


# “At 80 I Know Myself”: Embodied Learning and Older Adults’ Experiences of Polypharmacy and Perceptions of Deprescribing

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## Abstract

In response to the risks of polypharmacy for older adults, there are increasing calls for the development and implementation of deprescribing programs. This article examines the forms of expertise that inform older adults’ decisions about how to use medications given concerns over polypharmacy and a clinical focus on deprescribing. In-depth interviews with older adults found that diverse knowledge sources underpin decisions regarding polypharmacy and deprescribing. Findings indicate that this knowledge is formed through a lifetime of embodied learning—the production of relevant knowledge through lived experiences of the body. By way of this embodied learning, older adults possess individualized knowledge bases that inform health and health care decisions, especially regarding the use of medications. If deprescribing programs are to be embedded into standard preventive medical care of older adults, then it is valuable for health care providers to be aware of and take seriously the contribution of embodied knowledge.

## Keywords

polypharmacy, deprescribing, older adults, embodied learning, embodied knowledge

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“You have the feelings of your body. I’m a firm believer that your body tells you a lot of things. So you just have to be aware.” -Participant I.P.

## Introduction and Background

A growing body of literature centralizes polypharmacy and deprescribing as key determinants of well-being in later life (Barnett et al., 2016; Canadian Deprescribing Network, 2017; Garfinkel et al., 2015; Reeve & Wiese, 2014; Scott et al., 2014). In response to the risks of polypharmacy for older adults, there is an increasing call for the development and implementation of deprescribing programs. Drawing on data from in-depth interviews, this article examines the forms of expertise that inform older adults’ decisions about how to use medications given concerns over polypharmacy and a clinical focus on deprescribing.

Despite variations in the definition of polypharmacy (Alpert & Gatlin, 2015; Fried & Mecca, 2019; George & Verghese, 2017; Hajjar et al., 2007; Hanlon et al., 1996; Maggiore et al., 2010; Maher et al., 2014; Morin et al., 2018), the key component common among them is the concurrent and ongoing use of usually five or more medications. Using this broad definition, polypharmacy

is a very common phenomenon among Canadian seniors (Reason et al., 2012). According to Statistics Canada (2015), pharmacists dispensed 14 prescriptions to the average Canadian in 2005. This number rose to 35 prescriptions for adults of ages 60 to 79 years, and to 74 prescriptions for adults over the age of 80 years (Statistics Canada, 2015). In 2014, the Canadian Institute for Health Information (CIHI) reported that of seniors over age of 65 years, 25% take at least 10 medications. This increases to 40% for Canadians over age 85 (CIHI, 2014). Both Statistics Canada and CIHI have identified an important trend: concurrent use of multiple medications (or polypharmacy) intensifies with age.

This intensification may be burdensome to the well-being of many older adults given the numerous risks found to be associated with polypharmacy. Medications are intended to treat, manage, or cure disease. In the case of polypharmacy, however, the “‘cure’ may have

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become the ‘disease’” (Page et al., 2016, p. 584). Morin et al. (2018) indicate that negative outcomes associated with polypharmacy are the result of drug–disease interactions and adverse drug effects. According to Molokhia and Majeed (2017), the severity of these adverse drug reactions can lead to hospital admissions and potentially death. In fact, Ammerman et al. (2019) note that these adverse drug reactions account for one of the five greatest threats to older adults’ health. Polypharmacy has also been found to interfere with adherence to necessary and appropriate medications, which Kaufman (2016) explains leads to missed opportunities for improvements to health and wasted medications. These risks may be particularly troublesome for older adults with multiple chronic conditions as this population is often excluded from or underrepresented in drug trials (Ouellet et al., 2018).

In addition to such significant adverse effects to the quality of life of Canadian seniors, polypharmacy has also been found to hold notable economic implications (Morgan et al., 2016). The use of inappropriate medications has been estimated to cost Canada \$419 million annually; this number grows to \$1.4 billion annually when costs for treating the adverse effects of polypharmacy are included (Morgan et al., 2016). Therefore, from both gerontological and economic perspectives, solutions to the apparent problem of polypharmacy are needed. Accordingly, deprescribing programs are being tested and widely applied as a possible solution to the iatrogenic effects of polypharmacy.

With the intent to improve health outcomes and overall quality of life, deprescribing is a process of identifying medications that are no longer beneficial or that are perhaps causing harm, and the subsequent reduction or withdrawal of those medications, under the supervision of a health care professional (Page et al., 2016). Krishnaswami et al. (2019) argue that good prescribing practice includes deprescribing as a fundamental element. The benefits of deprescribing directly reflect the burden of overprescription and include alleviated financial burden (Reeve & Wiese, 2014), reduced risk of falls, fewer hospital admissions, improved mortality rates (Scott et al., 2014), reduced risk of adverse drug reactions (Reeve & Wiese, 2014), improved adherence to appropriate medications, and enhanced patient knowledge and engagement (Reeve & Wiese, 2014).

Given this shift toward deprescribing in clinical practice as a part of routine medical care of older adults, the Department of Family Medicine at a Southern Ontario University has designed and adopted the TAPER Project (Team Approach to Polypharmacy Evaluation and Reduction), which is a standardized pathway designed to reduce medication burden. In pursuit of this goal, the TAPER project must identify barriers to effective and appropriate deprescribing and determine gaps in knowledge. One of the key gaps in knowledge is the establishment of diverse patient perspectives on polypharmacy

and deprescribing, particularly the knowledge and expertise that they bring to their medication practice. Using an embodied learning conceptual framework, this article explores this embodied expertise of older adults through an analysis of in-depth qualitative interviews with older adults of age 70+ years experiencing polypharmacy.

## **Embodied Learning: Physical Experience and Cognition**

Embodiment and experiences of the body are central to the dynamic and multifaceted way humans learn. Embodied learning refers to the construction of valid and relevant knowledge accumulated by living in and through our bodies (Gustafson, 1998). In this process, the body operates as both possession and identity: “we both have bodies and . . . are bodies” (Blaxter, 2010, p. 48). As the body moves through the world, this embodied knowledge base expands, meaning that this knowledge is accumulated by doing over time (Griffin, 2017).

