0	48	72	14	3	0	0	0	1	0	2	
Academic Search Complete	198	58	140	137	2	67	65	3	3	0	0	0	1	0	2	
Medline (Ovid)	437	73	364	360	12	185	153	10	4	0	0	0	2	0	2	
Total	2005	200	1805	1768	48	891	769	60	37	0	11	0	9	1	28	

Table showing distribution of excluded articles across databases.

*Duplicates searched for in order of EMBASE/ CINAHL/Medline/PsycInfo/ASS)

Appendix 3. Data Extraction Template¹

Author	
Background of authors	
Country of study	
Year of publication	
Setting of study	
Aims (Phenomena of Interest)	
Participants	
GPs (n)	
Others(profession, n)	
Professional Orientation/Focus of GPs	
Methodology	
Methods	
Data collection	
Data analysis	
Main findings	

¹ www.joannabriggs.edu.au/documents/jbireviewmanual_cip11449.pdf

Enhancing transparency in reporting the synthesis of qualitative research: the ENTREQ statement

No	Item	Guide and description
1	Aim	To synthesize the existing published literature on the perceptions of GPs or their equivalent on the clinical management of multimorbidity and determine targets for future research that aims to improve clinical care in multimorbidity
2	Synthesis methodology	Meta-ethnography
3	Approach to searching	Pre-planned comprehensive search strategies used to seek all available studies
4	Inclusion criteria	Qualitative research methods (data collection and analysis) Population: General Practitioners or their equivalent Topic: Clinical management of multimorbidity No language or year limits
5	Data sources	Electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO, Econlit), Grey literature databases included WORLDCAAT via the Online Computer Library Center (OCLC), Proquest, PapersFirst via OCLC, ASSIA (Applied Social Sciences Index and Abstracts), Directory of Open Access Books (DOAB) and Ebrary. Search was last updated on 21 st September 2012
6	Electronic Search strategy	Literature search terms are described in detail in Appendix 1
7	Study screening methods	The titles and abstracts of retrieved citations were scanned by one reviewer (CS). Full papers were ordered for all potentially relevant abstracts Full papers were reviewed by two researchers (CS, CB) and were included if they met our inclusion criteria
8	Study characteristics	The characteristics of the included studies are presented in Table 1.
9	Study selection results	The studies screened are described in brief in Figure 1 (Flow diagram) and in greater detail in Appendix 2 (Excluded studies)
10	Rationale for appraisal	One study formally assessed quality. Decisions on inclusion and relevance of studies to our research question was independently conducted by two reviewers (CS, CB)
11	Appraisal items	The CASP tool was used to appraise all included studies
12	Appraisal process	Quality assessment was formerly conducted by one reviewer (CS)
13	Appraisal results	Study quality assessments are available for review if required..
14	Data extraction	<i>A data extraction proforma was derived from the Johanna Briggs data extraction tool. All text under the headings "results /conclusions" was considered data from the primary studies unless it was stated to be given by a healthcare professional that was not a GP. This data was extracted electronically and entered into a computer software package to facilitate data management.</i>
15	Software	NVivo 9
16	Number of reviewers	Three reviewers – CS, SMH, CB.

Enhancing transparency in reporting the synthesis of qualitative research: the ENTREQ statement

No	Item	Guide and description
17	Coding	The meta-ethnographic approach described by Noblit & Hare.
18	Study comparison	Overarching concepts that represented the entire dataset were formulated after initial readings of the included papers. The specific contribution of each paper to each key concept was then determined.
19	Derivation of themes	Themes were derived initially as key concepts representing the entire dataset. The contribution of each paper to each key concept was determined and the meaning of the key concept modified accordingly.
20	Quotations	Quotations from the primary studies are provided in Table 2 to illustrate themes/constructs.
21	Synthesis output	A line of argument was derived which represents a statement of GPs' perception of multimorbidity. The key concepts demonstrate key areas that have arisen from existing qualitative work, in a variety of healthcare settings, and as such gives direction to on-going research and intervention development in this field.

Appendix 5. Table of subthemes within key concepts.

Key Concept (number of papers)	Sub-themes (number of papers)
Disorganisation and fragmentation of healthcare (8)	Structure of primary health care (6) Inadequate time (5) Fragmented care/ involvement of secondary care (8)
The inadequacy of guidelines and evidence based medicine (10)	Single disease focus (5) Doubts on the evidence underpinning guidelines (5) Guidelines add to complexity (7) Queries on the relevance of disease specific outcomes (6) The use of guidelines for primary prevention (5) Using modified approaches to guidelines (5) Linking guidelines to physician reimbursement (3)
Challenges in delivering patient-centred care (10)	Individualising management (7) Taking a generalist approach (10) Importance of a longitudinal patient-GP relationship (7) The impact of multimorbidity and treatment burden (9) Specific complicating patient characteristics (6)
Challenges in shared decision making (10)	Discussing risks and outcomes associated with treatment options (8) Using alternative models of decision making (7) Lack of appropriate communication skills (3) Approaches to changing or de-prescribing medications (6)

Number of papers related to this key concept / subtheme in brackets.

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Review Protocol

Systematic appraisal and synthesis of qualitative research on GPs experience of patients with multimorbidity.

Objectives (defining the focus)

1. To search the medical and grey literature in a systematic way to retrieve qualitative research studies addressing difficult decisions encountered by GPs in the medical management/prescribing for patients with multimorbidity.
2. To appraise the quality of studies retrieved using the CASP criteria for appraising qualitative research
3. To conduct a synthesis of retrieved studies using the meta-ethnographic method
4. To interpret the synthesized literature in a way which will define what is known on this topic in a generalizable way
5. To develop and refine future research questions from this synthesized literature, that will address clinical needs in this area.

As per Estabrooks et al, the review question is focused on similar populations (GPs) or general themes (management of MM).ⁱ The concepts are otherwise allowed to emerge from the data however.

Design

Systematic appraisal and synthesis of qualitative research.

Sampling.

As purposive/ theoretical sampling has not been validated, a thorough search of relevant databases, grey literature, hand searching of relevant journal and references of included studies was completed to garner all relevant studies in this area. This comprehensive approach reduced the risk that any relevant data was excluded.

Search Strategy

- Electronic searches of specialist databases :EMBASE, Medline, CINAHL, PsychInfo ,ASC, Social Science Citation Index using both database specific search terms and validated methods for retrieving qualitative studies.
- Supplemented by searches of databases of grey literature, contacting other qualitative health researchers in relevant areas, searching reference lists of studies retrieved

Determining what is relevant

- Citations that are returned from our search strategy will be title scanned.
- The abstracts will be read for papers with relevant titles.

- Full papers will be retrieved for papers with relevant abstracts or potentially relevant or ambiguous abstracts (Atkins et al, 2008) .
- Full papers will be reviewed by two researchers.

