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E-1
The Impact Of Social Differences Through The Health Care System

**THE EFFECT OF MUSCULOSKELETAL DISORDERS ON SELF-REPORTED HEALTH
STATUS AMONG AMBULANCE PERSONNEL**

Doctoral (Ph.D.) thesis

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INTRODUCTION

The health status is influenced by numerous factors: genetics, individual lifestyle, personal attitudes, knowledge, micro and macro environment and the healthcare system. The work environment involves physical and psychological burdens and also chemical, biological and psychosocial risk factors. From an economic perspective, these diseases are a serious problem to the employees, employers and to the whole society.

Those active in the healthcare field are exposed to great risk factors that can affect their health. This situation is aggravated by the aging among workers, migration as well as the employment in private praxes.

The ambulance personnel's work is complex and more demanding compared to other health professions. Their fundamental task is to save lives, which entails a lot of responsibility that cannot be planned in advance. Due to the workload, a variety of occupational diseases lie in waiting. The psychological stress occurs almost every day: the rapid rescue missions, the life-saving interventions and decisions, the experience of death and dying, the cases related to children, the contact with relatives are mentally very hard on the ambulance personnel. The alternating work schedule and the 12-24 hour period of duty is one of the complicating factors in the physical dimension. We can also include the carrying of rescue devices (stretchers, carrying chairs, bags, ECG monitors, etc.) and also the movement of patients at long-term (due to the absence of elevators or lack of space, even over several floors), the contact with infectious agents, the risk of needle stick accidents as well as the traumas resulting from the domestic road and traffic (vibration damage and ambulance accidents). In addition, the healthcare sector has not one other segment where the workers are exposed to such extreme climatic fluctuations like the workers in the pre-hospital department. In the field of mental stressors we can encounter post-traumatic stress disorder, depression or burnout syndrome. Due to the physical agents, the musculoskeletal lesions are common among ambulance personnel (especially in the lower back and upper back region), which factors are proven to have an impact on the workers health self-assessment and indirectly on the quality of patient care. Ultimately, it can even lead to migration or job change. The deteriorated state of health does not only affect the quality of work, but the increased number of lost workdays are an extraordinary burden on society (e.g.: due to the increased costs).

Regarding these information, we came to the conclusion, that it would be timely to assess the health status of the Hungarian National Ambulance Service (HNAS) workers performing

active duty with a systematic, representative national survey. The choice of this subject besides the knowledge above mentioned is my own personal attitude regarding the theme. I graduated as an ambulance officer and also as a public health professional (health-promoting specialization). This is the reason, I would like to uncover the source of the problems and find possible alternative solutions.

AIMS OF THE THESIS

The aim of the thesis was to assess the active Hungarian ambulance personnel's health status (based on self-report) and the influencing factors and risks in a national sample. We examined three research areas: the workers' general health, musculoskeletal complaints and metabolic disorders.

The novelty of the thesis lies in the fact that our main line was to explore the relationship between musculoskeletal complaints and the perception of the self-reported health status.

Before the execution of the analysis, the following questions were formulated:

We hypothesized that:

- with the increase of working years at the Hungarian National Ambulance Service, the frequency of musculoskeletal problems incidence rises. (H1)
- the longer (period of time) a worker has been serving at the HNAS, the more likely is experiencing/has experienced musculoskeletal complaints in more affected body regions. (H2)
- the position fulfilled by the ambulance personnel affects the location where the musculoskeletal disorders are developing. The ambulance car drivers and emergency medical technicians are affected in the highest percentage by pain occurring along the spine (neck, upper back, lower back). (H3)
- the existence of a secondary job increases the occurrence of musculoskeletal problems. (H4)
- those workers who have already experienced any kind of musculoskeletal problems in their lifetime, evaluate their Physical health status worse (according to the SF-36 questionnaire I-IV. dimensions) compared to their Mental health (according to the SF-36 questionnaire V-VIII. dimensions) and to those colleagues who have never had such symptoms. (H5)
- those workers who report musculoskeletal discomfort are significantly overworked and upset. (H6)