### *Forms of Embodied Knowledge (Active and Passive)*

Citing Crossley (1995, 2004), Griffin (2017) states that a key objective of an embodied learning perspective is to explain how knowledge is acquired in contexts wherein the body is both the subject that is being acted upon and the agent that is doing the acting. One such context is the polypharmaceuticalized body, which includes but is not limited to the subcategory of the deprescribing polypharmaceuticalized body. In this instance, the body is the subject being acted upon by both medications and health care professionals, while the body is also potentially the agent that is actively adhering to or tapering off of medications. Across one’s lifetime, this co-existence of agency and subjectivity mutually reinforce each other in the development of habits and practices (Griffin, 2017).

### *Reflexivity and Expertise*

Another advantage of an embodied learning perspective is a consideration of cognition. Shilling (2017) uses the early pragmatists writings of Dewey to argue that the role of thought is inadequately taken up in embodiment theory. Building on this point, embodied learning is conceptualized as happening from physical experiences in combination with reflexivity and cognitive awareness. Shilling (2017) emphasizes some of Dewey’s key insights: knowledge flows through the body’s pre-reflective sensory routes and learning is facilitated by cognitive deliberation. This cognitive deliberation is fundamental to the collection and diffusion of institutionalized cultural practices (Shilling, 2017), including the ways in which we use medications.

### *Symbolic Thinking and Decision-Making*

The scope of human cognition and thought allows “people to experiment reflexively with alternatives without exploring them physically, it helps individuals scrutinize their own desires and habits” (Shilling, 2017, p. 1209). Medication practices are in an ongoing process of such exploration and scrutiny, particularly when the individual is encouraged/instructed by their health care team to modify their medication practices via deprescribing. In deciding if they are willing and/or able to deprescribe, the individual employs systematic and symbolic thought to assess the feasibility and desirability of such a task. Such an observation aligns with Archer (2012), arguing that this capacity for reflection permits the individual to strike a balance between bodily impulses and competing demands. Although symbolic thought serves a critical purpose, its lack of connection with the material world increases the risk for error and “consequent disappointments and practical failures” (Shilling, 2017, p. 1209). For this reason, knowledge acquisition demands both physical experience and cognition. As such, embodied learning relies upon the body’s experiences as it moves through the world in combination with that same body’s capacity for critical thought.

Griffin (2017) observes this embodied learning in the context of engagement in health behaviors, particularly physical activity and sport. Griffin (2017) emphasizes that health behaviors operate within specific social contexts and as such are social practices themselves. Accordingly, the decision to participate in a certain health behavior is a deeply complex process situated in social life, characterized by “people’s everyday lives and their routines and habits, alongside insecurities, pressures, concerns and fixations” (Griffin, 2017, p. 556). The same can be said for the way older adults make decisions relating to how they use their medications. These decisions are not characterized by the simplistic and binary choice “to take or not to take,” but are rather permeated by the complexities of social life.

### *Accumulating Expertise Across the Lifecourse*

To adequately address how older adults make decisions about their medications, it is not enough to only consider embodied learning in the development of knowledge that informs these decisions. It is equally necessary to adopt a lifecourse perspective as the physical experiences and cognitive reflection informing embodied knowledge and ultimately decisions regarding medications have been gathered across the lifecourse. This is of particular importance for the sample used in this study (age of 70+ years). It is in combination of many forms of expertise and knowledge through which older adults make medication decisions. A lifetime of embodied learning equips older adults with an individualized knowledge base that should be recognized as a source of valuable information used to

inform decisions around medication practice. If tapering programs are to be embedded into standard preventive medical care of older adults, then understanding, recognition, and validation of the embodied knowledge that underpins older adults’ decisions regarding their medications are critical.

### **Method**

This study constitutes the qualitative element of a larger mixed-methods project, TAPER. Conducted in the Department of Family Medicine at a Southern Ontario University, the ultimate goal of the TAPER Project is to reduce medication burden for older adults. In pursuit of this goal, this larger interdisciplinary team of researchers aims to implement deprescribing programs into standard medical care of older adults. In its entirety, this mixed-methods study includes four design elements: cross-sectional cohort data from the Canadian Longitudinal Study of Aging, a systematic review, a randomized control trial (RCT) for deprescribing, and a qualitative study for patient perspectives (which is this study).

Before this qualitative element of the project could begin, three key steps of the TAPER Project had to first be completed. First, baseline data were collected for demographic information, illness assessment, functional goals, symptoms goals, treatment preferences, and perceived medical problems. Next, the pharmacist performed a medication reconciliation, which involves the creation and maintenance of an accurate medication list, including information related to medication name, dose, frequency, and route of administration (Al-Hashar et al., 2017). The list produced from this medication reconciliation was then used to inform a consultation between the participant and their family physician to identify possible and appropriate medications to deprescribe. If medications were identified for possible discontinuation, participants in the treatment group were invited to deprescribe. A total of 40 participants were enrolled; 20 in the treatment group and 20 in the control group. Regardless of group assignment, all participants were asked if they could be contacted for an interview.

Following RCT assignments, the qualitative methods that constitute this study began. Of the 40 participants enrolled in the study, 21 consented to being contacted for an interview. All 21 of these participants were contacted by phone, of which 16 consented to and completed the interview. Eight participants from each group were interviewed. The overarching goals of the interviews were to identify patient perspectives on medication use and/or deprescribing and to investigate the lifetime construction of knowledge which informs these perspectives.

The average interview length was approximately an hour. Each interview was audio-recorded and transcribed verbatim. Participants were asked where they

would like the interview to take place, and all respondents asked to be interviewed in their homes. Interviews were conducted between December 2016 and October 2017. A semi-structured interview guide was used to help steer, rather than control, the conversations. The interviews expanded beyond the guide in diverse ways, depending on how participants shaped the conversation. Kallio et al. (2016) note that it is this versatility and flexibility of the semi-structured interview that makes it one of the most popular methods of data collection for qualitative research in the context of health care. This method allows participants the space for unique verbal expressions guided by questions based on previous knowledge and research into the topic area of interest (Kallio et al., 2016). Therefore, the semi-structured interview guide evolved from interview to interview, allowing for impromptu follow-up questions dependent upon the participants' responses. These follow-up questions were focused upon specific experiences related to medication use, and probes were used to unpack participants' values and beliefs about their medications.

