

Musculoskeletal Pain and Level of Education – A Cross-Sectional Study from Ullensaker, Norway

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Sammanfattning

I en postal tverrsnittstudie har vi undersøkt forholdet mellom muskelsmerter og utdanningsnivå i Ullensaker kommune. Vi brukte et standardisert spørreskjema om muskelsmerter (også kalt Ørebro-skjemaet) og fikk svar fra 3325 personer (svarprosent 55%). Vi registrerte utdanningsnivå og en rekke andre demografiske- og livsstils-variable samt funksjonsevne og subjektive helseplager. Vi fant i denne studien en sammenheng mellom utdanningsnivå og muskelsmerter. Personer med lavt utdanningsnivå har mer muskelsmerter enn personer med høyere utdanning. Når det gjelder å bli hindret i sine daglige aktiviteter av smertene er forskjellene enda større mellom de med lav utdanning og de med høy utdanning.

Nyckelord

muskelsmerter, utdanning, utdanningsnivå, sosiale ulikheter, prevalens, nakkesmerter, ryggsmert, skuldersmerter, knesmerter, utbredte smerter, hindrende smerter, funksjon



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– Essay –

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Abstract

This cross-sectional postal survey explores the relationship between musculoskeletal pain and level of education in Ullensaker municipality. We used a Standard Nordic Questionnaire (SNQ) to register self-reported musculoskeletal pain in 3325 persons in 2004 (participation rate 55 %). We registered educational level and a series of other demographic and life-style variables as well as functional ability and subjective health complaints. We found in this study that educational level and musculoskeletal pain is associated. People with low educational levels are prone to have more musculoskeletal pain than persons with higher education. When it comes to musculoskeletal pain that is limiting persons in their daily tasks the difference is even larger between persons with low educational level and persons with higher education.

Key words

musculoskeletal pain, education, educational level, social inequalities, prevalence, neck pain, low back pain, shoulder pain, knee pain, widespread pain, limiting pain, function

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1 INTRODUCTION

Musculoskeletal pain is a commonly occurring problem in individuals and on a societal level (11). Social inequalities are seen in most societies, giving differences in social class, social status and socioeconomic status. There are many measures of social inequalities, and educational level is one of them. Social class is measured in some studies according to education and social status is sometimes equated with either education or income (1). Difference in educational level is one commonly used marker for social inequality.

This study explores the relationship between musculoskeletal pain and level of education in Ullensaker municipality. Ullensaker is situated in the county of Akershus in the Eastern part of Norway. Oslo Airport is located at Gardermoen in Ullensaker. The district had approximately 23500 inhabitants in 2004.

I am living in Ullensaker County and I realized that a large population survey on musculoskeletal pain was conducted in my community and wanted to use the opportunity to participate in this study. This was a chance to have a topic for my MPH-Essay that had a local connection to my home area. I contacted the research group, and together we chose to focus at the association between educational level as an indicator of social inequality and musculoskeletal pain.

The increasing prevalence of musculoskeletal pain, including back pain, has been described as an epidemic. Pain complaints are usually self-limiting, but if they become chronic the consequences are often serious. These include the distress of patients and their families and also consequences in terms of welfare benefits and lost productivity (39).

Pain, in one form or other, is an inseparable part of everyday life. It is probably also the commonest symptom encountered in clinical practice. How people perceive and respond to pain, both in themselves and among others, can be influenced by their cultural and social background (22).

Pain affects all parts of society: rich or poor, young or old, all religions, cast, creed or color. Every person in his or her life's journey will some time or other experiences a varying degree of pain. Musculoskeletal pain is rarely life threatening and is seldom taken as an emergency.

The level of education of an individual can affect his/her approach to pain and treatment seeking behavior. Some times sufferers might not take the episodes of musculoskeletal pain serious because of ignorance of the possible consequences in form of reduced function and disability.

On the other hand an educated person might more often know when and how to get proper health care. He might recognize that pain can be a symptom of various other health related problems and diseases, and that pain that is not properly managed can lead to reduced function and disability. Education gives opportunity for the individual to explore the various ways of treatment and rehabilitation.

Depending on the measure, the size of the health differential between socioeconomic groups varies both within and between countries, but the socioeconomic gradient is always present (15, 37). Even though to a large extent different measures of socioeconomic status are related to each other, they are not completely interchangeable (4).

Education determines socioeconomic position in terms of occupational class and socioeconomic position determines income. Studies have shown that in European Countries, health in general among people in comparable social positions was very similar. The magnitudes of differences in health between social positions are surprisingly similar in different European countries, including the Scandinavian welfare states (7, 37).

In Norway the average educational level is high compared to the rest of the world, still there are differences in levels of education also in Norway. In this study we will measure educational level by the amount of years spent in schools and universities.

2 BACKGROUND

2.1 Musculoskeletal pain as a global problem

Pain is something that individuals experience sometime or other in their lives. Pain is a very personal event and it has a different meaning to each person, involving both physical and emotional elements. It cannot be measured by any medical test; only the person experiencing pain can describe it. The person who experience pain is the best judge of the type and intensity of his pain.

Pain has been described as a multidimensional phenomenon with sensory, affective, and cognitive dimensions (40).

Some people express extreme discomfort from relatively small injuries, while others show little or no pain even after a severe injury. Sometimes pain is present even though no injury is apparent at all, or pain lingers long after an injury appears to have healed. Each person perceives pain a little differently, and as a result, each person also responds to painful stimulation differently. Some people are more willing to express pain than others, but this does not necessarily mean that they hurt more. Pain research specialists have observed a wide variety of subtle variations in pain response. For instance, children are quicker to cry

after a relatively minor injury than are adults. Learned cultural behaviors often dominate the way individuals express pain.

Broad cultural differences in pain responsiveness have also been documented. In some aboriginal societies (70), people undergoing important rituals often incur extreme tissue injury willingly, and typically, pain is not expressed.

”Musculoskeletal Pain” is a widely used term, but whose entity is not well defined. Generally, the concept of musculoskeletal pain implies that muscles or skeleton are the origin of pain (41).

Two definitions of pain serve both clinicians and researchers. The first is that “Pain is whatever the experiencing person says it is, existing whenever he says it does” (38).

The second definition is formulated by the International Association for study of pain (IASP) and states that; “Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (24).

Pain can be acute, intermittent and chronic (8). Chronic pain can be defined according to pain duration; sometimes low back pain is defined as chronic when it lasts for more than 3 months. Chronic can also mean incurable, and the concept of chronic pain can mean different things for different persons. Regardless of definition, chronic pain involves the interaction of psychosocial, behavioral, and physiological processes, which can produce both different sensory experiences and different behavioral responses (12).

Unrelieved musculoskeletal pain has functional, cognitive, emotional and societal consequences. Pain can lead to disturbed sleep. It can also lead to physical disabilities, reduced mobility and functional ability.

In today’s world everyone wants to be independent physically and mentally and enjoy a good quality of life. Musculoskeletal pain limits a person’s ability to carry out various activities effectively and efficiently. A person with reduced functional ability more often has to depend on others for help and support, and this might lead to low self-esteem or poor self-image. These consequences lead to low quality of life. Physically it limits his or her movements and can lead to limited job opportunities.

