



HAL
open science

The Fear Avoidance Beliefs Questionnaire threshold for women with chronic Low Back Pain. Can it be defined by avoidance behavior? A pilot study

Yannick Delpierre, Laurène Norberciak, Sola Sader, Héloïse Pidoux, Arnaud Brayer

► To cite this version:

Yannick Delpierre, Laurène Norberciak, Sola Sader, Héloïse Pidoux, Arnaud Brayer. The Fear Avoidance Beliefs Questionnaire threshold for women with chronic Low Back Pain. Can it be defined by avoidance behavior? A pilot study. 2024. hal-04737992

HAL Id: hal-04737992

<https://hal.science/hal-04737992v1>

Preprint submitted on 15 Oct 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

The Fear Avoidance Beliefs Questionnaire threshold for women with chronic Low Back Pain. Can it be defined by avoidance behavior? A pilot study

Yannick Delpierre *

Centre de l'Arche, Saint-Saturnin, France

Laurène Norberciak

Groupement des Hôpitaux de l'Institut Catholique de Lille, Lomme, France

Dr Sola Sader

Centre de l'Arche, Saint-Saturnin, France

Dr Héloïse Pidoux

Centre de Médecine Physique et de Réadaptation Côte d'Amour, Saint-Nazaire, France

Dr Arnaud Brayer

Centre de l'Arche, Saint-Saturnin, France

*Corresponding author. Email: uam@asso-prh.fr

Keywords: chronic Low Back Pain, Fear Avoidance Belief, gait, ROC analysis, spatiotemporal parameters

1. Introduction

In the case of patients with chronic Low Back Pain (cLBP), fear-avoidance beliefs are depicted as a guarding strategy (Olugbade et al., 2019), essentially described for women. cLBP tends to perturb walking (Desai et Amonkar, 2021). The Fear-Avoidance Beliefs Questionnaire (FABQ) is currently used with: FABQw the work subscale; FABQpa the physical activity subscale. Only threshold values obtained from psychometric analysis have been defined as yet (Fritz & Georges, 2002).

Patients with cLBP walk with lower cadence and lower self-selected speed than healthy subjects (Desai et Amonkar, 2021). These dynamic parameters describe a high correlation with the FABQ score in the case of patients with other pathologies (Haddas et al., 2021). Therefore, considering women with cLBP, we associated significant low cadence and speed with the effect of fear-avoidance beliefs on walking. The aim of this study was to determine threshold values of each FABQ sub-scale based on cadence and speed.

2. Methods

2.1 Population

This study includes women with cLBP. An Ethical Committee (Angers) approved the study. We recruited 75 patients. Nine had only partial data and were excluded. The remaining 66 patients had a mean age of 38.2 ± 8.1 years, moderate pain (VAS= 4.93 ± 2.24) and moderate FABQ score (FABQ= 31.09 ± 13.76 ; FABQw= 21.09 ± 10.84 ; FABQpa= 10.00 ± 7.11). All the participants were informed about the purpose of the study and the possibility of withdrawing their participation at any stage without giving a reason, and that it complied with accepted ethical standards.

Pain intensity, evaluated with the Visual Analysis Scale (VAS), was located between the lumbar area and the lumbosacral region. The inclusion criteria were: women with cLBP, without neurological or orthopedic disorders, no surgery liable to interfere with locomotion and with complete data. Patients were excluded if they reported intellectual disability, musculoskeletal/neurological diseases, inequalities in leg length, locomotion injuries with surgery of the spine, with leg pain or if they presented incomplete data.

2.2 Protocol

A 3D motion capture system (Nexus, ViconT10, Oxford, UK, 100 Hz) recorded data for passive markers (14 mm) according to the Plug in Gait model. Markers on heels, lateral malleoli and second metatarsal head were used to define strides and compute cadence and speed. Each patient walked at preferred speed in a walking corridor (10 m). were averaged with five strides per patient.

