

REPORT

Understanding and Prevention of Low Back Pain in Care Workers

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Abstract. The aim of this study was to investigate the actual situation of low back pain (LBP) prevention in care workers with questionnaires, and this data were used to clarify and decrease LBP factors. Subjects were 52 care workers (30.7 ± 10.0 years old) in a nursing home who filled out two kinds of questionnaires about LBP, one about the prevalence of LBP (QN1) and the other about LBP control measures (QN2). They had either license of certified care worker, 1st or 2nd class care worker. The data were collected for the purpose of finding differences in age and career (QN1) and differences in LBP control measures (QN2) between subjects with and without LBP. The average career of the subjects was 19.1 ± 12.5 months, and the prevalence of LBP among them was 46.2% (24 care workers), of which 66.7% began having LBP after starting work as care workers. Moreover, 75.0% of these subjects began having LBP within a year after starting work. Further, of the 24 care workers with LBP, 66.7% reported constantly experiencing LBP. The major risk factors given for LBP in care work were transfer, the replacement of diapers, and movement in a half-sitting posture. Compared with LBP subjects, rates of taking preventative steps in the non-LBP group were low. More than 80% of the subjects with LBP engaged in prevention methods such as using body mechanics, learning the proper way to perform care activities, using LBP support belts, and increasing their skills and knowledge with regard to their job responsibilities. Most subjects began to engage in such prevention methods after the onset of LBP. The results of this investigation indicated that most subjects did not engage in measures to counter their LBP until after it had already started, and that they selected prevention methods which were easy to perform and effective. It is important for care workers to learn the best ways to inhibit pain and prevent the occurrence, or recurrence, of LBP. It is necessary for physical therapists to grasp the actual situation of LBP prevention as an occupational disease and to educate this.

Key words: low back pain, care workers, questionnaires

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Low back pain (LBP) is one of the major work-related diseases. The chief risk factors of occupational LBP are heavy physical work, static work posture, lifting and forceful movements, pushing and pulling movements, bending and twisting of the trunk, repetition of the same work, and whole-body vibration¹. Depending on these factors, the prevalence of LBP can rise remarkably. Most of these factors are present in the actual working conditions of care workers. Moreover, shortages of care workers and irregular working hours or shifts further influence the risk

factors of LBP. LBP can also be caused by factors in the working environment such as the stress of personal relations. In addition, due to increases in LBP medical expenses², it is hard for LBP patients to return to work³. Thus, care workers are exposed to many physical, psychosocial, and work organizational factors, all of which are connected to LBP. In fact, most care workers experience a career-long prevalence of LBP^{4,5}. WHO reported the importance of prevention and measures of LBP in work environment, as LBP was a typical disease which fulfilled not only work-induced but also work-related diseases⁶. Therefore it is very important to investigate the causes of LBP in care workers and to take the proper

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precautions. It is useful to catch the causes and prevention of LBP as an occupational disease in care workers, because physical therapists can remove the risk factor of LBP and educate the precaution suited for LBP patients. This study investigated the causes and prevention measures of LBP in care workers through questionnaires.

Materials and Methods

Subjects were 52 care workers (30.7 ± 10.0 years old) of a home for the elderly. There were 8 males and 44 females. They received two kinds of questionnaires about LBP from the researcher directly and filled out these questionnaires. First they filled out Questionnaire 1 (QN1), and after mailing out QN1 they filled out Questionnaire 2 (QN2), which was made in accordance with QN1. The contents of these questionnaires are shown in Table 1. The data were collected for the purpose of finding the prevalence of LBP (QN1) and LBP control measures (QN2). After collecting the data, sample number and rate were found item by item.

In a statistical analysis of the collected data, an unpaired t-test was used to find the difference of age and career between subjects with and without LBP. Differences in LBP control measures between subjects with and without LBP were examined by Fisher's exact test. A p-value less than 0.05 was considered significant.

This study was carried out after obtaining the informed consent of all subjects.

Results

The rate of valid answers was 100%. All of the care workers had learned care knowledge and skills in school, and they recognized the necessity of nursing education. The average career of the subjects was 19.1 ± 12.5 months, and the prevalence of LBP in the present study was 46.2%, of which 66.7% began having LBP after starting work as care workers. Moreover, 75.0% of these subjects began having LBP within a year after starting work. Regarding the length of time since the onset of LBP, 50.0% answered less than a year, 16.7% answered more than a year, and 33.3% answered more than five years. The age and length of career responses of the LBP group were significantly higher than those of the non-LBP group (Table 2). The degrees of LBP with the visual analogue scale (VAS) were 37.5% in 0–3, 50.0% in 4–7, and 12.5% in 8–10. Of the 24 care workers, 66.7% always felt LBP. The factors given for LBP that had begun before becoming a care worker included a decline in muscle strength and flexibility, a static work posture, and a half-sitting posture, whereas the factors given for LBP that had begun after becoming a care worker were lifting and forceful movements such as transfers, bending and twisting of the trunk such as a half-sitting

Table 1. Contents of questionnaire 1 and 2

Questionnaire 1

Theme: Understanding of low back pain (LBP) in care workers.
Type: unregistered and free writing.

