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Table title is the typed center, font size 10 pt, bold, initial letter of each word written with capital letter, except conjunctions. The titles are numbered and written on top of the table. Example: Table 3 Neisseria gonorrhoeae Resistance to 8 Types of Antimicrobials in 20 Specimens. Table, no vertical dividing line, and there are only three horizontal borderlines. Created tables in sequence two spaces from the text. Table descriptions and abbreviations are placed in the table description, not on the table title.

Typed center figure title with 10 pt font size, bold, numbered according to the appearance in the text and typed under the image. The source of the cited image and or table should be added to references if it is not the author's work.

Pictures (graphs, diagrams, and photos) and tables besides written in its place, also created separately on other pages of texts with sufficient sharpness and blackness. A maximum number of tables and or images are six pieces. Photos are sent in black and white glossy, or colored format when required, minimum size 3R (9 × 13.5 cm). Images and photos can also be sent on CD. Write correspondence as the footnote on the first page containing the full name of the author with degrees/academic degrees, institution, address, phone number, fax, mobile, and e-mail.

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The article contains results of original research in the field of basic medical or applied, and health. The article format consists of Title & Abstract (English) and Judul & Abstrak (Indonesian), Introduction, Methods, Results, Discussion, Conclusion(s), Conflict of Interest, Acknowledgments, and References.

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Maximum article title consists of 12 words (choose words and terms that are dense meaning and able to characterize the entire contents of the script). Typed with bold fonts, size 12 pt, one space, the initial letter of each word is written in capital letters (except the conjunctive), and center. The ownership row consists of 2 elements, the author name and origin institution. Author's name written with the initial fonts are capital and bold, size 11 pt, one space, and center. Institution name written with the initial fonts are capital, size 10 pt, one space, and center.

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The abstract is typed using 12 pt font size and one spaces. The abstract is written in one paragraph, one space, maximum 250 words, and should describes the entire contents of the article. The abstract should be suitable for the format of introduction, methods (contain method, place, and time of study), results, and discussion. Abstract be equipped with key words consisting of 3–5 words.

**Introduction**

The introduction is written succinctly to stimulate the reader’s interest include all the necessary information. At the end of the introduction was written the purpose of the study.

**Methods**

Methods contains the material under study, and the way described briefly by the order of operation as well as the location and time of the study. Explain statistical methods in detail. Consideration of ethical issues is included. If the protocol has been approved then the ethical clearance/approval letter number and the health research ethics committee must be written.

**Results**

The result is the core of scientific writing. This section presents data and information that will be used as
the basis of the conclusion and even expected to get a new theory. In results, listed the tables and or images, graphics, photos to explain and abbreviate the description should be given; numbered according to their appearance in the text. Results of the study and discussion should be written separately.

**Discussion**
Discussion of the article reveals, explains, and discusses the results of the study with an analysis by the research design, interpretation, and explanation of its synthesis. Also, the results obtained are compared with the results of previous research of others.

**Conclusion(s)**
The conclusion is submitted by the results obtained by the researcher and written briefly and clearly in two or three sentences.

**Conflict of Interest**
All authors must make a formal statement at the time of submission indicating any potential conflict of interest that might constitute an embarrassment to any of the authors if it were not to be declared and were to emerge after publication. Such conflicts might include, but are not limited to, shareholding in or receipt of a grant or consultancy fee from a company whose product features in the submitted manuscript or which manufactures a competing product.

**Acknowledgement**
Acknowledgments should be provided to research contributors without writing a degree.

**References**
References are written by the Vancouver system’s writing rules, given the sequence number corresponding to appearing in the article. List all author names if no more than six people; when more than six authors write the first six authors followed by et al. The references cited in the article are the most important references. The minimum referral number of 25 (twenty-five) copies of the most recent 10 (ten) years of journal article/book publishing. Reference should be sought from 80% primary literature and 20% secondary literature. Avoid referral in the form of personal communication except for information that is not possible from a public source. Include source name, date of communication, written permission, and confirmation of the accuracy of the source of communication.