Societal consequences of pain include increased economic and care giving burden on families, friends and the society (health care system).

The increasing prevalence of musculoskeletal pain, including back pain, has been described as an epidemic. Pain complaints are usually self-limiting, but if they become chronic the consequences might be serious. Musculoskeletal disorders (MSD) represent an important cause of morbidity and disability. Currently 40% of worldwide work-related health costs

are attributed to MSD (58). In Norway, MSD have been the dominant cause of sickness certification by doctor, whether measured by incidence, duration of single episodes, or number of days of work lost (59). MSD has also high prevalence in low-income countries (63).

Musculoskeletal disorders (MSDs) attributed to work include a group of condition that involve the nerves, tendons, muscles, and supporting structures of the body such as intervertebral discs. Often attributed to or exacerbated by the work environment, these disorders are also referred to as work-related musculoskeletal disorders (WMSDs) which can cause symptoms such as pain, numbness, and tingling, as well as reduced work productivity, lost time from work, temporary or permanent disability (33).

During the 1990s, long-term sick leave increased in Sweden (52). Health complaints relating to musculoskeletal pain and discomfort are the most common occupationally related illness (21) and about 40 % of all sick leaves in Sweden are currently due to musculoskeletal problems (52).

One of the major musculoskeletal disorders, back pain is the second leading cause of sick leave. In industrialized countries, back pain puts a large social and economic burden on the society as well as on the affected individuals (35). The compulsory sickness funds in the former West Germany show that 14% of all days lost from work and 3% of all hospitalizations are because of back disorders (38). In the UK it was estimated that back pain led to 45 million days lost from work per year (55).

Despite their enormous impact worldwide and its documented impact on public health, musculoskeletal disorders do not receive the attention they deserve and are inadequately funded (35). The resources allocated to research and patient care are probably not proportional to its impact worldwide. In recognition of this, World Health Organization has endorsed the Bone and Joint Decade 2000-2010, requesting more knowledge about the epidemiology of musculoskeletal complaints. (66).

2.2 Musculoskeletal Pain in Norway

In the Norwegian population, about 80-90% reports one or more episodes of musculoskeletal pain during a year (43). In the past month, about 60% of women and 40% of men had complaints of pain and stiffness in muscles or joints (14).

A large-scale Norwegian population based study done in the Norwegian County of Nord-Trøndelag between 1995-97 – “THE HUNT STUDY”, evaluated the incidence of musculoskeletal complaints lasting at least 15 days during the past month at nine different anatomic sites in relation to age and gender in an unselected adult population. As per this study, the overall age-adjusted incidence of musculoskeletal complaints lasting at least 15

days during the past month was 7.9% or nearly one in 12 individuals. On extrapolation of the data, the annual incidence of musculoskeletal complaints for at least 15 days during the past month was 1.07 cases per person-year. This meant that every adult in the population at risk would as a mean have one episode of musculoskeletal complaints in one or several regions during a year. Similarly, one of three individuals would have lower back pain during a year (19).

In another study undertaken to assess the prevalence of a wide range of subjective health complaints in a cross-sectional study of a normal population in Norway in 1996 with the standardized SHC questionnaire, musculoskeletal complaints were reported by 80% (women: 84%, men: 76%), whereas 13% reported substantial musculoskeletal complaints (women: 18%, men: 6%) (25). As quoted in the above mentioned study, from the National Insurance Administration's Social Security Statistical Year Book (1998) data (58), about 45% of long-term sickness leave (more than eight weeks), and nearly 33% of permanent disability benefits, and 45% of rehabilitation compensation are due to musculoskeletal complaints.

The situation was no different in the early years of the millennium, as quoted from the Statistics Norway, 2004 (53), by the authors of the article on the Hunt Study. Musculoskeletal complaints were the most common causes for attending primary health care facilities, sick leave, and disability pension in Norway (19).

2.3 Education and occupation

In affluent societies like Norway, living conditions as well as general health status have improved during the last decades. In spite of this, social health inequities still exist, and recent analyses from Oslo even indicate an increase during the last 30 years (68).

The association between low socioeconomic status (SES) and poor health in general is well established, but the relation between chronic musculoskeletal pain and SES is less clear. Most population-based cross-sectional studies have reported higher prevalence of musculoskeletal symptoms in individuals with low SES when compared with high SES individuals. SES reflects the position of individuals in a social stratification system, and most authors refer to either level of education, income, or occupation as indicator for SES, where as some have defined SES by living area (20). Occupational status, duration of education, and income level probably all reflect somewhat different aspects of SES (20). The lower the social class the higher the prevalence of less than good self rated health and limiting longstanding illness (50).

Education determines socioeconomic position in terms of occupational class and socioeconomic position determines income (67). The differences between welfare systems

in western European countries allow us to compare the impact of income and poverty on socioeconomic inequalities (67).

A lower level of health damaging demands characterizes Job situations that require a high level of education and a higher levels of control, and vice versa. Education affects the position in the labor market, which again affects the level of mastering and therefore the ability to continue in the labor market (62).

Back pain and its consequences are inversely related to indicators of high SES such as educational level, income, and occupational class (64). Low back pain is one of the few health problems that seem to be equally distributed between genders, although some studies have shown a male preponderance (46).

Education has been considered to play three different parts in relation to back pain: as a predictor of the frequency (incidence, recurrence and prevalence) of back pain, as a predictor of the outcomes of back pain episodes (importance and duration of pain and disability, interference with work and other activities, and health care consumption), and as a predictor of the outcomes of surgical and rehabilitative interventions performed among series of back pain patients (13).

Education may also be a marker for specific traits like intelligence, acquisition of adaptive skills, or awareness of risky health behaviors (13). People with a high level of education are less likely to believe in the myths of how to protect your back by being careful compared with persons with a lower level of education (26).

The risk of musculoskeletal sickness absence was higher for women than for men. However, associations and impacts of parental and own educational attainment as well as own income level were stronger for men than for women. The explanation could well be that the men had a lower reference absence risk (29).

It is important for clinicians who advise and support patients in their response to musculoskeletal pain to be aware of socioeconomic differences in coping strategies. Gender differences in the association between socioeconomic factors and coping should be further investigated (6).

3 MUSCULOSKELETAL PAIN IN ULLENSAKER

There have been formerly surveys conducted on musculoskeletal pain in Ullensaker in 1990 and 1994. From these surveys we know that musculoskeletal pain is common, 15 % in the Ullensaker survey in 1990 reported no pain during the previous year. 58 % reported that they had had musculoskeletal pain during the previous week, and 15 % had had musculoskeletal pain every day during the previous year. LBP was the commonest musculoskeletal pain, reported by 53 % of the population during the previous year. Pain from head (49 %), neck (48 %), and shoulder (47 %) was also experienced by nearly half the population during the previous year (41).

3.1 The Aim of the study

The aim of this study from 2004 is to describe the association between educational level and different types and patterns of self reported musculoskeletal pain in a large population based study.

1. To analyze the relation between educational level and musculoskeletal pain, work disability and reduced functional capacity in Ullensaker municipality.
2. To analyze the patterns of musculoskeletal pain and education according to age, gender and type of pain.

