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ORIGINAL ARTICLE

Perceived risk of osteoporosis: Restricted physical activities?

Qualitative interview study with women in their sixties

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Abstract
Objective. To explore elderly women's physical activity in relation to their perception of the risk of osteoporosis. *Design.* Qualitative study using in-depth interviews. *Setting.* Informants were purposely selected from a Danish population-based, age-specific cohort study conducted in the county of Copenhagen with people born in 1936. *Subjects.* Women in their sixties. *Results.* Women who perceived a current risk of osteoporosis tended to reduce their physical activity in an attempt to reduce the risk of bone damage. This behaviour was related to the imagined fragility of the bones (the risk inside the body), and the actual situations (the risk outside the body), including places and activities. Knowledge of a reduced bone mass reinforced the women's uncertainty about what their bones could endure. Experiences managing physical activity without injury resulted in reinterpretations of their risk of bone fractures and increased physical activity. *Conclusions.* Perceived risk of osteoporosis may lead to decreased physical activity and hence actually increase the risk. When informing individuals about health risk people's images and imaginations of the actual risk have to be acknowledged. When a bone scan is being considered, explicit advice encouraging physical activity – especially the weight-bearing kind – should be stressed.

Key Words: *Family practice, health behaviour, osteoporosis, physical activity, qualitative study, risk perception*

It is known that physical activity, especially weight-bearing exercise, is beneficial in the prevention of osteoporosis [1–3] and bone fractures [4] and in preventing falls [5]. A randomized, controlled trial of elderly women aged 85 or older showed that exercise slowed down the reduction of movement performance, but a positive effect could not be found in people with severe movement dysfunction [6]. This might suggest that it is important to maintain physical exercise throughout life and before severe movement dysfunction occur.

Studies have shown that general knowledge about osteoporosis is good [7,8], but more than 25% in a survey in Norway thought that people with osteoporosis should not engage in physical activity because of the risk of falling causing a fracture [7]. Studies reported women expressing fear of falling

We have only limited knowledge about lay people's behavioural response to the perception of being at risk of osteoporosis, in particular with regard to physical activity.

- Women who perceived a current risk of osteoporosis restricted their physical activity in an attempt to reduce the risk of bone damage.
- Risk perception was related to the women's images and imaginations of the actual risk and thus influenced their behaviour.
- When informing individuals about health risk a dialogue comprising the patient's interpretations and ideas is needed – in the case of osteoporosis explicit advice encouraging physical activity should be stressed.

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and having a fracture [9] and women diagnosed with a low bone mass may become uncertain about the strength of their bones [10]. Women are aware that lifestyle factors affect osteoporosis [7,8]. However, knowledge of the forms of exercise that can best prevent osteoporosis is meagre [11]. We still have only limited knowledge about lay people's behavioural response to being at risk of osteoporosis, in particular with regard to physical activity.

The aim of the study was to explore elderly women's physical activity in relation to their perception of the risk of osteoporosis.

Material and methods

A qualitative study using in-depth interviews was chosen to explore women's perceptions of osteoporosis [12]. This study is part of a larger study [10] and focused on the informants' experiences and perceptions.

The informants were selected from a Danish population-based, age-specific cohort study conducted in the county of Copenhagen with people born in 1936 [13]. The 16 informants in the present study were selected purposely from the answers to the questionnaires of the 60-year-old female population and represent a selection of those who had agreed to participate in an interview concerning osteoporosis. They had all had a bone scan six months to two years before the interviews. Two described having had osteoporosis and two had an almost normal bone scan. The others described their scan result as reduced, some as slightly reduced or having a tendency to osteoporosis (Table I). They

Table I. Informants in the interview study.

Informant number Social background	Bone fractures and perceived relation to osteoporosis	Bone scan result as described by informants
1. Cooperates in husband's silversmith shop Married	2 fractures – rib and shoulder (related to osteoporosis after the bone scan)	Osteoporosis
2. Office work Widow	1 fracture – wrist (related to osteoporosis)	Osteoporosis in the back, hips normal
3. Early retirement pension Married	None	Low bone mass, primarily the back
4. Full-time housewife, 9–10 years school Married	3 fractures – ankle, wrist, and shoulder (the shoulder was related to osteoporosis)	Reduced bone mass
5. Academic, teacher at the University Married	1 fracture – wrist (not related to osteoporosis)	Slightly reduced bone mass
6. Zone therapy Married	None	Slightly reduced bone mass
7. Earlier office work Actually without work Divorced	None	Slightly reduced bone mass
8. Early retirement pension, because of slipped disk Worked in a kitchen Widow	1 fracture – wrist (not related to osteoporosis)	Slightly reduced bone mass
9. Early retirement pension Earlier office work Married	1 fracture – wrist (related to osteoporosis?)	Slightly reduced bone mass
10. Early retirement pension Divorced	None	Slightly reduced bone mass
11. Early retirement pension Still working some hours as assistant nurse Married	None	Slightly reduced bone mass
12. Full-time housewife taking care of grandchildren Earlier half-time in a general store Married	None	A tendency to osteoporosis
13. Early retirement pension Earlier worked in a dress shop Widow	None	A tendency to osteoporosis
14. Early retirement pension Earlier teacher Married	2 fractures – ankle and clavicle (related to osteoporosis?)	A tendency to osteoporosis
15. Cooperates in husband's firm Married	None	Almost normal bone mass
16. Teacher Early retirement pension Married	None	Almost normal bone mass

had no serious chronic or disabling conditions. Seven had had bone fractures, but not in the hip or the backbone. Additional criteria were variations in educational background and marital status.