TEST MATERIALS AND METHODS

Our cross-sectional, quantitative study has been conducted between the June of 2014 and July 2015. After obtaining the necessary written permissions, the questionnaire-based data collection took place in the summer of 2014, with the participation of the following regions: Central Hungary, Southern Great Plain, Southern Transdanubia, Northern Great Plain and Central Transdanubia. In total, the employees of 166 ambulance stations were questioned. After receiving the necessary information, the participation in the survey was in a voluntary and anonymous manner. All active patrol duty ambulance personnel could participate in the study, who have reached the age of 18, and have been at least one year employed at the HNAS. The incomplete research tools were excluded, as well as those who despite the inclusion criteria worked in administration or management. A self-administered questionnaire was chosen for the data collection. This questionnaire contained standard and self edited questions. The questions edited by us covered information regarding socio-demographics, work, recreation, physical health and addictions.

For mapping the ambulance personnel's health status, we used the Short Form 36 questionnaire (SF-36) created by John E. Ware which is based on the perceptual and functional health model (Ware, 1992). This tool has appeared in approximately 4.000 publications and been translated to and validated in over 50 languages. The questionnaire can be used in a number of test samples; it is accessible, easy and quick to fill out. It can be used repeatedly (to monitor the changes) and is suitable for international comparisons as well. The translation and validation to Hungarian language happened with the leadership of Dr. Agnes Czibalmos in 1997. The SF-36 is suitable for measuring physical and mental health as well. The 36 question characterizes the respondent's health in 8 sub dimension. Each question has scores between 0 and 100. Then, the total of scores within a question dimension has to be averaged with the number of questions. Also, the dimensions can range from 0 to 100 points. The higher the score of a particular aspect, the healthier and less limited the respondent feels.

For mapping of musculoskeletal disorders, the Scandinavian Musculoskeletal Questionnaire was used (Nordic Musculoskeletal Questionnaire - NMQ), which examines the body in the following nine regions: neck, shoulders, upper back, elbows, wrists/hands, low back, hips/thighs, knees, ankles/feet. The incidence of pain is surveyed in multiple time periods: ever, in the last 12 months, the last month and the day of the study. Furthermore it includes questions about medical treatment, hospitalization, medications, number of sick leave days, obstructions regarding normal work and the changing of jobs and duties. The participants

have to answer 10 yes-or-no questions related to all body parts furthermore they have to specify the age when the complaint first appeared (the total of 99 questions). It is widely used in many occupational groups. The population of healthcare workers has been repeatedly studied.

The resulting data was analyzed using SPSS 20.0 statistical software during which, descriptive (mean, standard deviation and relative frequency calculations) and mathematical statistic procedures (χ^2 -test, Mann-Whitney U-test, Kruskal-Wallis test, Spearman's correlation, Linear regression) were performed taking account of normality. The level of significance was determined at $p \leq 0.05$.

A total of 4375 questionnaires were sent out, of which 2041 were returned (47%). Finally, the research contained 1971 samples (N=1971), which represents a 45% response rate.

ANALYSIS AND RESULTS

Self-reported health status in the sample

Based on the SF-36 questionnaire respondents considered their "Mental Health" the worst, while their "Physical functioning" was the best. (1. Table)

N=1971	SF-36 scale							
	<i>I. Physical Functioning</i>	<i>II. Role-Physical</i>	<i>III. Bodily Pain</i>	<i>IV. General Health</i>	<i>V. Vitality</i>	<i>VI. Social Functioning</i>	<i>VII. Role-Emotional</i>	<i>VIII. Mental Health</i>
<i>Abbreviation of scale</i>	FM	FS	TF	ÁE	VT	SM	ÉS	ME
<i>Min. value</i>	0	0	0	5	0	0	0	0
<i>n (%)</i>	1 (0.1)	112 (5.7)	5 (0.3)	3 (0.2)	3 (0.2)	11 (0.6)	140 (7.1)	8 (0.4)
<i>Max. value</i>	100	100	100	100	100	100	100	100
<i>n (%)</i>	1033 (52.4)	1379 (70)	1067 (54.1)	61 (3.1)	186 (9.4)	909 (46.1)	1404 (71.2)	111 (5.6)
<i>Average</i>	92	85	85	67	73	82	83	66
<i>SD</i>	13	28	21	20	20	23	30	21