3.2 Hypotheses

Our hypothesis is that persons with higher levels of education report less musculoskeletal pain than persons with lower education. We also believe that the difference in educational level will be larger when we ask for daily consequences of musculoskeletal pains. This is formulated in two specific hypotheses:

1. "The prevalence of musculoskeletal pain increase by decreasing educational level in all age groups for both genders".
2. "The prevalence of work disability and reduced functional capacity is larger in persons with low educational level on the same levels of musculoskeletal pain".

4 ETHICAL ASPECTS

The regional committee of medical ethics (REK Sør) has approved the research protocol and the data collection in 2004. Anonymity in the study was assured so that the questionnaire answers could not be connected to any particular person or address. There was no explicit written informed consent given to the subjects prior to data collection, but detailed information about the research project was provided on the questionnaire. Subjects, who returned the questionnaire, were presumed to have agreed to participate in the study and also agreed that their responses would be included in the database and used in the study.

5 MATERIALS AND METHODS

This study has a non-interventional, cross-sectional design, based on self-administered questionnaires. Late autumn 2004 a questionnaire about musculoskeletal complaints was sent to all inhabitants in Ullensaker in the following seven birth cohorts, 1918-20, 1928-30, 1938-40, 1948-50, 1958-60, 1968-70 and 1978-1980. After one reminder 3325 persons responded (participation rate 55%).

Ullensaker is situated in the County of Akershus in the eastern part of Norway. Ullensaker is a municipality with about 23500 inhabitants in 2004, situated 40 km northeast of Oslo. It is a rural community, and many of the inhabitants commute to jobs in Oslo. There are no major differences between the population of Ullensaker and the population of Norway with respect to demographic characteristics.

In this study the musculoskeletal symptoms were registered using a Standard Nordic Questionnaire. The respondents were asked to report whether they had experienced any pain or discomfort from the following 10 areas during the previous week: head, neck, shoulder, elbow, hand/wrist, upper back, hip, knee or ankle/foot. The checklist was supplemented by a "pain -region drawing". As a large number of respondents only marked yes for the areas they had pain and left the no-columns open in the questionnaire, all missing values were coded as no pain.

The duration of the pain was registered by two questions: "How long have you had pain?" (No pain, less than a year, 1-5 years, 6-10 years and more than 10 years) and "How long have you had your musculoskeletal pain during the last 12 months" (no pain, less than a week, 1-8 weeks, more than 8 weeks but not all the time, every day).

The intensity of pain was registered by one question “How bad have your pain been?” (No pain, not so bad, medium, bad, very bad).

Education is measured by self-report of the highest formal education (basic school only, occupational school, high school or university in 1 - 4 years, high school or university more than 4 years).

In addition we have information about age, gender, social demographics, job status, some life style factors, functional ability, psychosocial distress (GHQ-20) and other subjective health complaints.

6 ANALYSIS

For the statistical analyses we used SPSS version 11.0. P-values <0.05 were considered statistically significant.

We analyzed the relationship between educational level and different types of self-reported musculoskeletal pain. We also performed stratified analyses according to age and sex, and statistical differences between the sexes and age groups were analyzed with Pearson’s chi-square test.

7 RESULTS

7.1 Participation Rate

Table 7.1 Response rates in The Ullensaker Study 2004. Number of questionnaires posted, number of responses and participation rate in women, men, and total population.

Birth year	Women			Men			N post	All	
	N post	N resp	Part %	N post	N resp	Part %		N resp	Part %
1918-20	105	38	36,2	59	21	35,6	164	59	36,0
1928-30	205	131	63,9	190	121	63,7	395	252	63,8
1938-40	337	236	70,0	325	222	68,1	662	458	69,2
1948-50	521	372	71,4	526	313	59,3	1047	685	65,4
1958-60	524	324	61,8	586	278	47,4	1110	602	54,2
1968-70	928	543	58,6	902	407	45,2	1830	950	51,9
1978-80	451	180	40,1	449	139	31,1	900	319	35,6
All	3071	1824	59,4	3037	1501	49,4	6108	3325	54,5

The overall participation rate was 54.5 %. Women responded more often than men. In both genders the response rate was highest among the middle aged, and lower in the youngest and oldest (table 7.1).

7.2 Educational level in the Ullensaker population

Table 7.2 Educational level in the Ullensaker population, according to age and sex (n = 3279)

Education	Gender	All	24-26	34-36	44-46	54-56	64-66	74-76	84-86
		%	%	%	%	%	%	%	%
Elementary Educat.	male	16.7	3.6	11.8	12.7	18.5	28.1	29.6	50.0
	female	19.7	5.1	9.6	12.8	26.0	35.2	47.6	48.6
Occupat. Educat.	male	20.8	16.1	17.5	28.6	23.3	19.4	13.9	25.0
	female	11.0	5.1	6.6	16.8	13.4	13.2	12.7	11.4
Secondary School	male	28.6	34.3	24.9	30.1	26.5	30.4	33.9	25.0
	female	34.9	36.5	35.6	37.7	33.9	34.8	29.4	22.9
University 1-4 yrs.	male	22.2	29.2	28.8	18.5	21.7	15.7	17.4	0.0
	female	24.3	34.8	32.8	25.2	19.4	13.2	7.9	14.3
University >4 yrs.	male	11.5	16.8	17.0	10.1	9.9	6.5	5.2	0.0
	female	10.0	18.5	15.3	7.5	7.4	3.5	2.4	2.8

In Ullensaker 10.7 % of the respondents (n=3325) have more than 4 years of university education, while 23.4% of the respondents have had 1 to 4 years of university education. 32.1 % of the respondents have attained secondary school education and 18.5% primary school.

Table 7.2 illustrates the gender and age distribution of educational level. In the younger age groups women have a somewhat higher educational level than men, and a great majority has secondary school or more education.

In older age groups the level of education decrease gradually and in persons aged 84-86 years one half of the population reports only elementary education. In the older age groups men have higher educational level than women.

Men have more occupational education than women in the younger age groups.

7.3 Prevalence of Different Types of Musculoskeletal Pain in the Ullensaker Population.

Table 7.3 Prevalence of musculoskeletal pain for ten different body regions (n =3325)

Body Area	Have you had pain, stiffness or discomfort in the last 12 months?	Have you been unable to perform your routine daily activities in the past 12 months due this complaint?	Have you had pain, stiffness or discomfort in the last 7 days?
	% of respondents	% of respondents	% of respondents
Head	55.3	16.2	30.2
Neck	56.1	15.4	34.4
Shoulder	55.2	16.2	33.0
Elbow	16.4	5.7	9.5
Wrist /Upper Arm	29.7	9.3	17.3
Upper Back	30.1	10.4	18.0
Lower Back	59.4	20.8	33.6
Hips	26.3	8.8	16.2
Knees	32.5	8.1	18.2
Ankle / Feet	24.6	7.1	15.3

90.4% (3006 of 3325 respondents) in our population reported to have at least one musculoskeletal symptom during the last twelve months.

In Table 7.3 the prevalence of pain for one year and one week in ten different body regions, as well as prevalence of limiting pain for one year are shown.