Data collection

The informants were interviewed twice [12,14] mostly in the informants' homes in the period 1997–2001. The interviews were carried out by the author. At the first interview the informants were 63–64 years old. The first interviews lasted 1½ to 2½ hours and were based on an interview guide dealing with experiences and perception of health and illness in general, health risks, and disease prevention with specific attention to perceptions of osteoporosis and behaviours related to the risk of osteoporosis. In order to study changes over time the women, except one, were interviewed again after 1–2 years (8 months to 3 years). The next interview lasted 1–2 hours and focused on changes in behaviour related to new experiences and reinterpretations of their perception of osteoporosis. All these interviews but two were carried out in the informants' homes; one person did not have the time and one interview was done by phone. The second interview also functioned as validation of the interpretations of the first interview [15,16]. The interviews were taped and transcribed verbatim. Notes from telephone interviews concerning the interview situation, the process, and other impressions were written down immediately after the interviews and were used to contextualize the accounts.

Analysis

Data analysis aimed to elicit knowledge derived from everyday experience [17,18] and systematically followed the steps in the analysis as guided by Malterud [18]. Interpretation and the resulting pattern were guided by an understanding of ill health and health risks and related behaviour as perceived and given meaning within a sociocultural context, related to the specific time, place and situation [19]. The initial coding process revealed that the women's physical activities were related to their perception of osteoporosis as an immediate risk condition or a risk relevant in the future. The physical activities related to the perception of an immediate risk were explored in details. Subsequently, all the informants were then analysed for changes over time. The individual participants' statements during the second interviews were compared with their earlier statements to find changes in their accounts of physical activity that could be related to the experience of osteoporosis over time. The analysis was discussed thoroughly with other researches at the department, to achieve possible interpretations and relevant categories. Moreover, analysis across the material was validated by a summary for each woman, specifying the details of her account in relation to the general themes.

Results

The women were uncertain about whether physical activity and exercise could help at all, except for building up a strong skeleton in youth and helping to keep the muscles strong. They described conflicting information concerning physical activity and osteoporosis:

> *The doctor said to me: The things you should know are that it's good to go in for sport, but still if you are unfortunate and fall, you may break your back – and that actually made me nervous.* (2;1)

Physical activity and perception of the risk of osteoporosis

Most of the women perceived the risk of osteoporosis as immediate and they restricted their physical activities. Women who had a normal bone scan or perceived the risk as relevant in the distant future did not imagine their bones as so fragile or they believed medication had been started in time to stop the process of osteoporosis. They continued their usual physical activity.

When the women talked about the risk of osteoporosis, they talked about the imagined possible consequences of osteoporosis for themselves and the expected time to a possible event or outcome. The perception of the risk was furthermore related to the imagined fragility of the bones (the risk inside the body), and the actual situations (the risk outside the body), including places and activities. They spoke of their uncertainty about what their bones could endure, when they learned they had decreased bone mass, a tendency to osteoporosis, or had osteoporosis.

Restrictions in physical activities as a consequence of a perceived current risk

For women with a perceived current risk inside the body, the protection of the body by avoiding certain physical activities became the means available to them to try to escape the consequences of osteoporosis they feared. These women expressed a feeling of bodily fragility and said they imagined they would break their bones if they were exposed to an injury:

It doesn't take much before you push it, if you fall then something happens. (3;1)

They became cautious and avoided weight-bearing activities. Many chose to swim or cycle instead to put less strain on the bones. They were afraid of the backbone falling apart and a hip fracture perhaps resulting in invalidity. Nearly all specified that they were more afraid of breaking their back than their hip as the latter could be operated on. Women who related previous fractures to osteoporosis increased their efforts to avoid fractures. Through their actions to avoid injuries and bone damage the women identified different situations and activities as dangerous, as they would increase the risk. Five or six women were most afraid of taking a walk when it was muddy whereas others were more afraid of climbing a ladder, running for a bus, or playing badminton. Two women told about how their husbands now always had to do the heavier more demanding work at home. Three women said they were afraid of cycling, but they had to do so. They got off the bike at certain places and one of them explained she felt anxious if the bicycle wobbled. They had to keep an eye on the road:

When I'm walking, I'm looking down instead of walking and looking at the gardens, the flowers and the birds. Now I have to walk there and be careful that there isn't an unevenness I trip over. (4;1)

Several of the women changed the way they cleaned the house as they did not want to lift so much weight any more. Women who experienced symptoms mostly from their backs stopped the activities they felt caused the symptom. They avoided strain on the back; for example one woman explained things she did in order not to slouch during the day:

Each time I droop, I straighten up. Also when I am sitting in my armchair in the evening I have two foam cushions in order not to sag. I have to keep myself erect with this cushion. (1;1).

