Research Article

The Process of Polypharmacy Management in Older Adults: A Grounded Theory

Camilla Ripari[1,2,3], Barbara Bassola[2,3], Luca Giuseppe Re[2,3], Valentina Tommasi[2,3], Sara Marotta[2,3], Vincenza Aloia[2,3], Chiara Cartabia[2,3], Armando Cinelli[4], Silvia Cilluffo[3], Maura Lusignani[2,3]

1. University of Rome Tor Vergata, Rome, Italy; 2. ASST Grande Ospedale Metropolitano Niguarda, Italy; 3. Department of Biomedical Science for Health, University of Milan, Italy; 4. ASST Brianza, Italy

Background: In developed countries, the growing population of older adults is accompanied by increasing multimorbidity and medication use. Polypharmacy, commonly defined as the use of five or more medications, is associated with adverse outcomes and presents a complex daily management challenge.

Objective: This study aimed to explore and describe the key components of polypharmacy management in older adults within the Italian context.

Methods: A qualitative study using Charmaz's constructivist Grounded Theory approach was conducted. Participants were patients (n=25) from medical wards or day hospitals in an Italian hospital. Data were analysed through initial and focused coding, leading to category development and construction of the conceptual framework.

Results: Twenty-five older adults (median age 77 years) were interviewed, yielding five interrelated categories: "having knowledge and monitoring skills", "having a strategy to manage and take medications", "interpreting symptoms and modifying therapy", "having caregiver support" "engaging with healthcare professionals". These categories described the process of polypharmacy management.

Discussion and Conclusion: The findings indicate that management begins with acquiring knowledge and monitoring skills, followed by implementing strategies, interpreting symptoms, and adjusting medications. Caregivers provide essential support, while engagement with healthcare professionals ensures safe and appropriate management. Clinically, these results highlight the need for multidisciplinary interventions to address fragmented polypharmacy management and enhance communication with patients and caregivers.

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Corresponding author: Camilla Ripari, camilla.ripari@students.uniroma2.eu; camilla.ripari@ospedaleniguarda.it

1. Introduction

Medical and technological advancements have contributed to population ageing, particularly in high-income societies, leading to a growing prevalence of chronic illnesses[1]. Comorbidity, defined as the coexistence of two or more chronic health conditions[2], is especially common among older adults[3].

As the number of chronic conditions increases, so does the number of prescribed medications[4][5] In the presence of multimorbidity, medication management becomes complex, raising the risk of reduced quality of life, functional decline, hospital admissions, mortality, and healthcare costs[2].

Polypharmacy, commonly defined as the use of five or more medications[3], is a frequently used concept, although there is no universal consensus on the exact threshold. Increasingly, literature distinguishes between “appropriate” polypharmacy—based on clinical need and evidence—and “inappropriate” or “problematic” polypharmacy, where the risks of treatment outweigh its benefits[6][7].

In older adults, inappropriate polypharmacy is associated with a wide range of adverse health outcomes. Ensuring safe, effective, and individualized prescribing is therefore essential, considering ageing-related changes, multimorbidity, treatment burden, and patient preferences[8]. Among the key strategies is deprescribing - the systematic withdrawal of medications that no longer align with evolving care goals[4][9]. Pharmacological regimens must be continually re-evaluated, as medications that were once appropriate may lose their benefit or increase in risk over time. Regular medication reviews can reduce adverse drug events, improve quality of life, and support older adults in the self-management of chronic conditions[10].

However, medication management is often challenging in daily life. Older adults must remember schedules, open packaging, interpret instructions, and sometimes decide on their own whether to take a prescribed drug[11]. These difficulties can negatively impact adherence. Most studies exploring medication management relied on quantitative methods, such as surveys, which limit the investigation of patients′ individual strategies. Furthermore, few qualitative studies have involved older adults with multimorbidity and frailty, despite the increasing prevalence of polypharmacy in this population[12].

Understanding the lived experience of older adults in managing complex medication regimens is crucial to informing patient-centred care strategies and improving health outcomes[11]. In the light of these considerations, a qualitative study is essential to explore how older patients experience and manage polypharmacy, and to identify the key strategies and elements involved.

2. Aim

This study aims to explore and describe the key components of polypharmacy management in older adults within the Italian context.

3. Method

A qualitative study was conducted using Grounded Theory method, following Charmaz's constructivist approach[13].

The study population consisted of patients interviewed between March and May 2023 in a Hospital in Northern Italy, within medical wards and day hospital services.

