

Determinants of the intention for using a lumbar support among home care workers with recurrent low back pain

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Abstract In most effectiveness studies on lumbar supports for patients with low back pain, insufficient data are reported about adherence. In a secondary preventive RCT, we found beneficial effects and a good adherence among home care workers with low back pain. To target the use of lumbar supports on those patients who can benefit optimally from usage, we need to know why people are adherent. We used the attitude, social support and self-efficacy model to identify determinants for prolonged adherence to wearing a lumbar support. The strongest predictor for intending sustained use of a lumbar support was a positive attitude towards lumbar supports, explaining 41% of the variance ($B = 1.31$; $p < 0.001$). Social support and self-efficacy played a minor role. The intention for prolonged use of a lumbar support for workers with recurrent back pain was mainly explained by a positive attitude. The discomfort of a lumbar support was outweighed by perceived benefit.

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Introduction

Low back pain is a widespread medical and costly burden in industrialised countries. For example in the Dutch population, the one year prevalence of low back pain was 44% in 1998 [8], whereas the total costs attributed to low back pain were estimated at €269 per inhabitant [14]. Lumbar supports are used to prevent or manage low back pain, although there is moderate evidence that lumbar supports are not effective in preventing the onset of low back pain, and there is insufficient evidence on effectiveness in the management of low back pain [13]. However, most of the studies that investigated the effectiveness of lumbar supports did not report data on adherence to wearing lumbar supports, while adherence is a confounding factor when studying the effectiveness. If reported, in general adherence to the use of lumbar supports was poor in previous studies and was a matter of self-selection. A poor adherence to the intervention causes uncertainty of potential effects: Is effectiveness underestimated because of non-adherence? Or is the intervention ineffective, but can one not be certain because of non-adherence? [13].

We found in a RCT, which studied the effectiveness of lumbar supports for home care workers with a history of recurrent low back pain episodes (i.e., secondary prevention), that the use of a lumbar support in addition to usual care reduced the number of days with low back pain with 45%, reduced average pain intensity with 13% and improved functional status with 14% [11]. In this study, participants of the intervention group were instructed to use a lumbar support on those working days they experienced

or expected to experience low back pain. Adherence was good, as 78% of the intervention group had used the lumbar support at least one-third of the total calendar days they experienced low back pain [11]. Apparently, for adherence, possible benefits have to outweigh the discomfort of wearing such a lumbar support and we assume that experiencing recurrent low back pain or not is a threshold for considering and actually wearing a lumbar support.

Besides attributing possible effects to the use of lumbar supports, it is important to gain insight in determinants for adherence to target the use of lumbar supports on those patients who can benefit optimally from usage and to reduce barriers to enhance future adherence. For these purposes, the attitude, social influences and self-efficacy model (ASE-model) [4] can be used. The ASE-model (Fig. 1) is developed to explain health behaviour, and evolved from the theory of reasoned action from Fishbein and Ajzen [6], and Bandura's social cognitive theory [1]. We explored possible determinants for the intention to prolong using a lumbar support with the ASE-model.

Methods

Design

This adherence study was embedded in a randomised controlled trial [11] (ISRCTN73707379), and focused on the intervention group of this RCT. The intervention group received a lumbar support in addition to usual care, consisting of a short refresher course on healthy working methods provided by their employer from the start of their appointment (a yearly training of 2 h, practising the most frequent handlings and a yearly played board game with questions on healthy working methods); primary and secondary care for the management of low back pain was available as usual [5].

Subjects

All participants worked for a large home care organisation in Rotterdam. The inclusion criteria were: performing medical care and/or domestic tasks as a home care worker; experiencing low back pain symptoms at baseline or

experienced two or more episodes (at least 2 consecutive days) of low back pain symptoms in the previous 12 months; not suffering from specific low back pain, e.g., due to rheumatoid arthritis or vertebral fractures; not pregnant at the start of the study; not receiving medical treatment for high blood pressure, as lumbar supports are possibly associated with an increased blood pressure and heart rate when performing lifting tasks [10]. Employees who met the inclusion criteria received detailed information about the procedures of the trial and were enrolled after giving written consent.

Lumbar supports

The participants in the intervention group were given instructions to wear the lumbar supports on those working days that they experienced low back pain or expected to experience low back pain. There was convenience of a choice between four types of lumbar supports, supplied by Bauerfeind B.V., Haarlem, The Netherlands: LumboTrain[®] and LumboTrain[®] Lady, an individually adjustable (with hoop and loop fastening), fully elastic support available in five sizes for men or women; Lumboloc[®] and Lordoloc[®], two types of more stabilising supports with integrated stays in the back, individually adjustable (with hoop and loop fastening) and both available in six sizes. All supports were individually fitted. The choice of model was based on fit and wearing comfort. The expected life span of the lumbar supports was one year.