Inclusion criteria

Papers involving all of the following will be included

- 1) Studies using recognised qualitative research methods
- 2) Participants are General Practitioners (or any practitioner who fulfils the role of a GP/primary care physician / family physician etc)
- 3) Papers that concern multi-morbidity or multiple chronic diseases where there is no index disease, or one is not considered more important than the others
- 4) Papers that involve qualitative data gathering (interviews / focus groups etc) on the management of multimorbidity. Papers that described broad views or overviews of MM were excluded. (The primary focus is to review the literature on medications management in multi-morbidity, but papers with a broader focus were included in the search to increase the number of relevant papers retrieved.)

Making decisions on inclusion: Citations that are returned from our search strategy will be title scanned. The abstracts will be read for papers with relevant titles. Full papers will be retrieved for papers with relevant abstracts or potentially relevant or ambiguous abstracts. (atkins 2008)ⁱⁱ. Full papers will be reviewed by two researchers. Inclusion criteria are papers involving all of 1) the use of recognised qualitative research methods 2) participants were General Practitioners (or any practitioner who fulfils the role of a GP/primary care physician / family physician etc) 3)on the management of patients with multi-morbidity (or multiple chronic diseases where there is no index disease, or one is not considered more important than the others) 4) on the topic of medications management and prescribing.

Quality assessment

Quality assessment will performed using the CASP tool. The quality assessment will be used when evaluating the contribution of different papers to the synthesis findings, and to describe the range of quality that exists for the papers included. Quality appraisal will not be used to exclude studies that otherwise meet the inclusion criteria.

Data Extraction

Data on the main themes/ methods/ quality/ ethical procedures/study design/settings will be extracted. One researcher will extract data from all studies and a second researcher will extract data from a selection of studies, to assess data extraction reliability. The main themes (FOI and SOI) will be recorded as verbatim extraction where possible to limit the loss of important detail. Themes will be extracted only from finding that are relevant to our particular research question rather than from the paper as a whole (ie difficult decision making/prescribing in patients with multi-morbidity rather than experience of multimorbidity overall).

- Source data = text (documents)

- Source material = conceptual
- Key method = translation
- Final product = interpretation

Synthesis strategy

The synthesis will be undertaken using the 7 step meta ethnographic method (details below). An interpretive approach rather than an integrative approach will be used in the syntheses. Concepts will not be specified a priori, and will not be rigidly defined in order to squash findings into. They will be evolutionary throughout the synthesis, shaped by the data from primary studies. Interpretative synthesis involves techniques to identify related concepts in the original studies, which are then reworked and reformulated to extend theory and develop new constructs. Integrative approaches on the other hand involve quantification and systemic integration of data.

Data analysis/synthesis

To translocate study themes between studies, the major themes from each study will be recorded in a grid. These themes will initially be generated from FOI (first order interpretations) or participants views. Comparisons will be made between studies for recurring concepts (which may include similar or disparate findings) and absences of these concepts. Overarching themes that encompass the major findings from all studies will be thus constructed.

SOIs will be extracted as author interpretations. TOIs will be generated by combining the FOIs and SOIs across studies. The combination of TOIs will allow a line of argument to be constructed.

- Stages one and two: coding text and developing descriptive themes
 - Identifying the 'findings'
 - Line-by-line coding
 - Developing descriptive themes
- Stage three: generating analytical themes (In the light of the review question)

Meta-ethnography – the seven steps

The steps

1. Getting started – what does my specific research question aim to answer? What contribution will it make to current debates in this field?
2. Deciding what is relevant to the initial interest – N&H stated that the scope of a ME will be more restricted than that of a narrative review, to avoid making gross generalisations across disparate fields. Includes several distinct processes such as i) defining the focus ii) locating relevant studies iii) making decisions on inclusion iv) quality assessment.

Sampling may be conducted theoretically until saturation is reached, but it is not possible to establish the population of studies from which to sample without first identifying all relevant studies.

3. Reading the studies – careful reading to identify main concepts/ study setting/study participants/ the nature of the study/ the type of scenario discussed.

Look at the different contributions of each study to the review – do some have more important findings than others? (in narrative synthesis this would be termed weighting). Consider this contribution in terms of the studies quality/validity/trustworthiness also. Studies can be grouped together according to common/shared perspective or setting or context, guided by the research question.

Is reasonable to add some kind of quality assessment into this stage.

Busse recommends that in reporting the results of a systematic review a summary discussion section should be provided including the following :

- Methodology of the synthesis used (especially focusing on its limitations and their influence on the results)
- Evidence used (quality, validity, generalisability) – with emphasis on the possible sources of bias from the sources of evidence used and their potential influence on results of the synthesis
- Assumptions made
- Discrepancies and uncertainties identified (the way that any discrepancies in findings between included evidence were dealt with in the synthesis should be discussed and wherever the evidence is weak or non-existent, areas where future research is needed can be highlighted)
- Expected changes in technology or evidence (e.g. identified ongoing studies)
- Aspects that may have an influence on the implementation of the technology and its effectiveness in real settings
- Such a summary would enable the analysis of robustness to temper the synthesis of evidence as well as indicating how generalisable the synthesis might be.

4. Determining how studies are related – Consider the relationships between the concepts arising from each study. Look for recurring concepts. Be explicit in how the concepts from different papers relate to each other. Draw a grid which includes details of study setting and design: important contextual information for the synthesis. First order meanings = everyday understandings

of ordinary people. Second order meanings = Constructs of the social sciences. The key explanation (second order interpretation) of each paper is also recorded as a finding.

5. Translating the studies into each other (aka constructing a common rubric across studies – a form of content analysis – identifying the same themes that are expressed differently) - consider each cell of the grid in turn. Identify the actual key concepts in the paper. Is each concept encompassed by a key concept used to label a row of the grid? Some row key concept titles were taken directly from one paper. Make sure that the key concepts from each individual paper are encompassed by the grid at the end.

6. Synthesizing translations – Not mechanistic. Read the concepts and interpretations from the grid and see how these relate to each other. Group similar findings together then see how these groupings relate to each other.

Noblit and Hare identify two different types of 'translation':

1. Reciprocal translation (accounts are directly comparable)
2. Refutational translation (the accounts are oppositional)

Can a line of argument be constructed? The line of argument describes all the concepts in a paragraph; breakdown of the principal features of the line of argument are reflected in the third order interpretations (TOIs). TOIs are generally expressed as a testable hypothesis. TOIs are consistent with original results while also extending beyond them. TIOs justify the claim the ME achieves more than a traditional review, but in relation to a more focused question.

7. Expressing the synthesis – depends on who you are targeting: clinicians/researchers/policy makers.

Checking the synthesis with authors of primary studies: In the context of their meta-ethnography of qualitative research Britten et al suggest consulting the authors of included primary studies in order to test the validity of the interpretations developed during the synthesis and the extent to which they are supported by the primary data. This is most likely to be useful where the number of primary studies is small but the authors of the primary studies may have useful insights into the possible accuracy and generalisability of the synthesis.