Inclusion criteria were age over 65, alertness and orientation, diagnosis of at least two chronic conditions for at least one year, current hospitalization or medical day hospital care, use of five or more medications, stable clinical condition (NEWS2 $\leq$ 4). Patients who declined to participate were excluded.

Data were collected through in-depth, audio-recorded interviews averaged 25 minutes in length and were conducted in private spaces within hospital wards or day services to ensure confidentiality. Interview questions were based on literature and aligned with Grounded Theory methodology[13]. Sample questions included: "How do you manage your medications at home?", "Do you think the number of medications you take is appropriate for your health condition?", and "How do healthcare professionals support you in medication management?".

The audio-recorded interviews were immediately transcribed verbatim by the authors without a specific software and analysed using constant comparative method. The analysis followed the Grounded Theory process: initial line-by-line coding, memo writing, focused coding, and the development of conceptual categories. The coding was carried out by the first two authors. The identified categories were compared with existing literature to confirm, contrast, and contextualize findings. These categories were then integrated into a conceptual framework that illustrates the process of polypharmacy management in

older adults. Grounded Theory was choosen for its characteristic to explore processes and generate theory through in-depth, iterative, and comparative analysis[13].

To enhance credibility, findings were shared and discussed with three of the interviewed participants. Theoretical sampling and category saturation guided data collection and sample size determination.

Informed consent was obtained from all participants. Anonymity and confidentiality were assured. The institutional review board CEMIA3 approved the study with registered number 452-01072021.

4. Results

A total of 25 elderly patients were interviewed, 15 were inpatients and 9 outpatients. The average age was 77 years. Fifty-six percent were male. The number of medications taken daily by participants ranged from 5 to 16, with an average of 9 medications.

Other characteristics of the sample are presented in Table 1.

Patients (n=25)	
Gender – n (%)	
Female	11 (44%)
Male	14 (56%)
Age – M (SD)	77 (± 6)
Marital status – n (%)	
Single	3 (12%)
Married	13 (52%)
Widowed	7 (28%)
Divorced	2 (8%)
N of medications – M (SD)	9 (± 3)
N of medical conditions – M (SD)	4 (± 1)
Setting – n (%)	
Inpatient ward	16 (64%)
Day hospital	9 (36%)

Table 1. Sample Characteristics

The sample size was determined based on data and category saturation. Five categories emerged from the analysis of the interviews conducted. The categories were: (1) Having knowledge and monitoring skills; (2) Having a strategy to manage and take medications; (3) Interpreting symptoms and modifying therapy; (4) Having caregiver support; (5) Engaging with healthcare professionals.

4.1. Having knowledge and monitoring skills

The interviewees declare their home concerns about possessing the knowledge necessary for correct medication management. The first focused code within this category is “knowing why a medication is needed”, which highlights the importance of being aware of the therapeutic indication for each

prescription. This includes initial codes such as “knowing that a pill needs to be taken”. Example quotes include: “I know why I take the various pills. I don’t remember all the names, but if I have the boxes, I know which one is for my prostate or for the arrhythmia.” (interviewee 8). In another code “Knowing how long a therapy should be taken”, reference is made to the duration of the prescription, which in some cases is clearly communicated by the prescriber, and thus known by the patient: “I know I’ll have to take these medications for life, so I just keep going with them.” (interviewee 14).

Other aspects of knowledge identified through initial codes relate to “knowing how much medication to take”: “I know the dosage. The pulmonologist told me to take two puffs and rinse my mouth afterwards because it contains corticosteroids.” (interviewee 20); and “knowing when to take medications”: “I know I have to take them on a full stomach, so I take them after dinner.” (interviewee 11).

The second focused code in this category is “remembering to take medications”, which includes initial codes such as “remembering that a medication needs to be taken”. This focused code highlights the importance of not forgetting to take medications, made possible by knowing when they are required: “I never forgot because the night before I always prepared all the bottles with the medications and wrote the time on them.” (interviewee 3).

Hospitalization disrupted this process: “Before being admitted, I knew them all by heart because I prepared them every night.” (interviewee 3); “I used to know them all. Now I’ve forgotten them, because my therapy changed a bit since I was hospitalized.” (interviewee 9).

Another focused code within the knowledge necessary for proper medication management is “checking parameters for monitoring or symptoms”. Depending on their chronic conditions, the parameters mentioned by participants included blood pressure, blood glucose, and, in some cases, heart rate and oxygen saturation. In some situations, participants had established routines for monitoring the parameters related to their underlying conditions. For example: “I check my blood pressure every two days. I test my blood sugar every day, by myself.” (interviewee 2); “Every evening I check my blood pressure, oxygen level, and temperature. I keep a notebook where I write all my parameters every evening.” (interviewee 7); “I checked my blood pressure every morning and evening. [...] When my blood pressure was very high, I’d take an additional medication.” (interviewee 12).