Measures

Determinants were measured by questionnaires. The questionnaire items were derived from results of an earlier performed feasibility study for lumbar supports in home care [7]. Lumbar supports are not commonly used in the Netherlands and most people are unfamiliar with their existence, which was confirmed in our trial. At the start of the RCT, none of the 360 home care workers was using a lumbar support. Only 4% was aware of the existence of lumbar supports, and less than 1% had used one in the past. Therefore, we measured the attitude, social influences and self-efficacy determinants during the trial after 3, 6, 9 and 12 months. Attitude, social influences and self-efficacy determinants were operationalised by the mean score of several statements per determinant.

External factors

The determinants we considered as possible external factors of influence were: self-reported body height and a body mass index above 30, calculated from self-reported weight. Body height was considered because for a smaller

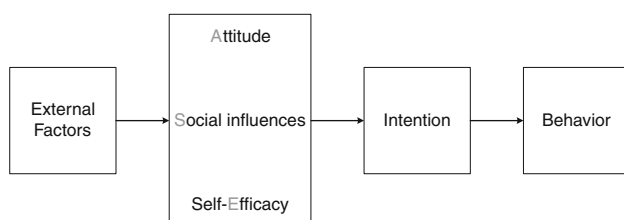


Fig. 1 The attitude, social influences and self-efficacy model

person a lumbar support is relatively tall, which might decrease comfort of wearing. A body mass index above 30 as obesity could also lower comfort of wearing. In a feasibility study a high body mass index was found to be associated with lower adherence [7].

Attitude

Attitude was divided into a positive and negative subscale. Positive attitude was based on 12 statements, for example: “Using a lumbar support facilitates me to perform my job.” Participants answered on a 5-point Likert scale ranging from 0 “strongly disagree” to 4 “strongly agree”. Internal consistency was good (Cronbach’s $\alpha = 0.93$).

Eight statements, like “Using a lumbar support is too warm.” were presented for negative attitude with an identical 5-point Likert scale. Internal consistency for the negative subscale was moderate (Cronbach’s $\alpha = 0.70$).

Social support

For measuring social support, the opinions of five groups of people potentially of influence were stated: peer, clients, managers, colleagues and therapists. For example: “When I use a lumbar support, my colleagues think I pity myself.” Home care workers were asked whether they disagreed or agreed on a 5-point Likert scale. With a Cronbach’s α of 0.40, the internal consistency was poor.

Self-efficacy

Four statements addressing the ability to use a lumbar support were posed to measure self-efficacy (Cronbach’s $\alpha = 0.80$). “How well do you manage to wear the lumbar support on warm days?” is an example. The answer categories on a 7-point Likert scale ranging from 0 “not at all”, to 6 “very well”.

Adherence and intention

To measure adherence during the intervention period of the trial, the workers of the intervention group were asked to keep a low back pain calendar. They could tag the days they experienced low back pain, and mark whether they had worn the lumbar support. These calendars were collected after 1, 3, 6, 9 and 12 months. As stated before, the workers were instructed to wear the lumbar support on those working days that they experienced or expected to experience low back pain. Because the number of days with low back pain was measured in calendar days, the minimum for adherence was predetermined arbitrarily at using the lumbar support on at least one-third of the calendar days with low back.

The intention to prolong the use of a lumbar support when experiencing/expecting to experience low back pain was measured after the intervention period at 12 months, with a 7-point Likert scale ranging from 0 “never” to 6 “always”.

Statistical analysis

All items were calculated into averaged subscale scores for analysing the influence of attitude, social support and self-efficacy.

To explore possible correlations, univariate Pearson correlations were calculated. Then the hypothesised ASE-model was filled in with a linear regression pathway analysis. Finally, on the ASE-determinants contributing to the model, a principal components factor analysis with varimax rotation was performed to explore possible sub-components within the scales. The analyses were performed with SPSS 15.