The body region reported, in which musculoskeletal pain was most prevalent in the last 12 months was low back (59.4 %) followed by neck (56.1 %), head (55.3 %) and shoulder (55.2 %).

The prevalence figures for the last 7 days were highest for neck pain (34.4 %) followed by low back (33.6 %), shoulder (33.0 %) and head (30.2 %).

Approximately one third to one fourth of persons with pain in a body region report that this pain has made them unable to perform their daily activities some time in the past 12 months. The one-year prevalence of limiting pain is most often reported due to lower back pain (20.8 %), followed by head and shoulder pain (16.2 % each) and neck pain (15. 2%)

Most persons with musculoskeletal pain have had pain in more than one body region, and a large proportion of the population reported widespread pain.

Table 7.4: Number of Body regions where pain was experienced last year and last week (n=3325)

No of Body Regions where pain was experienced	Pain experienced Last Year		Pain experienced Last Week	
	No of respondents	% of respondents	No of respondents	% of respondents
0	319	9.6	1068	32.1
1	364	10.9	541	16.3
2	446	13.4	437	13.1
3	468	14.1	416	12.5
4	448	13.5	300	9.0
5	425	12.8	201	6.0
6	304	9.1	143	4.3
7	242	7.3	91	2.7
8	141	4.2	48	1.4
9	84	2.5	41	1.2
10	84	2.5	39	1.2

In table 7.4 we report the proportion of persons with different degrees of widespread pain, measured as number of body regions where the respondent experienced pain in the last year and last week.

During the last year only about 10% of the respondents reported experiencing no pain, and another 10% reported localized pain from only one body area or pain site. Accordingly, about 80% of the population reported some degree of pain from multiple sites during the year. Widespread pain defined as experiencing pain in 5 or more body regions was reported by 38.5 % of the respondents.

When we examine the figures for last week, there are as expected more persons with no pain last week (32%), but still in this narrow period of time a little more than half the population (52%) have had pain from 2 or more locations in the body, and 17% has widespread pain (5 or more pain regions last week).

7.4 Gender and Age Differences in the Prevalence of Musculoskeletal Pain

Table 7.5 Gender differences in one-year prevalence of musculoskeletal pain (n = 3325)

	Women (n = 1824)		Men (n = 1501)		P for gender diff
	n	%	n	%	
Neck	1172	64.3	692	46.1	<0.001
Shoulder	1137	62.3	699	46.6	<0.001
Low back	1097	60.1	877	58.4	0.316
Knee	624	34.2	457	30.4	0.012
Widespread	846	46.4	434	28.9	<0.001

In the analyses of gender and age patterns in musculoskeletal pain prevalence we chose to restrict our analyses to some important and common types of pain; i.e. neck pain, shoulder pain, lower back pain, knee pain and widespread pain.

Neck pain was reported by more women than men (64.3% vs. 46.1 %), a highly significant difference. Similarly, on examining table 7.4 one can ascertain that a significantly higher number of women experienced shoulder pain (62.3 % vs. 46.6 %), knee pain (34.2 % vs. 30.4 %) and widespread pain (46.4 % vs. 28.9 %) as compared to men. On the other hand there was no significant difference in the prevalence of lower back pain among women and men (60.1 % vs. 58.4 %).

In table 7.5 the patterns of one-year pain prevalence in our seven age cohorts indicate that neck pain, shoulder pain, knee pain and widespread pain is significantly different across the seven age cohorts.

**Table 7.6 Age differences in one-year prevalence of musculoskeletal pain (percentages)
(n = 3325)**

Age	24-26	34-36	44-46	54-56	64-66	74-76	84-86	p
	%	%	%	%	%	%	%	
Neck (n=1864)	48.6	58.2	64.5	58.7	51.5	43.3	35.6	<0.001
Shoulder (n=1836)	46.4	55.8	61.3	60.4	55.7	39.3	35.6	<0.001
Low back (n=1974)	55.2	61.6	60.1	59.7	57.6	59.9	45.8	0.145
Knee (n=1081)	27.9	28.3	32.4	36.8	36.9	35.7	28.8	0.001
Widespread (n=1280)	34.8	36.7	40.5	45.7	36.7	29.4	35.6	<0.001

People in the age cohort of 44-46 years have a maximum prevalence of neck pain (64.5%) and shoulder pain (61.3%). The maximum no of persons with widespread pain is found in the 54-56 years age cohort. Similarly, older persons in the 54-56 & 64-66 age cohort experienced most knee pain (36.8% & 36.9%). On the other hand there was no significant difference in the prevalence of lower back pain that is more or less prevalent across all the age cohorts.

**Table 7.7 Gender differences in one-week prevalence of limiting musculoskeletal pain
(n = 3325)**

	Women (n = 1824)		Men (n = 1501)		P for gender diff
	N	%	n	%	
Neck	755	41.4	389	25.9	<0.001
Shoulder	698	38.3	398	26.5	<0.001
Low back	689	37.8	427	28.4	<0.001
Knee	344	18.9	261	17.4	0.274
Widespread	405	22.2	158	10.5	<0.001

Table 7.7 which shows the prevalence of limiting musculoskeletal pain among women and men in the past seven days, clearly indicates that women experience significantly more neck pain (41.4 % vs. 25.9 %), shoulder pain (38.3 % vs. 26.5 %), low back pain, (37.8 % vs. 28.4 %) and widespread pain (22.2 % vs. 10.5 %) than men. However, there is no significant gender difference in knee pain (18.9 % vs. 17.4 %).

There is a statistically significant difference among the seven age cohorts in the prevalence of one-week musculoskeletal pain as shown in table 7.8.

Table 7.8 Age differences in one-week prevalence of musculoskeletal pain (n = 3325)

Age	24-26	34-36	44-46	54-56	64-66	74-76	84-86	p
Neck (n=1144)	27.0	32.0	42.5	40.1	32.3	26.2	15.3	<0.001
Shoulder (n=1096)	22.9	28.2	38.7	40.1	37.8	23.8	23.7	<0.001
Low back (n=1116)	28.2	29.4	34.1	37.5	37.1	36.1	40.7	0.002
Knee (n=605)	11.3	12.9	15.9	24.2	24.7	22.6	23.7	<0.001
Widespread (n = 563)	10.0	12.6	18.1	23.8	19.4	14.7	22.0	<0.001

Low back pain past week was experienced by an increasing percentage of people as the age cohort increases and the 84-86 yrs age cohort had the maximum prevalence (40.7 %). However, neck pain (42.5 %) shoulder pain (40.1 %) & widespread pain (23.8 %) was experienced by a highest percentage of people in the 44-46 yrs and 54-56 yrs age cohorts.

Table 7.9 Gender differences in one-year prevalence of limiting musculoskeletal pain (n = 3325)

	Women (n = 1824)		Men (n = 1501)		P for gender diff
	n	%	n	%	
Neck	347	19.0	166	11.1	<0.001
Shoulder	350	19.2	190	12.7	<0.001
Low back	424	23.2	268	17.9	<0.001
Knee	164	9.0	105	7.0	0.036
Widespread	194	10.6	76	5.1	<0.001

Table 7.9, brings out the prevalence of limiting pain due to differences in gender. As compared to men, women tend to be impacted significantly more and are unable to perform their normal duties in the last year due to limiting pain in the neck region (19.0 % vs. 11.1 %) shoulder region (19.2 % vs. 12.7 %) lower back region (23.9 % vs. 17.9 %) and due to widespread pain (10.6 % vs. 5.1 %). The gender differences were smaller for being unable to perform normal routine work in the last year due to knee pain (9.0 % vs. 7.0 %).

