Negative influence of a mediatised video on low back pain-related misbeliefs and attitudes in the general population

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ABSTRACT

Background: Low back pain (LBP)-related misbeliefs are a risk factor for chronicity and thereby require further attention. **Objective**: To assess the influence of a mediatised video on LBP-related misbeliefs in the general population and to examine whether these individuals intended to change their behavior to protect their back after viewing the video. **Method:** French-speaking adults within the general population were recruited through advertisements and were asked to complete a self-administered questionnaire, available online between January 2021 to April 2021. The questionnaire asked about socio-demographic information and back pain beliefs (the 10-item Back-PAQ). Participants were then prompted to watch a mediatised video conveying negative messages. Immediately after viewing the video, participants indicated their degree of agreement with the messages conveyed they completed the Back-PAQ a second time and they indicated whether they intended to change their behavior as a result of watching the video. Changes in mean Back-PAQ score after viewing the video and the percentage of participants planning to protect their backs more were investigated. The influence of a history of LBP was also analysed. **Results**: 1338 participants were included. The initial mean Back-PAQ score was high (28.3 (SD 6)) and increased significantly after viewing the video (Cohen d: 0.42), indicating an increase in negative beliefs. This change was greater than the minimum detectable change (6.8) for 11.4% of participants. In total, 55% of respondents reported that they would protect their backs more after watching the video. Pain history did not influence the change in Back-PAQ score post viewing. **Conclusions**: This study demonstrates that a mediatized video which conveys negative messages about LBP reinforces LBP-related misbeliefs and may promote maladaptive behavior in a significant number of individuals. This study also confirms the prevalence of such misbeliefs in the general population and thereby, the necessity for clinicians to explore patients' misbeliefs and their origin.

KEYWORDS: beliefs, fear, knowledge, low back pain, communication.

Introduction

Low back pain (LBP) is one of the most common causes of disability [1] and a socio-economic burden [2]. More than 70% of individuals experience LBP in their lifetime; the number of years of disability due to LBP increased by 54% from 1990 to 2015 [2]. It is now commonly accepted that LBP management strategies should not follow a biomedical model but should instead be based on a bio-psycho-social model, particularly when there is a risk of chronicity or when the disorder is already chronic [3, 4, 5]. Among the "yellow flags", considered as risk factors for the transition to, and maintenance of, chronicity are "LBP-related misbeliefs" [5, 6, 7, 8]. Williams and Thorn defined pain beliefs as "patients' own

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conceptualisations of what pain is and what pain means for them" [9]. They can play an important role in behavioural and emotional responses to musculoskeletal pain [10]. Some pain beliefs can be positive/helpful (e.g. positive expectations) [11, 12] but others are based on inaccurate or incomplete information which are discordant with current scientific knowledge. The importance to consider pain beliefs are highlighted by their aforementioned consequences. LBP-related misbeliefs are common in the general population [13] and have been highlighted in community samples in New Zealand [14], Argentina [15], Norway [16], Switzerland [17] and Belgium [18]. LBP-related misbeliefs can be unhelpful as they can negatively impact pain intensity, disability, use of drugs and health care utilisation [8, 19, 20, 21]. Furthermore, LBP-related misbeliefs can induce catastrophic thoughts and avoidance behaviours [8, 22, 23, 24] e.g., avoidance of spinal flexion to "protect" the back [10]). Indeed, one of the most common beliefs is that the back is fragile and vulnerable and should be protected by limiting certain movements such as bending and lifting [8, 25, 26, 27, 28].

LBP-related misbeliefs may have different origins [8, 10], one of which may be the influence of media. Few studies have evaluated the potential influence of the media on negative beliefs about LBP. A recent video clip of a popular health professional discussing LBP was broadcast in French on social media to promote a high-profile French television program. The clip contained negative messages about LBP that contradicted with current recommendations [29]. As beliefs are modifiable, we used this opportunity to assess the impact of viewing the video clip on LBP-related beliefs within the general public. Our primary objectives were to determine the extent to which viewing the video changed beliefs regarding LBP in the general public and to examine whether participants intended to change their behavior to protect their back as a result of viewing the video. The secondary aim was to compare the impact of the video on beliefs between asymptomatic subjects (with or without a history of LBP) and those with ([sub]acute or chronic) LBP.