To be eligible for this study, participants had to be over the age of 70 years and experiencing polypharmacy (defined for these purposes as the concurrent use of five or more prescription medications). Patients who did not speak English, had cognitive challenges, and/or had anticipated morbidity within 6 months were not eligible for this study. Interviews were conducted with 16 older adults ranging in age from 73 to 90 years (mean age: 81 years). All participants resided in Southern Ontario, Canada. Eleven respondents identified as female and five respondents identified as male. All participants were recruited from a primary care setting. The participants' initials used in the upcoming presentation of results were randomly generated to protect participant anonymity. All participants provided written consent.

Thematic analysis of interview transcripts was informed by Braun and Clarke's (2006) six-phase method. Thematic analysis is a flexible method of qualitative data analysis and allows the analyst to move beyond basic data organization and description toward critical interpretation and analysis (Maguire & Delahunt, 2017). There were two coders, and the analyst used Dedoose Qualitative Software to assist with the process. Qualitative data were analyzed for apparent themes and patterns (Maguire & Delahunt, 2017). The first step of this method involved the coders familiarizing themselves with the data. This was accomplished by recording hand-written notes immediately after the interview, interview transcription, and reading through the transcripts several times to record initial observations. In the second step, codes were developed and excerpts from the interview transcripts were recorded under these codes (Braun & Clarke, 2006). In the next step, the codes identified in the second step were organized and reorganized into possible

themes. Next, Braun and Clarke (2006) advise analysts to look for themes that should be removed (not enough support from data) or collapsed together (two themes overlapping). During this process, themes that could be broken into two separate themes were also identified. Next, the fundamental spirit of each theme was identified, allowing for the stories of each to fit together to construct the "big picture story" of the larger research project. The final stage of Braun and Clarke's (2006) six-phase method involves the presentation of this "big picture story" in the form of a written report.

Braun and Clarke's (2006) method for thematic analysis allowed for the identification of relevant themes that were then linked back to the literature using the conceptual framework of embodied learning: agency and subjectivity, reflexivity and cognitive deliberation, capacity for symbolic thought, and life-course expertise. These smaller stories fit together to explain how older adults develop authority over their own bodies and health. This authority is helpful in understanding older adults' perspectives on polypharmacy and deprescribing.

## Findings

### *Forms of Embodied Knowledge*

To act independently, autonomously, and of free will is to have agency. Many of the older adults interviewed for this study demonstrated such self-determination in the establishment and maintenance of their medication routines. Respondents commonly reported that they blend expert medical advice with other sources of knowledge to make independent judgments about the best course of action for themselves as individuals. Such acts of agency were demonstrated by participants' *active engagement* in the management of their health care. By actively engaging in this complicated work, older adults accumulate active embodied knowledge on which to base their decisions about how to use medicines.

*Active embodied knowledge.* Participants expressed numerous and diverse processes through which they actively engage in the management of their medications. In addition to many external agents (most notably health care professionals), the intellectual self, dwelling within the body, also acts on the body. For many respondents, this intellectual self maintains active engagement in their medication routines—accepting, modifying, or rejecting the prescribed direction of health care professionals. This critical cognitive participation takes on many forms. In some cases, participants reported an ongoing self-surveillance, as was the case for I.P., who articulated her reliance on the messages that she receives directly from her body: "I think probably I'll be watching how my body reacts." Information obtained via this surveillance is then used to justify the maintenance, termination, or



modification of the medication use. Engagement of this nature was revealed in the words of L.C.:

Well that's what they told me to do, but I don't think there's any rule. I think I can break the rule, I never asked them, but that's the way I like to do it. And it seems to be working because my count seems to be lowering.

This demonstrated active intellectual engagement with the body; the data collected by way of this engagement facilitate the development of embodied expertise, consequently informing how the individual will use their medications moving forward.

Active engagement with health and medications was not only found to be important in helping older adults to make decisions about their medications—it also proved to serve an important function in the preservation of self-esteem. Participants demonstrated a preferred autonomy derived from having the physical and cognitive capacities necessary to manage their own medication routines. In L.C.'s words, "I am in control and I know what I am doing." One way that older adults reported maintaining this level of engagement (and in turn, autonomy) was through the performance of their own independent research. In conjunction with formalized medical advice, this independent research is used to more fully complete the knowledge base that older adults' access to support their health-related decisions. As H.D. explained, "the first thing I would do if . . . somebody put me on a new drug is go on the computer and find out what I could about it."

Having accessed diverse knowledge sources, many participants of this study reported using this information to generate and articulate personal theories to explain health and illness. These theories are used to make predictions, as was the case for H.D., "my theory is that all the things you've had in the past recur when you're old, ten times worse sort of thing." These theories were also found to offer analysis of the health care industry, as articulated by P.S., "I'm quite sure every medication out there in the world has comparable manufacturers doing it, maybe giving it a different name." P.S. also offered theories which infused a hierarchical value into medications, "my blood pressure medication [is the most important], I need that now." Others, including I.P., offered hypotheses, "I am getting older, and I wondered if maybe because your body slows down and so on and so forth, that maybe I don't need such a big dosage of them. So I wondered about checking the dosages."

Finally, some respondents constructed theories to offer diagnostic insight, including W.T., who stated, "I don't think I'm depressed with a capital D, I think all of us could be depressed at times." Here, older adults are establishing their personal agency by actively engaging in the management of their health care, as evidenced by the proposal of these broad and unique personal theories which predict, analyze, assess, hypothesize, and diagnose. These theories are illustrations of the embodied

knowledge that older adults deem legitimate and relevant when making decisions about their medications.