Other participants reported measuring their parameters in response to specific symptoms: “Every morning I used to check my blood sugar, and I’d check my blood pressure every two or three days or if I felt weak or dizzy.” (interviewee 3); “I check my blood pressure whenever I feel dizzy or short of breath. If I don’t feel well or think it might be too high, I check it to see how it is.” (interviewee 8); “I realized I had

high blood pressure because I wasn't feeling well and went to the pharmacy to get it measured. Given my age, I thought that might be the cause." (interviewee 20).

4.2. Having a strategy to manage and take medications

The second category identified has as its first focused code "having a strategy to organize medications," due to the relevance of this aspect in the interviews conducted. The most frequent initial codes are characterized by verbs such as "prepare," "organize," and "divide." Often, packages with different colors or marked with different times are used to facilitate therapy organization and ensure proper intake. The preparation routine differs depending on the person's habits. For some, medication preparation is a daily or weekly activity: "Usually, I prepare them in the morning for the whole day, divided into boxes for morning, afternoon, and evening." (interviewee 2).

The use of boxes is common among the interviewees, but the ways of identifying them vary. Sometimes the packages have different colours to recognize when to use them during the day: "I would prepare all the pills for the day, divided into small boxes with different colours depending on the time of day." (interviewee 23). "My wife [...] put the medications in small boxes with the time written on them." (interviewee 12).

Other strategies used by the interviewed patients concern ways to remember to take medications at the correct time. The most common method is "setting an alarm to remember medications", which becomes a focused code due to its frequency in the interviews: "To remember to take the pill, I have the alarm set on my phone at 4:00 PM." (interviewee 1); "I set the alarm both in the morning and in the evening, at 8 and 20, so I remember to take them." (interviewee 22). In some cases, the alarm becomes essential to comply with specific therapy schedules: "I set the alarm because some pills have to be taken forty-five minutes apart." (interviewee 24).

In other cases, interviewees do not use an alarm but still report "having a method to remember medications", which also becomes a focused code. The most common method is to link medication intake to an existing routine or habit in the person's daily life, such as meals or waking up. The initial codes refer to this, for example "not forgetting due to a routine", "taking the medication after eating", or "seeing the medications on the bedside table". One interviewee reports "It's impossible to forget in the morning right after waking up because you have breakfast and automatically think 'I have to take my medication'." (interviewee 1); "I keep them on the bedside table, so when I go to bed and see them, I remember and take them." (interviewee 8).

Another very common strategy is “having a medication list”, which becomes a focused code. Having a written and updated list of the therapies taken becomes a useful strategy in different situations. Some interviewees explicitly state how this strategy helps them and allows them to remember the prescribed medications: “I don’t remember all the medications because there are many. I have this sheet with a list of the medications I take.” (interviewee 2). Other interviewees use this list to prepare medications correctly, reducing potential errors due to the large number of drugs taken: “I have a complete list, because I take so many medications. So, with the paper in hand, I prepare them.” (interviewee 13).

In the interviews conducted, it often emerges that these strategies allow the interviewee to be autonomous in taking and managing the prescribed medications. “I live alone and manage on my own. I go to the pharmacy, and I get the medications.” (interviewee 3); “I always knew when I had to take a medication.” (interviewee 9); “I was independent in managing the pills.” (interviewee 5). Autonomy is also explicitly mentioned with respect to “taking medications”, which also becomes a focused code: “Before eating, I take the pills I know from the boxes. I do everything by myself, since I’m at home and I remember.” (Interviewee 4).

4.3. Interpreting symptoms and modifying therapy

The third category includes “knowing how to manage a symptom”, which emerges as a focused code and concerns the management of side effects or symptoms related to ongoing therapies.

Some initial codes refer to “adjusting one’s diet” or “being careful with symptoms” as symptom management strategies: “I regulate myself with food. [...] I can tell when my blood sugar drops—my hands shake, I get irritable, and I feel I need to eat. So, in that case, I know I have to eat right away.” (interviewee 2).