Table 7.10 Age differences in one-year prevalence of limiting musculoskeletal pain (n = 3325)

Age	24-26	34-36	44-46	54-56	64-66	74-76	84-86	P
Neck (n=513)	11.3	14.9	20.3	17.2	14.0	9.9	10.2	<0.001
Shoulder (n=540)	10.7	14.0	20.6	19.4	16.6	13.1	11.9	<0.001
Low back (n=692)	16.3	20.0	20.4	25.0	22.5	16.7	18.6	0.019
Knee (n=269)	3.1	4.3	7.8	10.9	13.5	11.9	6.8	<0.001
Widespread (n=270)	4.4	5.8	9.0	12.7	8.7	6.7	5.1	<0.001

The prevalence of limiting pain across different age cohorts is significant different in the age cohorts (Table7.10).

The people in the 44-46 yrs age cohort are most often unable to perform their normal and routine activities due to neck pain (20.3 %) and shoulder pain (20.6 %). Similarly, the age cohort of 54-56 yrs are most often incapacitated due to low back pain (25.0 %) and widespread pain (12.7 %) while limiting knee pain (13.5%) was most often reported by people in the 64 -66 yrs age cohort.

7.5 Musculoskeletal Pain and Educational Level

The association between educational level and different types of musculoskeletal pain is first analyzed in univariate analyses for one-year prevalence (table 7.11) of pain as well as one-week prevalence of pain (table 7.12) and one-year prevalence of limiting pain (table 7.13).

Table 7.11: Educational level and one-year prevalence of musculoskeletal pain (n = 3279)

	Neck (n= 1843)	Shoulder (n=1827)	Low back (n=1962)	Knee (n=1072)	Wspread (n=1271)
	%	%	%	%	%
Elementary educat. (n=605)	58.2	62.1	65.3	37.5	45.5
Occupat. school (n=506)	56.1	57.5	61.9	38.1	41.9
Secondary school (n=1051)	58.8	57.8	61.6	33.9	42.8
University (1-4 Yrs) (n=767)	49.8	46.8	53.7	26.3	29.3
University (>4 Yrs) (n=350)	59.1	54.0	55.7	26.9	31.1

From table 7.11, it can be seen that among the different groups of educational level, the maximum % of respondents who experienced pain in the past year in the shoulder region (62.1 %), low back (65.3 %) and widespread pain (45.5 %) was in people with elementary education.

On the other hand, respondents with more than 4 years of university education most often reported neck pain (59.1 %). Low back pain had the highest number of respondents in all other education levels i.e. elementary school (65.3 %), occupational school (61.9 %), secondary school (61.6 %) and high school or university education (1 – 4 yrs) (53.7 %).

Table 7.12: Educational level and one-week prevalence of musculoskeletal pain (n = 3279)

	Neck (n=1137)	Shoulder (n=1089)	Low back (n=1111)	Knee (n=598)	Widespread (n=559)
	%	%	%	%	%
Elementary educat.(n=605)	41.3	41.3	43.8	25.3	24.6
Occupat. school (n=506)	37.0	37.2	38.1	20.9	19.6
Secondary school (n=1051)	38.0	34.7	34.1	19.6	19.2
University (1-4 Yrs) (n767)	25.9	24.8	26.9	11.6	9.6
University (>4 Yrs) (n=350)	29.1	27.4	25.4	12.6	10.0

The past week prevalence of pain also indicates that among all the educational levels, maximum no of respondents with only elementary education suffered from neck pain (41.3%) shoulder pain (41.3%) lower back pain (43.8%) knee pain (25.3%) and widespread pain (24.6%).

However, within each education level, maximum respondents from elementary education (43.8 %) occupational school education (38.1 %) and high school or 1 – 4 years of university education (26.9 %) were suffering from low back pain. In case of secondary school education and more than 4 years of university education most respondents were suffering from neck pain (38.0 % & 29.1 %).

Table 7.13: Educational level and one-year prevalence of limiting musculoskeletal pain (n = 3279)

	Neck (n=510) %	Shoulder (n=533) %	Low back (n=688) %	Knee (n=264) %
Elementary educat. (n=605)	20.2	23.5	26.8	14.4
Occupat. school (n=506)	16.6	17.8	24.1	9.9
Secondary school (n=1051)	16.8	17.5	21.5	7.8
University (1-4 Yrs) (n=767)	11.6	11.1	16.9	4.3
University (>4 Yrs) (n=350)	10.9	9.1	13.7	3.4

On looking across educational levels, maximum % respondents unable to perform their daily normal and routine activities due to neck pain (20.2%) shoulder pain (23.5%) lower back pain (26.8%) and knee pain (14.4%) are having only elementary school education.

7.5 Logistic Regression

Table 7.14: Logistic regression: widespread pain last year and educational level, gender and age groups (n = 3279)

	Exp (B)	95 % CI	p-values
Educational level	1.0		
(ref. University >4)			
University (1-4 Yrs)	0.87	0.66-1.15	0.348
Secondary	1.61	1.23-2.09	<0.001
Occupational	1.78	1.32-2.40	<0.001
Elementary	1.91	1.42-2.56	<0.001
Gender	1.0		
(ref. men)			
Women	2.20	1.89-2.55	<0.001
Age Cohorts	1.0		
(ref 24-26 years)			
84-86 years	0.76	0.41-1.40	0.368
74-76 years	0.63	0.43-0.91	0.015
64-66 years	0.93	0.68-1.28	0.650
54-56 years	1.40	1.05-1.87	0.021
44-46 years	1.16	0.86-1.55	0.327
34-46 years	1.05	0.80-1.38	0.716

Subsequently, we performed five logistic regressions with widespread pain, limiting neck pain, shoulder pain, low back pain and knee pain as dependent variable, and educational level, age and gender as independent variables.

When we include age and gender in a multivariate analysis there is still a strong association between educational level and widespread pain (table 7.14).

As shown in Table 7.14, women were twice as likely to have widespread pain as compared to men (2.20 vs. 1.00). Similarly, education has an impact on widespread pain as evidenced by the fact that people having Secondary, Occupational and Elementary school educational level are likely to have more widespread pain 1.61, 1.78 & 1.91 times as compared to people with university level education.