Several of the older adults interviewed for this study were health care experts, not only as the result of their personal experiences, but of their professional specialties. Most commonly, nursing was the disciplinary background responsible for such professional expertise. K.G. holds a PhD in physiology ("Because I'm a physiologist, I know my body"). This form of expert embodied knowledge and hands-on experience required for such careers involves an active engagement by the participant into the field of medication practice. Such engagement positions the participant not as the body being acted upon, but rather as the body doing the acting, perhaps on other bodies, specifically in medication administration. Beyond the practical experience of administering medications, these occupations demand an expertise in the biochemistry of medications. These competencies are evidenced in many participants' superior comprehension of how the medications are acting on their bodies (e.g., adverse side effects, symptom management, improved longevity) and how the medications are interacting with each other.

Participants with these professional backgrounds also demonstrated expertise in the operational aspects of the health care system, as evidenced by K.G., the physiologist, when she explained her familiarity with health care settings: "I also know the system! I've been and worked within the hospital system for a very long while." These expert participants also articulated a deep understanding of their medical histories, as was the case for X.T., an 85-year-old retired nurse. X.T. explained the influence of her nursing education on her understanding of her body when she said, "the first thing you learn as a nurse is to be objective and to be observant. And as I was saying, I've been observant about my own body and how it works since I was young." It is through these life-course careers which necessitated medication expertise that some older adults actively engaged in their medication practice. In such cases, this active engagement—or agency—is both physical and intellectual. For these participants, the knowledge that informs their decisions about medications is strengthened by specialized expertise accumulated throughout their professional lives.

Through active engagement (including independent research and the proposal of personal theories) and professional experiences, older adults act as agents of their own lives. This agency is key to the construction of embodied knowledge, which older adults rely upon in the establishment of habitual medication routines. If health care providers intend to guide patients through deprescribing programs, appreciation of this lifecourse of agency-informed expertise is critical.

*Passive embodied knowledge.* The older adults in this study consistently reported the nature of embodied learning by way of the effect medical interventions had on their bodies. H.D. described her understanding of her

body by observing and articulating its reaction to Tylenol, “All drugs have a big effect on me. And if I take one Tylenol and I sit down . . . I just fall asleep like that.” This surveillance of one’s own bodily responses to medical intervention enables older adults to advocate for themselves with medical professionals. This was the case for X.T.; her body was telling her that one of her medications was not working for her, and she had to work to have this knowledge validated, “I kept saying, this isn’t working for me. So finally somebody heard me and put me on something else and I like that.” By way of embodied knowledge, X.T. detected that a particular medication was inappropriate for her, and she had to work to have this knowledge legitimized.

In addition to this type of advocacy, participants reported using embodied knowledge to promote their own quality of life by balancing medical advice regarding their particular diagnoses with a personal desire for indulgence. An awareness and ultimately an expertise of one’s diagnosis, coupled with an awareness of how one’s body responds to specific lifestyle behaviors, allow older adults to promote quality rather than only quantity of life. This process is expressed in a rather detailed but revealing passage from W.T.:

Because I think a diabetic knows their body, knows what they’re eating. If I go to the Keg for dinner, if I’m going to have a nice big at steak and a roast potato with, I don’t like sour cream, but with butter. And I’m going to have salt, and I’m going have things and a couple of drinks, a glass of wine and a dessert and that, why not? You know, that happens twice a year. Then I know that I can maybe take two more units because I’m going, and I take my sugar the next day and of course it’s up. And I treat myself with ice cream in the summer once a week. Ice cream seems to be the worst for diabetics, over chocolate bars or anything. Certainly for me. So when I have ice cream, it’s usually a Sunday. When you’re alone, it’s challenging to make your own meals, to eat nutritiously and properly. Anyway, it’s a nano, but I’m not that bad a diabetic. Then I don’t adjust it or anything because that’s me knowing I’m taking something that’s on a list to be careful about. And for a day or two, my sugar and glucose will be elevated. It takes that long to get the ice cream out of the system. Interesting. So that, I will adjust and know what to do with it and everything falls back into place when I’m okay. That same would be if I go for a brunch, birthday brunch and I’ll have waffles and maple sugar. Yeah, I mean, we’re going to live or might as well be dead and that might be once or twice a year too.

Another participant, M.N., was similarly alert to the influence that occasional changes to dining habits have on her body:

Sometimes it depends on what we eat too. You know, we had a dinner to go to, the rehearsal dinner to go to. Well the rehearsal was so late, we were in the restaurant at 9 o’clock getting dinner. So I ate things I shouldn’t have eaten. So the next morning I took my blood and underneath it, I wrote

“was at rehearsal dinner” [to remember] why it went up that high.

X.T. provided a similar report stating,

I just had it this morning, I had a half an apple for breakfast and a bowl of bran flakes and that shot my blood sugar up. And I could always feel it because I get visual problems. So I took a cinnamon and I’m back down again.

In some cases, it is not only dietary considerations, but other environmental triggers that respondents have, over time, learned to associate with unique physiological outcomes. In recognizing these particular associations, older adults have accumulated the knowledge necessary to know what is “normal” for their own bodies and what is “abnormal” and thus cause for concern. L.J. demonstrated this type of knowledge as she explained the relationship she has discovered between weather conditions, her activity levels, and her blood pressure:

I’d even try checking [my blood pressure] on a hot day when I’d come home hauling groceries and I’m hot. Yeah, my heart rate will be a bit higher, my blood pressure would be higher. Sit down for 15 to 20 minutes and its back down.

Here, L.J.’s body is the subject being acted upon by external forces. As these external forces take action on the body, L.J. learns more about her body. I.P. summarizes this learning in promoting the importance of remaining attuned to the messages that her body sends, explaining that “you have the feelings of your body. I’m a firm believer that your body tells you a lot of things. So you just have to be aware.”

In these respondents’ experiences (representative of many other participant reports), a lifetime of embodied learning has equipped them with the knowledge necessary to make decisions regarding their bodies. For older adults, decades of observing their physical reactions to various medicines and other dietary behaviors locates them as experts of their own bodies. Health care teams must recognize this knowledge if deprescribing programs are to become standard medical care for older adults.