Expected output of research

1. Qualitative research synthesis to be published in peer reviewed journals
2. Comprehensive description of work that has been conducted in this area
3. New interpretation across studies to highlight generalizable findings, and outlying findings
4. Direction on the next steps/research required to improve the quality of medicines management in patients with multi-morbidity, and inform the next stage of a PhD thesis/research project.
5. Presentations of the synthesis findings to different audiences.

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ⁱ Estabrooks. Qual Health Research 1994

ⁱⁱ Atkins S et al. Conducting a meta-ethnography of qualitative literature: Lessons learnt. *BMC Medical Research Methodology* 2008, **8**:21

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Title: GPs' perspectives on the management of patients with multimorbidity: systematic review and synthesis of qualitative research

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Contributions:

CS designed the study, undertook the systematic review, carried out data extraction, analysis and interpretation and wrote the manuscript.

SMH provided guidance on qualitative research methods, participated in the analysis and interpretation of results and reviewed the manuscript.

JB participated in the design of the systematic review and critical review of the manuscript.

CB participated in the design of the review, analysis and interpretation of results and critical review of the manuscript.

CS is guarantor.

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The sponsors of the study had no role in the study design, data collection, data analysis, data interpretation, writing of the report, or in the decision to submit the paper.

Prior presentations

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Number of included figures/tables: 3

1 Figure (Figure 1: Flow diagram of search)

2 tables (Table 1: Characteristics of Included Studies, Table 2: Translations and Synthesis)

Number of appended documents:5

Appendix 1: Search Terms, Appendix 2: Excluded Studies, Appendix 3: Data Extraction

Template, Appendix 4: ENTREQ statement, Appendix 5: Table listing subthemes within key concepts

Data Sharing

Additional data on the assessment of quality of included papers is available from
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Competing interest statement

All authors have completed the Unified Competing Interest form and declare: no support from any organisation for the submitted work; no financial relationships with any

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organisations that might have an interest in the submitted work in the previous three years, and no other relationships or activities that could appear to have influenced the submitted work.

Ethical Approval

Ethical approval was not required for this study as it was a systematic review and synthesis of previously published work

What this paper adds

Article focus

- Patients with multiple morbidities present unique challenges to healthcare providers. An awareness of these challenges is needed to direct research efforts and intervention design in this field.
- Qualitative studies have explored GPs perceptions of the management of multimorbid patients, but to date these studies have not been systematically reviewed or synthesized.

Key messages

- This systematic review shows that the problem areas for GPs in the management of multimorbidity may be classified into four domains: disorganization and fragmentation of health care; the inadequacy of guidelines and evidence based medicine; challenges in delivering patient centred care; and barriers to shared decision making.
- These domains may be useful targets to guide the development of interventions that will assist and improve the provision of care to multimorbid patients.

Strengths and limitations

- The meta-ethnographic approach used in this review gave a broader understanding of the challenges of multimorbidity than any single study, while still preserving the context of included studies.

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- We focused on the GPs’ perspective on multimorbidity – an understanding of the challenges experience by patients is also required to inform the development of effective interventions.

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Abstract

Objective

To synthesize the existing published literature on the perceptions of GPs or their equivalent on the clinical management of multimorbidity and determine targets for future research that aims to improve clinical care in multimorbidity.

Design

Systematic review and meta-ethnographic synthesis of primary studies that used qualitative methods to explore GPs' experiences of clinical management of multimorbidity or multiple chronic diseases.

Data sources

EMBASE, Medline, CINAHL, PsycInfo , Academic Search Complete, SocIndex, Social Science Full Text, and digital theses/ online libraries (database inception to September 2012) to identify literature using qualitative methods (focus groups or interviews).

Review methods

The 7 step meta-ethnographic approach described by Noblit and Hare, which involves cross-interpretation between studies while preserving the context of the primary data.

Results

Of 1805 articles identified, 37 were reviewed in detail and ten were included, using a total of 275 GPs in seven different countries. Four areas of difficulty specific to the management of multimorbidity emerged from these papers: disorganization and fragmentation of health

care; the inadequacy of guidelines and evidence based medicine; challenges in delivering patient centred care; and barriers to shared decision making. A ‘line of argument’ was drawn which described GPs’ sense of isolation in decision making for multimorbid patients.

Conclusions

This systematic review shows that the problem areas for GPs in the management of multimorbidity may be classified into four domains. There will be no ‘one size fits all’ intervention for multimorbidity but these domains may be useful targets to guide the development of interventions that will assist and improve the provision of care to multimorbid patients.

Introduction

Multi-morbidity, the co-existence of two or more long-term conditions in an individual patient, is increasingly the norm in primary care chronic disease management.(1, 2) The management of patients with multiple morbidities presents unique challenges to healthcare providers, and there is evidence that patients with multimorbidity receive a lower quality of care than those with single diseases.(3, 4) Healthcare utilisation, hospitalization rates and total health care costs are higher among multimorbid patients, even in systems where access to secondary care is restricted to referral by a primary care physician. (5), (6), (7) The epidemiology of multimorbidity is thus well described and there is now a need for interventions to improve healthcare in this patient group. (8, 9) A necessary step in the development of interventions is to understand why problems arise and what processes in the delivery of care are amenable to change. Interviews with stakeholders such as healthcare providers can be important sources of this information. (10) To date, qualitative studies from a range of countries have elicited GPs' views on challenges in the clinical management of multimorbidity, with diverse and sometimes conflicting findings. A synthesis of these studies has the potential to achieve a greater conceptual understanding of the challenges associated with multimorbidity than a single empirical study.

Meta-ethnography, one of the most commonly used methods for synthesizing qualitative research studies, employs a process of comparison and cross-interpretation between studies while preserving the context of primary data. (11) Similar to traditional systematic reviews, this process can generate new insights, highlight gaps in our knowledge and show areas of data saturation where no further primary research is required.(12)

An awareness of the overall picture of challenges faced by GPs in multimorbidity is needed to direct research efforts and intervention design in this field. To achieve this, we

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synthesised and analysed the existing literature on the views of GPs ~~or their equivalent~~ on
the management of multimorbid patients ~~using a meta-ethnographic approach~~ and
determined targets for future research ~~that aims~~ to improve multimorbidity care.

For peer review only

Methods

The seven step model of meta-ethnography described by Noblit and Hare was used.(13)

The first step involved *a clear statement of the specific research question* and the contribution it will make to the field.

