

Review Article

The Co-Occurrence of Polypharmacy and Unmet Needs for Social Care in Older People: A Systematic Review

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Polypharmacy is common in older people who often live with disability and dependency. The number of older people living with unmet needs for social care is also believed to be rising. Polypharmacy is simple to operationalise, whilst unmet needs are not routinely identified but are known to adversely affect health and well-being. Therefore, this systematic review aimed to investigate whether polypharmacy is a marker of unmet needs for social care in older people. Sixteen databases were searched from inception to January 2021. Studies were included if they reported quantitative data for polypharmacy (“multiple medicines”) in relation to unmet needs for social care (“relative or absolute”) in older people (“study criteria aged ≥ 55 years or mean age ≥ 55 in the sample as a whole or stratified data for the ≥ 55 -year age group”) and were from a high-income country (defined by the World Bank). Quality was assessed using the National Institute for Health tool for observational studies. Four studies were identified from 2,549 citations, and overall, the quality of evidence was low. Some older people using multiple medications had their social care needs met, whilst others did not. However, there is a clear rationale as to why polypharmacy may be linked to unmet social care needs. Given the limited studies identified in this review, future research should explore this further. The type of unmet need measure may be important to understand the nature of the relationship between the use of multiple medications and unmet social care needs.

1. Introduction

Polypharmacy describes the use of multiple medicines and is common in older people [1], who often live with disability [2] or dependency [3] and therefore have difficulty or need help with basic and instrumental activities of daily living, such as washing and shopping [2, 3]. Such needs can often go unmet [4–8], whereby help is needed but not received (“absolute unmet need”) or the help received is judged to be insufficient (“relative unmet need”) [8]; this can adversely affect health and well-being [5, 6, 9–12], increasing the utilisation of and pressure on hospital services [13–17].

The reasons underlying the unmet need for social care are varied. The availability of care is one such reason. For example, England’s social care crisis is well-documented, with state-funded services preserved for those with the most

severe needs and the fewest assets [18]. Other high-income countries are facing similar challenges [19]. Other factors that underpin unmet needs include the accessibility of services and attitudes or expectations about the acceptability of needing or requesting services [20]. Older people with multiple health problems may prefer to prioritise those issues that are most important to them, leaving some problems unaddressed. The supply of unpaid care is also important in understanding the rise of unmet social care needs. Older spouse carers are likely to be living with disabilities themselves [3], whilst the supply of unpaid care by adult children cannot keep pace with the growing need for care [21]. This is a pattern that is expected to worsen: for example, as dependency continues to rise with population aging [22], projections suggest a decline in the availability of formal and informal caregivers [21–24].

1.1. Polypharmacy: A Clinical Marker of Unmet Social Care Needs? Unmet needs are an important indicator of equity in care but are not routinely identified in practice [25]. Polypharmacy by contrast is simple to operationalise and is more commonly integrated into care records. Critically, polypharmacy has a rationale link to unmet social care needs and could potentially serve as a useful clinical marker of such needs.

The most compelling argument for a link between polypharmacy and unmet needs is that multiple medicines will likely indicate multiple health conditions and a range of associated needs. We know that poorer health and a greater number of functional difficulties are linked to a greater risk of unmet social care needs [26]. Therefore, it would be reasonable to assume that polypharmacy—a marker of poorer health and more functional limitations—could also be linked to an unmet need for care support. This makes sense, especially in the context of stretched and fragmented health and social care services [27], where someone with multiple care needs (and competing priorities) may have only a proportion of those needs met.

We also know that some people struggle with regimens of taking multiple medications [28]. When adherence is compromised, we can expect to see some adverse impact on health and the ability to live well day-to-day. Such difficulties in managing multiple medications may, therefore, impact on health and increase the need for support that is not necessarily met through services or informal care.

Furthermore, where certain combinations of medicines have undesirable consequences, people using multiple medications may adjust regimes on their own terms, accepting a compromise to day-to-day functioning and well-being. Polypharmacy may, therefore, signal the potential for unmet care needs, but where such (unmet) care needs are an acceptable compromise.

Finally, we know that polypharmacy is not always managed well from the service perspective [29]: if multiple medications are inadequately or infrequently reviewed, this may compromise the person's health and well-being, resulting in needs that could go unmet.

