

# MUSCULOSKELETAL PROBLEMS AND WORK CONDITIONS AMONG RIDING-INSTRUCTORS

Lotta Löfqvist<sup>1</sup>, Stefan Pinzke<sup>1</sup>, Marianne Stål<sup>1</sup> and Peter Lundqvist<sup>1</sup>

<sup>1</sup>Swedish University of Agricultural Sciences,  
Department of Work Science, Business Economy and Environmental Psychology  
PO. Box 88, SE-23053 Alnarp, Sweden  
lotta.lofqvist@ltj.slu.se

*Results from a questionnaire survey among riding-instructors showed that perceived symptoms most frequently were reported in the neck (52 %), the shoulders (60 %) and in the lower back (56 %) during the past 12 months. 91 % of the riding instructors reported symptoms from at least one of nine anatomic areas the past 12 months. The prevalence is high considered that the median age was 33 years. Mucking out was considered to have the highest work load among the work tasks. The most time consuming work task were riding lessons.*

**Keywords:** *Riding-instructors, work load, work tasks, work environment, questionnaire*

## 1 Introduction

Farming is a hazardous occupation. Accidents often occur and are especially frequent when working with animals (Pinzke and Lundqvist, 2006). Musculoskeletal disorders (MSD) are also common in farm work (Holmberg et al., 2003; Pinzke, 1996; Stål et al., 1996). Work related injuries are more frequent in animal farming compared with other occupations (Thelin et al., 2004; Walker-Bone and Palmer, 2002). Equestrian activities are uniquely dangerous because the participant is unrestrained and riding large, “unpredictable” animals capable of 40-mph speeds and kicking with up to one ton of force (Fleming et al., 2001). There are more females injured in horse accidents compared with other farm accidents where more men are injured (Hendricks and Adekoya, 2001). The most common type of accidents involving horses are falls (riding), kicks and being stepped on by the horse (Hendricks and Adekoya, 2001). Thus horse riding and the work around horses constitutes an increased risk for accidents (Fleming et al., 2001; Iba et al., 2001; Kriss and Kriss, 1997). The riding instructors are also exposed to several risk factors for developing MSD, for example working in bended and twisted positions, lifting heavy loads, repetitive work with high velocity (Bongers et al., 1993; Punnett and Wegman, 2004), working in cold temperature (Pienimaki, 2002) and work in standing position (Laperriere et al., 2006; Messing and Kilbom, 2001; Tissot et al., 2005)

There has been some indication that riding instructors often suffer from MSD, especially neck and back pain (Andersson et al., 1992; Lindström, 2004), but there are few clinical studies that have investigated their musculoskeletal health. A riding-instructor’s work consists of teaching how to ride but also how to take care of a horse. The work situation differs depending on what riding school they work on. On some schools the work merely consists of riding lessons while on other schools the work is a combination of riding lessons and stable work. When teaching riding, the instructor often stands in an indoor arena or a paddock for several hours. During the winter season

the indoor arena can be extremely cold (if it's not isolated or heated). To stand still during cold conditions is hazardous for the muscles and joints, especially if you are warm and sweaty after hard physical stable work. Most labour in horse stables is performed manually and as it was done a century ago.

## **2 Objectives**

The aim of this present study is to get a deeper understanding of the riding-instructors work conditions, their work load and perceived musculoskeletal health. The results from the survey are aimed to show which body parts are the most exposed and which tasks the riding instructors consider give the largest work load. Based on the result further research is planned in order to find different measures to prevent MSD among riding-instructors.

