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**Author(s):** Pellinen, Tiina; Villberg, Jari; Raappana, Maarit; Leino-Kilpi, Helena; Kettunen, Tarja

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## **Knowledge expectations among recently diagnosed knee osteoarthritis patients**

Running head:

T. Pellinen & all,

Knowledge expectations among recently diagnosed knee osteoarthritis patients

Tiina Pellinen, Jari Villberg, Maarit Raappana, Helena Leino-Kilpi & Tarja Kettunen

Tiina PELLINEN Ms.C., RN

Research Secretary

Department of Health Sciences

University of Jyväskylä, Jyväskylä, Finland

Jari VILLBERG Ms.C.

Statistician

Department of Health Sciences

University of Jyväskylä, Jyväskylä, Finland

Maarit RAAPPANA, Ms.C., RN

Head Nurse

Central Finland Health Care District, Jyväskylä, Finland

Helena LEINO-KILPI PhD, RN, FEANS

Professor and Chair

Department of Nursing Science

University of Turku, Turku, Finland

Nurse Director

Turku University Hospital, Turku Finland

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Tarja KETTUNEN PhD, RN, RM  
Professor in Health Promotion  
Department of Health Sciences  
University of Jyväskylä, Jyväskylä, Finland  
Central Finland Health Care District, Jyväskylä, Finland

Correspondence to T. Pellinen:  
e-mail: tiina.p@windowslive.com

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- Conflict of Interest statement

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**Abstract:**

**Aim.** To assess the socio-demographic and disease-related symptoms and emotions and knowledge expectations of patients recently diagnosed with knee osteoarthritis. A further aim was to determine associations between selected demographic variables and patients' expected knowledge.

**Background.** Patient counseling and information provision are recommended for all patients with knee osteoarthritis. In health care centers, there is a good possibility to establish the knowledge expectations of patients with knee osteoarthritis during counseling. Recent empirical evidence indicates a lack of research on knowledge expectations among recently diagnosed patients with knee osteoarthritis.

**Design.** A quantitative, descriptive inquiry design was adopted.

**Methods.** The data were collected from 252 recently diagnosed patients with knee osteoarthritis by a postal survey in 2013, using the Hospital Patient's Knowledge Expectations Scale as well as additional questions and statements. The data were analyzed using multivariate linear regression.

**Results.** Most of the respondents were female pensioners who also had other chronic diseases. Approximately half of the participants had had counseling on osteoarthritis. Knowledge expectations concerning pain management were emphasized. From the empowering knowledge perspective, the highest knowledge expectations concerned bio-physiological dimensions of knowledge, followed by ethical and financial dimensions. Age, employment status, pain and emotions of concern and hope among women and tiredness or fatigue and vocational/higher education among men were associated with knowledge expectations.

**Conclusion.** Patients with knee osteoarthritis have high knowledge expectations and there is a need to improve the counseling and care of pain and tiredness or fatigue symptoms. The development of the counseling of recently diagnosed patients with knee osteoarthritis also needs further research.

**Keywords:** knee osteoarthritis, Hospital Patient's Knowledge Expectations Scale, nursing, counseling, empowering knowledge, symptoms, emotions

## **Summary Statement:**

### **Why is this research or review needed?**

- We have no information on whether all recently diagnosed patients with knee osteoarthritis are provided with sufficient information or counseling.
- Lack of appropriate knowledge could be a barrier to the self-management of osteoarthritis.
- Knowledge is a cognitive requirement for empowerment and osteoarthritis patients need to be empowered to manage osteoarthritis and its symptoms.

### **What are the key findings?**

- Among osteoarthritis patients, the most common disease-related symptoms were pain and tiredness or fatigue and disease-related emotions of hope and concern.
- In general, knowledge expectations were high. Patients with knee osteoarthritis expect diverse knowledge concerning the self-management of osteoarthritis and empowering knowledge.
- Disease-related symptoms and emotions have an impact on patients with knee osteoarthritis' knowledge expectations. Particularly high levels of pain were associated with higher level of knowledge expectations among female patients with knee osteoarthritis.

### **How should the findings be used to develop policies/practices/research/education?**

- Health care personnel should ensure that all recently diagnosed patients with knee osteoarthritis are provided with knowledge according to their expectations.

- Self-management counseling needs to be accelerated and this could be done by involving more health care professionals like nurses in counseling.
- Especially pain, tiredness and fatigue should be taken into account when evaluating patients` knowledge expectations.