We hypothesised that LBP-related misbeliefs would increase after viewing the video clip in most people, regardless of the LBP past history of LBP, and that it might favor spinal protection behaviors.

Method

Study design and setting

A prospective pre-post study in which participants were invited to complete a questionnaire before and after watching a video clip was conducted. The questionnaire was available online on a digital platform (LimeSurvey) between 11/01/2021 to the 03/04/2021. The study protocol was approved by the Ethical committee of the University of Liege on 20/09/2020. All participants were volunteers, were informed about the study and gave their consent for participation.

Participants

To be eligible for participation in the study, participants had to be 18 years old or over, French-speaking and live in Europe (Belgium, France, Luxembourg or Switzerland). Exclusion criteria included visual impairment which prevented individuals from watching the video, not having an internet connection and all graduates from physiotherapy, osteopathy, occupational therapy, medicine (specialised in the management of LBP). Participants who did not complete every section of the questionnaire, those that did not provide consent for participation or who indicated that they had not watched the video were also excluded. A non-probabilistic recruitment method was used: participants were recruited using convenience sampling via mailing lists, flyers posted in numerous public places (e.g., hospitals, mailboxes, bakeries, supermarkets, etc.) and announcements posted on social networks (Facebook and Instagram).

Procedure and measures:

Individuals who wished to participate were invited to go to the LimeSurvey online questionnaire platform to complete the questionnaire using the web link or QR code found on the flyer/announcement. The questionnaire included several sections. It was not possible to go back to the previous section to change previous responses.

Section 1: Consent Once the questionnaire was opened, the respondent had to give consent in order to proceed to the next section.

Section 2: Sociodemographic characteristics: This section collected data of participant's general characteristics (age, gender, level of education, professional status), the presence of LBP in the last 24 hours (and, if present, the duration of the pain) and the individual's history of LBP so that we could classify participants into 4 subgroups: asymptomatic without history of LBP, asymptomatic with history of LBP, (sub)acute LBP (pain for less than 3 months) and chronic LBP (pain for more than 3 months).

Section 3: Pre-video questionnaire (Beliefs relating to LBP): The short version of the French version [30] of the Back-Pain and Attitudes Questionnaire [31] which is comprised of 10 items (statements) rated on a 5-point Likert scale ranging from 1 (false) to 5 (true) was used. The total score (ranging from 10 to 50) was calculated by summing the score for each item (the scores for items 6, 7 and 8 are reversed). Higher scores indicate more negative beliefs. This questionnaire has good reliability and the minimum detectable change (MDC) is 6.8 points [30].

Section 4: Video clip about LBP: The 4.24 minutes video clip used in the present study was broadcast on one of the main French TV channels website and on social networks, in particular on Facebook. It was an extract from a television programme presented by a popular French doctor and a celebrity. The video clip consisted of a doctor discussing everyday movements that he described as harmful to the back and that he strongly advised against performing to avoid putting one's back at risk. He provided seven main messages which can be found in the Tables. At the end of the video, participants were asked to confirm that they had watched the entire video.

Section 5: Post-video questionnaires: Immediately after the viewing, participants completed:

- A custom-made questionnaire designed to examine the degree of agreement with the 7 statements described above using a 5-point Likert scale: "Strongly agree", "Agree", "Undecided", "Disagree", "Strongly disagree". A score of −2, −1, 0, 1 and 2 points was respectively assigned to each response and the total score was calculated (range -14 to 14 points). We found good test-retest reliability for this questionnaire in a preliminary unpublished study (ICC: 0.98).
- The Back-PAQ (post viewing).
- The question: "After watching this video, do you plan to change how you perform your daily activities and will you pay more attention to protecting your back?".

Once the questionnaire was finished, a closing statement was provided in order to reassure participants that their back is a strong structure, and to explain the benefits of movement (even in the presence of back pain) and the potential risks associated with the systematic avoidance of basic movements. This explanation was added so that participation in this study would not be "harmful" to participants.

Statistical analysis

Statistical analyses were performed by a statistician who used JMP Pro 16.0.0 and SAS 9.4 software. Descriptive data were expressed as numbers and percentages for categorical variables, means and standard deviations

Table 1 Sociodemographic characteristics of the 4 subgroups.