In other cases, when noticing a symptom, the person reports stopping what they are doing: “The medication for blood pressure that a doctor prescribed me was too strong. I was out walking with my husband I felt dizzy, and I stop for a moment [...]. It also happened in the morning: when I got up, I felt dizzy. So I would just stay in bed a while and wait for it to pass.” (interviewee 5); “I’ve had episodes of dizziness, especially while exercising or making an effort. I discussed it with the doctor [...].” (interviewee 8).

One interviewee, instead, reports reducing a medication to prevent the appearance of a symptom: “I’ve always had low blood pressure, so I know that when summer and the heat arrive, I’ll start taking half a pill to avoid problems with low blood pressure.” (interviewee 22).

In another interview, the symptom is associated with the medication through the patient information leaflet: “One night I got up to go to the bathroom and felt dizzy, couldn’t stand up. [...] So, I read the leaflet, and it said this could happen with that kind of medication.” (interviewee 4).

In some cases, patients state that they “suspend or modify a medication because of a symptom”, which due to recurrence also becomes a focused code. Sometimes the modification or suspension happens autonomously, following previous advice or reverting to past dosages: “That time when the doctor added a new medication, after two days of feeling dizzy, I noticed my blood pressure was dropping too much, so I stopped taking it and went back to what I was doing before. [...] I didn’t inform the cardiologist.” (interviewee 3); “I felt dizzy. [...] I read the leaflet, and it said that could happen with that medication. So instead of two pills, I started taking just one. I had a doctor’s appointment two weeks later and told him, and he said I had done the right thing.” (interviewee 4). Other times, before stopping the medication, the patient consults with the general practitioner or a specialist: “It had happened in the past that I had high blood pressure, but the medications the doctor gave me—one made me cough, another made my legs swell. I discussed it with him again to try and change them and find one that suited me better.” (interviewee 18).

Another aspect it’s the “feeling of taking too many medications / too high dosage”, which becomes a focused code and includes initial codes such as “feeling the burden of too many medications” or “taking a large number of medications”. Sometimes the burden of polypharmacy is related to the appearance of side effects: “I had a huge number of medications. Occasionally, I had nosebleeds, and maybe the heparin was too much.” (interviewee 5); “Swallowing them is hard for me—I struggle with water, so I need to take them with food. At home, I would take them with breakfast, lunch, and dinner. But here in the hospital, sometimes the timing doesn’t match, so I keep some crackers or something else to help me swallow them. Otherwise, I feel them stuck in my throat and can’t get them down.” (interviewee 21). Other times, the burden is due to the addition of further medications: “Now I take too many medications, because I’ve many issues.” (interviewee 2).

4.4. Having caregiver support

The fourth category is represented by the theoretical code “having the support of a caregiver”. Having a caregiver, either formal or informal, who supports the individual in managing polypharmacy, emerges as a theme expressed by many of the interviewees.

“Receiving help from a caregiver” becomes a focused code. The caregiver does not always take over the entire process of medication management. The interviews reveal that support is often more present at a specific stage, such as in implementing an organizational strategy or preparing medications. Support may involve specific practical aspects, such as medication preparation: “Lately I’ve been struggling to remove the pills from the blister packs, so over the last few months my son has been preparing them for me.” (interviewee 13).

In some interviews, caregiver support is also described in terms of reminding the person to take their medications: “My wife used to remind me to take them, she would let me know when it was time to take a specific medication.” (interviewee 19); “Before the stroke, I managed everything on my own. Now I have a live-in caregiver. She’s very good and precise: she always reminds me when it’s time to take my medications.” (interviewee 5).

In some cases, the caregiver plays a central role in ensuring proper medication management: “My wife used to handle everything. She would prepare the medications once a week for the entire week [...] She helped me—otherwise, I wouldn’t have managed, there were so many pills.” (interviewee 12).

Caregivers often also assist the older person by preparing a medication list to support correct medication intake, organization, or as a tool during medical visits or hospitalizations: “My daughter made a list for me, so I have the full inventory.” (interviewee 6); “I have this sheet with the list of medications [...] my niece wrote it for me.” (interviewee 2).

Another focused code that emerged is “consulting with the caregiver.” In some cases, this exchange occurs specifically because the caregiver works in healthcare and, for this reason, assumes a more prominent and trusted role in the patient’s medication management. Initial codes referring to this type of relationship include “trusting the caregiver” and “receiving guidance from the caregiver.” Some examples: “I consult with my daughter, who’s been a nurse for 25 years [...]. I trust her more than my doctor.” (interviewee 5); “I measured my blood pressure every morning and evening, because my niece, who is a doctor, gave me some guidance. I consulted with her, and when my pressure was very high, she told me whether to take an extra pill.” (interviewee 12).