## INTRODUCTION

Knee osteoarthritis (OA) is the most common type of OA (Michael *et al.* 2010). It is estimated worldwide that among over 60-year-old people, 9.6% of men and 18% of women have symptomatic OA (WHO 2010). Ageing (WHO 2010, Zhang & Jordan 2010, Cross *et al.* 2014) and increasing obesity increase the likelihood of symptomatic knee OA (Zhang & Jordan 2010, Cross *et al.* 2014). The main symptoms of knee OA are joint pain, joint stiffness and disabilities (Walker 2011). Globally, knee OA is one of the leading causes of disability (Cross *et al.* 2014). Patients often visit primary health care services with symptoms like knee pain or loss of function (Commissioning guide 2013).

Conservative non-pharmacological cures are primary in patients with OA` care (Hochberg *et al.* 2012, Current Care Guidelines 2014). Self-management, patient counseling and provision of information about OA and its care are core recommendations for all patients with OA (March *et al.* 2010, Zang *et al.* 2010, Brosseau 2011, Current Care Guidelines 2014, McAlindon *et al.* 2014, Osteoarthritis 2014). In this article we use the term `patient counseling` to combine these recommendations because it reveals interpersonal communication and different educational activities of professionals (Poskiparta *et al.* 2000). Other patients with knee OA` core non-surgical treatments are land- and water-based exercise, weight-management and strength training (McAlindon *et al.* 2014). Accurate verbal or written information should be offered to enhance understanding of the disease and its

management (Osteoarthritis 2014). Core treatments, like exercise, should be tailored and offered either individually or in groups (Current Care Guidelines 2014, Osteoarthritis 2014).

Patients' adherence and health care professionals' commitment to OA care recommendations have varied (Rosemann *et al.* 2006, Brand 2007, Broadbent *et al.* 2008, Poitras *et al.* 2010, Kingsbury & Conaghan 2012, McHugh *et al.* 2012). Previously, most patients with OA have been knowledgeable about exercise and the process of OA but less knowledgeable about drug therapy and joint protection (Hill & Bird 2007). According to patient records, 17-30% of patients with OA have had information about the disease (Broadbent *et al.* 2008). Recently, it has been indicated that over a half of patients have not received knowledge about exercises for OA, managing pain or understanding their medication or OA (McHugh *et al.* 2012). As to overweight and obese patients with arthritis, less than a half have received advice to lose weight by a doctor or health care professional (Fontaine *et al.* 2007). However, over a half of general practitioners described that they had recommended exercise or prescribed paracetamol, topical NSAIDs or capsaicin to patients with knee OA. Diet had been recommended for 37% and walking aids or braces for 12% of patients. In addition, 31% of the patients had been referred to physiotherapists (Kingsbury & Conaghan 2012).

Patients with knee OA wish to have more knowledge and counseling at the time of diagnosis (Mann & Goberman-Hill 2011). According to Axford *et al.* (2008) those patients with knee OA who had more knowledge about OA coped better with the disease and had less depression. In turn, those who had less knowledge had more pain (Axford *et al.* 2008). We also know that a lack of knowledge could be a potential barrier to OA self-management and care (March *et al.* 2010).

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Patients with OA should be empowered to manage the disease and its symptoms in their everyday life (Walker 2011). Sufficient level of patients' knowledge is one of the cognitive empowerment prerequisites (Heikkinen *et al.* 2008). Patients need knowledge to understand the illness and treatments, to make decisions and to cope with the disease (de Haes & Bensing 2009). We know that counseling is essential for the self-management of knee osteoarthritis (Brosseau 2011) and that it could ease symptoms, decrease pain and improve the physical functionality of patients with OA (May 2010, Shin & Kolanowski 2010, Zhang *et al.* 2010, Brosseau 2011).

In this study, we evaluated recently diagnosed patients with knee OA' early knowledge expectations concerning OA self-management and empowering knowledge. Knowledge that endorses empowering can be considered through six empowering dimensions: bio-physiological, functional, experiential, ethical, social and financial (Leino-Kilpi *et al.* 1999, Heikkinen *et al.* 2007, Klemetti *et al.* 2014).