	Asymptomatic – no history of LBP	Asymptomatic – with history of LBP	(Sub)acute LBP	Chronic LBP	Total
	n = 290	n = 503	n = 164	n = 381	n = 1338
Sex, n (%)					
Female	176 (60.7)	345 (68.6)	118 (72)	255 (66.9)	894 (66.8)
Male	113 (39)	155 (30.8)	46 (28)	126 (33.1)	440 (32.9)
Other	1 (0.3)	3 (0.6)	0	0	4 (0.3)
Age in years, mean (SD)	29.8 (14.2)	34.3 (15.7)	30.3 (13.0)	38.0 (17.0)	34.0 (15.8)
Level of education, n (%)					
Primary	1 (0.30)	2 (0.4)	1 (0.6)	3 (0.8)	7 (0.50)
Secondary	33 (11.4)	51 (10.1)	28 (17.1)	28 (17.1)	177 (13.2)
Higher education	256 (88.3)	450 (89.5)	135 (82.3)	313 (82.2)	1154 (86.3)
Professional status, n (%)					
Working	111 (38.3)	251 (49.9)	71 (43.3)	199 (52.2)	632 (47.2)
On sick leave	1 (0.30)	6 (1.2)	1 (0.60)	12 (3.1)	20 (1.5)
Unemployed	7 (2.4)	8 (1.6)	1 (0.60)	13 (3.4)	29 (2.2)
Retired	15 (5.2)	33 (6.6)	4 (2.4)	35 (9.2)	87 (6.5)
Student	152 (52.4)	203 (40.3)	84 (51.2)	121(31.8)	560 (41.9)
Other	4 (1.4)	2 (0.40)	3 (2.0)	1 (0.30)	10 (0.70)

LBP: low back pain.

(SDs) for continuous variables, and medians and interquartile ranges (IQRs) for variables with a non-normal distribution. The effect-size (Cohen d) was calculated by dividing the mean difference by the standard deviation. Comparison of the change in Back-PAQ score between the four subgroups (with respect to LBP history) was analyzed using a mixed model with a random subject effect. The Kruskall Wallis test was used to compare change in Back-PAQ score (post value minus pre value) between the 4 subgroups. In case of significance, pairwise between-group comparisons were performed with a non-parametric test with correction for multiplicity (Steel-Dwass method). A McNemar test was used to compare the percentages of participants who chose each response option between pre and post viewing for each item of the Back-PAQ.A p-value < 0.05 was considered statistically significant.

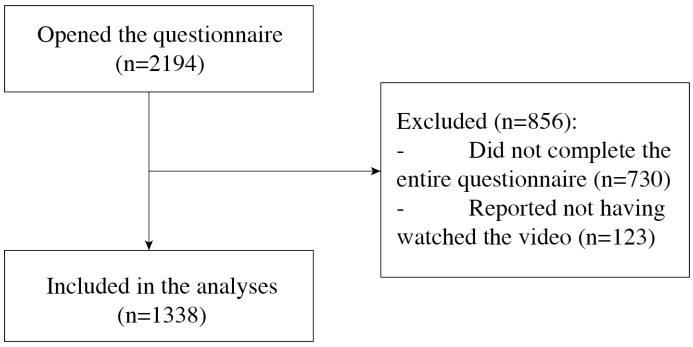

Figure 1 Figure 1: Flow chart of inclusions

Results

A total of 2194 individuals opened the questionnaire. Of these, 728 did not complete the entire questionnaire, and 123 reported not having watched the video. Therefore, 1338 participants were included in the analyses (Figure 1).

General socio-demographic and LBP-related information

Mean age of the total sample was 33.9 years (Table 1). The majority were female (66.8%), with a high education level (86.2%). Less than half of the sample were professionally active (47.2%) and 41.8% were students. With regards to location, 84.5% lived in Belgium, 15.1% in France, and the few remaining participants lived in the Grand Duchy of Luxembourg or Switzerland. Most respondents (1048/1338, 78.3%) reported currently having or having experienced LBP previously. Of these, 381/1338 (28.5%) and 164/1338 (12.2%) reported having chronic or (sub)acute LBP respectively at the time of the questionnaire; 290/1338 (21.7%) reported no LBP in the last 24 hours and no history of LBP, and 503/1338 (37.6%) reported being currently asymptomatic with a history of LBP.