Other interviews highlight initial codes such as “calling the caregiver” or “discussing it with the caregiver”, which describe situations in which the person seeks out the caregiver to discuss symptoms or issues related to their treatment: “I had a very strong pain in my neck, and I called my daughter to tell her. She realized I wasn’t speaking clearly and called the emergency room, understanding that something was wrong.” (interviewee 6).

4.5. Engaging with healthcare professionals

The interaction with different healthcare professionals is a recurring theme across all the interviews conducted and defines the final category that emerged.

One of the most frequently mentioned figures is the general practitioner (GP). From the initial codes identified, the focused code “consulting with the general practitioner” was selected. In some cases, however, a sense of distance and lack of trust toward the GP emerges. The GP is often perceived as someone who issues prescriptions, rather than a professional to be consulted for health-related issues at home: “I don’t really trust my GP [...] In my opinion, he’s only useful to write prescriptions, nothing more.” (interviewee 5).

Sometimes mistrust stems from an incorrect diagnosis or from an evaluation perceived as hasty or superficial: “I had gone the day before, and he told me it was nothing, but the next day I was in the emergency room. Recently, he had also given me many additional pills [...] when you’re not feeling well, this starts to weigh on you.” (interviewee 6).

In most interviews, however, the GP is emphasized as a point of reference for discussing ongoing therapies or new symptoms: “I have been followed by my GP for years, and I consult her often. For every minor issue, I would go and talk with her. For example, when I had angina pectoris, she adjusted my therapy. [...] My GP has never been one to overprescribe. She has always been balanced—if I needed something, she added it, and if something was no longer necessary, she removed it.” (interviewee 9).

Sometimes, consulting the GP leads to referrals to other professionals, with the GP acting as a mediator while still remaining a reference point: “For anything, I talk to my GP. He also calls me often to check how things are going [...] he is always up to date, even with my oncologist. I get along very well with him; for anything I know he is there, and I can consult with him. [...] I have always trusted him.” (interviewee 24).

Despite the central role of consulting the GP, interviewees also highlight the importance of “consulting with the specialist physician”, which, given its recurrence, was also selected as a focused code. The specialists mentioned by interviewees are different, though often reference is made to the one considered the primary point of care for their major chronic condition: “From the neurological perspective, [...] as soon as a problem arises, I can immediately contact the doctor and the professor who follow me; the relationship is very direct, and we always try to find a solution. For the rest, I don’t have a reference.” (interviewee 1).

In other interviews, patients refer more broadly to “trusting the doctors” or “following the professionals’ instructions”, often plural, including multiple specialists or hospital physicians: “The doctors have always explained things clearly. They told me why I had to take a medication and what it was for.” (interviewee 22); “I consult a lot with the doctors too, even when I feel some symptoms—I tell them, and we talk about it.” (interviewee 13).

Often, consultation arises when the patient reports a side effect or a symptom possibly related to a medication: “I read the leaflet, and it said that it could happen. So, instead of two, I started taking one, and when I had the visit two weeks later, I told the cardiologist, and he said I did the right thing.” (interviewee 4).

Sometimes, consultation occurs during hospitalization, a clinical setting where home therapies or dosages are frequently modified. In these cases, some patients report “consulting with a nurse”, which was also chosen as a focused code. Since nurses manage medication administration during hospitalization, patients tend to turn to them for clarification: “I consult a lot with nurses. I talk with them, I ask questions [...], I want to understand. Even for therapies, I always ask what medication I’m being given, especially if pills look different from those I take at home.” (interviewee 13); “The nurses follow the therapy the same way I did at home. When I go to Day Hospital, they’re excellent, I talk with them about what I’m being given. If I have doubts, they explain and tell me what medication I’m receiving.” (interviewee 19).

Patiens rely on nurses, aware that modifications make it more difficult to remember all the medications or to fully understand the therapy. Lacking the autonomy they had at home, they often postpone regaining awareness of their therapies until after discharge: “The nurses leave me the pills here, and I take them [...]. Now they’re different from the ones at home, I haven’t understood everything. While I’m hospitalized, I trust them, I take what they give me.” (interviewee 3).

Regarding home management, some interviewees mention the pharmacist as a figure to ask for advice on medications. From this, the focused code “asking the pharmacist” was identified: “I have good pharmacists I trust. Sometimes I asked them for clarification when I was given medications that did not match exactly what was written on the prescription.” (interviewee 10).