1.2. Why Is It Important to Investigate the Co-Occurrence of Polypharmacy and Unmet Social Care Needs in Older Individuals? As outlined above, there is a rational link between polypharmacy and unmet social care needs, which may have a useful clinical application. Identifying populations with unmet needs can help to minimise the adverse health consequences when people do not receive timely help with day-to-day activities. However, older populations are not routinely screened for unmet social care needs, thus missing important opportunities for intervention. In contrast, data about polypharmacy are widely collected and accessible across care settings. Thus, if polypharmacy is clearly linked to unmet social care needs, it could serve as a useful clinical marker to identify at risk populations. To consider this hypothesis, this systematic review aimed to synthesise evidence about the association and co-occurrence of polypharmacy and unmet social care needs in older people.

2. Materials and Methods

2.1. Protocol. The protocol for this review was registered with PROSPERO (CRD42021230606).

2.2. Review Criteria. Studies in any language were included if they reported quantitative data for polypharmacy (“the use of multiple medicines”) [30] in relation to unmet needs for social care (“relative or absolute”) [8] in older people (“study criteria aged ≥ 55 years or mean age ≥ 55 in the sample as a whole or stratified data for the ≥ 55 -year age group”) and were from a high-income country as defined by the World Bank [31]. “Relative unmet needs” describe the situation where the help received is judged to be insufficient, whilst “absolute unmet needs” describe the situation where help is needed but not received. Receipt of help included both paid and unpaid support. Our decision to use the lower threshold of 55+ years acknowledges that the onset of disability from long-term conditions starts earlier in the life course for the most socioeconomically disadvantaged populations [32]. The younger age threshold of 55+ therefore minimises the risk of eliminating evidence from such disadvantaged groups. No time limits were applied other than those imposed by the limits of the databases. Randomised controlled trials, qualitative studies, news items, editorials, opinion pieces, and irretrievable full texts were excluded. No other restrictions were placed on the study designs eligible for inclusion.

2.3. Search Strategy. To identify academic publications and grey literature, subject headings and keywords for (i) polypharmacy, (ii) unmet needs and (iii) older people were combined, using tailored strategies developed with and translated by an information scientist (Appendix 1). Sixteen databases were searched from inception to January 2021. These included Medline, Embase, PsycInfo, CINAHL, Scopus, Cochrane Database of Systematic Reviews (CDSR), Health Management Information Consortium (HMIC), Social Care Online, Social Care Institute for Excellence (SCIE), NHS Evidence, Health Survey for England, The Health Foundation, The King's Fund Library, OpenGrey, The British Library electronic theses database (ETHOS), and Google Scholar (first 300 results) [33]. Reference lists of included studies and publications of authors known to have carried out work on this topic were hand-searched to identify further potential publications. A final search in February 2022 to update the review identified no further eligible studies.

2.4. Study Selection. Titles and abstracts of all search records were screened by one reviewer (anonymised), and a sample of 50% was screened by a second reviewer (anonymised) to check consensus. The full texts of potentially relevant papers were then examined independently by both reviewers, and disagreements were resolved through discussion. Records not published in English were translated using Google Translate as necessary.