1. Table *Self-reported health status in the sample*

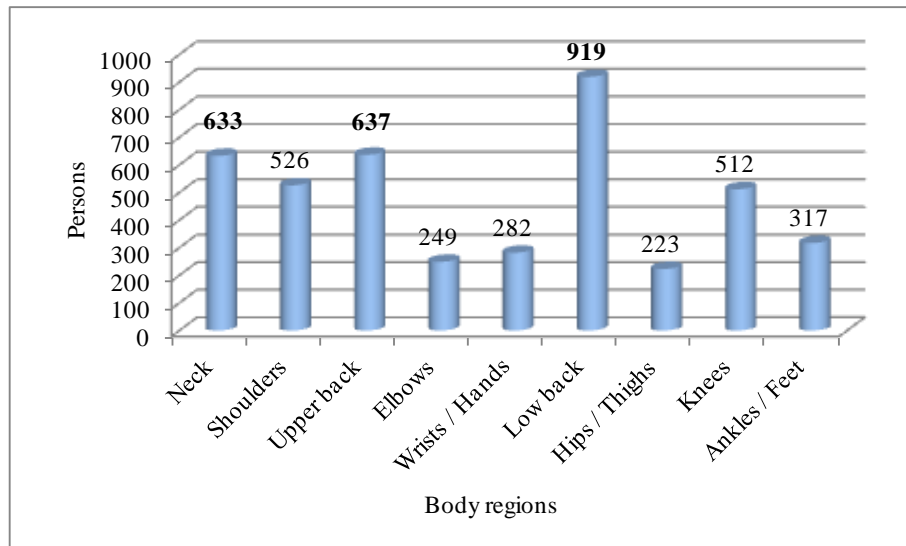
At the time of the present data collection, the majority of workers (1140 persons; 73.1%) considered their **health status** the same as **one year ago** (2013). Based on the results of the correlation analysis, in terms of the **interaction between** the individual **dimensions**, we can say, that if the respondents' health was considered positive in one aspect, than the other examined dimensions of the questionnaire were judged in the same manner ($p < 0.001$).

The data obtained, is in line with international tendencies, according to which ambulance personnel consider their health status much better compared to the general population (Czimbalmos, 1997; Kheiraoui, 2012). Compared to our prior pilot study, (the ambulance personnel working in Northern Hungary and Western Transdanubia regions were surveyed) - apart from the "Mental health" dimension – the workers now interviewed obtained higher scores.

The prevalence of musculoskeletal disorders in the sample

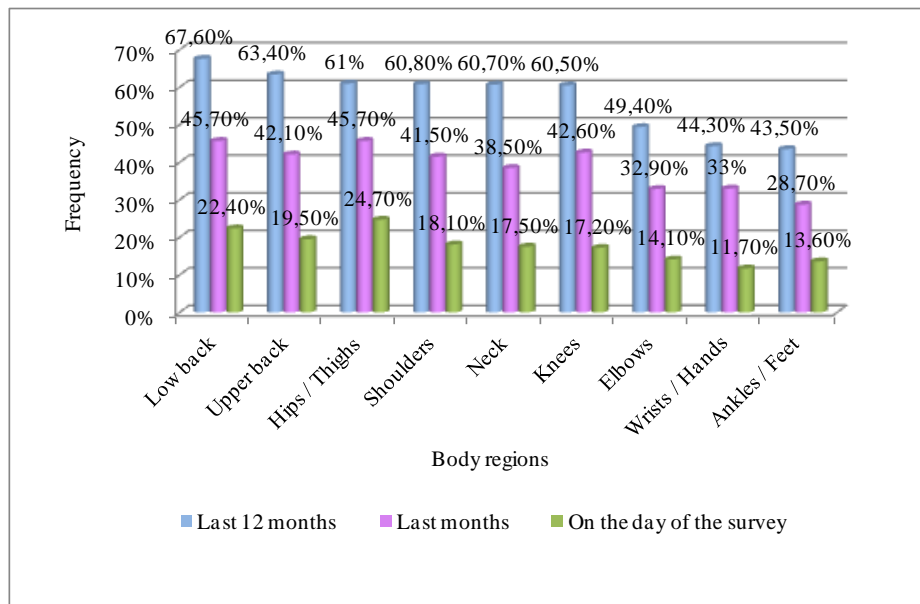
From the total of the ambulance personnel interviewed, 1345 persons (68.2%) had experienced musculoskeletal problems at least once/in their lifetime (hereinafter referred to as $n=1345$). On average, the respondents experienced pain in 3.2 ± 2.1 body regions. The majority (341 persons, 25.4%), had complaints in only **one** studied **body region**. The most mentioned

