



# Cultural Knowledge in Context – People Aged 50 Years and Over Make Sense of a First Fracture and Osteoporosis

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## Abstract

Catch a Break (CaB) is a secondary fracture prevention program that uses medical understandings of osteoporosis to assess first fractures and determine appropriateness for secondary fracture prevention. In this study, we interviewed CaB program participants to identify the understandings that patients themselves used to make sense of first fractures and the osteoporosis suggestion as cause. Semi-structured interviews were conducted with female and male participants of the CaB program in Canada. An interpretive practice approach was used to analyze the data. A random sample of 20 individuals, 12 women, and eight men all aged 50 years and over participated. First fractures were produced as meaningful in the context of osteoporosis only for seniors of very advanced age, and for people of any age with poor nutrition. The trauma events that led to a first fracture were produced as meaningful only if perceived as accidents, and having an active lifestyle was produced as beneficial only for mental health and well-being unrelated to osteoporosis. Cultural knowledge shapes, but does not determine, how individuals make sense of their health and illness experiences. Risk prevention program designers should include patients on the design team and be more aware of the presumptive knowledge used to identify individuals at risk of disease.

## Keywords

osteoporosis, primary fractures, lived experience, patient's sense-making

## Introduction

Osteoporosis, a progressive systemic biological disease characterized by low bone mass density (BMD) and deterioration of bone tissue, increase in bone fragility, and susceptibility to fracture, affects 50% of women and 20% of men in their lifetime (1). In 2010, more than 5 million first-fractures due to osteoporosis occurred in 12 industrialized countries in North America, Europe, and the Pacific Region, and 590 000 in Russia (2). Fragility fractures can cause acute and chronic pain, deformity, diminished quality of life, disability, loss of independence, nursing home admission, and death (3-9). Individuals with osteoporosis who experience a first fracture have a 20-fold increased risk of a second fracture compared to those individuals with a normal BMD and no prior fracture (3,10,11). There are about 130 000 osteoporotic fractures annually in Canada at a cost of \$4.6 billion (5,12).

In 2012, the International Osteoporosis Foundation introduced the “Capture the Fracture” approach to help reduce the incidence of secondary fractures (1). Secondary fracture

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prevention programs aim to identify individuals over age 50 with a first or primary fracture. Program facilitators identify patients at risk and alert the patient's family physician who then arranges for further investigations such as bone mineral density testing, vitamin and mineral supplementations, lifestyle behaviors, and prescription medication (5). Secondary fracture prevention programs have been established in the United Kingdom, Europe, Australia, Canada, and the United States (1).

Quantitative research on the success or failure of secondary fracture prevention programs typically focus on barriers to patient uptake of the osteoporosis diagnosis and lifestyle behavior modification suggestions (7,9,13,14). Some qualitative research identifies gaps in patient perception that affect willingness to comply with biomedical understanding of fragility (15). Some attention has been paid to the diagnosis experiences of the individuals affected (16). The question of how individuals with a first fracture understand the fracture within the cultural contexts of their own understandings remains unexplored. Therefore, the purpose of this study was to reveal how people aged 50 years and older use cultural knowledge about osteoporosis to make sense of a first fracture. We then comment on how patient's sense-making practices affect culture and what that might mean for osteoporosis clinicians and fracture prevention program designers. To do so, we took an interpretive practice approach (17,18). Interpretive practice takes the view that people construct the meaning of their experiences within cultural context, and that in doing so, reveal the degree to which culture shapes their thinking and decision-making (17,19-21). In the spirit of interpretive practice (22), we suspended our belief in the likelihood of osteoporosis as the underlying cause of a first fracture to show how patients make sense of a first fracture on their own terms.

## Methods

This study was one of a series of studies performed to evaluate the impact of secondary fracture prevention programs in Alberta from both system and patient perspectives (23-28). The catch a break (CaB) program was an Alberta-wide telephone-interview-based primary osteoporotic fracture identification and secondary fracture prevention program. The program used emergency department care records to identify individuals over age 50 with primary or first experiences of low trauma (high osteoporosis risk), non-hip fractures. CaB program staff contacted these individuals and invited them to participate in a telephone-based secondary fracture health risk assessment (HRA) survey (Appendix A). The aim of the CaB interview was to identify apparent first fractures, and to invite following up with a family physician. The survey included questions about lifestyle choices and the nature of the trauma event. On completion of the HRA survey interview, participants were invited to complete and mail a pencil and paper quality improvement (QI) survey (Appendix B). The QI survey concluded with a description of, and an invitation

to participate in a second interview study in which they would be asked to share their experiences of the CaB program. Accounts of how CaB program staff used survey concepts and their own felt sense of appropriateness to include people in the program have been reported elsewhere (23). For this study, we randomly selected 10 participants that CaB staff had documented as seemingly interested in following up with a family physician and 10 who were not interested. Given that men tend to be under-represented in osteoporosis research (29), we additionally sought to recruit at least 10 men. Given that multiple methods of common-sense reasoning and forms of cultural knowledge are likely to emerge from just a few interviews, we limited the study cohort to 20 individuals (30).