Table 7.15: Logistic regression: limiting neck pain last year and educational level, gender and age groups (n = 3279)

	Exp (B)	95 % CI	p-values
Educational level	1.0		
(ref. University >4)			
University (1-4 Yrs)	1.03	0.69-1.55	0.877
Secondary	1.60	1.10-2.34	0.015
Occupational	1.73	1.14-2.64	0.010
Elementary	2.22	1.48-3.33	<0.001
Gender	1.0		
(ref. men)			
Women	1.91	1.56-2.34	<0.001
Age Cohorts	1.0		
(ref 24-26 years)			
84-86 years	0.66	0.26-1.67	0.381
74-76 years	0.69	0.40-1.20	0.192
64-66 years	1.04	0.67-1.64	0.853
54-56 years	1.39	0.92-2.10	0.114
44-46 years	1.81	1.20-2.71	0.004
34-46 years	1.30	0.88-1.93	0.189

Limiting neck pain is also associated with low educational level and female gender in a simple multivariate model (table 7.15). Women and people with low educational level have more limiting neck pain adjusted for the other confounders.

The age pattern for limiting neck pain is not clear, but there is 1.81 times more likely that persons in age group 44-46 years report limiting neck pain compared to people aged 24-26 years. Similarly, level of education has a positive impact on limiting neck pain. A person with elementary education is 2.2 times more likely to report limiting neck pain than a person with university education.

Limiting neck pain is also associated with low educational level and female gender in a simple multivariate model (table 7.15). Women and people with low educational level have more limiting neck pain adjusted for the other confounders.

Table 7.16: Logistic regression: limiting shoulder pain last year and educational level, gender and age groups (n = 3279)

	Exp (B)	95 % CI	p-values
Educational level	1.0		
(ref. University >4)			
University (1-4 Yrs)	1.19	0.77-1.82	0.435
Secondary	2.00	1.34-2.99	0.001
Occupational	2.15	1.39-3.33	0.001
Elementary	3.05	2.00-4.66	<0.001
Gender	1.0		
(ref. men)			
Women	1.65	1.35-2.00	<0.001
Age Cohorts	1.0		
(ref 24-26 years)			
84-86 years	0.77	0.32-1.87	0.566
74-76 years	0.87	0.51-1.48	0.600
64-66 years	1.23	0.79-1.93	0.361
54-56 years	1.64	1.09-2.48	0.019
44-46 years	1.88	1.24-2.84	0.003
34-46 years	1.28	0.85-1.91	0.231

As evidenced in case of widespread pain & limiting neck pain, limiting shoulder pain is also impacted by level of education. The lower the education level, the higher is the likelihood of limiting shoulder pain. A person with only elementary education is 3.05 times more likely to have limiting shoulder pain compared to somebody with university education. Similarly, people with occupational & secondary school education level is 2.15 & 2.00 times more likely to report limiting shoulder pain.

People in the age bracket of 54-56 yrs are 1.64 times more likely to have limiting shoulder pain, while in persons aged 44-46 years, the likelihood of having limiting shoulder pain is 1.88 times higher than for a person aged 24-26 yrs.

Table 7.17: Logistic regression: limiting low back pain last year and educational level, gender and age groups (n = 3279)

	Exp (B)	95 % CI	p-values
Educational level	1.0		
(ref. University >4)			
University (1-4 Yrs)	1.26	0.88-1.80	0.210
Secondary	1.69	1.20-2.37	0.003
Occupational	2.07	1.43-3.00	<0.001
Elementary	2.29	1.59-3.30	<0.001
Gender	1.0		
(ref. men)			
women	1.41	1.18-1.68	<0.001
Age Cohorts	1.0		
(ref 24-26 years)			
84-86 years	0.92	0.44-1.92	0.830
74-76 years	0.82	0.52-1.30	0.399
64-66 years	1.22	0.84-1.79	0.298
54-56 years	1.46	1.03-2.08	0.034
44-46 years	1.17	0.81-1.68	0.402
34-46 years	1.22	0.87-1.72	0.249

For limiting low back pain there is also an association with low education and female gender (table 7.17). There is a slight tendency for more limiting low back pain in the 54-56 years old, but over all the age effect in this model was not significant (p=0.064).

As for the other variables examined people with lower education and female gender were statistically significantly more likely to have limiting lower back pain.

Limiting lower back pain is also impacted by level of education. Looking at Table 7.17, one can infer that lower the education level, higher is the likelihood of limiting low back pain. A person with only elementary education is likely to be 2.29 times more prone to limiting lower back pain compared to somebody with university education. Similarly, people with occupational & secondary school education level is 2.07 & 1.69 times more likely to report limiting lower back pain.

Table 7.18: Logistic regression: limiting knee pain last year and educational level, gender and age groups (n = 3279)

	Exp (B)	95 % CI	p-values
Educational level (ref. University >4)	1.0		
University (1-4 Yrs)	1.17	0.60-2.30	0.650
Secondary	1.97	1.05-3.67	0.034
Occupational	2.52	1.31-4.84	0.006
Elementary	3.32	1.76-6.25	<0.001
Gender (ref. men)	1.0		
women	1.32	1.01-1.72	0.039
Age Cohorts (ref 24-26 years)	1.0		
84-86 years	1.48	0.44-4.97	0.526
74-76 years	2.75	1.29-5.87	0.009
64-66 years	3.46	1.72-6.96	<0.001
54-56 years	2.94	1.49-5.82	0.002
44-46 years	2.18	1.08-4.40	0.030
34-46 years	1.29	0.64-2.61	0.481

For the knee increasing age is strongly associated with more limiting knee pain, as well as low education and a somewhat weaker association to female gender (table 7.18).

Unlike the other limiting pain variables that had a weak association with age cohorts, limiting knee pain is statistically significantly associated with age cohorts. The likelihood of having limiting knee pain increases from 2.18 times to 2.94 times & 3.46 times with increase in the age from 44-46 yrs to 54 -56 yrs and finally 64-66 yrs age group. Even in the age cohort of 74-76 yrs, a person is 2.75 times more likely to have limiting knee pain compared to a person in the 24-26 age cohorts.

Similarly, lower the education, more likely the chances of having limiting knee pain as evidenced by the Table 7.18. A person with secondary school education is 1.97 times more likely to have limiting knee pain. This likelihood increases to 2.52 times & 3.32 times in case of persons with occupational education and elementary education.

8 DISCUSSION

Our study on educational level and musculoskeletal pain show there is a strong and significant relationship between pain and educational level. People with low educational levels are prone to have more musculoskeletal pain and to be even more limited by their musculoskeletal pain in their daily tasks.

8.1 Methodological Considerations

A large population based epidemiological study using self-administered questionnaire was required to examine the phenomena in closer detail. Based on the population characteristics, Ullensaker was selected as there are no major differences between the population of Ullensaker and the population of Norway with respect to demographic characteristics. First I will discuss some strengths and limitation in this study, and then I will discuss some of the important results and finally I suggest some implications of this study.

8.1.1 Strengths

Pain is a complex concept; therefore it is best measured by self reporting (38). The willingness of the responders to admit to their experience in a pencil and paper test is crucial (16) when conducting a self-reporting study. In this study the SNQ was chosen because of its validity and reliability to measure musculoskeletal pain (31). However the questionnaire was designed to obtain reports about even minor symptoms, with no lower limit for the severity of the complaint. As a consequence symptoms with only minor or even no effect on functional status might also be included.

The original SNQ measures nine body regions, while we have added a tenth category, headache (31). This is because headache in clinical experience is closely related to neck and shoulder pain.