## Background

### *Patients with knee osteoarthritis' knowledge expectations*

Knowledge is defined here as facts, information and skills that a person has acquired through experience or counseling. It means the theoretical or practical understanding of a subject (Oxford Dictionaries 2014). Earlier studies have evaluated the content of bio-physiological and functional knowledge expectations among knee and hip patients with OA (Mann & Goberman-Hill 2011, McHugh *et al.* 2012). At the surgical stage of OA care, knowledge expectations were the highest concerning these dimensions (Valkeapää *et al.* 2013, Ingadottir



*et al.* 2014, Klemetti *et al.* 2014). In terms of bio-physiological knowledge, patients with OA expected knowledge about the progression of the disease (Mann & Goberman-Hill 2011, McHugh *et al.* 2012) and its causes (McHugh *et al.* 2012). As to symptoms, patients with OA expected knowledge on how to minimize symptoms (Mann & Goberman-Hill 2011). Regarding the functional dimension, patients with OA wanted knowledge about diet, exercise (Mann & Goberman-Hill 2011, McHugh *et al.* 2012) and aids (Mann & Goberman-Hill 2011). More knowledge was expected on exercise than on diet. Concerning OA self-management, knowledge was expected on the general management of the disease and pain management (McHugh *et al.* 2012).

However, in the existing research literature, little is known about the social, experiential, financial and ethical knowledge expectations of patients with OA. At the surgical stage of knee OA care, the lowest expectations were reported concerning the social dimension (Valkeapää *et al.* 2013, Ingadottir *et al.* 2014, Klemetti *et al.* 2014). Recent empirical evidence indicated that patients with OA` social knowledge expectations were related to local services (Mann & Goberman-Hill 2011). From the point of experiential knowledge, patients with OA wanted to know about the psychological consequences of OA. In turn, financial knowledge expectations focused on medication and vitamin use (McHugh *et al.* 2012). Moreover, studies do not provide information about patients with OA` knowledge expectations concerning the content of ethical knowledge dimension. Ethical knowledge includes knowledge about patients` rights, confidentiality and privacy.

Information provision regarding the history, treatment and self-management of OA has shown to be less likely among older than younger patients with OA. It is also more likely among women than men (Brodhant *et al.* 2008). In a surgical context, patients with OA` knowledge expectations were related to gender, employment status and country (Valkeapää *et*

*al.* 2013). Concerning previous OA patient knowledge expectation studies, there is a lack of studies related to associations with knowledge expectations especially among recently diagnosed patients with knee OA.

## **STUDY**

### **Aim**

In this study, the aim was to assess the socio-demographic and disease-related symptoms and emotions as well as the knowledge expectations of recently diagnosed patients with knee OA.

The research questions are:

1. What are the socio-demographic characteristics of recently diagnosed patients with knee OA?
2. What are the most common disease-related symptoms and emotions of recently diagnosed patients with knee OA?
3. What knowledge do recently diagnosed patients with knee OA expect?
4. What socio-demographic characteristics and disease-related symptoms and emotion are associated with knowledge expectations?

### **Design**

We used a descriptive study design in this study (Burns & Grove 2009).

## Participants

The data were collected from a health care co-operation district that organizes health care services for about 150 000 citizens in four municipalities in Finland. A purposive sample of patients with knee OA was recruited with the intent of reaching all diagnosed patients with knee OA in the municipal health care centers in the district within one year. The municipal health care centers provide basic public health care services.

The aim was to involve all the patients diagnosed in the co-operation district's health centers from the beginning of 2012 to the data collection stage of this study. The inclusion criteria were patients diagnosed with knee OA between January 2012 and January 2013 in municipal health care centers. All the patients that fulfilled the inclusion criteria were given an opportunity to participate in this study. The exclusion criteria were patients diagnosed with knee OA before year 2012 and patients that had clearly been diagnosed elsewhere, for example hospitals or special health care units. The target sample was obtained from electronic patient records between January 2013 and February 2013 using diagnosis catalogue. A total of 415 patients with knee OA fulfilling the inclusion criteria were found.

## Data collection

The data were collected by a questionnaire, using the Finnish version Hospital Patient's Knowledge Expectations (KEhp) scale (© Leino-Kilpi, Salanterä, Hölttä 2003), four OA self-management knowledge statements and two added counseling questions. KEhp had been used before for assessing the knowledge expectations of hospital patients (Heikkinen *et al.* 2007, Rankinen *et al.* 2007, Valkeapää *et al.* 2013, Ingadottir *et al.* 2014, Klemetti *et al.* 2014) and their family members (Sigurdardottir *et al.* 2015). The word 'hospital' in the KEhp

scale was replaced with the word 'municipal health-care center' in this study. As no other changes were made to the scale, conducting a pilot study was not necessary for this study.