Although this evidence for embodied learning positions the body as subject being acted upon by medical intervention and lifestyle behaviors, embodiment theory has inadequately addressed the role of thought (Shilling, 2017). In these physical experiences alone, learning is not achieved. It is these physical experiences in combination with cognitive awareness through which learning is facilitated (Dewey, 2011; Shilling, 2017).

### *Reflexivity and Expertise*

Evidence of reflexivity and cognitive deliberation is reflected in the above discussion of agency. Specifically, participants’ professional expertise (as nurses and academics) and active engagement in their health care

plans (via the performance of independent research and the development of personal theories) demonstrate the multifaceted ways in which older adults cognitively deliberate upon their medication use. According to Dewey (2011) and Shilling (2017), this is a necessary ingredient in embodied learning.

Many of the older adults interviewed reported that they are motivated to know all that they can about the medications that they are prescribed. X.M. expressed, "I'm happy to learn anything at all about medications and what I'm taking and if they're the right thing or not." Here, X.M. is inclined to acquire the necessary information, reflect on that information, and then draw her own conclusions regarding the appropriateness of the prescribed medication. In the same way, L.C. would "just like to know the ins and outs." Neither X.M. nor L.C. are passive recipients of medicines. Rather, they are reflexive and engaged in cognitive deliberation to evaluate the suitability of their medicines. This evaluation demonstrates the influence of embodied expertise on the choices participants make concerning their medications.

By evaluating the suitability of one's medications, some older adults are empowered to resist any actions taken upon their bodies that they deem unnecessary or harmful. For example, L.G. reported that following her own personal research, she had determined that a medication was unsafe. She was therefore qualified to express her resistance to that medication: "I knew what the drug was and the problems they're having with it. I would have refused it." For some, this work is informed by their professional expertise, as was the case for K.G., holding a PhD in physiology. K.G. is able to assess the suitability of a medication by engaging in intellectual deliberation underpinned by her academic qualifications: "Because I'm a physiologist, I know my body and I know what's necessary." K.G. even reported that she often refers back to her textbooks to evaluate her treatments. X.T., a retired nurse articulated this relationship when she explained, "I didn't really feel the medication I was on was appropriate to me—I'm a nurse by training." This ongoing reflexivity is evidence of the intellectual engagement necessary for the facilitation of embodied learning, the production of expertise, and the subsequent decisions made about how to use medications.

Reflexivity and cognitive deliberation are not exclusively used to evaluate whether or not one should take a prescribed medication. These intellectual practices are also engaged to determine how and when a prescribed medication should be taken. For example, O.F. demonstrated extensive critical thought regarding her insulin dosage:

The insulin that I take, I've reduced the amount based on what the readings are. I do my blood every morning. I think the order was for 40 mg of Lantus at nighttime—insulin and I reduced it to 24 units because that keeps the blood in

normal range. When I shared that with the family practice, that was ok because I was making a judgment call based on fact.

After deliberating over her situation, O.F. made a judgment call about her medication dosage. She did not passively accept the higher dosage, but rather considered other factors and came to an alternate conclusion. L.C. also made a judgment call regarding his medication dosage, despite his doctor's reassurance that the prescribed dosage was safe:

I figured that they interact with each other so just like grapefruit juice interferes with Lipitor, you never know with all those other drugs. Doctors said it's ok, but they could be wrong, you never know. It might interfere with me and I might be allergic to it and things like that so I like to spread it out and it's been working ok with me.

Here, L.C. was concerned that taking certain medications too close together might result in adverse drug reactions. Despite his doctor's opinion, L.C. remained apprehensive and modified his medication routine based on his own evaluation of the situation.

As evidenced in each of these respondent's reports, knowledge accumulation is the result of physical experiences of the body coupled with critical reflection upon those experiences. The ways in which older adults engage with their medications are underpinned by this embodied expertise. Analysis will now unpack the additional role of symbolic thought in the ongoing accumulation of this knowledge.

### *Symbolic Thought and Decision-Making*

Older adults are now being encouraged to deprescribe, despite a history of socially ingrained age-related norms that equate the aged body with the polypharmaceuticalized body. As demonstrated by W.T., "you've probably heard from all the seniors, you've probably heard them talking about Lasix . . . most seniors who have any bone loss do that, it's called Prolia. And just about every senior takes Prolia every six months." From W.T.'s perspective, all older adults are taking the same medications; to be medicated is very much the norm. This perspective holds implications for deprescribing, as older adults may be hesitant to reduce their medications if they hold the belief that polypharmacy is an age-related norm.

As cultural attitudes toward medications evolve in alignment with a biomedical awareness of the risks of polypharmacy and the benefits of deprescribing, older adults must engage in symbolic thought to make decisions relating to their medication practice. This type of thought is characterized by considerations of the following.

For many of the respondents, it is necessary to weigh the potential future benefits and risks of taking a



medication as prescribed. For example, L.C. described how he decided to spread out the dosage of a certain medication, for fear that it might cause adverse reactions: "It might interfere with me and I might be allergic to it and things like that so I like to spread it out and it's been working okay with me." Here, L.C. has contemplated possible future outcomes, drawn conclusions, and used this expertise to justify a modification to his present behavior.

To make a decision about future behavior, older adults were found to deeply consider the various forms of information required to take action. For M.K., pain level was a clear indicator for whether or not a medication is necessary: "if I was in pain two or three times a day, or constant, I'd just go back on it." Accordingly, participants were found to most heavily rely on the messages they receive from their body to determine whether or not they should take a certain medication. I.P. summarizes this phenomenon:

I just make my own decisions, sort of check, listen to both sides, and then sort of think about how [my] body reacts . . . I think that's my decision, right? I think probably I'll be watching how my body reacts.

Therefore, older adults rely upon their bodies' signals to help them decide if/how to take a medication.

In addition to information received from the body, older adults accessed further information to complete their medication knowledge base. For some, the internet was an easily accessible source of information, as was the case for L.O.:

Say we were put onto a new medication or dosage increased or we're having some, like for instance the swelling or something like that, we'd go onto the internet and check and see if it's some of the medication that's a side effect for.