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**Books and Other Monographs**

**Editor as Author**

**Organization as Author**

**Chapter in Book**

**Conference Proceeding**

**Journal Article from Internet**

**Authors**
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Reliability and Validity Test of the Indonesian Version of the Nordic Musculoskeletal Questionnaire (NMQ) to Measure Musculoskeletal Disorders (MSD) in Traditional Women Weavers

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Abstract

Musculoskeletal disorder remains to be a health and safety problem. One of measuring instrument often use to assess musculoskeletal disorders worldwide is the Nordic musculoskeletal questionnaire (NMQ). This questionnaire translated into various languages and tested for its validity and reliability. However, it has limitations, such as the difficulty of application in countries that do not speak English. This study aims to test the validity and reliability of the Indonesian version of NMQ in women weavers working using traditional handlooms in East Kalimantan Indonesia from March to May 2018. The validity of items obtained ranges 0.501 (min.) to 0.823 (max.), and Cronbach’s alpha reliability was 0.726. In conclusion, the NMQ in Indonesian version has satisfactory psychometric properties with adequate validity and reliability.

Key words: Musculoskeletal disorders, NMQ in Indonesian, reliability, validity

Uji Validitas dan Reliabilitas Nordic Musculoskeletal Questionnaire (NMQ) Versi Indonesia untuk Mengukur Gangguan Muskuloskeletal pada Penenun Tradisional Wanita

Abstrak

Gangguan muskuloskeletal masih menjadi masalah kesehatan dan keselamatan kerja. Salah satu alat ukur yang sering dipakai untuk mengkaji gangguan muskuloskeletal di seluruh dunia adalah Nordic musculoskeletal questionnaire (NMQ). Kuesioner ini telah diterjemahkan ke berbagai bahasa di dunia dan terbukti valid serta reliabel, tetapi memiliki keterbatasan di antaranya sulit diaplikasikan di negara yang tidak menggunakan bahasa Ingris sebagai bahasa sehari-hari. Penelitian ini bertujuan menguji validitas dan reliabilitas NMQ versi bahasa Indonesia pada penenun tradisional wanita di Kalimantan Timur periode Maret sampai Mei 2018. Dapatkan hasil uji validitas item berkisar antara 0,501 (min.) sampai 0,823 (max.) dan indeks reliabilitas Cronbach’s alpha sebesar 0,726. Simpulan, NMQ versi bahasa Indonesia cukup valid dan reliabel untuk mengukur gangguan muskuloskeletal.

Kata kunci: Gangguan muskuloskeletal, NMQ berbahasa Indonesia, reliabilitas, validitas

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Introduction

Musculoskeletal disorders (MSD) is a condition that can affect any part of the musculoskeletal system. It includes the muscles, bones, nerves, joints and spinal discs, along with supporting blood vessels and connective tissues such as tendons, ligaments, and cartilage. The symptoms, including pain, numbness, tingling, aching, stiffness, or burning. Musculoskeletal disorders have become increasingly prevalent worldwide during the past decade. It not only affects the workers’ quality of life but also imposes a significant economic burden to the society. It also has a high health cost, and it constitutes a significant cause of occupational injury and physical disability in both developed and developing countries.

MSD occurs in various industries, both formal and informal sectors. High-risk occupation including construction, agriculture, manufacturing, wholesale and retail trade, and human health and social work. Risk factors related to MSD include heavy physical work, forceful overexertion, awkward and sustained postures, repetitive movement, and vibration. A systematic review by da Costa and Vieira proposed that several biomechanical, psychosocial, and individual factors contributed to the occurrence of work musculoskeletal disorders (WMSD).

The syndrome of musculoskeletal work disorders includes pain and stiffness in various regions of the body like neck, shoulder, lower back, wrist, hand, and fingers. Based on various typical complaints, experts have compiled various instruments/questionnaires to examine the subjective complaints of WMSD. One of measuring instrument that is often used to assess musculoskeletal disorders worldwide is the Nordic musculoskeletal questionnaire (NMQ). With the support of the Nordic Council of Minister, the NMQ developed to create a simple, standardized questionnaire. It should be able to be used to detect and analyze musculoskeletal symptoms of different individuals in different parts of the body.

The NMQ has several advantages over other measuring instruments. Some of them are: standardized questions, worldwide recognition, its free, provide self-evaluation, and relatively quick identification of the symptoms. It also has applicability in large populations and frequent use together with other evaluation methods such as rapid upper limb assessment (RULA), rapid entire body assessment (REBA) and Ovako working posture analysis system (OWAS). However, NMQ also has limitations, among them is the difficulty of application in countries that do not speak English (for errors in translation, interpretation, and or validation) and restriction of exhaustive questions to three areas of the body (lower back, neck, and shoulders).