areas were the following: **lower back** (919 persons, 68.3%), **upper back** (637 persons; 47%) and/or **neck** (633 persons, 47.1%). (1. Figure), In terms of when the musculoskeletal lesion was first detected, in most cases the respondents' age was 28-29-30 (in all body regions).



1. Figure **The prevalence of musculoskeletal problems in certain body regions in our sample (n=1345)**

From the total of ambulance personnel who reported musculoskeletal pain, 936 people (69.6%) indicated that they were already active at the Hungarian National Ambulance Service during the formation of the lesion. The highest percentage of workers who have been hospitalized was because of ankles/feet problems (n=541) (39.4% indicated ankles/feet pain). Most had to **temporarily change** their **job** or **duties** due to lower back pain (n=285) (15.2% indicated lower back pain). In terms of temporal occurrence of musculoskeletal pain, most lower back complaints were felt one year prior to the day of the study (n=968). In the month prior to the completion of the questionnaires, the majority felt lower back and/or hips/thighs pain (n=712). On the day of the data collection, the majority of ambulance personnel suffered from discomfort in the hips/thighs (n=390). (2. Figure)



2. Figure **The prevalence of pain in each body region, one year, one month preceding and on the day of the survey.**

In the highest percentage those with musculoskeletal lesions were prevented from **normal work** due to lower back complaints (36.2%) (n=499). The least **obstructed**, were those with elbow pain (19.3%). Lower back pain is the reason why most visited a doctor, physiotherapist or chiropractor (33.5%), while those living with elbow complaints were the smallest proportion that turned to a professional (19.3%) (n=546). Those suffering from lower back pain were, in majority, who took some kind of **medication** (31.4%), while those with ankles/feet lesions (18.3%) (n=479) were the fewest who wanted to relieve their pain. Those with lower back complaints, were also the highest percentage who have been on **sick leave** (19.4%) compared to the respondents with neck pain, who spent the least amount of days on sick leave (4.9%) (n=313).

Overall, based on the results above, we can conclude that lower back complaints are the least tolerated by the ambulance personnel and this made them the least capable to work.

Among the occupational group that we studied the prevalence of musculoskeletal complaints is much higher than the European Union and domestic averages. The results are correlating with the musculoskeletal pain proportion occurring among domestic rescue workers (in our 2014 survey this ratio was 72.5%; 68% was the ratio in the 2001 study conducted among Tolna County ambulance personnel) (Pék, 2014; Csonka, 2001). Compared to those active in other sectors of the healthcare, the frequency of occurrence is almost equal, (Smith, 2006), although this type of pain is extremely common among nurses (Mehrddad, 2010; Attar, 2014; Bos, 2007.). Looking at the location of the musculoskeletal complaints, we can conclude that

healthcare workers - including the ambulance personnel– are most frequently tormented by lower back pain, followed by complaints of the neck and upper back regions (Arial, 2014; Crill, 2005; Hansen, 2012).

Considering the impact of the life saving work, the employees 69.6% (936 persons) have been already working for the Hungarian National Ambulance Service when the problem was first detected. In certain regions, departments and stations, no significant differences were found. During the rescue work time, the highest proportion of complaints occurred in the upper back (71.9%), the elbow (70.7%) and hips/thighs (70.4%) regions. With the progression of working years, fewer and fewer musculoskeletal lesions were reported, moreover the number of affected regions did not increase with work experience ($p=0,678$) (the average working years of those who had musculoskeletal complaints: 12.36 ± 8.74 years; the average working years of those who had no complaints: 13.65 ± 9.18 years, $p=0,005$). Those employees who've experienced pain in 6 body regions, have been working for the longest period at the HNAS, while the least time worked was by those with complaints in all 9 regions.

