Original Article

Development of APLAR-COPCORD Core Questionnaire for Identification of Risk Factors for Non Specific Low Back Pain

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Abstract

Background: Non specific low back pain (NSLBP) has been identified as one of the commonest rheumatic disorders in prevalence surveys in Asia-Pacific

Objective: Development of a core questionnaire for identification of risk factors of NSLBP at community level.

Methods: Following steps were followed: 1) item generation from literature survey, existing Nordic questionnaires and patient focus group discussions, 2) development of a preliminary APLAR-COPCORD English questionnaire, 3) translation into target language, back translation and development of a synthetic target language version, 4) adaptation of the synthetic target language version through tests of comprehensibility, content validity test-retest reliability, and 5) finalization of the English questionnaire. .

Results: 45 items were generated. A preliminary English questionnaire was developed. **Conclusion:** The developed English questionnaire will serve as an efficient tool for identification of risk factors of NSLBP in Asia-Pacific communities.

Key words; NSLBP, APLAR COPCORD.

Introduction

Burden of non-communicable diseases are coming in front through World Health Organization (WHO). One recognized platform for studying musculoskeletal diseases is community Oriented Program for Control of Rheumatic Disorders (COPCORD). Low back pain (LBP) is an important clinical and public health problem being the most ubiquitous illness among human after the common cold[1]. It is the most frequent cause of disability among younger adults in the United States (US)[2]. Around 70-80% of adults experienced low back pains at some point during their lives and up to 50% of these at least once a year[3]. In the United Kingdom (UK) as in many other countries, back pain is known to be a major cause of suffering and disability, especially adults in working age[4]. Approximately 7% of people who suffer episodes of low back pain consult their general practitioner annually, at a cost of $500 million consultation and more than 80 million working days lost from each year[5]. According to

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COPORD study group of Bangladesh, the point prevalence in the rural, urban slum and affluent urban communities for NSLBP were 6.6%, 9.9%, 9.2%, respectively[6]. COPCORD studies in over 17 countries around the world have identified low back pain and knee pain are common in the community and are likely to increase with the ageing population[7]. In the Community survey in a rural area in western India, LBP was 17.3%[8]. NSLBP is a diagnosis of exclusion[9]. Based on the pain duration, there are 3 types of LBP: acute, subacute and chronic[10]. NSLBP is not curable with currently available therapeutic options. For prevention of low back pain, the etiology or risk factors for this condition should first be identified. Questionnaires are one of the most commonly used instruments for collecting health-related information in clinical and research studies for their ease and simplicity of use.[11]

APLAR member countries are working together. All realized the need of an APLAR-COPCORD core English questionnaire for identification of risk factors for nonspecific low back pain. The aim of this study was to develop the APLAR-COPCORD core English questionnaire for identification of risk factors for non specific low back pain for Asia Pacific region followed by translation to Bengali and cross cultural adaptation and validation of its Bengali version.

Material and Methods

COPCORD Study Groups of Bangladesh and Iran participated in the present study. Investigators in each country worked separately and exchanged their views and opinions through frequent communications. A partial modification of the method used by Chassany et al. for the development of a questionnaire for functional digestive disorders[12] was used for development of the core English questionnaire and Beaton's method[13] for translation and validation of the target language versions. This combination resulted in following successive steps.

1. Item generation
2. Development of a preliminary APLAR-COPCORD English questionnaire
3. Translation into target language, back translation and development of pre-final target language versions
4. Adaptation and validation of the pre-final target language versions
5. Development of the final English questionnaire

It was decided that the participating groups would make a common checklist of items, and develop a common preliminary core questionnaire in English. Subsequently, the groups would develop their own target language versions simultaneously and separately. After testing of the target language versions, necessary modifications would be made in the core English questionnaire. Different core questionnaires would then be combined and amalgamated through frequent communications and exchanges of views and ideas for the development of final questionnaire.

Comprehensibility

Thirty consecutive NSLBP patients were enrolled for comprehensibility testing. As a general recommendation for questionnaires that they should be understood by the equivalent of a 12-year-old (roughly a Grade 6 level of reading)[13]. The questionnaire was administered to additional ten 12-year-old children.

Content validity

The content validity of the questionnaire was assessed by an expert committee composed of 4 experts in the field of rheumatology in Bangladesh as per method of Beaulieu et al.[14]

Test-retest reliability

Forty-five consecutive patients of NSLBP were enrolled to test the reliability of the questionnaire. Participants were requested to fill questionnaire again seven days after the first enrollment. The correlation between the test responses and retest responses were analyzed by Spearman's correlation. A high degree of correlation was 0.8

to 1, a correlation ranging between 0.6 to 0.79, was a good correlation and a low correlation coefficient was below 0.6.