## **3 Methods**

### *3.1 Materials and methods*

To investigate the musculoskeletal health and work conditions among riding-instructors, a questionnaire was sent by post to instructors in Sweden. Names and addresses to different riding schools was found through the Swedish Equestrian Federations' homepage. In total there are approximately 560 riding-schools in Sweden (Regeringskansliet, 2006) and most of them are members of the Swedish riding association. All of the riding schools which had an e-mail address were contacted and asked three questions. What is the name of your riding school? How many riding-instructors do you have? What are the names of your riding-instructors? 454 mails were sent and 186 riding schools responded with answers on the three questions. 714 names of riding-instructors were collected this way. Through the union Agrifack (academics in agriculture, forestry, garden, environment and nutrition) 87 additional names of riding-instructors were collected. In total 801 questionnaires were sent out. The subjects had to be a riding-instructor and work on a riding school in order to participate in the study. In total 572 out of 798 possible answers were received which gave a response rate of 72 % after two reminders. 545 of the answers in the survey fulfilled the criterion. The questionnaire consisted of 50 questions concerning work tasks, work load and physical health. The Standardized Nordic Questionnaire (Kuorinka et al., 1987) was used to analyse the self-estimated occurrence of pain, ache and discomfort in nine anatomic areas (neck, shoulder, elbow, hand/wrist, upper back, lower back, hip, knee and foot/ankle), over the past 12 months, the past seven days and if the symptoms had prevented the individuals from doing their daily work. The last question was not treated in this survey. Questions concerning different work tasks were created to determine what work tasks the riding instructor performed, how often they performed them and how much time they spent doing every work task. The questionnaire also contained questions where the riding-instructor should estimate the work load of every work task using the CR-10 scale (Borg, 1990) and the body parts exposed doing that specific task. The CR-10 scale for perceived physical muscle exertion includes the following grades: 0 = No exertion at all; 0.5 = Extremely weak; 1 = Very weak; 2 = Weak; 3 = Moderate; 5 = Strong; 7 = Very strong; 10 = Extremely strong.

## 4 Results

In total, 545 respondents participated in the study, 96,7% (n=527) were women and 3,3% (n=18) were men. The age of the participants ranged from 14 to 72 years. The mean age of the women were 33,6 and 38,8 years for the men, respectively. All together the participants worked 28,6 hours per week in average, the women worked 28,4 and the men 36,0 hours per week. In average the instructors had worked for 10 years (range 0,5-50 years) and had ridden in average for 25 years (range 4-60 years). In the following the men are excluded from the results.

During the cold season 71,2 % of the instructors work in an non heated indoor arena. More than half (55,9 %) of the instructors considered work in cold climate to be a problem. During the winter 89,8 % worked sometimes during the week under cold conditions. 14,5 % had an accident during the last year. Almost 80 % (79,8 %) of the riding instructors considered their health to be good, and 84,7 % considered their work environment to be good.

The prevalence of symptoms was highest in the neck, lower back and the shoulder according to the Standardized Nordic Questionnaire (Table 1). A total of 474 (90,6 %) of 523 female instructors had experienced pain ache and discomfort from at least one of the nine body regions during the past 12 months. In the past seven days 54,9 % had pain in at least one of the nine anatomic areas. During the past 12 months the instructors reported pain ache and discomfort from “the upper extremities” 69,4 %, “the lower extremities” 53,2 % and 76,3 % from “the back”, respectively.

Table 1. Prevalence of pain ache and discomfort during the past 12 months and the past seven days among female riding-instructors (n=523).

Body regions	12 months n (%)	7 days n (%)
Neck	273 (52,2)	131 (25,3)
Shoulder	318 (60,8)	142 (27,5)
Elbow	83 (15,9)	42 (8,1)
Wrist/hand	151 (28,9)	51 (9,9)
Upper back	202 (38,6)	92 (17,9)
Lower back	295 (56,4)	134 (26,3)
Hip	167 (31,9)	68 (13,3)
Knee	145 (27,7)	55 (10,7)
Ankle/foot	96 (18,4)	42 (8,1)
<u>Clustered body regions</u>		
“In any body region” <sup>1</sup>	474 (90,6)	291 (55,2)
“The upper extremities” <sup>2</sup>	363 (69,4)	172 (33,5)
“The lower extremities” <sup>3</sup>	278 (53,2)	133 (26,3)
“The back” <sup>4</sup>	399 (76,3)	212 (41,7)

<sup>1</sup> “In any body region” consists of at least one of the following body regions: Neck, shoulder, elbow, wrist/hand, upper back, lower back, hip, knee and ankle/foot

<sup>2</sup> “The upper extremities” consists of at least one of the following body regions: Shoulder, elbow and wrist/hand

<sup>3</sup> “The lower extremities” consists of at least one of the following body regions: Hip, knee and ankle/foot

<sup>4</sup> “The back” consists of at least one of the following body regions: Neck, upper back and lower back

Riding lessons and putting the saddle and bridle on were the work tasks that were done most frequently during a week, in mean 3,4 days a week. Grooming, handling horse blankets and sweeping were also done frequently, 3,1, 3,1 and 3,3 days a week respectively. Riding lessons were also the task the instructors spent most time doing per day, in average 3,0 hours per day (Table 2).