Consultation with the pharmacist often occurs in relation to temporary or seasonal ailments rather than chronic therapies: “If it’s the usual routine medications, I just go to pick them up; but if I need something else, sometimes I consult the pharmacist. [...] There’s one pharmacist who is very good and sometimes gives me advice.” (interviewee 13).

Despite the recurrence of consultation with professionals, in some situation interviewees express the "need for a point of reference", which became another focused code. Some interviewees describe difficulties in identifying a single point of reference for polypharmacy management, among all the professionals they interact with.

Not having one professional in charge of managing the entire therapy is perceived as a source of discomfort: "The GP refers to the fact that I am under the care of the specialist [...] who, however, only manages the acute phase [...]. This means that one is basically left alone. [...] The lack of a human connection, of a reference person, is a problem. The GP is absolutely unable to manage a complex case like mine." (interviewee 1); "Every day I see a different person, each one has their own way of doing things. Even the doctor changes every day. [...] If I had a single person following me, who knew all my problems, it would be different. Now, for every illness, I have to consult with a different person." (interviewee 2).

Often, the difficulty in finding a reference professional leads patients to discontinue medications on their own, without revaluating the situation or sharing symptoms, feeling they have no professional to turn to: "I don't trust my GP, I no longer consult with him. He didn't even know I had had a stroke. [...] I consult with my daughter, who is a nurse, and if I don't think I need a medication anymore, I stop taking it." (interviewee 5); "My GP didn't even realize I was about to die when I had heart surgery. [...] The cardiologist added a medication for my blood pressure. I tried to explain that it always rises during visits because I get nervous, but it's usually lower. He added the drug anyway, and after two days of dizziness and low pressure, I stopped taking it and went back to my previous therapy. I didn't inform him." (interviewee 3).

4.6. The process

Based on the results presented, the following representation was defined, which synthesizes and represents the process of polypharmacy management in older adults.

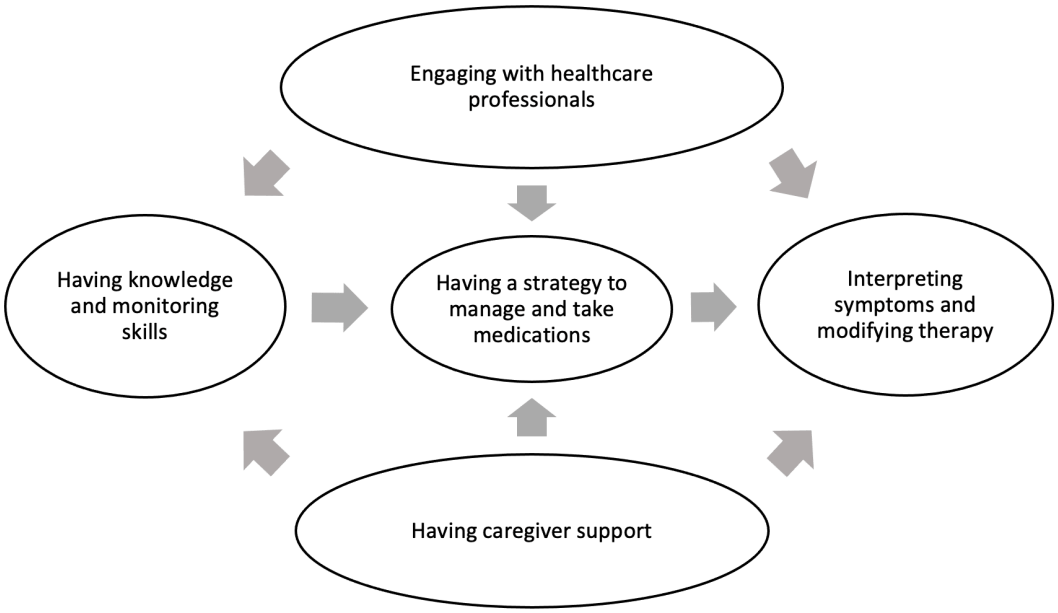

Figure 1. Polypharmacy management process in older adults

The first category, “having knowledge and monitoring skills”, precedes the others, as it constitutes the essential foundation that enables older adults to manage their medications. Through their knowledge and by monitoring signs and symptoms, individuals can implement strategies to safely handle and take medications—such as organizing prescriptions or developing reminders for adherence—summarized in the second category, “having a strategy to manage and take medications”. The subsequent category reflects a further step, namely “interpreting symptoms and modifying therapy”, which builds on the individual’s knowledge and therapeutic management practices. Across these stages, “having the support of a caregiver” often proves fundamental, whether consistently or intermittently present, as a trusted figure who can provide assistance and reinforcement within the process. Finally, “consulting with healthcare professionals” emerges as a category accompanying the process, since such interactions may occur actively and at different points throughout older adults’ management of polypharmacy, depending on specific needs.