The pharmacist and family physician were also considered reliable sources of information. Notably, some respondents reported that they would "shop around" for the response that they were most comfortable with. W.T. explained that she would assess the information provided by a professional, and if necessary seek out further and possibly alternative professional advice: "I might go ask the pharmacist first because it's close and if I don't like his answer or if he's iffy, I'll go to my doctor." For these respondents, to make decisions about how they will engage with medications in the future, they must consider and evaluate the various sources of information necessary to support that decision-making process.

As older adults are placed on deprescribing plans, engagement in these hypothetical exercises becomes increasingly more necessary. Although strongly supported by the biomedical evidence, deprescribing programs compel older adults to reconceptualize their relationship to medications and to reassess their medication knowledge. It is largely this embodied knowledge that predicts their relationship to and use of medications;

therefore, it is the capacity for symbolic thought that creates space for this reconceptualization to occur.

### *Accumulating Expertise Across the Lifecourse*

As participants reflected upon their lives, various themes were identified that represent their long-term relationships with their bodies, health, and medicine. Participants' long-term experiences in and relationships with their bodies have resulted in unique personal medical histories of which they are the experts. In the words of O.F., "I've been a diabetic for 19 years, so I'm pretty used to it." For O.F., nearly two decades of living in a diabetic body has familiarized her with the ways in which her condition acts on her body and the many factors (e.g., diet and insulin) that influence her condition. Supported by this longitudinally informed knowledge, O.F. has become an expert of her own body and relies upon this expertise to make health-related decisions.

Conversely, X.T. relied upon her knowledge of her personal medical history to advocate for herself and identify a diagnostic error:

I was diagnosed at that time as Type II Diabetic and I felt terrible. I never honestly believed that I had diabetes, and I know that that could be part of denial, but in my case I don't think it was because I've been hypoglycemic since I was a child.

Knowing that she had been hypoglycemic since childhood, X.T. could not accept a diagnosis that did not fit with her personal expertise. H.D. similarly had experiences with medical error, creating a general distrust of health care providers: "I've never ever thought that the doctor knew best . . . I've had some very unfortunate episodes in my life with the medical profession. Partly through, well ignorance, they just didn't know." For H.D., some medical errors were inevitable and perhaps justifiable simply because the research and technology that we rely upon today was not historically available. These experiences, however, have colored her relationship with the health care system, been influential in the production of her embodied knowledge base, and thus are predictive for how she engages with medicine.

Having observed these advancements in research and technology, older adults have been witnessing the evolution of the health care system. H.D. laughed as she shared her perspectives on how the delivery of health care has transformed:

But now the fashion is the sooner they get it fixed, the better, you know? Fashions over the years have changed enormously . . . I'll refer to something and these young [doctors] will say, "what's that?!" Or somebody said, "why didn't they give you an MRI or something?" And I'll say, "well they didn't have any!"

Here, H.D. is positioned as expert, sharing with her health care providers why her medical care has unfolded



in a certain way. For health care providers who have not personally witnessed these historical transformations in health care, the answers to what are seemingly simple questions to older patients may not be so obvious.

Having accumulated many decades of experiences, older adults have developed a rich understanding of their personal medical histories and a nuanced awareness of both the flaws and improvements of the medical system. It is these lifecourse experiences that position older adults as experts of their own bodies and that ultimately predict how they engage with medicines. As X.T. summarizes, “you pick things up as you go along.”

## Discussion

The findings of this study are largely consistent with the literature on embodiment and embodied learning. Data analysis revealed that in collaboration with traditional medical advice, older adults rely upon a diverse number of sources, accumulated across their lifetime, to help them make decisions about their medications. The body itself was found to be a fundamental source of this learning.

As detailed by Griffin (2017), the human body simultaneously engages in two social practices in the ongoing development of embodied knowledge and habits. The first of these social practices is *agency*, in which the body engages in a certain action. In this particular case, the action of relevance is medication practice. The second of these social practices in the expansion of embodied knowledge is *subjectivity*. When the human body is positioned as subject, it is being acted upon by external agents. As it relates to medication practice (and particularly deprescribing), these external agents might include family physicians, specialists, pharmacists, other allied health professionals, family, friends, and even the medications itself. The simple physical experience of living in a body that is being acted upon by external forces creates opportunity for knowledge acquisition regarding how the body, as the passive subject, reacts to such forces. Fundamentally, as medications and health care teams take action on the body, the inhabitant of that body learns. In turn, that learning is predictive of medication-related decisions.

Habits are developed as the result of this ongoing and synchronized nature of agency and subjectivity (Griffin, 2017). Accordingly, older adults' habitual medication routines and overall relationships with their medications are the result of a lifetime of experiences as both agent and subject, which is consistent with the findings of this study. These experiences are fundamental to the formation of embodied knowledge, which was found to be a predictive factor in how older adults make decisions about their medications.

As our bodies (as subjects) physically experience the role of medications, our minds (as agents) must critically reflect on that role in order for embodied learning to occur. Cognitive deliberation is essential to the

understanding and transmission of cultural norms (Shilling, 2017), including norms related to health practices. According to Shilling (2017), information passes through the pre-reflective sensory routes of the body, but learning is only achieved when one cognitively deliberates on that information. This learning was found to facilitate the construction of embodied knowledge which subsequently was found to influence medication-related decisions.

Symbolic thought involves the virtual maneuvering of symbols that represent the world around us (Dewey, 2011; Shilling, 2017), allowing humans to consider challenges and propose feasible solutions. Doing so provides the opportunity to generate these solutions without tangible and instantaneous sensory knowledge. To be constrained to perceptions of only the present would be limiting to human thought—symbolic thought therefore provides humans the means needed to predict, consider, and solve future problems. This skill is especially important given the ever-changing social institutions in which our lives operate (Shilling, 2017). In order for humans to thrive in such evolving social contexts, we must engage in this cognitive practice. The health care system is an example of one such evolving institution. With changing cultural attitudes and emerging research, our relationships with medications are in a state of flux. Specifically, despite popularized images of the polypharmaceuticalized older adult, older adults are now being encouraged to deprescribed. The participants of this study demonstrated engagement in symbolic thought as a means of navigating this changing cultural landscape.