The KEhp scale included a total of 40 items that formed six summative variables from six dimensions of empowering knowledge; bio-physiological (9 items containing e.g. disease, its symptoms, examinations and complications), functional (7 items containing e.g. daily functions like hygiene, exercise, diet and aids), experiential (3 items containing e.g. emotions and earlier hospital experiences), ethical (9 items containing e.g. patient rights, duties, decision making and confidentiality), social (6 items containing family's support and patient unions) and financial (6 items containing e.g. financial benefits, costs, medication and rehabilitation). The scale included statements on knowledge expectations concerning the different dimensions of knowledge. The items were rated on a 4-point Likert scale (1 = strongly disagree - 4 = strongly agree), i.e. a higher value meant higher knowledge expectations. Answer option 0 meant 'Does not apply'.

At the end of the KEhp scale, there were items concerning possible disease-related symptoms (9 items) and emotions (10 items). The patients were asked how often they experienced different kinds of symptoms e.g. pain and emotions e.g. fear. The items were rated on a 4-point Likert scale (1 = very often - 4 = not at all).

Four specific OA knowledge statements were added to the beginning of the questionnaire. These statements, which were prepared for this study in accordance with the National Current Care Guidelines (2014), concerned the extent of knowledge that the respondents expected to receive about the different dimensions of OA self-management. These statements created a new summative variable, OA self-management knowledge expectations. The items in the statements were rated in the same way as the KEhp scale's items.

The socio-demographic characteristics included age, gender, educational background, employment status and chronic illnesses. There were also two additional questions regarding counseling: 'Have you received counseling on osteoarthritis?' and if the answer was 'yes', there was an open question 'What health care professional has counseled you?'

The data were collected by a postal survey between February 2013 and April 2013. The participants received the questionnaire and the information about the survey in a letter that the researcher sent to all 415 patients with OA. A reminder was sent to all non-respondents in March 2013. A total of 252 (61%) patients completed and returned the questionnaire to the researcher.

### **Ethical considerations**

The study was conducted following the principles of responsible conduct of research (TENK 2012). Ethics committee approval was obtained from the health care co-operation district (9U/2012). Permission for this study was received from the director of the health care co-operation district. The patients were informed that participation was voluntary and that data would be analyzed confidentially and anonymously (cover letter).

### **Data analysis**

SPSS version 20 was used to analyze the data. Descriptive statistics were used to describe the demographics and disease-related symptoms and emotions. The data were expressed as means, frequencies and percentages. For the comparison of the mean values of the variables, the variables where over a quarter of the respondents answered 'Does not apply' were excluded from the analysis. There was one variable in the social knowledge dimension ('How

could I see a priest or theologian?') that was excluded from the analysis, because 33.3% of respondents had responded 'Does not apply'. Statement category 0 = Does not apply was excluded from the analysis.

The mean values were calculated from the summative variables of the additional OA self-management knowledge expectations and of the six dimensions of knowledge (biophysiological, functional, experiential, ethical, social and financial). The total knowledge expectation was calculated by using the means of six summative variables of the knowledge dimensions. The items concerning disease-related symptoms and emotions were divided into two parts (1 = little or not at all and 2 = a lot), because there were only few answers in some statement categories. The division improved the coverage of the results.

Descriptive statistics (i.e. frequency, percentage and mean) were considered as sample characteristics. In this study, it was decided to analyze only two most experienced disease-related symptoms and emotions, because other symptoms and emotions were reported less. The associations of socio-demographic characteristics and disease-related symptoms and emotions with knowledge expectations among the male and female respondents were determined with the Multivariate Linear regression analysis.

Due to a strong correlation between educational background variables, the regression analysis was conducted with both factors separately. It was decided to include basic education in the analysis. However, the statistically significant association between educational background and knowledge expectations was reported when it occurred. The statistically significance level was set at  $p < 0.05$ .

## **Validity, reliability and rigor**

The content validity of the KEhp scale was based on theoretical literature on knowledge, statements by an expert panel and earlier pilot studies (Heikkinen *et al.* 2007, Rankinen *et al.* 2007, Johansson *et al.* 2014, Klemetti *et al.* 2014).