A post-doctoral researcher with qualitative research experience conducted one semi-structured interview with each person individually between October 27 and December 16, 2016, over the telephone in a private office. The interview guide (Appendix C) was structured to explore patient experiences of the CaB program and understanding of the fracture experience. We did not know and did not ask if these individuals had actually followed up with a family physician to discuss the possibility of osteoporosis. We did know, however, that the CaB interview was the first time these people had been exposed to the possibility of conceiving of osteoporosis as the underlying cause of the fracture. The interviews lasted from 18 to 60 min. Interpretive patterns noticed during the interview were documented as field notes and followed up within the analytic process.

A relationship with participants developed during the interviews, not before. There were no repeat interviews, and no one withdrew their participation. Interviews were digitally audio-recorded, anonymized, transcribed by professional transcribers, and stored on a password and finger-print protected lap-top computer during data collection. Transcriptionists signed a confidentiality agreement.

Using medical knowledge about osteoporosis identification as a cultural lens, PH identified the meanings and context through which participants made sense of their first fracture experiences and of osteoporosis as cause. Through multiple readings of the transcripts and in conversation, the research team discussed the initial findings, and identified the rationale and cultural knowledge that participant used to understand the fracture and make decisions. Analysis ceased when no new methods of reasoning or forms of cultural knowledge emerged. Word 2011 was used to store the data, emergent analysis, and analytic drafts. The entire research team then reviewed the outcomes and validated or made suggestions for additional data exploration. On completion of the study, audio files, field notes, and transcripts were transferred to an encrypted, password protected, secure shared drive. The study was approved by the Conjoined Health Research Ethics Board at the University of Calgary REB16-0258 and at the University of Alberta Pro00062903.

## Results

Semi-structured interviews were conducted with 27 individuals with a primary fracture experience. Of these, seven were subsequently excluded when we discovered that the CaB program staff had inadvertently included seven individuals with a secondary, rather than primary fracture. Two of those excluded in light of the prior osteoporosis diagnosis were men. Our final sample of 20 participants involved 12 women and 8 men. The median age was 73.5 years, with women ranging in age from 56 to 91 years and men from 59 to 77 years. In the analysis that follows, we show the ways in which patients make sense of a first fracture and of osteoporosis as cause. We comment on the impact of our findings on understanding the degree to which cultural knowledge of osteoporosis shapes patient experience, and on what that might mean for fracture prevention program designers.

### Age and Ageing Discourses

Participants commonly used stories, examples, and numerical age to construct and support an image of osteoporosis as that which affects seniors of advanced age. One participant used an extreme case example of a fracture and cited a specific number of years aged to perpetuate the dominant ageist view of osteoporosis, “my mother is 94”, with a severe fracture, “she fell and shattered her wrist” (P199, F, 65). Another participant used cultural knowledge about appearance, such as hair color “I don’t even have grey hair!” (P054, F, 56) and employment status, “you retire when you’re 65 and when you’re 65, you’re a senior” (P054, F, 56) to protect herself from being perceived as a senior with osteoporosis. She also cited information displayed on the CaB website to qualify the presumed relationship between seniors and fragility fractures, “it was a seniors’ forum on how to prevent falls for seniors. Age 49? Is that really a senior? I clicked it off” (P054, F, 56). Another participant perpetuated the perception that being old means feeling old to produce a vision of herself as young and therefore not a member of the osteoporosis community. The impact of doing so is to exclude young people who feel old from the osteoporosis suggested diagnosis, “I still feel pretty young” (P501, M, 61), as well as apparently “old” people who feel young.

There were outliers to presumptively linking seniors of advanced age and osteoporosis. Diet was used to render both younger and older individuals eligible for being a member of the osteoporosis community, “a lot of people when they’re older, especially if they’re alone, don’t get proper nutrition, calcium, magnesium, whatever to keep their bones strong” (P200, F, 63); “I mean, you can be a younger person and have osteoporosis because of poor diet (054, F, 56).