In step two, *a search strategy* was devised to retrieve papers related to this aim. We focused our search to locate primary studies that used qualitative methods to explore the clinical management of multimorbidity or multiple chronic diseases by GPs or their equivalent. We searched seven databases using database specific search terms and validated methods for retrieving qualitative studies: EMBASE (Elsevier), Medline (Ovid), CINAHL, PsycInfo , Academic Search Complete, SocIndex, Social Science Full Text(all Ebsco) (Appendix 1).(14-17) We supplemented this by searching databases of grey literature and reference lists. The search was not limited by language or dates of publication. The titles and abstracts of retrieved citations were read by one reviewer (CS). Full papers were ordered for all potentially relevant abstracts.(18) These papers were reviewed by two researchers (CS, CB) and were included if they met our inclusion criteria. Studies that examined the management of multimorbidity as part of a wider research question were included. We assessed the quality of included studies using the Critical Appraisal Skills Programme (CASP) for qualitative research.(19) Assessment of study quality was not used to exclude studies that otherwise met the inclusion criteria, but gave useful insights into the methods used for data collection and analysis.

Step three of the meta-ethnographic synthesis involved *reading the studies*. Initially two reviewers (CS and CB) read and re-read the included studies, and independently listed the main findings from each one. Study findings were defined as all data in the results and discussion sections of the included papers – including both the first order interpretations

(views of the participants) and second order interpretations (views of authors). In studies where GPs were interviewed with another health care professional, the analysis was restricted to the views of the GP where possible.

In step four, we *determined how the studies were related* to each other by comparing individual study findings. Four key concepts were chosen which reflected the main findings of all included studies. We also abstracted data on standard fields such as study aims, design, methods, setting and participants (Appendix 3).(20) Data was entered in to QSR International’s NVivo 9 software to assist our qualitative analysis and synthesis.(21)

In step five, studies were *translated in to each other* by examining the contribution of each study to a key concept. Within the key concepts, similarities and differences in study findings and contexts were noted, and deviant cases were sought. To address the potential for clinical bias a third reviewer with a non-medical background (SMH) independently read all included papers and cross-checked the derivation and development of the key concepts.

In step six, we *synthesized the translations* in each key concept to develop third order interpretations, or higher levels of abstraction of the data for each key concept. We linked the third order interpretations using a ‘line of argument’, which represented the overarching perspective of GPs towards multimorbidity.

The final step involved expressing the results of the synthesis, for which we used tables, figures and text. The ‘Enhancing transparency in reporting the synthesis of qualitative research’ (ENTREQ) statement was used to inform the reporting of our results (Appendix 4).(22) Additionally, a summary of our findings were supplied to the first authors of all included papers, in order to validate our findings as representative of the original sources.

Results

The electronic database search returned 2,005 citations, leaving 1805 citations after removal of duplicates (Figure 1). A further 1768 citations were excluded by reading the title or abstract: 48 did not concern primary care, 891 were not qualitative studies, 769 did not concern multimorbidity, and 60 did not concern the GP's perspective. Full text articles were retrieved for 37 citations. Eleven of these were excluded because they did not use qualitative methods. A further 16 articles were excluded because, although they concerned patients with multiple chronic diseases, their exploration was focused on the management of an index disease. One possible relevant citation was in abstract form only (the study authors were contacted and the full account of this data has not been published yet) (Appendix 2). One additional study was retrieved from reference searching of the nine remaining studies. Ten studies were included in the final synthesis (Table 1).

The included studies were conducted in seven countries: Belgium, England, Germany, Ireland, Scotland, The Netherlands and the United States. A total of 275 GPs were involved; five studies used focus groups and five used interviews with individual GPs. One of the included articles was published in German. The authors were contacted for an English translation and as none was available the article was translated by a native German speaker in collaboration with CS. The overall quality of the 10 included studies was high, with all papers meeting the majority of CASP criteria. The most common weaknesses were related to data saturation (not reported in six studies) (23-28) and reflexivity (not discussed in five studies). (25-27, 29, 30) GPs with academic/research affiliations were over-represented as research subjects in five studies, representing a potential source of bias. (23, 26, 29-31)

Six studies primarily focused on multi-morbidity. In these, multimorbidity was defined for study participants as two or more chronic diseases (24, 26, 29, 32) or introduced to

participants using a multimorbid case vignette (30) or an editorial on multimorbidity.(23)
Four studies retrieved by our search did not focus primarily on multimorbidity but were
included as multimorbidity emerged as an important issue for study participants; two
studies addressed polypharmacy (28, 31) and two explored the role of guidelines in primary
care. (25, 27)

Translation of included studies

GPs in all studies reported challenges in multimorbidity, which they faced with “moderate optimism to something close to despair”.(30) Even in the context of deprivation, some participants reported feeling like a “wrung out rag” after complex multimorbidity consultations while others felt “energised” by the “privilege and rewards” that could be obtained from working in such a complex environment.(24) Four key concepts that reflected the principal findings of all included studies were determined. These are reported below and shown in Table 2. Within each key concept, subthemes arose and are highlighted in bold.

Disorganisation and fragmentation of healthcare

The included studies covered a range of different health systems, all of which lacked specific systems for treating patients with multimorbidity. In most studies this lack of organisation hampered care by causing logistical difficulties and excess consultation demands on the patient and their GP. Only one study mentioned that these problems were not serious enough to warrant a change in service organisation.(29)

The prevailing **structure of primary health care** reduced GPs' ability to respond to the needs of patients with multimorbidity. Insufficient consultation **time** led to amended or suboptimal approaches in many cases.(23, 24, 29) It was suggested that weighting

consultation lengths to the complexity of multimorbidity would facilitate more effective management. (23, 29)

Fragmented care resulted from “the involvement of several medical specialists, who each emphasize the importance of ‘their’ guideline” (30) and “poor communication from specialists and hospitals to the family physician”(31) which meant that “coordination and overview on medication were hard to maintain”.(32) In some studies, GP’s had a broad sense of responsibility towards overseeing and screening patients’ medications (28, 31, 32); others were unsure about their role in screening prescriptions and felt that a clear line of responsibility was required.(23) It was suggested that specialists did not “consider the wider harms and benefits of organ-specific intervention”, thereby adding to the problems of multimorbidity, in contrast to GPs who had a “holistic” view of the patient; “The cardiologists, you know, don’t mind if they bleed to death”.(26)

Despite these reservations, the input of specialists was desired. A “balance of equals” was called for, that would allow GPs and specialists to discuss complex patients and improve the awareness of complexity in multimorbidity amongst specialists.(23, 31) This would help all doctors involved “to speak with one voice. Different stories provoke distrust”.(30)

The inadequacy of guidelines and evidence based medicine

There was concern among GPs about clinical guidelines, which are “generally written for sole conditions” and do not account for “the unique circumstances of each patient”.(25, 27)

Most GPs felt guidelines were less useful in multimorbidity and that they actually **added to the complexity** in some cases: “no one can tell you the added benefit of an additional agent for blood pressure if you are already on ten”. (26, 30) However, others felt that using guidelines in multimorbidity ensured patients received the best quality care: “why should

their asthma be treated any differently just because they've got asthma and heart disease and you know osteoporosis or whatever".(29)