The internal consistency of the questionnaire and summative variables were estimated using Cronbach's alpha coefficient. For the OA self-management knowledge expectations summative variable it was 0.84. In previous studies, the KEhp scale's Cronbach's alpha coefficient had been 0.91-0.98 (Heikkinen *et al.* 2007, Rankinen *et al.* 2007, Ingadottir *et al.* 2014, Johansson *et al.* 2014, Klemetti *et al.* 2014, Sigurdardottir *et al.* 2015). In this study, the scale's Cronbach's alpha coefficient was 0.98. In the summative variables, the variation was 0.84 (experiential) - 0.93 (financial).

## **RESULTS**

### **Sample characteristics**

The data were collected from a total of 252 patients with knee OA. The mean age of the participants was 68 years (range 25-89 years) and most of them were female. Over half of the participants had completed 8-year basic education or primary + lower secondary (4+5) education. Among the participants who had completed vocational/higher education (n = 124), half had completed lower secondary level vocational education (n = 62). Most of the participants were retired. Approximately three quarters (74%) had chronic illnesses and half (51%) had been counseled on OA (Table 1). The counselors were mainly doctors (n = 68) and physiotherapists (n = 41). Some of the participants had received counseling from an orthopedist, nurse or physiatrist.

The most common disease-related symptom was pain, which half of the participants (50%) experienced to a high degree. The second most common symptom was tiredness or fatigue (35%). Other disease-related symptoms (sense of weakness, sickness and vomiting, lack of appetite, sleeplessness, dyspnoea and tickling) were experienced to a high degree by 12% (mean) of the participants. The most felt disease-related emotion was hope, which 59% of the participants reported to experience to a high degree. The second most common emotion was concern (25%). Other disease-related emotions (fear, despair or hopelessness, impatience, grief, depression, anxiety and uncertainty) were experienced to a high degree by 12% (mean).

### **Knowledge expectations of patients with knee OA**

The participants had high knowledge expectations concerning OA self-management (mean 3.30, Scale 1-4). The highest knowledge expectations were perceived concerning pain management and care (mean 3.41), followed by prevention of joint injuries (mean 3.38) and exercise (mean 3.34). The lowest knowledge expectations concerned losing weight (mean 2.95).

Knowledge expectations concerning all the empowering dimensions was high (mean 3.32, Scale 1-4). The highest knowledge expectations were recorded in the bio-physiological (mean 3.52), ethical (mean 3.36) and financial (mean 3.36) dimensions. The knowledge expectations were the lowest in the experiential (mean 3.24) and functional (mean 3.18) dimensions. The highest knowledge expectations concerned bio-physiological knowledge on possible care complications (mean 3.60), on how to prevent complications (mean 3.59) and when to contact a care institution if the symptoms aggravate (mean 3.58).



## **Association of socio-demographic characteristics and disease-related symptoms and emotions with knowledge expectations**

Significant gender differences were found. Pain and concern experiences were associated with OA self-management knowledge expectations by the female participants as follows: experiencing a lot of pain ( $p = 0.020$ ) and a lot of concern ( $p = 0.001$ ) were associated with higher OA self-management knowledge expectations. In addition, experiencing a lot of pain was associated with higher total knowledge expectations among them ( $p = 0.008$ ) (Table 2).

Age, employment status, pain and hope experiences were associated with knowledge expectations concerning the different dimensions of knowledge by the female participants as follows: Age 71-75 ( $p = 0.044$ ) was associated with higher social and age 66-70 ( $p = 0.046$ ) and 71-75 ( $p = 0.026$ ) with higher financial knowledge expectations. Retirement was associated with higher bio-physiological ( $p = 0.045$ ) and functional ( $p = 0.018$ ) knowledge expectations. Experiencing a lot of pain was associated with higher bio-physiological ( $p = 0.012$ ), functional ( $p = 0.009$ ), experiential ( $p = 0.026$ ) and financial ( $p = 0.027$ ) knowledge expectations and a high degree of hope experience with functional ( $p = 0.032$ ) knowledge expectations (Table 2).

As to the male participants, tiredness or fatigue and vocational/higher education were associated with different dimensions of knowledge expectations as follows: Experiencing a lot of tiredness or fatigue was associated with lower functional ( $p = 0.022$ ) and experiential ( $p = 0.042$ ) knowledge expectations. Lower secondary level vocational education was associated with higher experiential knowledge expectations ( $p = 0.036$ ) (Table 3).