Based on the obtained results our first and second hypothesis (H1, H2) is proven to be incorrect because in our sample the time spent with ambulance personnel duties did not increase the occurrence of musculoskeletal complaints and also it did not influence the number of body regions affected by musculoskeletal pain.

The presence of any secondary employment did not increase the occurrence of pain, therefore contradicting to our fourth claim. (H4)

We examined whether the fulfilled position has an impact on the relative frequency of musculoskeletal lesions occurrence. Because the ambulance car drivers and emergency medical technicians in majority lift and move the patients and rescue technical equipment they have been combined in one group ($n=1174$). In contrast, due to similar reasons paramedics and MD with emergency medical specialization formed another group ($n=171$). We divided the locations where the complaints occurred to the spinal region (neck, upper back, lower back) and other regions, because especially the previously mentioned body region can be damaged during lifting and moving patients. In our sample the workers' position, namely the tasks they fulfill day-to-day did not influence the location where the musculoskeletal disorder was developed (Fisher's exact test result $p=0.903$), since in both examined groups the spinal complaints were in majority (ambulance car drivers/emergency medical technicians 1021 people; 87%; paramedics/doctors 150 people; 87.7%).The respondents' position had no significant influence on the number of affected body regions, since the involved ambulance

car drivers/emergency medical technicians indicated on average 1.86 ± 0.81 affected body regions, while the paramedics/doctors 1.89 ± 0.77 body regions ($p=0.640$).

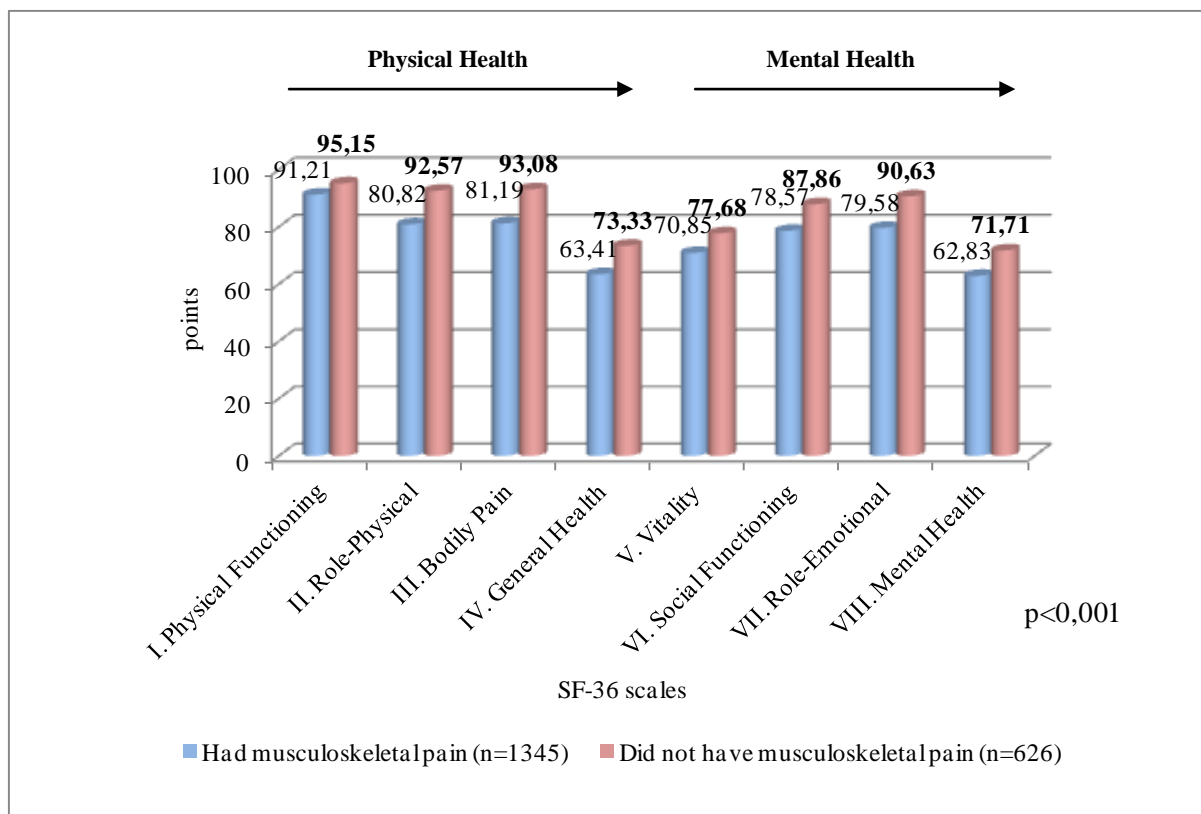
Based on these results we can say that our third hypothesis is incorrect, as the ambulance personnel's duties had no influence on the location where the musculoskeletal problem occurred. (H3)