GPs doubted if the **evidence underpinning guidelines** could be extrapolated to patients with multimorbidity: "The guidelines are going to be set for optimum situations, and someone with multiple comorbidities [is] not going to be optimum"(25-27, 31) They also questioned the **relevance of disease specific outcomes** and guideline recommendations on the use of **primary prevention** (i.e. antihypertensive or lipid lowering agents) in multimorbidity, preferring to orient management to symptoms or quality of life.(23, 25)

GP's used **modified approaches** to guidelines, involving for example, the estimation of risk associated with particular diseases/ treatments.(26, 30) However, some felt this modification was in conflict with "best practice" and felt guilt at not implementing guidelines fully.(24, 30) Initiatives that linked **physician reimbursement** with adherence to guidelines were seen as a threat to GPs' ability to deliver patient centred care.(24, 26)

Challenges in delivering patient-centred care

In response to the many demands of multimorbidity, GP's recognized the importance of delivering patient-centred care, which incorporated two principal concepts: **individualised** management and a **generalist** approach.(23-26, 28-32) Delivering patient-centred care was seen as an aid for some but a challenge for others. For instance, some GPs felt that taking a broader view of the patient, incorporating nonmedical or psychosocial issues, increased the level of complexity in their management.(24) However, for others adopting a patient-centred approach was seen as a way of resolving the conflicts and uncertainty that can occur, particularly with co-implementation of multiple sets of guidelines.(24, 32)

In most studies, the **longitudinal nature of the patient-GP relationship** was seen as a "major facilitator" and "elementary component" of patient-centred care in multimorbidity.

(23, 24, 28-32) Within the specific context of deprivation, longitudinal care was “potentially transformative” by giving “time to build relationships with patients” but it was also was a source of problems, by creating dependence and increased demands by patients for consultations.(24) The impact of **treatment burden** was an important consideration given the greater costs and risk of adverse drug events associated with the use of multiple medications.(23, 29, 32) This burden was compounded by certain **patient characteristics** such as cognitive or memory problems, poor social supports and finances, and low levels of motivation (23-26, 28, 29) which were likely to affect a patient’s ability to understand and adhere to treatment.(25, 26, 30-32)

Challenges in shared decision making

Shared decision making was considered to be more complicated in the context of multimorbidity due to many of the issues discussed above. The importance of eliciting a patient’s preferences was widely acknowledged, but GPs had difficulties’ doing this in practice.(30, 32) GP’s reported that many patients actively participate in decision making, can prioritize and are “good with trial and error”.(29, 30) However, for certain patients making choices could be a “source of distress” and contributed to them becoming “over the top anxious about their conditions”.(29) Discussing the **risks and outcomes associated with treatment options** in a way that facilitated patient involvement was particularly challenging, as was discussing the balance between quantity and quality of life.(24-26, 30, 32) In response to difficulties in shared decision making, GPs employed a range of techniques including **prioritization** of the doctor’s or the patient’s agenda(28, 29, 31), **avoidance** of decision making(23, 30), drawing on one’s own **personal experience**(31) or using **additional investigations** to support a decision.(26)

Enhanced **communication skills** were seen as necessary in multi-morbidity to facilitate clear and concise discussion with patients on the interplay between their chronic diseases and to help with **de-prescribing** medications, which if done badly could be interpreted as withdrawing care. (26, 30, 31) GPs felt that they had a pivotal role to play when patients were in the advanced stages of a chronic disease but due to multimorbidity may no longer be receiving specialist input. In this setting, adopting a palliative approach may be useful when making decisions on medications. (30, 32)

Third order interpretations and the 'line of argument'

By synthesizing the individual contributions of each study to the key concepts, third order interpretations were generated and linked using a 'line of argument' (Table 2).

- 1) Disorganisation and fragmentation of healthcare: The involvement of multiple specialists and the emphasis on single disease care is antagonistic to the 'holistic' goals of GPs. This problem is compounded by poor co-ordination and communication within the health service, leaving GPs feeling excluded from their patients care and with a sense of uncertainty regarding their role.
- 2) The inadequacy of guidelines and evidence based medicine: Guidelines offer GPs less support in the management of multimorbid patients and may in fact cause additional problems when they try to adhere to them.
- 3) Challenges in delivering patient centred care: Patient-centredness is an overriding principal for GPs in multimorbidity but trying to achieve this increases the complexity of care in some cases, and can lead the GP into additional conflict with specialist services or evidence based medicine.

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5 multimorbidity is limited by difficulties in communicating risk-benefit and outcomes in a
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7 field where there is much more uncertainty on these issues.
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10 These key concepts represent four problematic domains in the provision of healthcare in
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12 multimorbidity, as seen by GPs. The line of argument linking these domains suggests that
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14 GPs feel isolated in the management of patients with multimorbidity, a group that they are
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16 specifically tasked with caring for.
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Discussion

The studies presented here used a bottom-up approach to explore the management of patients with multimorbidity. This paper is the first to our knowledge to systemically review and synthesize their findings and demonstrates the diversity in how GPs see this issue. The difficulties that GPs encounter span a number of clinical domains including system factors, the evidence base for chronic disease management and their own communication skills in the context of multiple physician and patient agendas. These findings are important because they highlight the separate but interacting areas of clinical practice that require intervention to improve care in multimorbidity. Thus, this study is additive to the findings of the individual studies reviewed; synthesizing the contributions of existing qualitative investigations in this area has led to a broader description and fuller understanding of the range of challenges that exist. Given the considerable overlap and repetition of data that emerged from the primary studies, it is unlikely that further scoping work on the challenges in multimorbidity will be useful. However, despite the commonalities, the significance of each domain varied between settings. Further research should focus on the reasons why some domains matter more in particular settings and how local factors modify and influence these domains, with a view to exploring what solutions exist and what those solutions may be.(33) There will not be a ‘one size fits all’ intervention to support and improve the quality of care in multimorbidity. However, the domains that have emerged from this review give a useful framework for future work in this field.

Comparison with other research

Disorganisation and fragmentation of care

Integrating patient care across services is important in all aspects of medicine, but there is a pressing need to address this in multimorbidity. Patients attending four or more doctors experience problems such as conflicting medical advice, unavailable test results and duplication of tests more commonly.(34)Our study indicates that, across settings, GPs receive poor communication from other care providers in multimorbidity, leaving them guessing about the course of management. Enhanced use of information technology may support more seamless multimorbidity care, by allowing bi-directional communication and local integration between care providers.

Satisfaction with prevailing health systems also varied between studies. Generalizations relating to a health system cannot be made from one single study, but this divergence is worthy of further exploration. For instance, a comparative analysis, using a multimorbidity perspective, of the strengths and weaknesses between the UK system (which uses explicit quality frameworks for chronic disease management) and a health system without such an approach may help inform policy and the development of interventions at health system level.