## DISCUSSION

The current study examined the socio-demographic characteristics, disease-related symptoms and emotions and knowledge expectations of recently diagnosed patients with OA. The mean age of participants in this study was 68 years. Most of them were retired women, with chronic illnesses. About half of the participants had had counseling concerning OA. Most of the counselors were general practitioners and physiotherapists. The most experienced disease-related symptoms were pain and tiredness or fatigue and the most felt disease-related emotions hope and concern. OA knowledge expectations were observed to be high concerning self-management, especially pain management and bio-physiological, ethical and financial empowering dimensions. The association of the female participants' pain experiences with knowledge expectations was noteworthy.

The socio-demographic results of the female participants and age are in line with previous studies reporting that age and female gender increase the likelihood of knee OA (Blagojevic *et al.* 2010, Zhang & Jordan 2010, Cross *et al.* 2014). Although the existence of chronic diseases had no association to knowledge expectations, they should be taken into account in counseling, because co-morbidities and OA in other joints may affect treatment choices (McAlindon *et al.* 2014). Further, our results regarding counseling implementation is consistent with earlier counseling practices or knowledge provision evaluated by patients with OA or general practitioners (Kingsbury & Conaghan 2012, McHugh *et al.* 2012,). General practitioners and physiotherapists as OA patient counselors have also been reported in earlier studies (Rosemann *et al.* 2007, Coleman *et al.* 2008, de Jong *et al.* 2008, Bezalel *et al.* 2010, Hansson *et al.* 2010, Coleman *et al.* 2012, Feinglass *et al.* 2012, Marra *et al.* 2012, McHugh *et al.* 2012), which indicates their responsibility.

It is noteworthy to point out that in this study half of the participants experienced a lot of pain, which had earlier been found to be a common symptom of OA (Walker 2011). They also reported tiredness or fatigue. Previous studies have shown a connection between pain and tiredness (Somers *et al.* 2009) and between pain and sleep disturbance (Smith *et al.* 2009) among patients with OA. Possibly due to that connection, both symptoms were common in this study. Hope and concern were the most experienced disease-related emotions. As far as is known, there are no earlier studies concerning hope and concern being associated with patients with knee OA' knowledge expectations. Among the patients undergoing hip replacement, the differences between received and expected knowledge correlated with the frequency of pain, tiredness or fatigue and fear (Johansson *et al.* 2014).

The highest knowledge expectations concerning OA self-management focused on pain-management, which had been reported earlier (McHugh *et al.* 2012). The participants also wanted to know about the prevention of joint injuries. In contrast to our study, Hill & Bird (2007) showed a lack of knowledge concerning joint protection. Although weight control is a core issue in counseling among patients with OA (Osteoarthritis 2014), in this study, the participants expected more knowledge about exercise than about losing weight or diet. Similar priority in knowledge expectations had been found in the study of McHugh *et al.* (2012).

In line with earlier studies, the patients' knowledge expectations were especially high, concerning the bio-physiological dimension (Heikkinen *et al.* 2007, Rankinen *et al.* 2007, Mann & Goberman-Hill 2011, McHugh *et al.* 2012, Valkeapää *et al.* 2013, Ingadottir *et al.* 2014, Johansson *et al.* 2014, Klemetti *et al.* 2014) and concerning care complications (Heikkinen *et al.* 2007). On the other hand, divergent from earlier studies applying the KEhp scale (Heikkinen *et al.* 2007, Rankinen *et al.* 2007, Valkeapää *et al.* 2013, Ingadottir *et al.* 2014, Johansson *et al.* 2014, Klemetti *et al.* 2014), functional knowledge expectations were

the lowest in this study. Therefore, it could be possible that the surgical stage of care increases functional knowledge expectations. As patients are presumably still at the conservative care stage at the beginning of the diagnosis, functional knowledge expectations are lesser.

In this study, socio-demographic variables, symptoms and emotions were more related to knowledge expectations among female than male participants. Age and employment status were related to knowledge expectations among women. According to earlier studies applying the KEhp scale, also age (Heikkinen *et al.* 2007) and employment status (Valkeapää *et al.* 2013) were significantly related to knowledge expectations. According to Valkeapää *et al.* (2013), retired patients had more experiential, ethical and social knowledge expectations than employed patients. However, in this study retired female participants had more bio-physiological and functional knowledge expectations than employed or home working female participants. Heikkinen *et al.* (2007) found that older patients expected more knowledge than younger patients. In this study, older female participants only expected more social and financial knowledge than younger. Among men, the level of education was associated with experiential knowledge expectations. Heikkinen *et al.* (2007) found that less educated patients had more knowledge expectations concerning all knowledge dimensions. In this study, the male participants who had lower secondary level vocational education had more experiential knowledge expectations than more educated men.