Results

Of the intervention group in total ($n = 183$), 143 (78%) workers had used the lumbar support for at least one-third of the total number of days they reported low back pain. On average the supports were worn on 5.5 days per month (SD 6.1, range 0–27.3), which was 90% of the mean number of days with low back pain per month. As much as 134 workers (73%) completed the 12-month adherence questionnaire and were used in the analyses. The general characteristics of these 134 workers were similar to the characteristics of the total intervention group, and are listed in Table 1 together with the ASE-determinants scores. The reasons for withdrawal from the RCT were: participation was too much of an effort (4), personal circumstances (2), other health problems (10), pregnant and unwilling to fill in follow-up questionnaires (2), lumbar support was uncomfortable, not beneficial and unwilling to fill in follow-up questionnaires (3), therapist advised against support (1), dismissal from job in home care (8), deceased (1), and unknown/without giving a reason (11). Another 7 workers were missing in the analyses because of incomplete adherence data.

Intention

A proportion of 7.5% reported that in the future they would never use a lumbar support when experiencing/expecting to experience low back pain; 6.7% said they would use a lumbar support sometimes; 18% intended to keep using it regularly; 34% most of the times; and another 34% intended to always keep using a lumbar support.

Table 1 Characteristics of the workers reporting adherence data ($n = 134$)

General	
Age, Mean (sd)	43 (8.8)
Female, n (%)	132 (99)
Body mass index, kg/m^2 (sd)	27 (5.9)
Low back pain, number of calendar days per month (sd)	6.3 (6.3)
External factors in model	
Height, m (sd)	1.68 (0.08)
Obese, n with BMI ≥ 30 (%)	33 (25)
ASE-determinants in model	
Positive attitude, towards lumbar supports, scale 0–4, mean (sd)	2.57 (0.77)
Negative attitude, towards lumbar supports, scale 0–4, mean (sd)	1.85 (0.66)
Social support, towards lumbar supports, scale 0–4, mean (sd)	2.72 (0.63)
Self-efficacy, using lumbar supports, scale 0–6, mean (sd)	3.42 (1.50)
Intention, 0–6, mean (sd)	4.21 (1.86)
Adherent during study period, used lumbar support at least 1/3 of the days with low back pain, n (%)	105 (78)

Table 2 Univariate Pearson correlations

Height	Obese		Intention
-0.01	0.01	Positive attitude	0.64***
0.11	0.24**	Negative attitude	-0.31***
n/a	n/a	Social support	0.40***
n/a	n/a	Self-efficacy	0.46***

** $p < 0.01$; *** $p < 0.001$ (2-tailed)

Correlations

The univariate correlations revealed that from the external factors only obesity correlated statistically significantly with negative attitude. Positive attitude, negative attitude, social support and self-efficacy all correlated significantly with intention to keep using a lumbar support (Table 2).

Pathway analysis

Body height and obesity did not influence positive attitude. Body height and obesity explained 7% of the variance of negative attitude. In this, obesity was the only significant determinant ($B = 0.36$; 95% CI 0.10–0.61; $p = 0.006$) and accounted for 6% of the explained variance.

For intending to keep using a lumbar support, 45% of the variance could be explained by the ASE-determinants.

A positive attitude was the strongest predictor for intention ($B = 1.31$; 95% CI 0.91 to 1.71; $p < 0.001$; R^2 change = 0.41), followed by self-efficacy ($B = 0.22$; 95% CI 0.03 to 0.42; $p = 0.026$; R^2 change = 0.02). Social support was not statistically significant, but accounted for 2% explained variance ($B = 0.39$; 95% CI -0.05 to 0.82; $p = 0.083$), and none of the variance was explained by negative attitude ($B = 0.23$; 95% CI -0.22 to 0.67; $p = 0.315$; R^2 change = 0.00). Figure 2 summarises the pathway analysis and contains the correlation (Spearman's rho) between adherence during the RCT and intention, which was 0.40 ($p < 0.001$).

Factor analysis

Within the positive attitude scale we found two components with initial Eigenvalues >1 , which together explained 68% of the variance. The first concerned a low back pain relief component, consisting of items like “A lumbar support makes my low back pain more bearable.”, and the second a practical component, with items like “The lumbar support remains placed properly during my work”. Also within social support, two components were found, together explaining 56% of the variance. The first consisted of social support by family/friends and managers. The second of support by clients and colleagues. Self-efficacy yielded one practical component (63% explained variance), with items, such as “How well do you manage to put on the lumbar support?”