We cannot say with certainty that the formed lesions are completely a result of work regarding ambulance personnel duties. But most probably plays a major role because over two thirds of workers developed these lesions, in the mentioned time. We have seen also the fact that the reason of spinal complaint development is multi-factorial, and lifting is just one that plays a role in it (e.g.: the position occupied during transport in the ambulance). The tolerance formed during years, the fear of losing the job and unemployment or the breadwinner role are most likely the reasons why with the progression of working years fewer body region complaints were reported. This fact contradicts international tendencies (Alexopoulos, 2003). The type of part-time job certainly had a great influence on the lack of significant correlation between the secondary job and the development of musculoskeletal pain – also contradicting proven correlations in foreign studies (Attar, 2014) - although the majority who detected pain signed up for manual labor .

The effect of musculoskeletal complaints on self-reported health

In all aspects, **the existence** of musculoskeletal **disorders** have a negative influence on the workers' health status self-assessments ($p < 0.001$). Those respondents who already experienced musculoskeletal pain, definitely considered their *Physical and Mental health* worse as well. However, between these two components the psychical status was considered inferior by the ambulance personnel in the sample. In many cases it can be observed, that physical pain is not necessarily associated with psychological overload but in our study we can report the close interaction of the two components (lin.reg. $p < 0,001$). (3. Figure)

We can conclude that our fifth hypothesis (H5) was proven incorrect because, however those who never experienced musculoskeletal pain considered their health status better, their Mental health was judged much worse compared to the Physical status. This tendency was typical throughout the entire sample.



3. Figure The effects of musculoskeletal complaints on self-reported health status (SF-36) in the sample (N=1971)

The data obtained is consistent with international tendencies (Nordlund, 2004, Joslin, 2014). In our sample, the biggest difference was between the "Role-Physical" and "Bodily pain" dimensions (28 point). Also in a Norwegian sample, the incidence of complaints had the biggest influence on the "Bodily pain" (Morken, 2002). The ambulance personnel's bad psychological state is well known, which can be a precursor to a number of mental illnesses (Pék, 2014).

Our findings confirm that respondents, who reported of musculoskeletal discomfort, felt their lives were significantly **upset** ($p < 0.001$). 60% of respondents described themselves as extremely overworked.

The sixth hypothesis proved that working with pain is mentally difficult for the employees and they feel overworked and upset compared to those colleagues who have never experienced such symptoms. (H6)

19.4% of those who reported musculoskeletal lesions, consider their state (in 2014) worse or much worse compared to **one year ago** (2013) (those with no complaints: 9.3%; $p < 0.001$). The **number of complaints** correlated with the health status. The more body regions with