Exposure to the CaB program led at least one participant to question the presumed relationship between age, first

fractures, and osteoporosis, “So I always think about, you know, people, you know, mid to advanced middle age and senior citizens. That’s who I characterise in my own mind as having osteoporosis ... but I guess I’m just about 61 now (Laughter) so perhaps I apply” (P501, M, 61).

### Lifestyle Risk Discourses

Some participants perceived being “old” and fragile as more problematic to their sense of self than being active yet implicitly at risk of a fracture. Participation in the CaB program did not persuade these participants to risk foregoing the benefits of being active for the security of protecting themselves from having a first fracture, “If someone had told me about Catch a Break before I still would have gotten on my horse and ridden. I wouldn’t have changed my lifestyle. It likely would not have prevented this incident” (P057, F, 63). The mental health benefits of exercise were prioritized over the possible risk of an exercise-induced fracture, “You know, if I don’t ride (a bicycle), I don’t feel like I’m alive. I’ve been active my whole life, and it’s been a big help to me” (P175, M, 78).

The osteoporosis suggestion led one individual to wonder if he should choose to continue to participate in the tasks of daily living, “stuff I usually do” and risk a second fracture, or choose to respect the apparent risk and depend on others to do the things he would normally do, “Unless somebody was there to tell me don’t change the tire, then I might have listened to them and not done anything, but then again I’ve done that all my life, you know, I just do stuff that I usually do”. He also perpetuated cultural knowledge about physicians as having the responsibility to monitor patient behaviour, “... and if I get into trouble (from his physician) for doing it then I just have to stop and think about it” (P366, M, 72).

### Trauma Discourses

Participants identified factors from within their external and internal environments to make sense of the trauma event, and to categorize it as a normal accident or an indication of osteoporosis. Some used the inner inability to control time to render the accident unavoidable, and themselves unavoidably subject to the circumstances, “It happened really quickly; I had no chance to even think about how I was falling” (P008, F, 61). Others drew on factors in the external environment to explain what happened, “there’s a tiny curb sticking out that wasn’t marked” (P200, F, 63) and to understand the accident. Others used how they fell, what they fell on, or how hard or soft they landed to render the fracture relative to the circumstances “I was more sure it was the way that I fell rather than a problem with my bones” (P008, F, 61); “It was a fracture because of the heavy impact, not because my bones were brittle in any way, shape or form” (P200, F, 63). Taking responsibility for causing the accident rather than attributing the cause to osteoporosis, allowed some people to characterize the trauma event as an accident, “I crashed going down the hill on my bike because I’m stupid

and I went into the trees and fell over sideways ... so is that osteoporosis or ... Because I went down fairly hard right? Yeah so anybody could break a bone with osteo or not right?" (P307, M, 66). Construing risk as inherent in the activity, rather than in the bone, allowed participants to define risk prevention as accident prevention, "it's not like I was doing nothing, I knew I instigated it" (P032, M, 59); "So I probably just thought, I just did something stupid" (P307, M, 66). I just fell off my bike, come on. (hah) Let's not make a big deal out of this! (P501, M, 61). Highlighting the nature of the object involved in the accident, "it's damn heavy", allowed another individual to understand how a normal activity, could lead to a bone fracture, "I was surprised it was a break from a, you know, lifting a couch, (P032, M, 59). Other factors, such as a weak back, were also used to substantiate the ordinariness of his actions and the outcome, "... I've had ongoing back issues for, well I see a chiropractor regularly" (P032, M, 59).

One individual drew attention to the activity and accident as well as the CaB survey interview experience as context for perpetuating a view of osteoporosis as a disease of older age individuals, "I didn't feel it was that relevant because um my hmm what they were saying was more like it was more age-related or, you know, osteoporosis-related, where it really wasn't, because as I can recollect my conversation, my fracture was due to a bicycle accident!" (P50, M, 61).

## Discussion

Rather than automatically taking up the age, lifestyle, and trauma distinctions expressed in medical terms as indications of fragile bone, we found that CaB participants created their own age, lifestyle, and trauma distinctions to understand a first fracture and the osteoporosis suggested explanation.