The NMQ has been translated into various languages and occupation and tested for its validity and reliability. However, the literature that discusses the results of the NMQ translation, validity, and reliability test in the Indonesian version is still limited. This study aims to simplification and translating NMQ into the Indonesian version. The make the NMQ accessible for the use in the Indonesian setting. Its validity and reliability tested in women weavers working using traditional handlooms in East Kalimantan Indonesia.

Methods

The study was on 50 "Samarinda Sarong" women weavers who work using traditional handlooms in Samarinda, East Kalimantan, Indonesia from March to May 2018. The traditional weaving "Samarinda Sarong" is one of Samarinda city tourism icons, which until now maintained because it is considered to have artistic value and high origin.

The NMQ is in two well-differentiated structures. The first part, the general one, refers to symptoms in 9 parts of the body (neck, shoulders, elbows, wrists/hands, upper back, lower back, hip/thighs, knees, and ankles/feet) during the last 12 months/7 days. The second part, the specific one, refers to symptoms in three parts of the body (neck, shoulders, and lower back) throughout the subject's working life/7 days beforehand. To answer this questionnaire, the subjects were asked to answer "yes" or "no" to the following question: "Have you any time during the last 12 months had trouble (ache, pain, discomfort) in— followed by a list and body diagram of the nine different anatomical areas. If the respondent marked "yes", then the respondent was asked to answer the question "Have you at any time during the last 12 months been prevented from doing your normal work (at home or away from home) because of the trouble?" and "Have you any trouble at any time during the last 7 days?" (Figure 1).

Data were analyzed by the Statistical Package...
for the Social Sciences (SPSS) ver. 21, in order to describe continuous and qualitative variables, mean, standard deviation (SD) and percentage frequency used respectively.

Pearson product-moment correlation used to evaluate the construct validity of the total score of the NMQ per questionnaire is an association with the baseline. NQM Indonesian version considered as ‘good to excellent’ when \( r \geq 0.75 \), as ‘good’ when \( r \) ranged between 0.5 and 0.7, as ‘fair’ when \( r \) ranged between 0.25 and 0.50, and as ‘little or no relationship’ when \( r \) was less than 0.25. Cronbach’s alpha intraclass coefficient and the 95% confidence interval (CI) of the point estimation calculated for the whole questionnaire. Cronbach’s alpha values \( >0.70 \) were considered satisfactory.

The study was reviewed and approved by the Health Research Ethics Committee, Faculty of Medicine, Universitas Mulawarman, Samarinda with letter number: 33/KEPK-FK/IV/2018. Informed written consent requested from the participants before their participation.

### Results

The majority of respondents in this study were >46–56 years old (34%), the majority of marital status were married (96%), education level is mostly elementary school (graduated 6th grade) (62%), most of the working experience is more than 5 years (80%) and working time is mostly >5–8 hours per day (76%) (Table 1).

In this study, the NQM original version simplified from the type of chain question to a single question (“Have you at any time during the last 12 months had trouble (ache, pain, discomfort) in”). Whereas, the answer option was changed from "yes" or "no" to a rating with 4 scales, i.e., no pain (A) (scale 0), moderate pain (B) (scale 1), pain (C) (scale 2) and very sick (D) (scale 3). The 28 body regions studied consist of: upper neck, lower neck, left shoulder, right shoulder, left upper arm, back, right upper arm, waist, buttock, bottom, left elbow, right elbow, left lower arm, right lower arm, left wrist, right wrist, left hand, right hand, left thigh, right thigh, left knee, right knee, left calf, right calf, left ankle, right ankle, left foot and right foot.

The question of NMQ and the 28 items/body region of NMQ translated into Indonesian from the English format producing three separate Indonesia version: one proposed by the author, one by a general medical practitioner,

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number (n=50)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28–34</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>34–40</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>40–46</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>46–56</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>56–70</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>&gt;70</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Married</td>
<td>48</td>
<td>96</td>
</tr>
<tr>
<td><strong>Education background</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never went to school/did not graduate elementary school</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Elementary school (graduated 6th grade)</td>
<td>31</td>
<td>62</td>
</tr>
<tr>
<td>Secondary high school (graduated 9th grade)</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Senior high school (graduated 12th grade)</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td><strong>Working experience (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>&gt;5</td>
<td>39</td>
<td>80</td>
</tr>
<tr>
<td><strong>Working time per day (hours)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3–5</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>5–8</td>
<td>38</td>
<td>76</td>
</tr>
<tr>
<td>&gt;8–10</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
and another by English language expert from Language Laboratory. After going through the analysis/review of content aspects and grammar, three separate translations produced to one single Indonesian version. The final results of the NMQ simplification and translation into Indonesian is in Figure 2.