The inadequacy of guidelines and evidence based medicine

GPs in the studies reviewed here desired evidence on which to base their management but had mixed feelings on the clinical utility of guidelines as they currently stand. This finding is supported by prior studies showing that, internationally, few guidelines offer modified advice for patients with multimorbidity.(35, 36) To increase the relevance of clinical guidelines for multimorbid patient, our findings thus support the call for greater representation of multimorbid patients in trials and greater involvement of GPs in the writing of guidelines.(37)

Chronic diseases can occur in combinations that are concordant (have synergies in treatment) or discordant (conflicting treatments or interactions).(4) Although the synergies between certain conditions were discussed in the papers reviewed here, examples of specific discordant conditions were rare. It would be useful to explore what discordant combinations commonly occur in practice. This information could be used to inform the development of caveats in guidelines, educational initiatives or prioritization tools that would support safe approaches to competing diseases. (38)

Delivering patient centred care

This domain emerged as an intuitive and over-riding goal of GPs in all studies and interventions in multimorbidity must help GPs deliver on this aspiration. Continuity of care emerged as an important tenet of patient-centredness and should be promoted in any such interventions. Three subtypes of continuity of care have been previously described(39); of these, both informational and management continuity were seen here as necessary for patient safety and cohesive management. However, it was relational continuity that appeared to most facilitate care in multimorbidity, by allowing GPs to foster trust, anticipate preferences, and empower their patients over time. Multimorbid patients that GPs felt required particular assistance are those with cognitive impairment, mental health issues or low social support, and accordingly may require nuanced interventions to support their care.

Challenges in shared decision making

Shared decision making is facilitated by many aspects of primary care. (40-42)Nevertheless, GPs in the studies presented here sought additional skills in shared decision making in multimorbid patients, especially for complex decisions that involve not prescribing or discontinuing medications. It is known that interventions to improve shared decision making

may fail due to barriers such as lack of time and perceived lack of suitability of the patient.(43, 44) Given the overlap between these barriers and those that GPs encounter in multimorbidity, it is likely that special attention is warranted for the development of models of decision making for multimorbid patients. Evaluating existing models of shared decision making, such as the choice talk/ option talk/ decision talk model described by Elwyn and colleagues, in clinical encounters with multimorbid patients may be a useful place to start this process.(45)

Usefulness of meta-ethnography

The systematic approach of meta-ethnography as applied in this study has a number of strengths. It gives a fuller description of multimorbidity care while preserving the important contextual features that are inherent in general practice research. Our themes, developed from the experiences of 275 participants, indicated considerable overlap from each of the primary studies. Nevertheless, different opinions within particular themes gave useful insights into how system factors and context can influence practice.

Robustness of findings

The step by step approach used in our analysis generated themes in a transparent and reproducible way. The robustness of our findings is supported by several features. First, the quality of the studies reviewed was assessed using a published framework and quality levels were uniformly high. Secondly, there was concordance in the themes derived by non-clinical and the clinical reviewers on the research team. Thirdly, the findings from our analysis were disseminated to the authors of the primary studies. In the resulting feedback, the authors felt their results were represented within the findings of the synthesis.

Limitations and challenges

Retrieving qualitative studies from biomedical databases is challenging despite recent advances in the indexing of qualitative literature. We used validated combinations of qualitative search terms to optimize the list of citations returned. (14-17) Furthermore, we also used non biomedical databases to ensure that articles of relevance in the sociology or psychology literature were not missed.(18)

~~Multimorbidity is also not a MeSH term and a broad but less specific search strategy was used to counter this (Appendix 1). There was no language restriction used for inclusion of studies, and translations of potentially relevant titles and papers were conducted. However, we could have missed papers not listed on English language databases.~~

Multimorbidity is not a MeSH term and there is a lack of consensus on what the term means or encompasses with regard to diseases and disease severity.(46) We used a broad but less specific search strategy to account for this (Appendix 1) which resulted in the retrieval of papers with important information on multimorbidity, but whose original focus was not on this issue. Achieving consensus on the definition of multimorbidity will be important for the generalizability of findings and evaluation of future interventions in this field.

The term ‘multimorbidity’ was first discussed in the literature in 1976, however the first article that we found investigating this issue with GPs using qualitative methods was published in 2009.This lag mirrors the recent surge in quantitative research investigating multimorbidity, which may be explained by the increasing prevalence and economic impact of multimorbid patients.(47)

There was no language restriction used for inclusion of studies, and translations of potentially relevant titles and papers were conducted. However, we could have missed papers not listed on English language databases.

Although the quality of included studies was generally good, the over –representation of academic GPs as participants was a potential source of bias and may limit the generalizability of our findings to the overall GP population. Future studies should endeavour to include GPs outside of the academic field to ensure the full range of clinical challenges is explored.

The primary data in our review originated from focus groups or clinical vignettes, reflecting what clinicians say rather than what they do. It would be valuable to use case based data in future studies, to see for example what specific conflicts arise between guidelines and how shared decision making is currently broached in practice. Such data would also help inform educational programmes in multimorbidity for GPs and GP trainees.

Our findings are limited to the challenges experienced by health care professionals in management of multimorbidity; the patient perspective also requires consideration. Elderly patients report functional decline, poor quality of life, and high health care costs as major consequences of multimorbidity and accordingly these factors should be incorporated into interventions design in this area.(48)

Conclusions

This systematic review shows that the problem areas for GPs in the management of multimorbidity may be classified into four domains: disorganization and fragmentation of health care; the inadequacy of guidelines and evidence based medicine; challenges in delivering patient centred care; and barriers to shared decision making. There will be no

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‘one fits all’ intervention for multimorbidity but these domains may be useful targets to guide the development of interventions that will assist and improve the provision of care to multimorbid patients.

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Figure 1. Flow diagram of search.