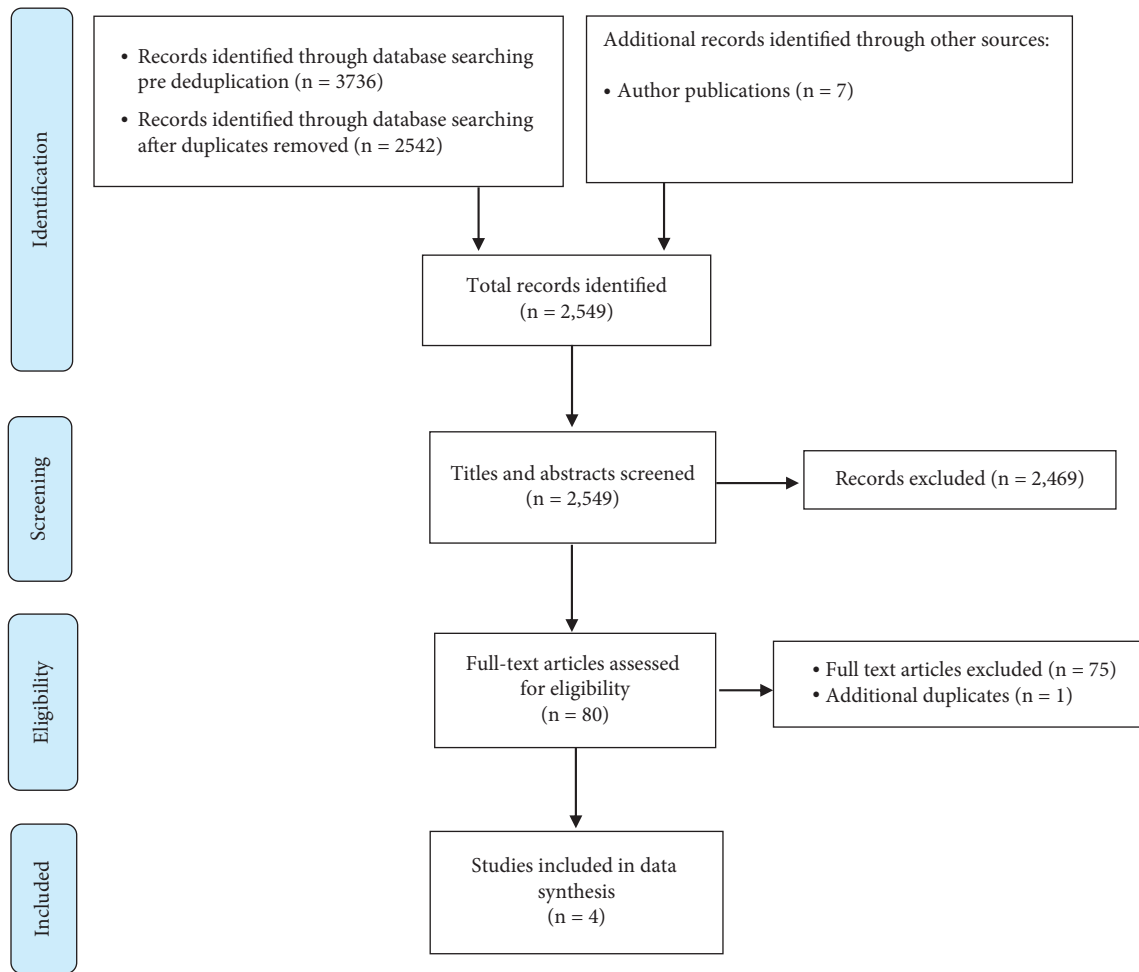


FIGURE 1: PRISMA flowchart of study selection.

2.5. Data Extraction. Single data extraction is acceptable when resources are limited, but it requires a greater degree of caution to avoid errors [34]. Study details and data were, therefore, extracted onto an Excel spreadsheet by the lead author and cross-checked by them on a second occasion. Extracted items included the following: (1) first author and year of publication; (2) study design, country, participant characteristics, and sample size; (3) operationalisation of polypharmacy; (4) operationalisation of unmet need, and (5) quantitative data for unmet need in relation to polypharmacy.

2.6. Quality Assessment. The quality of the included studies was assessed by the lead author using the National Institute for Health (NIH) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies [35]. No records were excluded on the basis of quality assessment in order to present the evidence in context.

2.7. Evidence Synthesis. A meta-analysis was inappropriate due to the limited reporting of an effect size. A narrative synthesis was, therefore, undertaken [36].

3. Results

From 2549 citations, four studies conducted in the community setting, and published between 2013 and 2019, were included (Figure 1). All of the included studies operationalised polypharmacy as medication count, and one examined medication classes within this [37]. Three studies were reported as cross-sectional [38–40], whilst one [37] did not explicitly report the design; this was interpreted as cross-sectional by the review team.

One study, which used an absolute measure of unmet need, indicated that polypharmacy was similar between those with and without unmet care needs [40]. In two studies, the populations were typically taking nine or more medicines daily, yet the proportion reporting unmet needs was 11% in one study [37] and up to 90% in the other [39]. The study by Naess and colleagues used a relative measure of unmet needs, which we know is shaped by expectations and judgements of the adequacy of care. The study by Kayyali and colleagues appeared to use an absolute measure of unmet need, which offers a more objective quantification of unmet need (although it did not explicitly state the type of measure used). The differences in rates of unmet need

TABLE 1: Characteristics of included studies.