Table 2. The number of days per week (mean, sd), the number of hours per work session (mean, sd) and the number of hours per week (mean, sd) the instructors do the different work tasks. Based on the instructors that do the specific work task (n=149-501).

Work tasks	n	No of days per week		No of hours per work session		No of hours per week	
		mean	sd	mean	sd	mean	sd
Riding lessons without jumping exercises	501	3,4	1,75	3,0	1,45	10,8	8,04
Riding lessons with jumping exercises	480	2,0	1,55	2,4	1,41	5,3	5,81
Office work	448	3,0	1,95	1,8	1,69	6,7	8,36
Feeding	419	2,9	2,07	,8	,64	2,4	3,15
Mucking out	362	2,6	2,03	1,8	1,26	5,2	6,31
Removal/handling manure	149	1,6	1,75	,5	,49	0,8	1,38
Handling straw, shavings and hay	354	2,6	2,11	,8	,66	2,2	2,99
Sweeping	399	3,1	2,12	,4	,35	1,4	1,60
Handling horse-blankets and leg-protections	412	3,1	2,09	,4	,33	1,5	1,67
Grooming	402	3,3	2,17	,6	,54	2,4	3,07
Putting the saddle and bridle on	466	3,4	2,01	,4	,35	1,6	2,01
Correcting and educating horses	409	2,4	1,92	1,3	1,07	4,2	6,28

Mucking out was considered to have the highest work load (4,1) on the CR-10 scale (Borg, 1990) followed by removal of manure (3,9) and the handle of straw, shavings and hay (3,6).

## 5 Discussion

### 5.1 Symptoms

The preliminary results indicate that riding-instructors had a high prevalence of MSD, especially in the neck, shoulder and low back. Almost 91 % had pain, ache and discomfort from at least one anatomic area during the past 12 months and 55 % during the past seven days. Compared with other occupations (Gustafsson et al., 1994) the prevalence was high especially in consideration to the low median age (33,0 years) of the instructors. The reported back and shoulder symptoms were high which was also

seen in other studies among other occupations (Akesson et al., 1999; Arvidsson et al., 2006; Cromie et al., 2000; Gummesson et al., 2006; Holmström, 1992; Lagerstrom et al., 1995; Smith et al., 2004). The riding instructors also self-estimated a high degree of MSD in the neck (52 %), almost the same prevalence as shown in studies of air traffic controllers (Arvidsson et al., 2006) which had a more expected prevalence due to their more static computer work.

### 5.2 *Work tasks*

Riding lessons was the work task that the instructors did most often and the longest time which was not so surprising. The lower back or shoulder was the body areas considered to have the highest physical exertion in connection with the different work tasks. They were also the body areas with the highest prevalence of symptoms.

### 5.3 *Work load*

Riding lessons was not considered a work task with a high physical exertion but since the instructors in mean spent 10,8 hours a week teaching, the dose will be high in comparison to other work tasks. Mucking out was considered to have the highest work load 4,1 on the CR-10 scale, that gives a work load in-between moderate and strong which is a high work load considered that the instructors in mean do the work task at least twice a week and the duration is in mean 1,8 hours.

### 5.4 *Future*

The results from the questionnaire survey will provide a base for further research. The next step in the research will be a work task analysis with kinetic measurements of exposed body parts in the work tasks with high perceived exertion. With an in-depth knowledge about riding instructor's musculoskeletal status and their physical health the aim is to find different measures to prevent musculoskeletal symptoms.

## 6 **Conclusions**

Considering the high degree of symptoms and the instructors' low mean age, it is of great importance to take preventive actions concerning the riding-instructors work situation. It should be possible for a riding-instructor to work in the profession a whole working career and not be forced to quit working due to lack of physical health. Therefore preventive measures are essential in the work around horses. Preventive measures may be constituted of ergonomically developed tools, and work routines, better clothes etc.

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