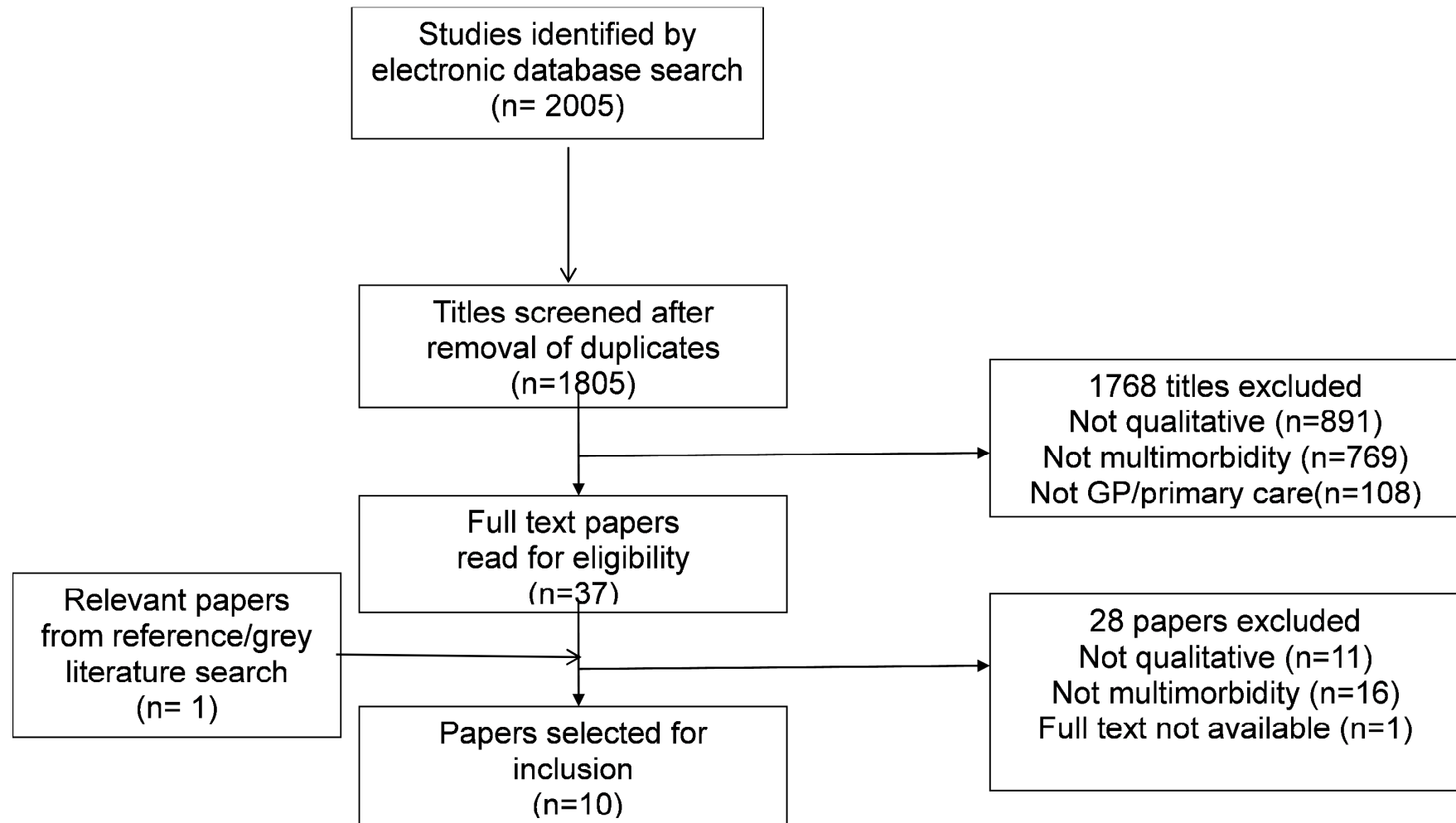


Table 1. Characteristics of Included Studies

First Author	Objective	Data Collection	Participants (n)	Qualitative methodology / analysis	Country	Year of pub
Smith ²³	To explore the views and attitudes of GPs and pharmacists managing patients with multimorbidity in primary care.	Focus group with topic guide; participants were given a published editorial on multimorbidity before hand	GPs (13) & pharmacists. GPs were tutors to undergraduate medical students, worked in a mix of rural/urban, deprived/affluent practice and varied by gender and years of experience	Framework	Ireland	2010
O'Brien ²⁴	To understand GPs and practice nurses' experiences of managing multimorbidity in deprived areas and elicit views on what might help.	Individual semi-structured interview facilitated by researched topic guide	GPs(15) & nurses, working in areas of high deprivation in Scotland	Constant comparison	Scotland	2011
Steinman ²⁵	To investigate clinician attitudes about the usefulness of heart failure guidelines in patients of various ages/morbidity	Telephone based interview using Likert scales followed by open ended questions	Primary Care Practitioners (48/58) and Internists (10/58) responsible for sub-optimally managed patients with heart failure.	Content analysis	USA	2012
Fried ²⁶	To explore clinicians' perspectives of and experiences with therapeutic decision making for older persons with multiple medical conditions	Focus groups with broad discussion initially then focused questions on polypharmacy, side effects, and evidence based medicine in multimorbidity	GPs (36) purposively sampled to vary on academic, community and Veteran Affair settings	Content analysis	USA	2011
Solomen ²⁷	To explore the relationship between prescribing guidelines and patient-partnership by exploring the attitudes of patients, GPs and PCT prescribing advisors	Semi-structured interviews	GPs (8) sampled using maximum variation by location, gender, single vs. group practice	Framework	England	2012
Anthierens ²⁸	To describe GPs' views and beliefs on polypharmacy	Semi-structured interviews	65 GPs working in mixed rich/poor urban environment	Content Analysis	Belgium	2010

Bower²⁹	To explore GP and nurse perceptions of multimorbidity and the influence on service organization and clinical decision making	Individual semi-structured interview using topic guide with questions and case vignettes.	GPs (15) & nurses, working in a pay for performance system (NHS). Purposively sampled from research network, to vary on list size and deprivation.	Framework	England	2011
Schuling³⁰	To explore how experienced GPs feel about deprescribing medication in older patients with multimorbidity and to what extent they involve patients in these decisions.	Focus groups	GPs (29) split into 3 groups. All were GP trainers of at least 5yrs experience 'used to reflecting on their practice'	Thematic	Netherlands	2012
Marx³¹	To explore the 'dilemma of polypharmacy' in primary care	Focus groups	GPs (21) 3 Focus groups with a mix of fulltime GPs, junior and senior academic GPs. Conducted at an academic GP conference.	Mind maps and grounded theory	Germany	2009
Luijckx³²	To explore GPs' considerations and main aims in the management of multimorbidity, and factors influencing this management in daily practice.	Focus groups using an interview guide	Purposively sampled GPs (25), with/out involvement in training/academia, in five focus groups.	Constant comparison	Netherlands	2012

Table 2. Translations between studies with third order interpretation and line of argument