As shown in Table 2, the mean of the total NMQ score was 15.94 (±8.17). The highest score is from 9th item on "Bottom" (1.62), 8th item on "Buttock" (1.58) and item number 0 on "upper neck" (0.86). The lowest score is from 13th item on the "Right lower arm" (0.12), 7th item on "Waist" (0.14) and 12th item on "Left lower arm" (0.16). The most significant variance observed in item 7 "Waist" (1.266), item 9 "Bottom" (1.138), and item 5 "Back" (1.102); while the smallest variance observed in item 12 "Left lower arm" (0.21). The smallest Pearson correlation is from item number 7 "Waist" (0.823), item number 7 on "Back" (0.752), and item number 5 on "Back" (0.689).

As shown in Table 2 and Figure 1, the Cronbach’s alpha as an internal consistency range from 0.707 (lowest) to 0.728 (highest). There are several alternatives to increase the Cronbach’s alpha coefficient. With question number 8 "Buttock" deleted this can increase Cronbach’s alpha coefficient by 0.726. If question number 10 "Body region of the left elbow" deleted this can increase Cronbach’s alpha coefficient by 0.727 and if item question number 11 "Body region of the right elbow" deleted this can increase Cronbach’s alpha coefficient by 0.728. However, in general, the combination of all 28 items/
body region showed the highest reliability with Cronbach’s alpha coefficient of 0.726 (Figure 3). This result generally shows that the Indonesian version of NMQ is reliable to measure MSD.

Based on Table 2 and the previous criteria, the results of the Pearson correlation showed the item number 7 and 8 declared are “excelent” because Pearson correlation (r) more than 0.75, and item number 0, 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 declare are “good” because Pearson correlation (r) ranged from 0.5 to 0.7.

In general, all of the questions are valid to measure MSD in traditional women weavers.

**Discussion**

The questionnaire, as one of the measuring instruments, must be valid and reliable. Validity measured what is intended to be measured, explains how well the collected data covers the actual area of investigation, and expresses the degree to which a measurement measures what it purports to measure. Reliability concerns the extent to which a measurement of a phenomenon provides stable and consist result, and also
### Table 2 Descriptive Characteristics, Cronbach's Alpha Reliability, and the Pearson Correlation of Each Data for Internal Consistency of Indonesian Version of the NMQ (n=50)