The decision to select a cut-off at 5 regions or more of the 10 body regions from the body map in the SNQ, which are to be considered as widespread musculoskeletal pain, is somewhat arbitrarily but partly based on findings from other studies. Natvig et al. found that those who reported pain in 5 regions or more from the SNQ have markedly reduced functional ability (47) and persons with low back pain as part of widespread pain had more often long-term work disability (45).

Educational level can also be a marker of individual or societal characteristic that interact with risk factors and coping strategies. Not only have a person own educational level, but also parental education level seems to have an independent association on sickness absence for musculoskeletal pain (29). Family is the first school where persons start learning.

This is a population based and large epidemiological study. We have used well-validated tools for registration of musculoskeletal pain, and the question about education seems to function adequately. We have registrated all sorts of musculoskeletal pain, as well as limiting pain (consequences for daily life). The SNQ (Standard Nordic questionnaire) has been tested for reliability and validity with good results. Test retest reliability is acceptable, and there is good correlation between the questionnaire and examination by physiotherapists (31, 41)

8.1.2 Limitations

As results of selection bias the responders were more often middle-aged and female than non-responders. This might reflect a tendency towards a high response rate in persons with musculoskeletal pain, because pain is more prevalent in women and middle-aged persons (41). Persons with low education are underrepresented in mail surveys compared with interview surveys (49) probably because they more often find it difficult to answer written questionnaires.

Selection bias may have led to an overestimation of musculoskeletal pain as responders are more often female and middle-aged, the groups with the highest prevalence's of musculoskeletal pain and because people with pain might find it more interesting to respond to a questionnaire about pain than people without pain. On the other hand persons with low education, and persons with serious musculoskeletal disorders, are prone to be non-responders but they will have more musculoskeletal pain than other groups. So the direction of the bias on the total prevalence figures is not certain.

Selection bias might also give too high estimates of educational level in the population, as persons with low educational level are prone to be non-responders. However, in this study the educational level is highest in the younger age groups, and these groups had the lowest response rates. So the direction of response bias for educational level is not certain.

Increase in the response rate would have helped eliminate any bias due to low response. As the non-response bias can have effects in different directions and the main associations found is strong, the relationship between musculoskeletal pain and educational level is probably valid even if the response rate is relatively low. We do not think that the relationship between musculoskeletal pain and educational level is affected in any major way by the response rate.

As missing values on pain report was systematically coded as no pain some "real" missing values might have been missed and replaced by "no pain". As a consequence of this

prevalence rates might be systematically low, and might be regarded as minimum figures for prevalence in the study population. However, the figures of missing values on other questions were low, and probably the underestimation of prevalence figures due to this recoding is rather small.

Our data is cross-sectional, and we can therefore not conclude about causality. It might be that high educational level cause less musculoskeletal pain, but it might also be that person with less pain easier manages to get high education. It is also possible that factors selecting persons to education also has relation to risk factors for pain.

While the study tried establishing a relationship between musculoskeletal pain and level of education, the study did not take into consideration the occupation of the respondents and the relationship between the level of education and occupation. This aspect can help to establish mechanisms between musculoskeletal pain and the nature of work. Musculoskeletal disorders attributed to work include a group of conditions that involve nerves, tendons, muscles and supporting structures of the body such as inter vertebral discs. Often attributed to or exacerbated by the work environment, these disorders are also referred to as work-related musculoskeletal disorder (WMSDs) which can cause symptoms such as pain, numbness, and tingling, as well as reduced work productivity, lost time from work, temporary or permanent disability (33). Highly repetitive work, forceful exertions, lifting and forceful movements and whole-body vibration are examples of risk factors that have been associated with increased reporting of WMSDs (3). How large part of the total pain prevalence in the population that is work-related pain is not easily assessed. Persons without salaried work reports more musculoskeletal pain than persons at work. However, there is a selection of healthy persons in the work force (“Healthy worker effect”), and therefore an important part of the total pain might be work-related even if having work seems to protect against musculoskeletal pain in epidemiological comparisons of the groups. However, we were not able to control for type of work in the analyses, as we lack detailed data on type of work in The Ullensaker Study.

People with low education and low wages are more likely to work in physically demanding jobs and tasks involving stress on the spine. After an episode of back pain or other musculoskeletal pain, they may have to wait longer to resume a demanding job than person with sedentary occupations. They may be less satisfied with their jobs and less motivated to continue working or to work as hard after an episode of back pain (13). This might lead to long-term sick leave and absence from work and to financial burdens on individual, society and country.

Persons with low education may also have poorer sick leave benefits or fear loss of their jobs because of pain, or be more prone to return to a physically demanding jobs before the back injury has resolved, risking re-injury or prolongation of symptoms (13).

The mechanism for sickness absence mentioned from the review by Dionne et al. (13) is about low back pain, but might also be of interest for other types of musculoskeletal pain.

8.2.Results

8.2.1 Education, Age and Gender

Our study reveals a strong relation between age, sex and educational level. We have found that level of education decreased with older age groups and in person's aged 84-86 years one half of the population reported only elementary education. Among the older age groups, men have higher education than women. Among the younger age groups men have more occupational education than women. Our study shows that 60 years back the opportunity to study was limited, the people who were better off financially or the people who comes from the higher class of the society were the only that were able to afford higher studies. During the industrialization society needed the occupation orientated educations and this education gave more job opportunities. But in the younger generations things have changed and there are more opportunities for funding for education or getting loan from the government or educational society. Especially in the Nordic countries you do not have to depend on your parents for your higher studies, even though parents do not have much education or funding children can go for higher studies. We see in our time that most immigrants in 1st generation have very limited formal education or no education but their children are often taking higher education.

Secondly the motivation is high in younger age group to study today. With high education opportunities is more open for a variety of jobs as the world is becoming one job market. This is also because with technology one can work anywhere and without having to move. In the older generation most of the people worked manually and got musculoskeletal pain some time or other in their course of their occupation. More men were educated in past and women were occupied in house hold jobs. Now things have changed and both genders are involved more equally and they have more equal opportunities.

8.2.2 Musculoskeletal pain prevalence

In the Ullensaker population, 90.4% (3006 out of 3325 respondents) reported to have at least one musculoskeletal pain during the last twelve months (table 7.2). One third to one fourth of persons with pain in a body region reports that pain limit them to perform daily activities some times in the past 12 months. About 80% of the population reported some degree of widespread pain during the year. Among the various musculoskeletal pains, low back pain, neck pain head and shoulder pain were the most commonly occurring. A large fraction of the population reported widespread pain as well. This is accordance with former studies from Ullensaker and other studies (10, 49).

There have been a number of population surveys that have estimated the prevalence of individual musculoskeletal symptoms. However few studies have considered the relative frequency of musculoskeletal symptoms at different sites. The studies that have studied different symptoms simultaneously have suggested a considerable degree of overlap between different pain sites. There are also suggestions that the more areas of musculoskeletal pain a person has, the more likely it is that other areas will be involved later (51).

Age and sex distribution of persons with neck pain were different from the other complaints, with neck pain more often reported by women and younger age groups. This was most prominent in neck pain last year, where we also found that the highest prevalence was in the group with university education > 4 years. This is possibly because neck pain in periods and not limiting daily life might be linked to more executive work, while more chronic and limiting neck pain is more often linked to lower education and less varied work.