First Author	Disorganisation & Fragmentation of healthcare	The inadequacy of guidelines & evidence based medicine	Challenges in patient centred care	Challenges in shared decision making
Smith ²³	<i>'lines of communication need time and nobody appears to have time'</i> <i>'collusion of anonymity, which is, you know, this is not my patient, not my patient'</i>	<i>'the paradox faced by conscientious GPs in attempting to balance the potentially competing demands of health promotion, evidence-based medicine, and the use of multiple medications'</i>	<i>'a focus on function and quality of life was preferable to considering specific disease outcome measures'</i>	<i>'...decision making very difficult to achieve.'</i> <i>'decisions were linked to the theme of avoidance of complex issues which...can appear to become increasingly problematic and unsolvable'</i>
O'Brien ²⁴	<i>'adaptation of existing practice systems, particularly appointment length, relationship continuity, and referral systems for resources outside primary care, may improve services from the perspectives of professionals'</i>	<i>'need .. to demonstrate that we are interested in (patients) as a person, not someone who has heart failure'</i>	<i>'wanted to develop relationships with patients because she thought that greater understanding of their circumstances would help her get to the root of (medical) problems'</i>	<i>'there was a need to address 'a bit of the patient's agenda and our agenda' within consultations'</i>
Steinman ²⁵	-	<i>'...those with multiple comorbid conditions were more likely to experience harm from aggressive guideline based treatments'</i> <i>'guidelines represent a criterion standard of evidence-based care....regardless of patient age or comorbid burden'</i>	<i>'Each patient is a unique situation and is not going to be the same as another patient.... We have to go by the individual patient, by the patient's comfort, how is he feeling, and how is he doing.'</i>	<i>'a suggested approach to decision making for older adults that provides guidance on prioritizing care, accounting for comorbid conditions, and factoring in the role of estimated life expectancy'</i>
Fried ²⁶	<i>'fragmentation of care for patients who receive care for their multiple conditions from many physicians.'</i> <i>'the limitations imposed by current reimbursement systems, which fail to acknowledge the complexities of caring for older persons with multiple conditions'</i>	<i>'If they cannot manage... I am not going to complicate it further by adding something to get to the goal range.'</i> <i>'other clinicians believed that guideline-directed care would produce the best outcomes'</i>	<i>'Tailoring their approach ...from a consideration of such factors as patients' cognition and availability of social support'</i>	<i>'...conflicts between what they wanted to do for the patient and what the patient wanted'</i> <i>'...patients' and families' inaccurate understanding of harms and benefits, and they described performing testing to help patients understand their risk.'</i>
Solomen ²⁷	-	<i>'there was a perception that real patients differ from those recruited to the trials that inform guidelines'</i>	<i>'Many GPs felt they needed to be able to interpret guidelines in the context of individual patients'</i>	<i>'to reach a compromise by following guidelines and accommodating patient factors, such as patient preferences or the patient's ability to tolerate medicines'</i>
Anthierens ²⁸	<i>'The coordination of the medication regime of different disciplines is a tough job...'</i>	<i>'preventive aims are often minimal considering their age and polyopathy, which is in contrast with guidelines talking about one specific disease.'</i>	<i>'As a GP you have a broader view of your patient. You look at him/her from his own life.'</i>	<i>'They have a holistic view of the patient because of the long standing doctor-patient relationship..... a very tough job for GPs with major implications for their workload'</i>

Table 2. Translations between studies with third order interpretation and line of argument formation

Bower²⁹	<p>'clash between services and the needs of patients was most salient in terms of logistics and inconvenience'</p> <p>'Difficulties in information sharing between professionals meant that patients often had to co-ordinate care'</p>	<p>'...ambivalence about the need to consistently change clinical practice to reflect multimorbidity'</p> <p>'...why should their asthma be treated any differently just because they've got asthma and heart disease and you know, osteoporosis or whatever'</p>	<p><i>'Weighing up what that patient can manage on the conditions they have, as to what it actually says to do.'</i></p> <p>'benefits of continuity of care in patients with multimorbidity'</p>	<p>'Dealing with multiple competing agendas in multimorbidity was important.'</p> <p>'limited impact of multimorbidity on clinical decision making'</p>
Schuling³⁰	<p>'...medication lists of the doctors involved are not exchanged and are consequently inconsistent.'</p> <p>'...several healthcare providers are involved in a patient's treatment and communication is sometimes poor'</p>	<p><i>'guidelines are kind of a hindrance. At the moment they do not cater for older patients.'</i></p> <p><i>'I have difficulty not following the guidelines if I don't have good reasons to do so.'</i></p>	<p>'GPs report to support the concept of a patient-centred management as best practice'</p> <p><i>'take her quality of life into account and ask myself will she live long enough to benefit from this (preventive) drug?'</i></p>	<p>'the importance of exploring patient preferences about treatment goals, in practice GPs appear hesitant.'</p> <p>'... GPs tend to avoid discussing withdrawal of preventive medication with their elderly patients'</p>
Marx³¹	<p>'poor communication from specialists and hospitals to the family physician'</p> <p>'highlights the need for professional discussion on the one hand and avoiding unnecessary medication by "multiple prescribers on the other hand.'</p>	<p>'The desire of family doctors to deliver the best possible patient care quickly leads to polypharmacy, if guidelines are used'</p>	<p>'conflict arose in the actions of GPs trying to deliver personalized care to individuals and trying to delivering guideline orientated care'</p>	<p>'uncertainty could be counteracted by good communication between the doctor and patient.'</p> <p>'the patient and the doctor are in an interactive process, which necessitates careful negotiation'</p>
Luijckx³²	<p>'in multimorbidity, fragmentation of care is a pitfall.... stimulated by disease-centred reimbursement systems'</p> <p>'impeding multimorbidity management... insufficient time and compensation'</p>	<p>'adhering to standard regimens or strict guidelines was unwanted, as it contradicts their integrated perception of a unique person with a specific combination of diseases'</p>	<p>'A personal patient–doctor relationship was considered a major facilitator in the management of multimorbidity'</p> <p>'patient-centredness can be regarded as 'tool' to counteract multimorbidity's potential pitfalls'</p>	<p>'GPs agreed that they want to involve their patients' perspectives and preferences into the decision-making process'</p>
Third Order Interpretations	<p>The involvement of multiple specialists each operating on a single disease paradigm without an overview of the 'whole patient' leads to fragmented care in patients with multimorbidity. Single disease care is antagonistic to the goals of GPs in primary care. This problem is compounded by poor co-ordination and communication within the health service, leaving GPs feeling excluded from their patients care and with a sense of uncertainty regarding their role.</p>	<p>GPs have reservations about the outcomes and risk-benefit of guidelines in multimorbid patients. Although useful as a template, GPs feel that guidelines offer them less guidance or support for multimorbid patients and may in fact cause additional problems when they try to adhere to them.</p>	<p>Patient-centred care is an overriding principal for GPs in multimorbidity and incorporates the principles of individualization and generalism. Trying to achieve this aim increases the complexity of care in some cases, and can lead the GP into additional conflict with specialist services or EBM.</p>	<p>While GPs recognize the importance of involving patients in decision making process, they have difficulties in doing so. Communicating risk and outcomes in way that will engage patients in the decision making process is an area that GPs feel unskilled in, thereby limiting the patients influence as factor that would help the decision making process</p>

Italicized extracts represent first order interpretations (views of participants in included studies). Non-italicized extracts represent second order interpretations (views of authors of included studies).

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