Step 5. Development of the final English questionnaire

The Bengali pre-final questionnaires developed as a result of the validity and reliability testing were matched with the English questionnaire. A consensus among participating COPCORD investigators led to the development of the APLAR-COPCORD core questionnaire for identification of the risk factors for NSLBP.

Ethics

The study was performed following the Declaration of Helsinki principles and informed consent was obtained from all participants before enrolment.

Results

Step 1. Item generation

Findings in epidemiologic follow up studies in the western world[15] were studied. A systematic review of LBP literature generated several items: Age[16], Gender[17], Obesity[18,], Socio-economic status[19], Marriage status[20], Smoking[21], Current pregnancy, Number of children[22], Parenteral history of low back pain[23], History of traffic accident, fall [24], Educational level[25], Work related manual material handling e.g lifting, lowering, pushing, pulling and manual carring tasks without carring tasks without mechanical assistance[26]. Work related postures:[27]. Psychosocial factors at work[28]. At private life stress[29], Scoliosis[30].

Several risk factors were such that they required physical examination (e.g. range of back movement) or laboratory and radiological investigations (e.g. Inflammatory and infective causes of LBP). The risk factors were categorized into two groups: **(1)**. those, which can be identified by a questionnaire only, **(2).** those, which can be identified by examination, which were sorted in an examination sheet. Through repeated exchange of ideas and discussion, a consecutively numbered 45-item common preliminary APLAR-COPCORD English questionnaire was developed.

After several expert group discussions the following list of risk factors was finalized. Age, Gender, BMI, Socio-economic status, Marriage status, Opioid consumption, Alcohol intake, Number of children, Parity, Educational level, Smoking, Previous personal history of LBP, History of LBP during pregnancy, Current pregnancy (Third trimester), History of traffic accident, fall (who have admitted to hospital), Occupation, Work related manual material handling (means manual caring tasks without mechanical assistance), Lifting, Lowering, Pulling, Pushing, Kneeling, Squatting, Sitting, Standing, Whole body vibration, Frequent bending and twisting, Monotonous work, Job dissatisfaction, Control at work, Coworkers support, Social support at work, Psychological demands, Feeling stress/worry at work, Depression, Anxiety, Psychosomatic problems, General health, Running, Jogging, Leisure time sitting (Watching TV, Videogames, Intensive sport activities, Computers), Scoliosis, Kyphosis, Leg length inequality, Hormone replacement therapy.

Steps 2 & 3. Development of the preliminary English questionnaire and its translation

A 45-item preliminary English questionnaire was developed through repeated communication among investigators from five countries. Synthetic Bengali and Persian versions were developed through translation, back translation and expert committee meetings within the country groups.

Step 4. Adaptation and validation of the synthetic target language versions

Comprehensibility test

In Bangladesh, 10 males (33.3%) and 20 females (66.7) completed the synthetic Bengali questionnaire. Mean age was 38.07 ±8.6 with age range 20-50 years. Eight (26.7%) subjects never attended school, four (13.3%) had only primary educations, 18 (60%) had more than primary level education. 100% patients were married. Female were 66.7%. Highest number of patients 16(53.3%) had monthly income < 2500 Tk. Among current occupation majority of the participants were housewives 17(56.7%) Other occupations were businessman 3 (10%), weaver 1(3%), farmer, security guard and shopkeeper.

The participants found the questionnaire simple and comprehensible. Ten subjects commented it as long and exhausting and suggested to use a shorter version with a simpler format.

While testing comprehensibility among 12-year-old children, six respondents failed to understand the word 'Tribe'. The word became comprehensible after giving an example to four of the children. Examples were also necessary for words like 'recreational activity', 'monotonous' and 'Receptionist'.

On the basis of the feedback from the comprehensibility test, the investigators agreed on following decisions. The questions were put in a tabulated form in the core questionnaire and also in the target language versions to reduce the length of questionnaire. To prevent recall biasness, questions relating to body positions in daily and occupational activities duration was kept as last 7 days and previous one year.

Content validity

In Bangladesh, in the test of relevance of the questions, the responses were 'completely relevant', 'relevant' and 'relatively relevant' 82.5%, 14.6% and 2.9% respectively. None of the questions was judged 'not relevant at all'. The question of 'whether the questions in the questionnaire evaluate every aspect of a risk factor': 77.8% scored 'good', 22.2% 'average'.