This discussion of participant engagement is consistent with not only embodiment literature but also the literature that specifically examines how people use medications in the context of aging. For example, Ballantyne et al. (2011) explain that older adults demonstrate a sense of personal responsibility over their own health. Attaining and maintaining health is the result of one's own initiatives and actions (Ballantyne et al., 2011), including physical/social activities, diet, and the critical evaluation of medical advice (Ballantyne et al., 2011). In this way, rather than positioning older adults as passive recipients of conventional medical intervention, they should be more accurately understood as active players in the ongoing management of their health and well-being in later life.

This discussion of embodied learning would be exceptionally limited if it were not to explicitly adopt a lifecourse perspective. A cross-sectional snapshot of older adults' embodied knowledge would be an inadequate representation of the many years of lived experience that older adults rely upon when deciding how to engage with their medications. Given that medical practitioners aim to integrate deprescribing programs into standard medical care of older adults, the many years of lived experience of these patients must be considered. The findings of this study demonstrate that older adults possess a lifetime of experience related to their personal

medical histories, experiences with medical errors, and observed evolution of the health care system. These themes represent older adults' long-term relationships with their bodies, health, and medicine.

## Limitations

The cross-sectional nature of this study places limits on its implications. Given that participants were interviewed only once, the findings do not offer adequate insight into how embodied knowledge is developed over time. Future longitudinal approaches would be valuable in offering this perspective. Further to temporal considerations, this work does not address the gendered patterns of medication management. Although gendered differences are beyond the scope of the present research, it is noteworthy that the majority of participants identified as female. Future studies might consider gendered differences in the accumulation and application of embodied knowledge, although significant differences did not emerge from the data in this study.

Importantly, the researchers conducting the qualitative component of the larger TAPER Project did not have access to other information that should be deemed relevant for future research. This information includes level of education, employment history, socioeconomic status, race and ethnicity, living arrangements (alone/shared), number of medications, and type of medications (prescribed, over-the-counter, herbal, etc.). Much of this information should be deemed meaningful as some (race/ethnicity, education, socioeconomic status) represent different forms of capital which inform biographical experience and thus different forms of expertise. Bourdieu (1985) identified four types of capital, including social, economic, cultural, and symbolic—which together determine one's social life trajectories. Based on this identification, Coleman (1988) emphasized how individuals use concrete resources that have been actualized from social capital. This access to concrete resources for use by individuals—which ultimately informs biography and narrative—is relevant to the findings presented in this article as participants' educational and professional backgrounds are reasonable predictors of their capacity to engage in reflexivity and cognitive deliberation. Simply, some older adults are better positioned to engage intellectually to facilitate embodied learning, produce expertise, and subsequently make decisions about how to use their medications. Accordingly, future research should investigate how various marginalized communities construct the knowledge necessary to inform decisions around medication management.

## Conclusion

Embodied learning, bolstered by the scope of human cognition, "helps individuals scrutinize their own

desires and habits" (Shilling, 2017, p. 1209). Such personal analysis is evident in older adults' medication practices and intensifies when their health care providers encourage a modification of this practice. Encouraging modification forces older adults to evaluate not only if the modification is feasible but also if it is in alignment with their personal expertise. In doing so, a lifetime of embodied learning, including systematic and symbolic thought, allows the older adult to negotiate the relationship between their bodily impulses and other competing demands. In the context of deprescribing, this negotiation might include balancing one's instinct to medicate despite medical advice to the contrary.

Using in-depth semi-structure qualitative interviews, this RCT set in routine primary care allowed for the examination of older adults' relationships with their health care routines, specifically medication practice. Through the lens of embodied learning, this examination demonstrated the ways in which older adults rely upon their personally curated expertise to inform their decisions regarding medication use when confronted with the task of deprescribing. Particularly, older adults are engaging in the processes of agency and subjectivity, reflexivity and cognitive deliberation, and symbolic thought. These are social processes that occur across the lifecourse and are critical in the generation of knowledge and expertise, ultimately informing how older adults make decisions about their medications.

The problematizing of polypharmacy in the biomedical literature (Garfinkel et al., 2015; Reason et al., 2012; Scott et al., 2014) has motivated health care providers to advocate for programs of deprescribing to be integrated into the standard care of older adults (Scott et al., 2014). The design of these deprescribing programs necessitates a profound understanding of and appreciation for the knowledge that older adults hold over their own bodies. As health care practitioners aim to promote quality of life in seniors by addressing the risks of polypharmacy, thoughtful and critical reflection on this expertise will increase the value of such programs while protecting patient dignity and autonomy.

As Griffin (2017) observes, health behaviors are social processes as they operate within specific social contexts. As such, human engagement with health behaviors is infused with the very complexities of social life, including our "personal insecurities, pressures, concerns, and fixations" (Griffin, 2017, p. 556). Therefore, designers of deprescribing programs are tasked with understanding the social networks within which deprescribing exists. Future research should examine the role of medications as dynamic social agents acting in these complicated social networks. Social science perspectives such as these are essential in addressing the risks of polypharmacy and ultimately in optimizing the ways in which medications are used to promote quality of life for older adults.