When it comes to limiting pain, relatively, women across age cohorts (impacted by the various musculoskeletal pains) were unable to perform their normal duties in the past year more often when compared to the men in the similar age cohorts. This might be because women in total have more strains and stress during a regular day (both home and in job), or it might be a result of more severe pain or more widespread pain in women than in men. Most pain complaints are usually self-limiting. But if they become chronic the consequences are serious. These include the distress of the patients and their families and consequence of employers in terms of sickness absence and for society as a whole in terms of welfare benefits and lost productivity.

8.2.3 Association between Education and Pain

A low level of formal education has previously been reported to be associated with an increased risk of musculoskeletal disorders (69); our results confirm this strong association between low educational level and increased occurrence of musculoskeletal pain.

Our study showed different patterns of musculoskeletal pain in different groups of educational level. Our results confirm this strong association between low educational level and increased occurrence of musculoskeletal pain. The level of formal education is a useful and widely applied marker of socioeconomic status, and our findings are comparable with those of Szpalski *et al*, (56) Walsh *et al*, (64) and Dexter and Brandt (12) A low level of education is also associated with an increased prevalence of rheumatological disorders (18).

Our study showed different patterns of musculoskeletal pain in different groups of educational level. The occurrence of neck pain according to educational level differed from the others, as neck pain last year was more evenly distributed between the different levels of formal education.

Education has been considered to play three different parts in relation to back pain: as a predictor of the frequency (incidence, recurrence and prevalence) of back pain, as a predictor of the outcomes of back pain episodes (importance and duration of pain and disability, interference with work and other activities, and health care consumption), and as a predictor of the outcomes of surgical and rehabilitative interventions performed among series of back pain patients (13) as mention earlier.

As we discussed above persons with neck pain are more often young and women. In these groups most persons have a high level of formal education. They might have more static work, or perhaps the educational level is so high in these groups that education does not give any much advantage in the competition on the labor marked any more.

Looking across educational levels, maximum % respondents unable to perform their normal and routine activities due to different pain regions are having elementary education. People with elementary education are more often involved in various odd types of work postures and hence they experience more pain than other educational groups. There is a need to further study the association between education and type of work.

Our study on educational level and musculoskeletal pain show there is relationship between pain and educational level. People with lower educational levels suffer more musculoskeletal pain. Our study also confirms a strong relation between age, gender and educational level.

Our results illustrate that persons with high education level also suffer from musculoskeletal pain, but less often. We may ask why so? One possible explanation is that persons with higher educational level respond to pain and seeks health care differently. They might find out causal factors and be more prone and able to try to eliminate such factors. Education might give different perspective to see the pain. Persons with high educational level might also have better possibility to find another job opportunity that helps them to reduce their musculoskeletal pain. Even if they are on sick benefits they possibly might feel that they are not much burden to home, society and the country. Their knowledge and education might give them better opportunities to adjust them self to a new situation if they experience much pain. All situations has its positive and draw back consequences, but education might help to over come it little easier than people who does not have enough educational background.

Educational level can also be a marker of individual or societal characteristics that interact with risk factors and coping strategies. Not only own educational level, but also parental education level seems to have an independent association on sickness absence for musculoskeletal pain (29) as mentioned earlier. Family is the first school where persons start learning.

It seems that not only are subjects with lower levels of formal education at higher risk of developing musculoskeletal pain but they are also less able to cope with the complaints on their own. Education can change person perception of health, it can promote health of the

individual, and it can provide better opportunity of employment. Person with lower education or lower socioeconomic background often use strong pain killer or abuse medicine, or alcohols which help them to reduce musculoskeletal pain, but at the same time it affect him/her pathologically as liver detoxify. Long time use of pain medicine might also reduce pain threshold. Generally, it may be lower education groups living behavior is less healthy and that this might affect their health directly or indirectly.

Education is often considered the best surrogate measure of socioeconomic status (SES), because it is generally easy to collect and is unlikely to be affected by chronic diseases that begin in adult life, as might occupation and income. It provides us with a quick and useful proxy for a much more complex set of social factors. Education may also be a marker for specific traits like intelligence, acquisition of adaptive skills, or awareness of risky health behavior (13).

"Education is the most powerful weapon which you can use to change the world" - Nelson Mandela.

8.3. Implications

Education can change a person's perception of health, it can promote health of the individual, and it can provide better opportunity of employment. Education is one way of health promotion. Education is the horizon for the future.

Pain is expensive. Its costs to the healthcare system, society, and particularly the individual are huge. Individuals who suffer with persistent pain utilize a great percentage of the health care system resources. More over this person are far less productive financially. Every year, pain deprives society and its workers of an estimated four billion workdays, which adds up to at least \$55 billion in lost productivity for full –time workers (28).

The present study shows that even in Norway today musculoskeletal pain is related to a person`s socioeconomic situation. Self-reported health status is known to correlate with mortality, and it is a person`s perceived health problem which influence the demand for health care. Significantly more persons living in a non –affluent area of Oslo reported extensive pain, compared to persons in an affluent area. Inactivity, poor mental health, and being a non-western immigrant implied increased risk of severe symptoms (4).

It is important for clinicians who advise and support patients in their response to musculoskeletal pain to be aware of socioeconomic differences in coping strategies. Gender difference in the association between socioeconomic factors and coping should be further investigated.

Neil Betteridge, Director of Public Affairs at Arthritis Care and Chair of the Steering Group for PARE, added his support to the call to action. This survey is a valuable addition to the

current body of evidence and provides important insights into strategies required to improve care. It is time to bring musculoskeletal pain out of the shadows and ensure that it receives serious attention from policy makers. No government can afford to ignore the costs to health and quality of life currently associated with musculoskeletal problems.

The present findings may have implications both from a public health perspective and in a clinical setting. Firstly, the odds of consulting increase significantly with lower level of formal education. From public health perspective this fact represents a great challenge. Secondly, the association between mental distress and consulting chronic pain may be important in a clinical perspective. The role of primary care traditionally has been management of pain and disability, but patients with chronic musculoskeletal pain also need psychological support. There is now increasing evidence that “chronic pain is not the same as acute pain lasting longer” (27) and the role of psychological factors in chronic back pain are also emphasized in newer clinical guidelines (9).

Almost everyone who has chronic pain adopts at least one strategy of self-management, and most adopt several. These were divided into active and passive strategies; use of the former was more prevalent among better-educated people, and was associated with lower levels of pain-related disability, better general health, and less use of healthcare services and medication. Education on active self-management needs to include the recognition of important and/or dangerous symptoms or inappropriate management (54).

Promoting active self-management in chronic pain may not always be effective. This could arise because of lack of appropriate targeting, lack of training in the implementation, or an ineffective intervention. However, the potential benefits are multiple and widespread, and these are all therefore important issues for future research in this area (54).

9 CONCLUSIONS

Educational level and musculoskeletal pain is associated. People with low educational levels are prone to have more musculoskeletal pain and even more to be limited by their musculoskeletal pain in their daily tasks. And as education determines socioeconomic position in terms of occupational class (29), type of work and musculoskeletal pain are related.

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