Contents

0. age, sex, care worker's career
1. Do you have LBP now? (yes or no)
 - * if yes;
 - A. How long have you been LBP?
 - B. What is the causes of LBP?
 - C. What is the degree of LBP in visual analogue scale (VAS)?
2. What movement is hard for low back?
3. Do you have any pain except for LBP? (yes or no)
 - * if yes;
 - A. What part is painful, and is the degree of pain in VAS?
 - B. What is the causes of the pain?
4. What do you take steps for LBP?

Questionnaire 2

Theme: Prevention of low back pain (LBP) in care workers.
Type: unregistered and free writing.

Contents

1. Do you have LBP-control measures as follows? (yes or no)
 - A. using body mechanics.
 - B. taking proper ways of care.
 - C. LBP exercise.
 - D. using LBP supporter.
 - E. improvement of muscle flexibility and power.
 - F. taking care in a pair.
 - G. learning care knowledge and skills.
 - H. others.
2. When do you begin to take the preventions?
3. Does your LBP lessen after taking the preventions? (yes or no)
4. What is the most important for you to prevent LBP?

Table 2. Prevalence of LBP

	Age (years)	Career (months)	Month since having LBP
Non LBP	$25.6 \pm 6.2^*$	$14.7 \pm 8.7^*$	
LBP	36.7 ± 10.4	25.2 ± 13.7	55.8 ± 67.6
Before employed	44.0 ± 5.3	32.0 ± 10.7	138.0 ± 57.7
After employed	33.0 ± 10.4	21.8 ± 14.1	14.8 ± 6.4

* Significant difference between LBP and non LBP ($p < 0.01$).
(mean \pm S.D.)

posture, lack of exercise, and a lack of proper care skill (Table 3). The greatest risk movements with regard to LBP among the care workers were transfer (42.1%), replacement of diapers (21.1%), movements in a half-sitting posture (15.8%), and others (i.e., giving a bath, replacement of bed sheets, and handling of patients) (Table 3). Of the subjects, 61.5% had other pains in addition to LBP (Table 4). For the

Table 3. The movements caused LBP and hard movements for low back

Movements caused LBP				Hard movements for low back	
LBP before employed		LBP after employed			
Reduce of muscle power	40.0 (%)	Transfer	44.4 (%)	Transfer	45.0 (%)
Long time sitting	20.0	Bath care	22.2	Replacement of diapers	20.0
Half-sitting posture	20.0	Lack of exercise	11.1	Half-sitting posture	15.0
Others	20.0	Others	22.3	Others	20.0

Table 4. Regions and degrees of pain besides LBP

Regions and degrees of pain	Causes of pain	
(%) (VAS)		(%)
Neck	9.1 (2–3)	Over load 37.5
Back	18.2 (2–4)	Keeping same posture 25.0
Shoulder	27.3 (1–5)	Being careful of LBP 12.5
Elbow and wrist	18.2 (1)	Others 25.0
Knee and ankle	18.2 (1–3)	
Others	9.0	

VAS: visual analogue scale.

Table 5. Prevention of LBP

Acquirement of care knowledge and skills	33.3 (%)
Use of body mechanics	23.8
Improvement of muscle power and flexibility	14.3
Others	28.6

Table 6. Rate of performing LBP-control measures (%)

	A	B	C	D	E	F	G	H
All subject	69.2	69.2	38.5	38.5	30.8	53.8	84.6	38.5
Non LBP	57.1	57.1	33.3	0*	28.6	42.9	85.7	28.6
LBP	83.3	83.3	37.5	83.3	33.3	66.7	83.3	50.0

A: using body mechanics. B: taking proper ways of care. C: LBP exercise. D: using LBP supporter. E: improvement of muscle flexibility and power. F: taking care in a pair. G: learning care knowledge and skills. H: others.

*: significant difference from LBP (p<0.01).

prevention of LBP specifically, however, the acquirement of care knowledge and skills (33.3%), the use of body mechanics (23.8%), the improvement of muscle power and flexibility (14.3%), and other methods (i.e., exercises for LBP, working in pairs, and using supporters for the trunk) were the most common responses given (Table 5).

Compared with the LBP group, all of the rates of utilized LBP prevention methods given by the non-LBP group were low except for Method G (learning care knowledge and skills). In particular, none of the subjects in the non-LBP group performed Method D (Table 6). In total, 53.8% of the subjects began to utilize the prevention methods after beginning care work, 30.8% began after the onset of LBP, and the rest began before beginning their jobs as care workers.