All of the most common disease-related symptoms and emotions had association with knowledge expectations. Pain, concern and hope were found to be statistically significant related to knowledge expectations among women. More pain-experiencing female participants had more OA self-management related expectations concerning all knowledge dimensions, bio-physiological, functional, experiential and financial dimensions. The study of Axfod *et al.* (2008) showed that patients with knee OA who had the lowest knowledge

about OA experienced more pain than those who knew more about OA. The results support the idea that pain level could perhaps be decreased by ensuring that the patients have enough knowledge about self- and pain-management. Self-management requires a range of knowledge to make daily decisions.

More concern experiencing female participants expected more OA self-management knowledge and more hope experiencing expected more functional knowledge. Emotions seem to affect knowledge concerning OA care and daily functions. Among male participants, those who experienced more tiredness or fatigue had less functional and experiential knowledge expectations. This result may suggest that if men's tiredness and fatigue are addressed they could have more knowledge expectations about matters concerning daily functions, emotions and experiences. Disease-related emotions had no association with men's knowledge expectations.

In summary, this study aimed to examine knowledge expectations and associated socio-demographic and disease-related symptoms and emotions of recently diagnosed patients with knee OA. The study produced new data on the most common disease-related emotions of patients with knee OA and the background factors' associations with knowledge expectations collected separately from male and female participants. In this study, we defined a recently diagnosed patient as a patient whose OA had been diagnosed less than a year ago. As there are no previous studies on the knowledge expectations of recently diagnosed patients with OA, this study provides new insight into the matter. The results of this study indicate that there is need to improve counseling practices at the early state of OA, because responding to knowledge expectations is a core component of patient-centered counseling.

## Limitations

The data collection method was chosen because it was a fast and effective way to achieve a representative sample for this study. However, the method had certain limitations. The variation of typical OA symptoms in time and different grades of OA could have made the diagnosis and the exact moment of assessing it difficult. All the patients with knee OA diagnosed in their municipal health care centers were given an opportunity to participate in this study. The response rate after a reminder was sent to all non-respondents was 61%, which can be regarded as a satisfactory rate in a postal survey.

As to generalizability, the limitation was that this study was only conducted in one province and in a particular region in one country, which could limit the generalizability of the results internationally. However, the fact that the data were collected from 12 municipal health care centers in four municipalities could increase the representativeness of the results. As the total population of patients with knee OA in Finland seems to be similar to the population of this study (Current Care Guidelines 2014), the results could, with certain reservations, be generalized in Finland. The generalizability of the results may have been weakened because we did not receive information on all the non-respondents in the study. Only 18 of the non-respondents gave a reason by phone or by post for not participating in this study. It was remarkable that eight of them reported that they had not received a knee OA diagnosis and that was why they did not respond. The respondents' age distribution and other chronic illnesses could also have affected answering activity. Only the patients with knee OA diagnosed in municipal health care centers were included in this study, which could also limit the generalizability of the results. Patients with knee OA diagnosed recently in other places like occupational health care or special health care units were not included in the study.

The KEhp scale was applied to health care centers' patients for the first time. We did not ask the respondents for feedback on the scale. One question 'How could I see a priest or theologian' was excluded from the analysis, because one third of participants had responded 'Does not apply'. This raises the question of how suitable this question was for this study population. However, the KEhp scale had a good reliability in this study.

## CONCLUSIONS

In view of knee OA epidemiology, there is need for successful self-management that could be supported by counseling and ensuring that patients get information according to their expectations. Effective counseling in basic health care could bring cost savings. Patients with OA would be more capable of self-management and thereby less dependent on health care services. Also the need for special health care services could be at least delayed. These study findings have three implications for knee OA care.

First, our results confirm that patients with knee OA counseling has not met the care recommendation that counseling should be offered to all patients with knee OA (March *et al.* 2010, Zang *et al.* 2010, Current Care Guidelines 2014, McAlindon *et al.* 2014, Osteoarthritis 2014); about half of the participants told they have not had counseling on OA. In the future, there is need to intensify counseling for patients with knee OA. In addition to doctors and physiotherapists, also other health care professionals like nurses could take part in counseling. For example, diet and exercise counseling is part of every health care professional's work. Nurses have been involved in patients with OA counseling in many intervention studies and they have been one of the key sources in knowledge provision.