complaints a person had, the worse their health status was considered in the dimensions of the SF-36 ($p < 0.001$). The workers judged their "*Mental Health*" the worst regarding almost **every body region** and those who detected (also) hips/thighs pain declared their health condition the worst in all dimensions. The fact that, somebody has been **hospitalized** had a negative effect on the self-assessment of health status. The exception was the "*Vitality*" dimension. Those receiving hospital treatments considered their "*General Health*" the worst. The highest difference (9.19 points) appeared in the "*Role-Physical*" dimension between those, receiving and not receiving hospital treatment. The majority who needed to **change jobs or duties** (171 persons; 60%) was caused by pain in one body region, while there were 5 persons (1.8%) who had to **change jobs or duties** because discomfort felt in all nine regions. This fact worsened the ambulance personnel's self-assessments of health in every dimension ($p < 0.001$). Those respondents, who were forced to change duties and activities, judged their "*General Health*" the worst. The biggest difference was observed in the "*Role-Emotional*" dimension (16.53 point). In terms of temporal occurrence of the problem, those evaluated their state worst, who had musculoskeletal discomfort even on the day of the data collection. (2. Table)

Examined factors		Temporal occurrence			
		Problem occurred more than one year ago (n=377)	Problem occurred within a year (n=968)	Problem occurred one month before the study (n=712)	Problem occurred on the day of the study (n=390)
SF-36 dimensions	I. Physical Functioning	94.72±10.07	89.85±14.35	88.23±15.36	84.36±17.49
	II. Role-Physical	89.59±23.76	77.40±32.68	74.02±34.36	67.63±36.76
	III. Bodily Pain	92.49±14.73	76.79±22.77	72.03±23.23	65.04±23.64
	IV. General Health	70.08±17.80	60.81±19.83	58.83±20.19	53.95±19.85
	V. Vitality	77.00±17.41	68.46±20.19	66.85±20.61	62.49±21.47
	VI. Social Functioning	86.04±20.13	75.66±23.93	73.56±24.37	68.81±25.36
	VII. Role-Emotional	87.45±27.43	76.52±33.65	73.22±35.19	67.61±37.21
	VIII. Mental Health	71.09±19.42	59.62±20.87	57.76±20.92	53.10±20.97

2. Table **The effect of temporal occurrence of musculoskeletal problems on ambulance personnel's health status self-assessment.**

Those, who were obstructed by their complaints from working, considered their "*General Health*" worst in all dimensions of the SF-36 questionnaire ($p < 0.001$) compared to those respondents, who were never affected by such problems in their usual duties. The greatest difference was observed in the aspect of "*Bodily Pain*" (19.63 points). Those, who turned to a **physiotherapist** or **chiropractor** considered their health worse in every aspect ($p < 0.001$). These respondents reached the lowest score in the "*General Health*" dimension and compared

to those employees, who did not need professional help the biggest difference was experienced in the "*Role-Physical*" dimension (15.27 point). Based on the SF-36 questionnaire, those who had had to take **pharmacological products** or **medication** due to the problem, reported their "*General Health*" the worst. Those who use/used analgesics assessed their condition worse in all dimensions ($p < 0.001$), within this the biggest difference was seen in terms of "*Role-Physical*" (16.33 points). Those workers who were forced to be on **sick leave** due to musculoskeletal ache, considered their health worst according to the SF-36 questionnaires "*Vitality*" dimension. These respondents considered their condition worse in every dimension compared to those colleagues who did not need sickness benefit ($p < 0.001$). The biggest difference between the two groups was visible in the "*Role-Physical*" dimension (19.35 points).

The effect of musculoskeletal symptoms on other health indicators:

The ambulance personnel's **Body Mass Index (BMI)** had no effect on the frequency of musculoskeletal problem development, although 71.8% of workers had a BMI above normal value (mean 27.78 ± 4.6 kg/m²) ($p = 0.860$). Those who reported the analyzed problems, were more frequently at **the doctor** and on **sick leave** ($p < 0.001$), indicating the seriousness of the situation. However, the prevalence of complaints had no effect on the frequency of **medication administration** or **analgesics** use. The ambulance personnel reported that this problem greatly **interferes** with the performance of **daily life activities** ($p < 0.001$).

The abnormal BMI values correspond with prior domestic studies, (Betlehem, 2008, Pék, 2013) however compared to the international situation it shows a worse picture (Gamble, 1991).

After analyzing and evaluating the results, we can conclude that from our six hypotheses formulated in advance only H6 was proven true, while the rest were proven to be incorrect.