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## References

- Al-Hashar, A., Al-Zakwani, I., Eriksson, T., & Al Za'abi, M. (2017). Whose responsibility is medication reconciliation: Physicians, pharmacists or nurses? A survey in an academic tertiary care hospital. *Saudi Pharmaceutical Journal*, *25*(1), 52–58.
- Alpert, P. T., & Gatlin, T. (2015). Polypharmacy in older adults. *Home Healthcare Now*, *33*(10), 524–529.
- Ammerman, C. A., Simpkins, B. A., Warman, N., & Downs, T. N. (2019). Potentially inappropriate medications in older adults: Deprescribing with a clinical pharmacist. *Journal of the American Geriatrics Society*, *67*(1), 115–118.
- Archer, M. (2012). *The reflexive imperative in late modernity*. Cambridge University Press.
- Ballantyne, P. J., Mirza, R. M., Austin, Z., Boon, H. S., & Fisher, J. E. (2011). Becoming old as a “pharmaceutical person”: Negotiation of health and medicines among ethnoculturally diverse older adults. *Canadian Journal on Aging*, *30*(2), 169–184.
- Barnett, N. L., & Oboh Smith, K. (2016). Patient-centred management of polypharmacy: A process for practice. *European Journal of Hospital Pharmacy*, *23*(2), 133–117.
- Blaxter, M. (2010). *Health* (2nd ed.). Polity Press.
- Bourdieu, P. (1985). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Greenwood.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.
- Canadian Deprescribing Network. (2017). *What is deprescribing?* <https://www.deprescribingnetwork.ca/deprescribing/>
- Canadian Institute for Health Information. (2014). *Drug use among seniors on public drug programs in Canada, 2012*. [https://secure.cihi.ca/free\\_products/Drug\\_Use\\_in\\_Seniors\\_on\\_Public\\_Drug\\_Programs\\_2012\\_EN\\_web.pdf](https://secure.cihi.ca/free_products/Drug_Use_in_Seniors_on_Public_Drug_Programs_2012_EN_web.pdf)
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, S95–S120.
- Crossley, N. (1995). Merleau-ponty, the elusive body and carnal sociology. *Body and society*, *1*(1), 43–63.
- Crossley, N. (2004). The circuit trainer's habitus: reflexive body techniques and the sociality of the workout. *Body and society*, *10* (1), 37–69.
- Dewey, J. (2011). *How we think*. Martino.
- Fried, T. R., & Mecca, M. C. (2019). Medication appropriateness in vulnerable older adults: Healthy skepticism of appropriate polypharmacy. *Journal of the American Geriatrics Society*, *67*(6), 1123–1127.
- Garfinkel, D., Ilhan, B., & Bahat, G. (2015). Routine deprescribing of chronic medications to combat polypharmacy. *Therapeutic Advances in Drug Safety*, *6*(6), 232–233.
- George, C., & Verghese, J. (2017). Polypharmacy and gait performance in community-dwelling older adults. *Journal of the American Geriatrics Society*, *65*(9), 2082–2087.
- Griffin, M. (2017). Embodied learning and new physical activity in mid- and later life. *Qualitative Research in Sport, Exercise and Health*, *9*(5), 554–567.
- Gustafson, D. L. (1998). Embodied learning about health and healing: Involving the body as content and pedagogy. *Canadian Woman Studies*, *17*(4), 52–55.
- Hajjar, E. R., Cafiero, A. C., & Hanlon, J. T. (2007). Polypharmacy in elderly patients. *The American Journal of Geriatric Pharmacotherapy*, *5*(4), 345–351.
- Hanlon, J. T., Weinberger, M., Samsa, G. P., Schmader, K. E., Uttech, K. M., Lewis, I. K., Cowper, P. A., Landsman, P. B., Cohen, H. J., & Feussner, J. R. (1996). A randomized, controlled trial of a clinical pharmacist intervention to improve inappropriate prescribing in elderly outpatients with polypharmacy. *The American Journal of Medicine*, *100*(4), 428–437.
- Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, *72*(12), 2954–2965.
- Kaufman, G. (2016). Polypharmacy: The challenge for nurses. *Nursing Standard*, *30*(39), 52–60.
- Krishnaswami, A., Steinman, M. A., Goyal, P., Zullo, A. R., Anderson, T. S., Birtcher, K. K., Goodlin, S. J., Maurer, M. S., Alexander, K. P., Rich, M. W., & Tjia, J. (2019). Deprescribing in older adults with cardiovascular disease. *Journal of the American College of Cardiology*, *73*(20), 2584–2595.
- Maggiore, R. J., Gross, C. P., & Hurria, A. (2010). Polypharmacy in older adults with cancer. *The Oncologist*, *15*(5), 507–522.
- Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *AISHE-J: The All Ireland Journal of Teaching and Learning in Higher Education*, *9*(3), 3351–33514.
- Maher, R. L., Hanlon, J., & Hajjar, E. R. (2014). Clinical consequences of polypharmacy in elderly. *Expert Opinion on Drug Safety*, *13*(1), 57–65.
- Molokhia, M., & Majeed, A. (2017). Current and future perspectives on the management of polypharmacy. *BMC Family Practice*, *18*(1), Article 70.
- Morgan, S. G., Hunt, J., Rioux, J., Proulx, J., Weymann, D., & Tannenbaum, C. (2016). Frequency and cost of potentially inappropriate prescribing for older adults: A cross-sectional study. *CMAJ Open*, *4*(2), E346–E351.
- Morin, L., Johnell, K., Laroche, M. L., Fastbom, J., & Wastesson, J. W. (2018). The epidemiology of polypharmacy in older adults: Register-based prospective cohort study. *Clinical Epidemiology*, *10*, 289–298.



- Ouellet, G. M., Ouellet, J. A., & Tinetti, M. E. (2018). Principle of rational prescribing and deprescribing in older adults with multiple chronic conditions. *Therapeutic Advances in Drug Safety*, 9(11), 639–652.
- Page, A. T., Clifford, R. M., Potter, K., Schwartz, D., & Etherton-Beer, C. D. (2016). The feasibility and effect of deprescribing in older adults on mortality and health: A systematic review and meta-analysis. *British Journal of Clinical Pharmacology*, 82(3), 583–623.
- Reason, B., Turner, M., McKeag, A. M., Tipper, B., & Webster, G. (2012). The impact of polypharmacy on the health of Canadian seniors. *Family Practice*, 29(4), 427–432.
- Reeve, E., & Wiese, M. D. (2014). Benefits of deprescribing on patients' adherence to medications. *International Journal of Clinical Pharmacy*, 36(1), 26–29.
- Scott, I. A., Anderson, K., Freeman, C. R., & Stowasser, D. A. (2014). First do no harm: A real need to deprescribe in older patients. *Medical Journal of Australia*, 201(7), 390–392.
- Shilling, C. (2017). Body pedagogics: Embodiment, cognition and cultural transmission. *Sociology*, 51(6), 1205–1221.
- Statistics Canada. (2015). *Medication use among senior Canadians*. <https://www150.statcan.gc.ca/n1/pub/82-003-x/2009001/article/10801/findings-resultats-eng.htm>