Second, as knowledge expectations are high, health care professionals should ensure that counseling, especially from bio-physiological, ethical and financial perspectives, is available for recently diagnosed patients with knee OA. Knowledge is needed for successful self-management and it has to be tailored according to age, employment status, other diseases, disease-related symptoms and emotions. There is also need for information on how patients themselves could seek knowledge from reliable sources.

Third, according to this study, especially pain among women and tiredness or fatigue among men has association with knowledge expectations. It has been indicated that patients with OA' pain receives too little attention from health care professionals. They should be able to diagnose the symptoms of pain, tiredness or fatigue in patients with OA and take them into account in counseling when assessing patients' knowledge expectations. In this study, the most common disease related emotions had association to the female patients' knowledge expectations, which should also be considered in counseling.

In the future, there will be need for action research to develop new counseling methods to improve OA information provision. Also counseling interventions could be performed based on patients with knee OA` knowledge expectations to examine their efficacy. Patients with OA` experiences, opinions and wishes should be studied to improve counseling. It would be important to study counseling implementation and content among recently diagnosed patients with knee OA to acquire more comprehensive information on OA self-management and conservative care implementation and how they could be improved by taking into account the whole care chain.

**Author Contributions:**

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE\*):

- 1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- 2) drafting the article or revising it critically for important intellectual content.

\* <http://www.icmje.org/recommendations/>



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Variables	Frequency	Per cent
Gender		
Female	164	66
Male	83	34
Age in years		
under 60	48	19
61–65	43	17
66–70	45	18
71–75	55	22
over 76	56	23
Basic education		
Primary school	134	56
Secondary school	73	30
Matriculation examination	34	14
Vocational/academic education		
None	84	40
Lower secondary level	62	30
Upper secondary level	44	21
University level	18	9
Employment status		
Employed/homework	28	12
Retired	186	82
Student	0	0
Unemployed	14	6
Chronic illness		
Yes	177	74
No	63	26
Knee OA counseling		
Yes	122	51
No	116	49



**Table 1.** Sample characteristics (N = 252)

**Table 2.** Regression analysis (Coefficient (b)) for socio-demographic characteristics and disease-related symptoms and emotions on the knowledge expectations among women

Associated factors	OA SM	Total	S1	S2	S3	S4	S6
Age in years							
Under 60						Referent	Referent
61–65						0.172	0.319
66–70						0.410	<b>0.542*</b>
71–75						<b>0.514*</b>	<b>0.590*</b>
Over 76						0.241	0.138
Employment status							
Employed/ homework			Referent	Referent			
Retired			<b>0.421*</b>	<b>0.572*</b>			
Unemployed			0.274	0.330			
Pain							
Little or not at all	Referent	Referent	Referent	Referent	Referent		Referent
A lot	<b>0.271*</b>	<b>0.297**</b>	<b>0.304*</b>	<b>0.365**</b>	<b>0.344*</b>		<b>0.331*</b>
Concerns							
Little or not at all	Referent						
A lot	<b>0.454**</b>						
Hope							
Little or not at all				Referent			
A lot				<b>0.298*</b>			
R-squared	0.275	0.169	0.174	0.199	0.181	0.172	0.158

*Note.* The abbreviations in the second row are: OA SM: OA Self-management knowledge, Total = Total knowledge, S1 = Bio-physiological knowledge, S2 = Functional knowledge, S3 = Experiential knowledge, S4 = Social knowledge, S6 = Financial knowledge

Bold values = significant values

\* P < 0.05, \*\* P < 0.01

**Table 3.** Regression analysis (Coefficient (b)) for socio-demographic characteristics and disease-related symptoms and emotions on the knowledge expectations among men

Associated factor	S2	S3
Vocational/academic education		
None		Referent
Lower secondary level		<b>0.679*</b>
Upper secondary level		-0.283
University level		-0.644
Tiredness or fatigue		
Little or not at all	Referent	Referent
A lot	<b>-0.656*</b>	<b>-0.702*</b>
R-squared	0.265	0.300

*Note.* The abbreviations in the second row are: S2 = Functional knowledge, S3 = Experiential knowledge

Bold values = significant values

\* P < 0.05, \*\* P < 0.01