NOVEL FINDINGS AND PRACTICAL APPLICATIONS

The analysis presented in the thesis, served with several new results, which can be summarized like the following:

Recent research findings:

- The novelty of this work is definitely given by the fact that in Hungary, there was never a study in this focus group with such a large number of elements researched.
- It can be said that nearly 70% of the Hungarian National Ambulance Service's employees have suffered from musculoskeletal lesions. On average, one worker experienced musculoskeletal pain in three body regions. Two-thirds of the ambulance personnel who had musculoskeletal complaints developed a lesion, while working at the HNAS and did not increase the number of body parts affected and even showed a lower frequency of occurrence. The presence of a second job and the position fulfilled by the worker had no verifiable impact on the development of the problem.
- Most workers had lower back, upper back and neck region discomfort feeling.
- Based on the SF-36 questionnaire, the presence of musculoskeletal complaints affected negatively those active in the pre-hospital environment health self-assessment in every aspect. This negative effect appeared mostly in the "*Role-Physical*" and "*Bodily Pain*" dimensions. The respondents with pain in more body regions definitely considered their condition worse. The more severe the ambulance personnel's condition (received hospital treatment, were obliged to change their employment, were prevented from fulfilling everyday duties assigned to them, looked up an orthopedic specialist, were treated with medication and/or were forced to be on sick leave because of the complaints) the worse their health status was judged.
- The workers' abnormal body mass index did not increase and physical activities and sports did not reduce the incidence of musculoskeletal complaints.
- The incidence of complaints increased the frequency of alcohol consumption.

The practical application of the findings:

- Based on the discovered correlations, the risk factors should be reduced at the appropriate level of prevention.
- By moderating the development of musculoskeletal disorders the burden on workers and employers will also decrease.
- Overall, the quality of patient care will improve.

SUGGESTIONS

When formulating the suggestions, we tried to take into consideration the domestic professional and political directives, the attitudes and potentials of the Hungarian National Ambulance Service on the subject, as an employer. The guidelines were formulated at different levels of prevention:

Primary prevention

Aim: Prevent the development of the problem, reduce or eliminate risk factors, and strengthen the health-conscious behaviors.

- Learning proper patient movement and lifting techniques. The practice of these techniques during day-to-day work.
- The modernization, multiplication and development of devices helping in patient raising and carrying.
- The maintenance and improvement of workers' fitness and physical condition (e.g.: a minimum equipped fitness room within the ambulance station, organized team sporting activities, collective events).

Provide them efficient, proper quality rest, relaxation and spiritual refreshment between duties. To do so, the modernization of the ambulance stations (beds, sanitary facilities) would be necessary, of course, where it is not already done. Create a possibility of learning progressive relaxation or autogenic training methods.

Secondary Prevention

Aim: Timely checkups and screening. Increase the willingness to participate in these examinations.

- Systematical annual screening and the introduction of effective occupational health inspections (blood sampling, measurements, fitness tests, musculoskeletal screening). Plan regional screening and aptitude test groups (screening group).

Social support: Specialists (psychologists, autogenic training, Balint group) and the prioritization of their immediate environments support.

Tertiary Prevention

Aim: The earliest treatment of the already existing lesions at the highest possible level to prevent any further aggravation and function loss.

- Reorganization of the affected employees' work by changing duties and tasks or by reduction of working hours. This step should be taken into consideration in case of employees with musculoskeletal problems when restarting work.
- Support of rehabilitation facilities and various healthcare providers (physical therapist, massage therapist, chiropractor).
- Providing necessary protective equipment and therapeutic devices (e.g.: waistband).

The proper financial support is essential at all levels of actions and interventions, also the promotion of the topic and extensive presentation of the problem could attract more resources and sponsors. It is important that the affected workers can turn to their employers with confidence and not be afraid of possible consequences (e.g.: layoffs, unpaid leave), thereby avoiding the fact that the work -in this case, life-saving medical attendance- quality standards are reduced.

ACKNOWLEDGEMENT

Over the past three years, the preparation of the present research meant the biggest challenge of my professional and personal life which would not have been possible without the support of the people around me.

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