Citation	Study design	Country	Participant characteristics	Total sample	Exposure (polypharmacy)	Outcome (unmet needs)	Study findings	Quality rating
Scholes et al. [40]	Cross-sectional survey	England	A nationally representative sample of people aged ≥ 65 living in private households	3,217	Number of prescribed medicines taken in the last week (excluding smoking cessation products and contraceptives)	Those needing help but not receiving help in the last month for the relevant ADL(s) (absolute measure)	(i) Almost all participants needing help with ADLs reported that they had taken at least one prescribed medicine in the last week; levels were similar among those with met and unmet needs (for details, see Figure 5G and Table 5.6 in [40]) (ii) Multiple medication use was markedly lower among those who did not need help with ADLs	Fair
Jamison et al. [38]	Cross-sectional postal questionnaire	East of England and London	Stroke survivors aged >18 living in the community outside institutional long-term care (mean age 72.7, SD = 11.6), and their caregivers (anyone identified by the patient as having a role helping with medicine taking)	596 (out of 1687 questionnaires were returned)	Total number of daily medicines (mean all patients = 6.4; mean for patients with unmet needs = 9.7)	Needing more help with respect to practical aspects of medicine taking (relative measure)	11% reported needing more help in at least one domain of medicine taking. Unmet needs were associated with being on a higher total number of daily medications (OR: 1.2, 95% CI 1.1 to 1.3, $p < 0.0001$)	Fair

TABLE 1: Continued.

Citation	Study design	Country	Participant characteristics	Total sample	Exposure (polypharmacy)	Outcome (unmet needs)	Study findings	Quality rating
Naess et al. [39]	Cross-sectional design with an eight-month follow-up	Norway (Oslo)	Patients aged 75+ living in their own homes, who received daily home care, had ≥3 chronic diagnoses, received daily medication, and had been hospitalized during the last year	83 (out of 150 eligible participants)	Daily medications (mean = 9; SD = 4.2)	Fulfillment of prespecified home nursing care needs (relative measure)	(i) 43% of patients had a serious disability, for which needs (e.g. encourage self-care and means to improve ADL) were fulfilled in <10% (ii) In those with eating difficulties (39%), 63% received support for food intake, and 38% were assessed for nutrition and problems with food intake (iii) 34% of patients had mobility limitations for which needs were fulfilled in <20%	Poor
Kayyali et al. [37]	Cross-sectional study (but design not stipulated)	England (London Borough of Richmond)	Predominantly housebound patients taking multiple medications (mean age 81.7 years; range 49–98 years)	133	Multiple medications (mean 9.4, range 1–23)	Unmet social care needs (the type of unmet need measure is not specified but appears absolute from the text)	11.3% had inadequate social care. Continence, dehydration, hygiene, and nutrition issues were found, often caused by mobility problems or a lack of suitable toilet facilities. A need for home modifications such as handrails to prevent falls was also identified (12.0%)	Poor

among these two study populations with similar levels of polypharmacy may, therefore, be partly explained by the potentially different unmet need measures used. The study by Jamieson and colleagues [38] operationalised unmet need as a relative measure in only one IADL domain (managing medications), unlike the other studies where measures of unmet need included multiple IADLs. This study confirms that more medications are associated with needing more help to manage them.

Two studies were rated fair in quality [38, 40], and two were rated poor [37, 39]. Characteristics of the included studies are summarised in Table 1, and a quality assessment table can be found in Appendix 2.

4. Discussion

4.1. Principle Findings. There is limited evidence about the link between polypharmacy and unmet social care needs from the few studies included in this review. There is a rational link between unmet social care needs and polypharmacy which would warrant future research, but a very small, poor quality, and heterogeneous evidence base limits our assessment of this.