<table>
<thead>
<tr>
<th>Item/Body Region</th>
<th>Mean</th>
<th>SD</th>
<th>Variance</th>
<th>r</th>
<th>p Value</th>
<th>Corrected Item/Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 0</td>
<td>0.86</td>
<td>0.948</td>
<td>0.898</td>
<td>0.576</td>
<td>0.007</td>
<td>0.153</td>
<td>0.724</td>
</tr>
<tr>
<td>Item 1</td>
<td>0.74</td>
<td>0.899</td>
<td>0.809</td>
<td>0.573</td>
<td>0.055</td>
<td>0.383</td>
<td>0.518</td>
</tr>
<tr>
<td>Item 2</td>
<td>0.66</td>
<td>0.772</td>
<td>0.596</td>
<td>0.542</td>
<td>0.032</td>
<td>0.355</td>
<td>0.718</td>
</tr>
<tr>
<td>Item 3</td>
<td>0.66</td>
<td>0.717</td>
<td>0.515</td>
<td>0.510</td>
<td>0.010</td>
<td>0.351</td>
<td>0.719</td>
</tr>
<tr>
<td>Item 4</td>
<td>0.46</td>
<td>0.762</td>
<td>0.580</td>
<td>0.570</td>
<td>0.058</td>
<td>0.444</td>
<td>0.716</td>
</tr>
<tr>
<td>Item 5</td>
<td>0.80</td>
<td>1.050</td>
<td>1.102</td>
<td>0.689</td>
<td>0.000</td>
<td>0.487</td>
<td>0.713</td>
</tr>
<tr>
<td>Item 6</td>
<td>0.40</td>
<td>0.782</td>
<td>0.612</td>
<td>0.535</td>
<td>0.031</td>
<td>0.404</td>
<td>0.717</td>
</tr>
<tr>
<td>Item 7</td>
<td>0.14</td>
<td>1.125</td>
<td>1.266</td>
<td>0.752</td>
<td>0.000</td>
<td>0.570</td>
<td>0.710</td>
</tr>
<tr>
<td>Item 8</td>
<td>1.58</td>
<td>0.971</td>
<td>0.832</td>
<td>0.834</td>
<td>0.000</td>
<td>0.093</td>
<td>0.726</td>
</tr>
<tr>
<td>Item 9</td>
<td>1.62</td>
<td>1.067</td>
<td>1.138</td>
<td>0.619</td>
<td>0.024</td>
<td>0.494</td>
<td>0.713</td>
</tr>
<tr>
<td>Item 10</td>
<td>0.26</td>
<td>0.751</td>
<td>0.564</td>
<td>0.503</td>
<td>0.015</td>
<td>0.007</td>
<td>0.727</td>
</tr>
<tr>
<td>Item 11</td>
<td>0.18</td>
<td>0.560</td>
<td>0.314</td>
<td>0.517</td>
<td>0.022</td>
<td>-0.041</td>
<td>0.728</td>
</tr>
<tr>
<td>Item 12</td>
<td>0.16</td>
<td>0.468</td>
<td>0.219</td>
<td>0.501</td>
<td>0.016</td>
<td>0.534</td>
<td>0.715</td>
</tr>
<tr>
<td>Item 13</td>
<td>0.12</td>
<td>0.328</td>
<td>0.108</td>
<td>0.586</td>
<td>0.006</td>
<td>0.561</td>
<td>0.714</td>
</tr>
<tr>
<td>Item 14</td>
<td>0.28</td>
<td>0.607</td>
<td>0.369</td>
<td>0.664</td>
<td>0.001</td>
<td>0.368</td>
<td>0.720</td>
</tr>
<tr>
<td>Item 15</td>
<td>0.18</td>
<td>0.482</td>
<td>0.232</td>
<td>0.577</td>
<td>0.007</td>
<td>0.439</td>
<td>0.719</td>
</tr>
<tr>
<td>Item 16</td>
<td>0.52</td>
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<td>0.762</td>
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<td>Item 26</td>
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<td>0.706</td>
<td>0.498</td>
<td>0.690</td>
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<td>0.699</td>
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<td>8.17</td>
<td>66.751</td>
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<td>1.000</td>
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The degree to which the results obtained by measurement and the procedure can be replicated.\textsuperscript{21,22} The finding indicates that the NMQ in Indonesian version has satisfactory psychometric properties with adequate validity and reliability. It can be used to measure MSD on traditional women weavers. Similar to this study, several efforts translating NMQ into other language is Legault et al.\textsuperscript{10} concluded that the French adapted version of the NMQ-E is an appropriate self-administered musculoskeletal symptom screening tool for the adolescent population. Arsalani et al.\textsuperscript{23} concluded that adaptation of the NMQ in Iranian version has an acceptable conceptual structure and provides reliable information to measure health condition (MSD) in Iranian nursing personnel. Mesquita et al.\textsuperscript{14} concluded the Portuguese version of the standardized Nordic musculoskeletal questionnaire seems to be valid and revealing good coefficients of reliability to measure MSD in food distribution workers in Portuguese. de Barros and Alexandre\textsuperscript{24} concluded that the Brazilian version of the standardized Nordic questionnaire has a firm agreement and substantial reliability. Kahraman et al.\textsuperscript{16} argued the Turkish version of the NMQ has appropriate psychometric properties, including good test-retest reliability, internal consistency and construct validity, and can be used for screening and epidemiological investigations of musculoskeletal symptoms. Alaca\textsuperscript{25} stated that the Turkish version of the
Figure 3 Result of Overall Cronbach's Alpha Reliability Test

NMQ-E showed adequate internal consistency (Cronbach coefficient $\alpha=0.78$).

Conclusion

The study demonstrates that translating of the NMQ into the Indonesian language fulfills the criteria of a reliable and valid assessment tool to rate the MSD. The high internal consistency and construct validity support the application of the NMQ as an easily administered tool to assess MSD in the Indonesian setting.

Conflict of Interest

The author declare no conflict of interest.

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References