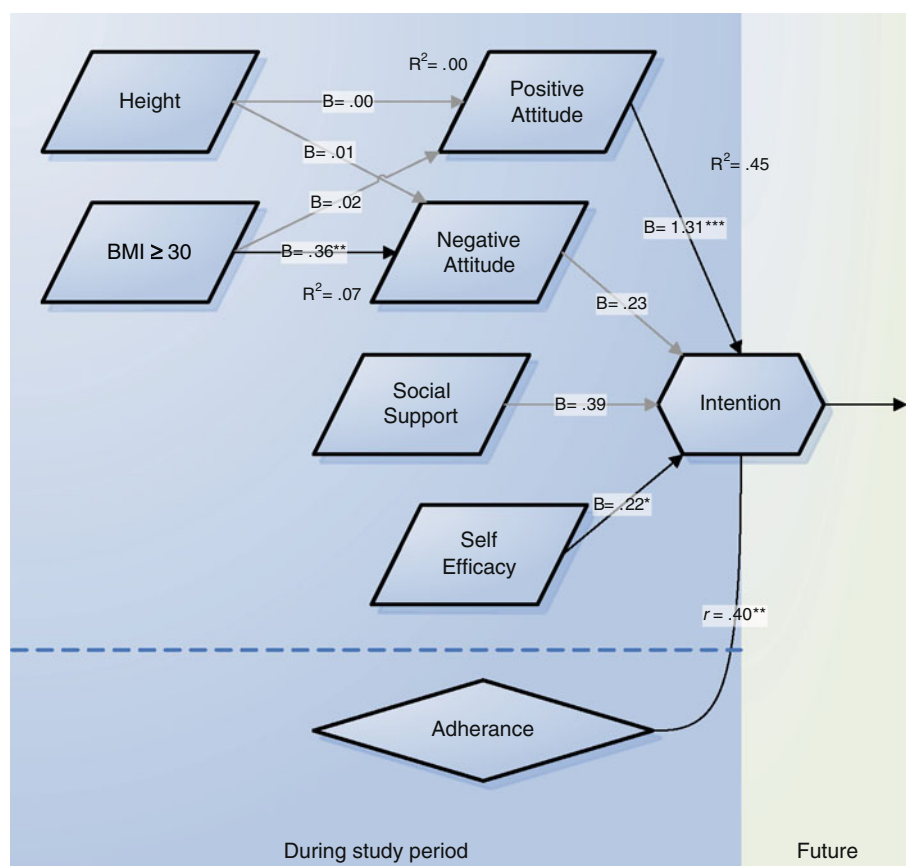
Discussion

After one year of experience with a lumbar support, 86% of the home care workers with recurrent low back pain intended to keep using a lumbar support when experiencing/expecting to experience low back pain. Only 7.5% was determined to never use a lumbar support again. A higher intention was mainly explained by positive attitude and to a limited extent by self-efficacy. Obesity was significantly related with negative attitude. However, the influence of negative attitude on intention was diminished by positive attitude in the multivariable analysis. This diminished influence pertained also for the role of social support.

The correlation between adherence during the trial and the intention to keep using a lumbar support was lower than we would expect. We assume that this is partly caused by workers who were adherent because they participated in the study and no longer intend to continue using a support.

We have to emphasise that administering a lumbar support as a secondary preventive measure is part of a behavioural change process, since workers are at least in a contemplation stage of change [9], or even beyond.

Fig. 2 Pathway analysis for intending to keep using a lumbar support. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$



Besides, deciding to participate in this trial has been a form of preselecting; out of the 668 eligible workers 46% (308) were unwilling to participate. Both forms of preselecting, together with 27% missing data on adherence may have caused our results are too positive. However, the proportion of workers determined to never use a lumbar support again, would still be only 17%, even if we would add all workers who withdrew because the supports were uncomfortable and all workers lost to follow-up or with missing data for unknown reasons (21 in total).

As far as we know, this is the first study using the ASE-Model to clarify determinants for lumbar support usage. A next step in identifying specific target groups could be a Q methodology study. Q methodology provides a foundation for the systematic study of subjective attitudes, viewpoints, opinions or beliefs [2, 3], and originates from Stephenson's [12] idea to invert a factor analysis, thus analysing correlations between subjects. Because each subject in a Q-study prioritises his/her subjective attitudes, the factor analysis of these prioritised subjectivities generates target group profiles, providing detailed information about differences and similarities in viewpoints of importance.

From the results of this study, we conclude that the discomfort of a lumbar support has to be outweighed by perceived benefit. Besides concerns on effectiveness [13],

offering a lumbar support to people as a primary preventive measure, where people are not likely to experience benefit from it's usage, is bound to be a waste of scarce health-care resources because of a poor adherence. For workers with recurrent back pain, however, reducing practical hindrances by making sure that the support remains fixed during work for example, and creating sufficient social support for using the support within the organisation are factors that may help to enhance adherence with the use of lumbar supports.

Conflict of interest statement None.

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