### Age

The CaB program was designed to invite people over a very broad age range, 50 years and over, to perceive osteoporosis as that which could have led to their fracture. Conversely, our results show how participants used a very narrow age range as well as cultural assumptions about aging to distance themselves from the osteoporosis suggestion and from perceiving their bones as fragile (23,31). Negative cultural meanings associated with being senior (32-36) enabled participants to perceive themselves an inappropriate for the suggested diagnosis. While doing so sustains a view of youthfulness as being robust, active, and healthy, it also perpetuates a view of being senior as sedentary, fragile, and unhealthy, and limits the inclusion of younger individuals in fracture prevention and information services (23). Practically speaking, program designers could play an active role in helping people at or around age 50 to disentangle the negative assumptions associated with aging from the positive benefits of sustaining bone health. Program facilitators and by association, clinicians, could be educated to hear and acknowledge

the terms of reference that patients themselves use to make sense of their illness experiences (37-39).

Participants produced and used distinctions between what they perceived as good nutrition constructed as calcium and magnesium supplementation to substantiate the presumed relationship between good nutrition and bone health. While calcium and magnesium supplementation may or may not improve bone health (40), in the context of everyday reasoning, calcium, and magnesium supplementation, appears to have become embedded in public understanding of what people of any age can do to build and sustain healthy bone.

### Lifestyle and Trauma Risk

We found that the meaning of having an active lifestyle, in particular as it relates to osteoporosis, requires clarification. The lifestyle criteria embedded within the CaB HRA survey include both a question of whether or not the persons interviewed are physically active and an assessment of whether the fracture was caused by a high or low trauma accident.

Research outcomes on relationships between physical activity, bone health, mental health, and fracture risk (39,41-45) vary in the degree to which these factors are studied and related. Some studies relate the benefit of exercise in general and high-impact exercise in particular, such as jumping, aerobics, and running to bone health (39,41,42), while other studies relate high-impact exercise to injury and fracture risk (43). Some studies emphasize a positive relationship between exercise and mental health (44,45), while others emphasize a positive relationship between exercise and bone health (46) or the lack of benefit of some forms of exercise for bone health (47,48). Program designers use the distance fallen and whether a fall occurred inside or outside the home to categorize a trauma as high or low impact and to identify the risk of a secondary fracture (49,50). Participants used and privileged their own understanding of risk and lifestyle choices to assess the fracture outcome. Uniting the trauma outcome and background conditions, "anyone could break a bone" and relativizing the external environment allowed them to produce a view of the trauma event as inherently uncertain and open to interpretation. In so doing, they produced for themselves a positive sense of self in the face of a negative diagnosis.

The CaB program offered participants the option to distinguish high from low traumas and fragility from normal fractures. However, with few exceptions, the fracture was produced as meaningful to participants only if seen as the normal outcome of an unexpected accident. Program designers could see our results as an invitation, in the spirit of transparency, to reveal their trauma distinctions to patients, rather than apply them without prior explanation.

### Limitations

While our results contribute to understanding how everyday reasoning and forms of cultural knowledge shape how patient

perceive themselves and others, this study has limitations. The interviews and analysis were conducted at a particular point in time and context in which participants were on the trauma and healing trajectory. It might be helpful to examine how common sense reasoning changes with experience and through contact with medical professionals at various times post-fracture. Our results might also have been enhanced had we gathered data on the location and type of fracture relative to age and sex. A strength of this study, balancing these limitations, is that we were able to produce a coherent account of participant's constructions of their understandings and unique reasoning processes.

Our results have implications for theory. We have shown how patients apply cultural concepts or knowledge about osteoporosis, aging, and, lifestyle in their own terms and within cultural context to make sense of an unexpected fracture experience (51). We have shown, therefore, that individual experience depends to some degree on medical knowledge and that medical knowledge depends to some degree on how individual persons use theory for their own practical purposes. Given that cultural context is not a fixed entity, but changes within the process of individual sense-making, it cannot be assumed that patients and medical professionals will use the same knowledge in the same way and at the same time.

## Conclusion

First fractures were produced as meaningful in the context of osteoporosis only for seniors of very advanced age and for people of any age with poor nutrition. The trauma events that led to a first fracture were produced as meaningful only if perceived as accidents, and having an active lifestyle was produced as beneficial only for mental health and well-being unrelated to osteoporosis. Cultural knowledge shapes, but does not determine how individuals make sense of their health and illness experiences. Risk prevention program designers should include patients on the design team and be more aware of the unarticulated presumptive knowledge they use to identify individuals at risk of disease.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Ethical Approval

Ethical Approval to report this study was obtained from Conjoined Health Research Ethics Board at University of Calgary REB16-0258 and at the University of Alberta Pro00062903.

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## Statement of Informed Consent

Verbal informed consent was obtained from the patients for their anonymized information to be published in this article.

## Supplemental Material

Supplemental material for this article is available online.

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