Test-retest reliability

Forty-five patients with NSLBP were interviewed during the test and forty of them attended after seven days for retest. The dropout rate was 11.11%. The mean duration of habits, daily activities and professional activities as stated during test and retest closely correlated with each other. 14 (36.84%) variables showed a correlation between 0.8 to 1 (high degree of correlation) and 12 (14.7%) variables scored from 0.6 to 0.79, which signifies good correlation. Only 10 (26.8%) variables showed correlation coefficients below 0.6 indicating poor correlation. All the later

variables were related to past activities, raising the probability of difficulties in recalling the past durations exactly, i.e. psychosocial factors at work.

Step 5. Finalization of the English questionnaire

A rephrased 44-item in Bengali version resulted from the adaptation and validation procedure. Necessary changes were made in the English version. The core English questionnaire finally developed through successive steps of development of preliminary English questionnaire, translation into target languages and testing of their validity and reliability.

Discussion

The use of questionnaire is a common practice in health research. With the increase in the number of multinational and multicultural research projects, the need for adapting questionnaires for use in other than the source language has also grown rapidly[31]. Most questionnaires were developed in English-speaking countries[32]. It is now recognized that if questions are to be used across cultures, the items must not only be translated well linguistically, but also must be adapted culturally to maintain the validity of the instrument at a conceptual level across different cultures[33]. Questionnaires have also been used for identification of risk factors, but such questionnaires have not been extensively used across cultures. The need for development of a common core questionnaire was felt in the Asia-Pacific region after emergence of data on common rheumatic diseases. The basic argument for common questionnaire was that it would stimulate the epidemiologists to take up studies on identification and at the same time it would ensure uniformity of data, and if pooled identification of the risk factors with high power and precision. To be applicable across different communities and cultures in the Asia Pacific region, the language of the questionnaire had to be English. But none of these populations is English speaking. So, the original English version could not be tested for comprehensibility and validity in the local community. A simultaneous local language

(Bengali) version had to be developed. This approach of simultaneously developing country-specific questionnaires and then identifying common elements among them to form the core of a cross-cultural instrument has been recommended and used by the WHO (WHOQOL project). The local versions were tested among the patients and the results were translated back to the core versions. Participation of researchers from varied socio-cultural background ensured the representation and reflection of social and cultural factors that might influence the development of NSLBP.

It may be concluded that the developed core NSLBP risk factor identification questionnaire is a valid and reliable instrument. However, as per statement of the participants, there is some scope for making it shorter, simpler and for further conceptual and methodological development.

Acknowledgements

References

1. Kucukdeveci AA, Tennant A, Elhan ALT, Niyaoglu H. Validation of the Turkish version of the Ronald – Morris disability questionnaire for use in low back pain, Spine, 2001; 24:2738-43

2. Patrick DL, Deyo RA, Atlas SI, Singer DE, Chapin A, Keller RB. Assessing health related quality of life in patients with sciatica. Spine, 1995;20:1899-909

3. Frymoyer JW, Cats –Baril WL An overview of the incidence and cost of low back pain. Ortop Clin North Am. 1991; 22:.263-71

4. Palmer KT Walsh K, Berball H, Cooper C, Coggon D, Back pain in Britain comparison of two prevalence surveys at intervals of two years. BMJ, 2000; 320: 1577-8

5. Nuki G, Ralston SH, and Lukmani R, Diseases of the connective tissues joints and bones In; Haslett C, Chilver ER, Hunter JAA, Boon NA Davidson Principles and Practice of Medicine 20th ed. Churchil livingstone Edinburgh, 2006;1183

6. Haq SA, Darmawmn J, Islam MN, Uddin MZ, Das BB, Rahman F et al., 'COPCORD Study in Bangladesh: the prevalence of Rheumatic Disease in a Rural Community, J Rheumatol, 2005;33: 348-53

7. Brooks LY, Rolfe MI, Cheras PA, Myers SP. The comprehensive Osteoarthritis Test: a simple index for measurement of treatment effects in clinical trials. J Rheumatol, 2004; 31: 1180- 1186

8. Chopra A, Patil J Billampelly V, Relwani J, Tardale HS, Prevalence of rheumatic diseases in a rural population in western India; a WHO – ILAR COPCORD study, J.Assoc.Physicians India, 2001;49: 240-46

9. Nordin M, Balague F, Cedraschi C. Nonspecific lower back pain; surgical versus nonsurgical treatment. Clinical Orthopaedics and Related Research, 2006; 443:156-167

10. Andrew O.Frank. Common clinical problems, spinal problems. In: Peter J.Medison DAI, editor. Oxford Textbook of Rheumatology. Newyork: Oxford University press, 1998; 89-114.