Ratings of agreement with the messages in the video clip

Mean total score for the degree of agreement with the 7 messages was −6.9 (SD 6.0). Table 2 shows that at least half individuals (>53%) agreed or strongly agreed with all 7 messages. Agreement with messages 5 ("When picking up an object from the ground, squat down instead of bending forward to avoid hurting your back") and 7 ("Avoid wearing a backpack with only one shoulder strap to avoid hurting your back") was particularly high: 90% and 88.4% respectively (Table 2).

Back-PAQ Score

Mean initial Back-PAQ score for the overall sample was 28.3 (SD 6) (out of 50 points). For item 1 ("You can easily hurt your back") and item 2 ("You could hurt your back if you are not careful") a scores of 4 or 5 (suggesting misbeliefs) were frequent for item 1 (54.4%) and for item 2 (76.5%) on the pretest. This proportion increased further after viewing the video to 70.5% for item 1 and 85.2% for item 2 (Table 3). Mean Back-PAQ score after viewing the video (30.0, SD 6.75) increased significantly in the whole

sample (mean change: 1.74, SD 4.16; $p < 0.001$; Cohen d: 0.42). Analysis of the changes revealed that the score increased by ≥ 6.8 points (MDC) for 152 participants (11.4%). The mixed model used to compare change between the 4 subgroups revealed a significant group effect (higher initial total Back-PAQ score in the group with chronic pain than the other 3 subgroups) and a significant time effect characterized by an increase in the Back-PAQ score after viewing the video, with no group * time interaction effect (Table 4).

Intention to change behaviour post viewing

In response to the question "After watching this video, are you going to change how you perform your daily activities and will you pay more attention to protecting your back?", 55% (735/1338) of participants indicated that they would change their behavior, 23% (309/1338) were undecided and 22% (294/1338) stated they would not change.

Table 2 Ratings of agreement with the 7 main messages from the video clip (expressed as percentage of participants) (n=1338)

	Strongly agree (%)	Agree (%)	Unsure (%)	Disagree (%)	Strongly disagree (%)
Message 1	31.1	41	13.2	9.1	5.5
Message 2	35.7	31.9	12.9	12.6	6.8
Message 3	37.4	33.9	11.3	11.8	5.6
Message 4	26.2	27.4	20.7	19.4	6.4
Message 5	60.8	29.1	4.3	3.5	2.2
Message 6	46.8	38.2	7	5.2	2.9
Message 7	50	38.4	5.7	4.0	1.9

Message 1: When you get out of bed in the morning, try to keep your spine as straight as possible to avoid injuring your back.
Message 2: Avoid twisting/rotating your back to avoid injuring your back (e.g., when turning to pick up something behind you).
Message 3: Avoid bending forward without support to avoid injuring your back.
Message 4: When doing a daily task that requires bending over (e.g., brushing your teeth), always use your hand to support yourself to avoid hurting your back.
Message 5: When picking up an object from the ground, squat down instead of bending forward to avoid injuring your back.
Message 6: Avoid sitting in a slumped position and keep your back straight to avoid injuring your back.
Message 7: Avoid wearing a backpack with only one shoulder strap to avoid injuring your back

Discussion

The results of this study showed that viewing a video clip containing negative messages about LBP increased the extent of LBP-related misbeliefs immediately after viewing the video in a 20-50 age group. More than half of the participants stated that they would change their behavior to protect their backs after the viewing. Whether participants had current LBP or not, and whether they had (sub)acute or chronic LBP did not affect the magnitude of change in the Back-PAQ score post viewing.

The extent of LBP-related misbeliefs in this sample of participants from the French-speaking population of Europe was high, as shown by the mean initial total Back-PAQ score (29/50). These findings are consistent with those of previous studies in general populations [13, 14, 15, 16, 17, 18]. The high prevalence of misbeliefs was further confirmed by the relatively high degree of agreement of the participants with the messages conveyed in the video.