Changes in physical activities integrating new experiences

The women described changes in physical activity due to new experiences and reinterpretations of their risk of bone fractures. They explained that they were not afraid of getting a fracture all the time, but it came up in many situations:

I behave exactly as usual except that when I make my bed for example, or I have to do something or other, then I have to, just like that, "oh, your back, now you must just watch out, you know". So it's there at the back of my mind. (2;2)

In contrast, women who experienced an injury, e.g. a fall, without breaking their bones said they became convinced that their bones were perhaps less brittle than they had imagined. Similarly women who had managed a physically heavy workload had the impression that their skeleton was strong and they started to resume physical activities as before:

Suddenly it collapses, if you. . .. *But then it can do it too when you carry tiles. I have carried tiles and I couldn't feel anything with my bones. And I feel strong.* (11;2)

Three women said they had had a good experience following an exercise programme with a physiotherapist; they felt they could do exercise under instruction, but they did not have the money to continue this as they also had to pay for medication. Four women had a control scan with only a slightly different bone mass density (BMD). This confirmed for them that preventive strategies and treatments could not prevent the consequence of an injury if they already had fragile bones.

Experiences from their social network and family also influenced their physical activity. One woman said she was asked to participate in a leisure activity and game with her family. She said she took the chance and nothing happened. Afterwards she felt she could manage more. In contrast two women spoke of how their husbands were nervous about their risk of getting a fracture and supported them in being more careful. One of the husbands went in front of his wife, pointing out dangerous situations to her. Women who experienced other health problems, e.g. worsening of chronic bronchitis or breast cancer, related that how the risk of osteoporosis became less important.

Discussion

The present study demonstrated why and how the perception of a current risk of osteoporosis in a group of women led to fear of bone damage and restrictions in physical activity, especially the weight-bearing kind. Positive experiences in managing physical activity and taking a chance without injury made them resume physical activity.

The informants in this study may be more conscious of risk factors because of their participation in the population study and they could be more worried about the risk of osteoporosis than other women at risk. Recent years have seen a continuous flow of information and campaigns targeting osteoporosis, and the public discourse on hormone replacement as first-line treatment for osteoporosis

has changed [20]. Awareness of osteoporosis has increased and the level of knowledge of osteoporosis is higher in women than in men [21]. However, studies have shown that people still lack the more specific knowledge concerning osteoporosis as regards nutrition and exercise [21,22]. Furthermore, interviews with a volunteer sample may not reflect the perception and experiences of non-responders to the original cohort study.

The researcher as a doctor may have influenced the way the women talked about protecting their bodies as they might expect the health system to recommend that they should avoid injuries. However, they may be more reflective because of the passage of time and they may act on the new recognition acquired during the research process, resuming more physical activities. From a medical point of view the women in this study seemed to overestimate the risk of reduced bone mass. For many of the women there was no difference in whether they had osteoporosis or decreased bone mass. This might be because communication regarding risk is difficult [23], and words such as a tendency to or reduction of bone mass indicate a diagnostic condition rather than the probability of an event.

Knowledge of osteoporosis or decreased bone mass created uncertainty regarding what the bones could endure, resulting in restricted behaviour. Women appeared to take the scan literally. They interpreted the scan result (a mark on a curve) showing decreased bone mass to mean bodily fragility [10], which resulted in restrictions in physical activity. Rimes and colleagues showed that women who had a low BMD result were more anxious and reported more osteoporosis-preventive behaviour than others [24]. Other studies show that information about osteoporosis may trigger uncertainty and worry [9,25,26]. Martin and colleagues found that, whether osteoporotic or not, women expressed fear of future fractures and future limitations due to osteoporosis [9]. This worry related to osteoporosis may be because osteoporosis is imagined to show itself with sudden serious outcomes [27]. According to the present study the fear of fractures increased in specific situations, often related to physical activity. The perception of risk of bone fractures thus comprises both the risk related to bone-mass reduction and an adverse event related to the situation and the surroundings. Furthermore, risk perception is dynamic and changeable according to the social and cultural context in which risk is experienced [19]. This study illuminated how experiences over time influence risk perception and changes in behaviour. These findings could probably be transferred to other areas of perception of bodily health risks.

Conclusions

Perceived risk of osteoporosis may lead to decreased physical activity and hence actually increase the risk of osteoporosis [28]. When a bone scan is considered, a dialogue comprising the patient's interpretations, ideas, and feelings about the health risk is needed. This might also help to make the meaning of the language and words used clear, so misunderstanding can be avoided. In the case of osteoporosis, explicit advice encouraging physical activity – especially the weight-bearing kind – should be stressed.

Future research could explore the information given to patients concerning osteoporosis, with a particular focus on information regarding physical activity and how this information is interpreted and perceived by patients.

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