4.1.1. Why Might Polypharmacy Potentially be Linked to Unmet Social Care Needs? As to why some older people in each included study of this review experienced unmet needs for social care, those prescribed multiple medicines may, for example, have complex conditions and therefore competing priorities, particularly as health and social care are too often fragmented [27]. Furthermore, the evidence included in this review came from the community setting, and most older people (who often live with polypharmacy) remain in their own homes as they age [41], though not all may have sufficient access to formal or informal caregiver support.

Social care might also be a component of what is driving polypharmacy. Unmet social care needs could lead to deteriorating health [5, 6, 9–12] and then increased healthcare utilisation [13–15, 17] and additional prescriptions, for example. That said we cannot determine from the limited evidence identified in this review whether a person would have fewer unmet needs if they took fewer medicines. The need for more help with respect to practical aspects of medicine taking among community-dwelling stroke survivors [38] may reflect the wider literature in terms of the informal caregivers' burden and lack of training and support [42]. Meanwhile, among those prescribed multiple medicines where mobility problems impaired self-care [37], it is possible that anticholinergic medications, for example, contributed to functional impairment [43, 44].

4.1.2. Why Might the Evidence be Mixed in This Review? Contrasting findings about rates of unmet need in populations with similar levels of polypharmacy within this review [37, 39] may be, speculatively, explained by the measure of unmet need. However, more evidence is needed to clarify this. Using (what appears to be) an absolute approach to operationalise unmet needs [37] would, for

example, capture people who are most in need of support [8], unlike a relative measure [39], which is driven by expectations of care. Furthermore, whilst, in a nationally representative sample of older people, the levels of polypharmacy were similar in those with and without absolute unmet needs, polypharmacy was markedly lower among those who did not need help with ADLs [40]. Thus, we can infer that polypharmacy is indicative of high needs, but these are potentially not always assessed and met.

4.2. Strengths and Limitations. We employed a comprehensive search strategy with clear review criteria to ensure all relevant evidence was represented. The evidence we found came from the community setting, which is of interest given that “aging in place” is the preferred strategy in many countries [45]. Given the projected rise in social care needs with population aging [3, 46], our examination of unmet needs for social care as a standalone outcome, and exclusion of studies where the social care component could not be isolated (for example, see [47, 48]) is another strength.

A limitation of this review is the paucity and limited quality of evidence, due to the cross-sectional nature of the included studies for example, which meant we could not assess causation or the duration of unmet need (Appendix 2). It is also possible that the evidence presented is understated, as the included studies were published from 2013 to 2019, and unmet needs are believed to have risen during the COVID-19 pandemic [49, 50]. From the evidence included, we could not determine a specific medication threshold most associated with unmet social care needs, though an unmet need for support to manage multiple medications appears more likely for those taking more medications [38]. Nor could we draw any conclusions about the relationship between polypharmacy and unmet needs among older people living in care homes—a group often excluded from research studies. Home nursing care [39] is also not exclusively limited to personal assistance. Finally, in the included studies, it was not always clear whether unmet needs stemmed from insufficient formal or informal care provision [38], which perhaps reflects the blurring of boundaries between the two [51].

5. Conclusion

In this review, some older people using multiple medications had their social care needs met, whilst others did not. However, there is a clear rationale as to why polypharmacy may be linked to unmet social care needs. Given the limited studies identified in this review, future research should explore this further, for example with population-level longitudinal datasets that seek to identify (i) whether unmet needs are more common beyond a certain medication threshold, and if so, (ii) whether this differs between settings and (iii) the pre and post COVID-19 era. The *type* of unmet need measure may also be important to understand the nature of the relationship between the use of multiple medications and unmet social care needs. Future studies should explore this where data are available.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Additional Points

What Is Known about This Topic? (i) Polypharmacy is common in older people, who often live with disability and dependency. (ii) Whether polypharmacy could serve as a marker of unmet needs for social care in older people is unclear. *What This Paper Adds?* (i) There is a rational link between unmet social care needs and polypharmacy, but a very small, poor quality, and heterogeneous evidence base limits our assessment of this. (ii) Robust research is needed to fully explicate the relationship between polypharmacy and unmet social care needs in older populations.

Disclosure

The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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Supplementary Materials

Appendix 1: systematic review searches. Appendix 2: quality assessment of included studies using the National Institute for Health (NIH) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. (*Supplementary Materials*)

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