The analyses were carried out with Statistica (V13, Dell, USA) and Excel (Microsoft, USA). A Shapiro-Wilk test ensured normality for each of the distributions. Data are presented as means \pm standard deviations. Links between the FABQ scores and cadence/speed were studied with the Pearson correlation coefficients. For significant correlations, each possible threshold value was studied using Receiver Operating Characteristic (ROC) analysis: from 0 to maximum of each sub-scale. Low cadence and speed in reference with healthy subjects (Hollman et al. 2016) were considered as quantitative fear-avoidance beliefs. True/false positive/negative cases were distinguished as a function of these quantitative fear-avoidance beliefs. Then, the predictive power of the FABQ score and sub-scores to detect fear-avoidance beliefs (low cadence and speed) were studied. The Area Under the Curve (AUC) was used to determine the diagnostic accuracy of each scale or sub-scale. The AUC is interpreted as the probability of correctly identifying patients who present significant fear-belief avoidance as follows: high probability if $AUC \geq 0.8$, fair probability if $0.7 \leq AUC < 0.8$, poor

probability of $0.6 \leq \text{AUC} < 0.7$. The optimal threshold values were defined from the highest Youden's J statistic (Delacour et al. 2005). A 95% confidence interval around the difference between the AUC and 0.5 was defined. Alpha was set at .05.

3. Results and discussion

The patients walked at a speed of 1.09 ± 0.14 m/s and a cadence of 109.10 ± 8.52 steps/min. Correlations with the FABQ sub-scale are detailed in Table 1.

Table 1. Correlations between dynamic parameters and FABQ sub-scales. Credit: Y. Delpierre

	FABQ	FABQ _w	FABQ _{pa}
Cadence	-0.25† (p=.04)	-0.31† (p=.01)	0.03 (p=.82)
Speed	-0.16 (p=.19)	-0.22† (p=.05)	0.02 (p=.90)

† significant correlation

Only FABQ and FABQ_w presented significant but low correlation with cadence and speed. The threshold value of FABQ_{pa} could not be defined from ROC analysis. We obtained the optimal cut-off values: 39 for the FABQ scale and 26 for FABQ_w. The Figure 1 presents ROC analysis in case of FABQ scale. The AUC were 0.77 and 0.69 respectively for the FABQ scale and the FABQ_w subscale. The threshold value for FABQ_{pa} was computed to 13.

Figure 1. ROC curves for FABQ_w scale. Credit: Y. Delpierre

Therefore, FABQ_w>26 identified patients with cLBP at risk of not returning to work. This value is lower than Fritz and George's value (Fritz & George, 2002) but is close to that described by Cleland et al. (2008). Correlations with other biomechanical or motor control variables should be analyzed to refine this study. Our FABQ_{pa} cut-off value corresponds to the value described by Cleland et al.

Limitations. Firstly, only women were considered in the study. Secondly, we used significant but low correlations. Finally, we considered reference data in the case of healthy subjects presented in the literature.

4. Conclusions

This first study defines FABQ thresholds based on biomechanical parameters.

Conflict of Interest Statement

None.

References

- Cleland, J.A., Fritz, J.M., Brennan, G.P. (2008). Predictive validity of initial fear avoidance beliefs in patients with low back pain receiving physical therapy: is the FABQ a useful screening tool for identifying patients at risk for a poor recovery? *Eur Spine J*, 17:70–79. doi: 10.1007/s00586-007-0511-y
- Delacour, H., Servonnet, A., Perrot, A., Vigezzi, J.F., Ramirez, J.M. (2005). La courbe ROC (receiver operating characteristic): principes et principales applications en biologie clinique. *Ann Biol Clin*, 63(2):145-54
- Desai, P.S., Amonkar, N. (2021). A comparison of the spatio-temporal parameters during gait in subjects with and without chronic low back pain: a systematic review. *International Journal of Science and Research*, 10(8):62-75.
- Fritz, J.M., George, S.Z. (2002). Identifying specific psychosocial factors in patients with acute, work-related low back pain: the importance of fear-avoidance beliefs. *Phys Ther*, 82:973-983.
- Haddas, R., Boah, A., Block, A. (2021). Fear-avoidance and patients' reported outcomes are strongly correlated with biomechanical gait parameters in cervical spondylotic myelopathy patients. *Clin Spine Surg*, 34(5):E289-E294. doi: 10.1097/BSD.0000000000001111
- Hollman, J.H., Watkins, M.K., Imhoff, A.C., Braun, C.E., Akervik, K.A., Ness, D.K. (2016). A comparison of variability in spatiotemporal gait parameters between treadmill and overground walking conditions. *Gait Posture*, 43:204-9. doi: 10.1016/j.gaitpost.2015.09.024
- Olugbade, T., Bianchi-Berthouze, N., Williams, A.C.C. (2019). The relationship between guarding, pain, and emotion. *Pain Rep*, 4(4):e770. doi: 10.1097/PR9.0000000000000770

Received date:04/04/2024

Accepted date: 28/06/2024

Published date: XX/XX/2024

Volume: 1

Publication year: 2024