The analysis and coding are represented in Table 2.

Examples of initial codes	Focused codes	Theoretical codes
Knowing that a pill needs to be taken (1) Understanding which medications need to be taken (2) Knowing why I take the pills (8) Knowing how long a therapy should be taken (14) knowing how much medication to take (20) ...	Knowing why a medication is needed	Having knowledge and monitoring skills
Not forgetting to take medication (3) Remembering the medications (6) Being aware of when to take medications (9) Remembering that a medication needs to be taken (11) ...	Remembering to take medications	
Checking blood pressure or blood sugar (2) Measuring blood pressure for a symptom (8) Recording the parameters (18) Seeing the values from the tests (5) ...	Checking parameters for monitoring or symptoms	
Writing the time and quantity on the package (2) Preparing the medications in small containers the night before (3)	Having a strategy to organize medications	Having a strategy to manage and take medications

Examples of initial codes	Focused codes	Theoretical codes
Organizing yourself with the boxes according to the schedule (7) Preparing your pills (9) Dividing the medications into boxes (21) Scrivere sopra la confezione l'orario (22) ...		
Having an alarm (1) Setting the alarm (to remember to take the pills) (22) ...	Setting an alarm to remember medications	
Not forgetting because of a routine (1) Having a schedule to take medications (5) Taking medications after eating (7) ...	Having a method to remember medications	
Having a list of medications (2) Having a complete list of medications (13) Having all the boxes (24) ...	Having a medication list	
Managing (therapies) on their own (3) Being independent in managing pills (5) Doing it independently (4) ...	Managing therapies independently	
Taking the pills from the boxes (4) Taking the medications (11) ...	Taking medications	

Examples of initial codes	Focused codes	Theoretical codes
Regulating theirself with food (2) Reading the leaflet to understand side effects (4) Stopping and waiting for a symptom to pass (8) Adjusting one's diet (13) Being careful with symptoms (20) ...	Knowing how to manage a symptom	Interpreting symptoms and modifying therapy
Removing a medication because of a symptom (4) Suspending a medication because of a symptom (5) Replacing a medication due to a complication (6) Returning to the previous dosage (7) ...	Suspend or modify a medication because of a symptom	
Feeling the burden of too many medications (6) Taking a large number of medications (7) Struggling to remove the pills from the blister (13) Feeling burdened due to difficulty swallowing pills (21) ...	Feeling of taking too many medications / too high dosage	
Having a formal caregiver who remembers the medications (5) Having the medications prepared by the caregiver (12) Being helped by the caregiver (15)	Receiving help from a caregiver	Having the support of a caregiver

Examples of initial codes	Focused codes	Theoretical codes
Being reminded by the caregiver to take the medications (19) ...		
Consulting with the caregiver (5) Calling the caregiver (6) Asking the caregiver for advice (10) Trusting the caregiver (25) ...	Consulting with the caregiver	
Asking the general practitioner for advice (4) Having the general practitioner adjust the therapy (6) Consulting with the general practitioner (8) Talking to the doctor about a symptom (11) Trusting the family doctor (14) ...	Consulting with the general practitioner	Engaging with healthcare professionals
Talking with the specialist doctor about medications (1) Following the instructions of the professionals (3) Consulting with the specialist doctor (16) ...	Consulting with the specialist physician	
Following what the nurses say in the ward (3) Trusting the nurses in the ward (4) Relying on the nurses (10)	Consulting with the nurse	

Examples of initial codes	Focused codes	Theoretical codes
Asking the nurses (18) Consulting with the nurses (13) ...		
Asking the pharmacist what a medication is for (2) Asking the pharmacist for advice (3) Trusting the pharmacist (18) Getting advice from the pharmacist (22) ...	Asking the pharmacist	
Being alone in overall management (1) Feeling the need to have a point of reference (2) Not trusting the general practitioner (5) Struggling to understand changes in therapy (6) ...	Need for a point of reference	

Table 2. Data analysis

5. Discussion

The main aim of this study was to explore how older adults manage polypharmacy and to identify the key components of this process, within the Italian context.