Despite the high initial score, the Back-PAQ score increased significantly after viewing, suggesting that the video reinforced and amplified participants' LBP-related misbeliefs. This increase was greater than the minimal detectable change (MDC) [30] for 11.4% of participants. Moreover, 55% of participants stated that they would consider changing how they performed their daily activities and would take more care to protect their backs after watching the video. It is particularly important to note that the largest changes occurred in those who had the fewest negative beliefs prior to viewing, highlighting the strong negative effect of the video on health-related beliefs in a 20-50 age group; the relatively high educational status of our sample does not seem to have protected them from these beliefs changes. These results have important implications for public health since mediatisation of health information can impact a large number of individuals [32].

Changes in beliefs following viewing were particularly marked for the first 4 items of the Back-PAQ, which are specific to beliefs about back fragility/protection. The initial scores for these items were frequently very high, reflecting the strong presence of negative beliefs in the general population, as found in previous studies [14, 17, 18]. Furthermore, these items were also the most negatively influenced by the video.

Comparison of the subgroups with (sub)acute or chronic pain, or a history of LBP revealed stronger misbeliefs in those with chronic pain, as has been found in previous studies [15, 17, 18, 33]. However, it was interesting that the magnitude of change in beliefs post viewing did not differ between the subgroups. A ceiling effect may have affected the results for the subgroup with chronic pain since mean initial Back-PAQ scores were higher in that group. Considering the high prevalence of misbeliefs in patients with chronic LBP, healthcare professionals should consider these patients as a specific subgroup for rehabilitation, with a clear need of educational approaches [34].

The harmfulness of everyday actions (getting out of bed, sitting or picking something up without keeping the back straight, rotating the trunk or bending forward) on the back was emphasised in the video clip. Yet, this information is contrary to guidelines [29, 35] which recommend that health professionals should avoid using certain words such as 'worn out', 'injury', 'weak', 'avoid leaning forward' because they might reinforce patients' unhelpful behaviours and resultant disability [10, 25, 36, 37]. The messages provided in the clip also contrast with recent studies [38, 39] and laboratory studies that showed that lifting a load in lumbar flexion with the knees straight does not increase stress on the lumbar segments [40, 41]. Furthermore, people with LBP usually overprotect their back: they perform functional activities with less movement of the back than asymptomatic individuals [42, 43]. This protective behavior is associated with negative beliefs [44]. Manual handling programs that teach individuals with LBP to limit lumbar movement when carrying loads do not reduce pain or functional disability [45].

Unfortunately, it is not uncommon for the media to convey information that is not aligned with scientific knowledge [8, 32]. Although improving beliefs is now considered a priority for the treatment of LBP [4, 10], the results of the present study confirm that the media can convey inappropriate messages that induce or reinforce negative beliefs within a sample of 1338 adults, and that this might lead individuals to adopt inappropriate behaviors.

Limitations

This study was original and evaluated beliefs regarding LBP in a large sample using a validated questionnaire. However, it has some limitations. Although we used varied methods of recruitment, selection bias may be present considering some exclusion criteria (e.g. lack of internet connection). The fact that these participants with LBP were younger than in other studies [2] and that this cohort had a relatively low mean age suggest an over-representation of a subgroup of age. This selection bias might have influenced the magnitude of our result. Indeed, the selected TV program may have been designed to target a subgroup of the population and different generations might be affected differently by messages conveyed in the media as their trust in media content may differ. Inclusion of a control group who did not view the video might have strengthened our

Table 3 Proportion of respondents who attributed each rating for the items of the Back-PAQ pre and post viewing (n=1338)