Discussion

LBP is one of the most severe problems faced by care

workers, as it can deteriorate one’s ability and motivation for work. This study investigated the LBP conditions of care workers and how they understand and deal with the problems caused by LBP. Of the subjects with LBP, 66.7% began having LBP after beginning employment as care workers. Moreover, 75.0% of these began having LBP within a year after beginning work. This finding suggests that they might not have been aware of LBP prevention measures. In fact, most of these subjects did not try any of the available prevention measures for LBP until after the onset of LBP. More over, few subjects without LBP took any precautions whatsoever. It is therefore important for care workers to be educated about work-related injuries and for employers to insure that work environments are in good condition.

The causes of LBP that began after beginning work were different from those of LBP that began before starting work. Subjects with LBP before beginning care work gave the reduction of muscle power, extended time in a sitting

position, and a half-sitting posture as the main reasons for their LBP. On the other hand, regarding LBP that began after starting work, subjects responded that LBP occurred during caregiving and that transfer was the main reason for its onset. Thus, the causes of LBP varied depending on the type of work. Transfer includes such LBP risk factors as lifting and forceful movements, pushing and pulling movements, and the bending and twisting of the trunk. Care workers must engage in transfer and other heavy motions many times in a single day. This result was similar to that reported by Cheung⁷⁾, stating that back strains that occur while handling clients are a major health care hazard in the nursing profession. In addition, the American Nurses Association (ANA) has promoted a campaign to encourage a health care industry-wide effort to prevent back and other musculoskeletal injuries⁸⁾. Finally, with regard to the current study, lifting was given as the major factor of LBP-related stress. ANA gave various LBP measures for patients and nurse and these measures are necessary and important. It is considered that the quickest and easiest step in ANA's measures is education and training, because the cost is low and there is a physical therapist at least in hospital and elderly facilities. All care workers must have education and training to care the patients, but many of them cannot make use of the experiences. It is important for physical therapists to enlighten LBP prevention because they are professional of body mechanics.

Rates of reported shoulder pain were the highest in subjects with LBP in this study. Myers *et al.*⁹⁾ reported high back and shoulder injury incidence rates among nursing assistants and stressed the importance of social integration and work organization issues. This suggests that shoulder pain is associated with transfer, and that lifting, pulling, and holding movements burden the shoulders. Indeed, not only the shoulders, but also other regions of the body are affected by LBP either directly or indirectly.

Most LBP patients recover within two months of the onset of pain, but some develop chronic LBP¹⁰⁾, and there are many non-physical factors that can influence the severity of LBP, such as working environment, working time, and working shift, etc. It is necessary, therefore, to try to select the best available LBP-control measures. In the present study, eight methods of LBP prevention were investigated (Table 6). The rates of engagement in LBP prevention measures among LBP subjects were higher than those of non-LBP subjects for all methods except for Method G. As stated above, this indicates that non-LBP subjects were less concerned about LBP prevention, while LBP subjects understood these methods as ways to inhibit or improve the aggravation of LBP rather than to prevent it. The percentages of engagement in Method C (LBP exercise) and Method E (improvement of muscle flexibility and power) were particularly low, despite the fact that 14.3% of the subjects responded that the improvement of muscle

flexibility and power was the most important prevention method. It is difficult, however, to determine the effectiveness of these methods on LBP with regard to the time required for improvement and subject patterns of continuation. In contrast, more than 80% of the subjects with LBP reported engaging in prevention Method A (using body mechanics), Method B (performing care activities more properly), Method D (using LBP support belts), and Method G (learning care knowledge and skills). Methods A, B and G came under education and training, and methods B applied assistive equipment in ANA's measures. All these methods can be taken at low cost easily. These methods can be utilized while at work and therefore do not require additional time outside of work to be effective. In addition, the biomechanical and postural stresses found in this study correlated with previously reported musculoskeletal injury rates¹¹⁾ and studies that found that the ergonomic design of care work environments can help minimize LBP¹²⁾¹³⁾. Back supports have also been shown to be effective in the prevention and reduction of LBP¹⁴⁾¹⁵⁾. These reports show that LBP patients can easily engage in prevention measures and therefore realize their effectiveness.

This investigation demonstrated that most subjects did not actively engage in measures to prevent LBP until after they had LBP. Further, they selected prevention methods which were both easy to perform and effective. Therefore it is important to devise LBP prevention methods that care workers can easily and effectively perform while on the job. The first thing to solve LBP in work environment is to decrease the risk factor of LBP. It was considered that physical therapists could play an important part in introducing, teaching and supporting LBP preventions.

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