11. Saw SM, Ng TP. The design and assessment of questionnaire in clinical research. Singapore Med J. 2001;42(3):131-35

12. Chassany, O, Marquis, P, Scherrer, B, Read, NW, Bergmann, JF, Fraitag, B, Geneve, J, Caulin, C, 'Validation of a specific quality of life questionnaire for functional digestive disorders'. Gut, 1999; 44: 527-33

13. Beaton, DE, Bombardier, C, Guillemin, F & Ferraz MB, 'Guidelines for the Process of Cross-Cultural Adaptation of Self- Report Measures'. Spine, 2000; 25(24): 3186-91.

14. Beaulieu J, Scutchfield FD, Kelly AV. Content and criterion validity evaluation of National Public Health Performance Standards measurement instruments. Public Health Rep. 2003;118(6):508-17.

15. Hochberg MC, Lawrence RC, Everett DF, Cornoni-Huntley J. Epidemiologic associations of pain in osteoarthritis of the knee. Data from the National Health and Nutrition Examination Survey and the National health and Nutrition Examination -1 Epidemiologic follow-up survey. Semin Arthritis Rheum. 1989; 18 (suppl 2) 4-9

16. Papageorgiou AC, Croft PR, Ferrys, Jayson MIV, Silnan AJ. Estimating the prevalence of low back pain in the general population: evidence from South Manchester back pain survey Spine, 1995; 20: 1889-94

17. Bener AB, Omer FER, Rahim AS, Abuzeid MSO et al. Epidemiology of low back pain in the United Arab Emirates. APLAR J of Rheumatol. 2004; 7: 189-195

18. Pinto AL ds, Hollanda DB PM, Radu AS et al. Musculoskeletal findings in obese children Journal of Paediatrics and Child Health. 2006; 42 (6): 341-344

19. Valkerburg HA, Haanen HCM. The epidemiology of low back pain. White AA, Gordon AL, editors, symposium of idiopathic low back pain, Miami, Florida. 1982; 9-22

20. Silman AJ, Ferry S, Papageorgiou AC, Jayson MJ, Croft PR. Number of children as a risk factor for low back pain in men and women. Arthritis Rheum 1995; 38(9): 1232-35

21. Leboeuf –Yde C, Yashin A & Lauritzen T. Does smoking cause low back pain? Results from a population based study. Journal of Manipulative and Physiological Therapeutics 1996; 19(2): 99-108

22. Svensson HO, Antderson GBJ, Hagstad A, Jaesson PO; The relationship of low back pain to pregnancy and gynecological factors. Spine, 1983; 15: 371-375,390

23. Balague F, Shovron HL, Nordin M,Dutoit G, Pul LR, Walburger M, Low back pain in school children; a study of familial and psychological factors. Spine, 1995;20: 1265-70

24. Walsh K, Cruddas M & Coggon D, low back pain in eight areas of Britain, Journal of Epidemiology & Community Health. 1992; 46(3); 227-230

25. Roth RS, Punch MR, Bechman JE, Educational achievement and pain disability among women with chronic pelvic pain, Journal of Psychosomatic Research. 2001; 563-69

26. Matsui H, Maeda A, Tsuji H, Naruse Y, Risk indications of low back pain among workers in Japan, Spine, 1997;22(11): 1242-1248

27. Bergquist Utlman M, Larsson U, Acute low back pain in industry. Acta Orthop Scand, 1977; Suppl 170: 1-177

28. Karasek RA, Job demands, job decision latitude and mental strain: Implication for job redesign. Adm sci Q. 1979; 24: 285-311

29. Waddell G, McCulloch JA, Kummel E et al. Non organic physical signs in low back pain. Spine, 1980; 5: 117-125

30. Harreby M, Neergaard K, Hesselsoe G et al. Are radiologic changes in the thoracic and lumbar spine of adolescent's risk factors for low back pain in adults? Spine, 1995; 20(21):2298-2302

31. Bullinger M, Alonso J, Apolone G, et al. Translating health status questionnaires and evaluating their quality: the IQOLA Project approach. International Quality of Life Assessment. J Clin Epidemiol. 1998; 51: 913–23.

32. Guillemin, F, Bombardier, C, and Beaton D,. 'Cross- cultural adaptation of health-related quality of life measures: literature review and proposed guidelines'. *J Clin Epidemiol*, 1993: 46: 1417-32.

33. Ferraz MB. Cross cultural adaptation of questionnaires: what is it and when should it be performed [editorial; comment]? J Rheumatol. 1997; 24:2066–68.

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