Through interviews with older adults, five interrelated categories emerged: (1) having knowledge and monitoring skills; (2) having a strategy to manage and take medications; (3) interpreting symptoms and modifying therapy; (4) having the support of a caregiver; and (5) engaging with healthcare professionals. These categories were derived from 220 initial codes, synthesized into 20 focused codes. Together, they

outline a process that represents the dynamic process by which older adults engage in polypharmacy management.

The first category, “having knowledge and monitoring skills”, provides the foundation of the process. Adequate health literacy enables older adults to understand the purpose of their medications, monitor relevant signs and symptoms, and develop self-management abilities, thereby reducing the risks associated with polypharmacy and improving health outcomes[14][15][1]. Interviewees highlighted that such knowledge is often partial or fragmented, underscoring the importance of clear communication and shared decision-making with healthcare professionals[11][16].

Building on this foundation, older adults develop “a strategy to manage and take medications”. These strategies include both internal approaches—such as linking medication intake to daily routines—and external supports, such as alarms, pillboxes, or color-coded systems. Literature confirms the effectiveness of combining these strategies to improve adherence[12][11]. Caregivers often play a key role in supporting such organizational strategies[17].

A further step in the process involves “interpreting symptoms and modifying therapy”. This stage reflects the capacity of older adults to reassess their treatments in response to changing health conditions. However, unsupervised modifications—such as discontinuing or reducing medications without professional consultation—can result in significant risks[9][11]. Medication reviews, especially in the context of multimorbidity, are thus essential to ensure appropriateness and minimize treatment burden[9][17].

The categories “having caregiver support” and “engaging with healthcare professionals” intersect all stages of the process. Caregivers, both formal and informal, provide crucial support in monitoring, organizing, and even communicating with healthcare providers[18][17]. At the same time, interactions with healthcare professionals can strengthen knowledge, promote adherence, and ensure safe modifications of therapy. Yet, interviewees reported fragmented and sometimes conflicting inputs from different providers—family physicians, specialists, nurses, and pharmacists—reflecting a lack of coordinated, multidisciplinary care[19][1]. Such fragmentation can compromise patients’ trust and leave them without a clear reference person, thereby complicating polypharmacy management.

Overall, the process of polypharmacy management in older adults described in this study offers a comprehensive representation of how older adults navigate polypharmacy at home. It highlights the

central role of health literacy, self-monitoring, and tailored strategies, while also underscoring the importance of caregiver involvement and effective, coordinated professional support.

5.1. Implication for practice and research

Future research should investigate older adults in other settings, such as nursing home or community services, and investigate the caregiver perspective. The process of polypharmacy management needs to be further explored, both with qualitative studies examining the dimensions and with quantitative studies measuring polypharmacy management behaviours. Developed and validated measurement tools to assess not only adherence but the entire management process are essential.

In clinical practice, the findings highlight the need to reassess fragmented polypharmacy management and promote multidisciplinary interventions, and more effective communication with patients and caregivers. There is a clear need to enhance health literacy regarding medications, through patient education targeting knowledge of therapies, symptom monitoring, and practical support. Assessments should consider difficulties in remembering, acquiring, or monitoring medications and whether caregivers are adequately trained.

5.2. Limits

One of the main limitations of this study is that the sample consisted of patients accessing hospital services. This may have excluded older adults who cannot access such services and who might face additional challenges in managing polypharmacy. Future research could recruit participants from nursing home or community services to obtain a more representative sample of the older adults' population. Additionally, only cognitively intact individuals were interviewed, excluding those with cognitive impairments for whom medication management may be even more challenging. Including caregivers of these individuals in future studies would provide a more comprehensive perspective. The study was conducted in only one hospital in Italy, this may influence the generalizability of the results which need to be evaluated in order to be used in other contexts.

6. Conclusions

The study results indicate that older adults manage polypharmacy through a sequential process. Initially, they acquire knowledge about their medications and develop self-monitoring skills for potential symptoms. This is followed by the implementation of strategies to take medications effectively, which in

turn informs symptom interpretation and potential adjustments in medication use. Caregivers often play a key supportive role, and collaboration with healthcare professionals is crucial for safe and appropriate management.

The process of polypharmacy management in older adults is complex, and sequential, suggesting that educational interventions should follow a structured pathway: first, improving health literacy and monitoring skills; second, teaching strategies for medication adherence; and third, guiding symptom and complication management. Caregivers should be involved throughout. Healthcare gaps, such as the absence of a consistent professional point of reference for older adults, contribute to errors and healthcare costs. Nurses are well-positioned to ensure continuity of polypharmacy management in older adults. This study provides a foundational understanding of polypharmacy management from the perspective of older adults and the obstacles inherent to this process.

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