	Pre-viewing					Post-viewing					
	Score 1 (%)	Score 2 (%)	Score 3 (%)	Score 4 (%)	Score 5 (%)	Score 1 (%)	Score 2 (%)	Score 3 (%)	Score 4 (%)	Score 5 (%)	p-value
Item 1	14.5	12.6	18.4	25.6	28.8	10.4	9.9	9.3	27.3	43.2	< 0.001
Item 2	7.0	7.0	9.5	30.2	46.3	4.6	5.3	4.9	30.6	54.6	< 0.001
Item 3	45.5	20.6	18.8	11.4	3.8	26.1	22.9	20.4	21.0	9.6	< 0.001
Item 4	15.9	15.2	29.1	32.1	7.5	13.3	15.1	22.3	36.0	13.3	< 0.001
Item 5	46.1	22.6	14.9	11.6	4.7	45.8	19.7	18.5	10.6	5.4	0.14
Item 6*	47.3	31.1	13.2	5.7	2.8	45.4	30.6	14.1	5.8	4.2	0.004
Item 7*	10.0	27.3	24	13.6	25.1	9.6	25	25.6	15.7	24.1	0.28
Item 8*	10.4	26.9	28.8	12.0	22.0	8.8	26.1	27.7	14.4	22.9	0.002
Item 9	30.4	18.3	17.9	24.8	8.5	23.3	21.8	19.5	26.5	8.8	< 0.001
Item 10	20.3	16.9	17.8	32.5	12.6	20.3	18.8	19.2	28.8	12.9	0.09

Score 1 = false, score 2 = possibly false, score 3 = unsure, score 4 = possibly true, score 5 = true (scoring is reversed for items with *)

Table 4 Back-PAQ scores (means, SDs) with results of the mixed model (main effects for group, time, and group × time interaction).

	Asymptomatic – no history of LBP	**Asymptomatic – with history of LBP**	**(Sub)acute LBP**	**Chronic LBP**	**Main effect Time**	**Main effect Group**	**Group x Time Interaction**		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	p-value	p-value	p-value	F	p-value
Pre viewing Back-PAQ score	27.5 (6.0)	27.7 (6.2)	27.9 (6.0)	29.8 (6.2)	(5.6)			10.11	<0.001
Post viewing Back-PAQ score	29.1 (6.8)	29.7 (7.0)	29.3 (7.1)	31.4 (6.0)	<0.001	<0.001 7	0.8	0.10	<0.001

conclusions, however we believe that it is unlikely that Back-PAQ score would have changed when completed twice with an interval of only 5 minutes (the duration of the video). The negative influence of the video may have been underestimated due to a ceiling effect related to the high prevalence of initial negative beliefs. It would also have been relevant to investigate a possible misbeliefs consolidation effect induced by the video clip by conducting a follow-up of the participants to determine if the changes in beliefs persisted or whether they actually changed their behavior after viewing the video clip. However, we did not perform such a follow-up since we included a closing statement in the questionnaire that was in line with current recommendations considering that it would have been unethical for participants to conclude the study after potentially reinforcing their negative beliefs. If such a follow-up is conducted in a further study, health status measurements should also be included to enable to the evaluation of possible nocebo effects [46, 47] of such kind of messages inducing negative beliefs conveyed in the media. Finally, our study did not investigate neither participants' perception to know if they perceived the popular French doctor as a healthcare provider or a journalist nor the specific influence of the selected media (a French one) which might have been different between the participants from France and those from other countries.

Conclusion

In conclusion, the results of this study demonstrate that a video clip shown on social media that conveyed negative messages about LBP reinforced LBP-related misbeliefs and may promote maladaptive behavior in a significant number of individuals. It is therefore essential for health professionals mastering the best practices in terms of LBP management to collaborate with the media providing health information to develop and share tools (such as video clips) providing evidence-based information. This study also confirms the high prevalence of LBP-related misbeliefs in the general population and thereby, the necessity for clinicians to explore patients' misbeliefs and their origin and to take them into consideration.

Conflict of interest

ML and JCB are employees of "AGIR à dom.", a non-profit home care provider. JCB has received grants, personal fees, and non-financial support from Philips healthcare, RESMED outside the context of the submitted work. JCB has also a patent with NOMICS SA. ML has received grants, personal fees, and non-financial support from Air Liquide Healthcare and SEFAM outside the context of the submitted work. JLP is supported by a research grant from the French National Research Agency (ANR-12-TECS-0010) in the framework of the "Investissements d'avenir" program (ANR-15-IDEX-02) and the "e-health and integrated care" Chair of excellence of the University Grenoble Alpes Foundation. JCB and JLP are co-inventors of a patent N°WO2016041025A1. The others authors (DN, CS, MCR, JPM, LL, EML, NM) have no conflicts to disclose linked to this work.

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