THE DEVELOPMENT OF PRAYING ABILITY SCALE FOR MUSLIM WITH DIABETIC FOOT PROBLEM

BY

MUHAMMAD JASFIZAL BIN JASNI

A dissertation submitted in fulfillment of the requirement for the degree of Master of Orthopaedic Surgery

Kulliyyah of Medicine
International Islamic University Malaysia

DECEMBER 2019
ABSTRACT

Solah or prayer is one of the pillars of Islam and a fundamental component of ibadah. Muslim prayer involves physical motions and recitations. It requires cleansing of body, ablution, and proper clothing prior to the prayer. In Muslim patient who have diabetic foot problem, most of them having difficulty in doing prayer due to their variety disability. This newly developed scale is meant to gauge their ability to pray objectively. 19 items have been established to be tested. 212 participants enrolled in this study which took place at IIUM Medical Centre and Hospital Tengku Ampuan Afzan. 125 participants are from the control group while 87 participants are from the diabetic group. They were selected through stratified random sampling. This study shows The Kaiser-Meyer-Olkin (KMO) value was 0.72 The Exploratory Factor Analysis shows the 19 items of praying ability scale composed of five domains. Cronbach’s alpha values on finalized 19 items was 0.788 which signify good scale reliability. All of the items showed good factor loadings of more than 0.5. The 5 identified domains are namely Preparation of praying (factor 1), Physical movement (factor 2), Spirituality (factor 3), Cognitive & Tayammum (factor 4) and Disturbance (factor 5). The individualized Cronbach’s alpha of each domain ranged from 0.67 to 0.903This study has proved that the new Muslim Praying Ability Scale (PAS) is valid and reliable tools to measure prayer ability in diabetic foot problem patient.
I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Orthopaedic Surgery.

...............................  Nazri bin Mohd Yusof  
Supervisor

I certify that I have read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Orthopaedic Surgery.

...............................  Raffael bin Ismail  
Internal Examiner

This dissertation was submitted to the Department of Orthopaedic and is accepted as a fulfillment of the requirements for the degree of Master of Orthopaedic Surgery.

...............................  Mohd Shukrimi bin Awang  
Head, Department of  
Orthopaedics, Traumatology and Rehabilitation

This dissertation was submitted to the Kulliyyah of Medicine and is accepted as a fulfillment of the requirements for the degree of Master of Orthopaedic Surgery.

...............................  Azmi bin Md Nor  
Dean, Kulliyyah of Medicine
DECLARATION

I hereby declare that this thesis is the result of my own investigation, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Muhammad Jasfizal Bin Jasni

Signature………………………… Date ………………………
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

DECLARATION OF COPYRIGHT AND AFFIRMATION OF FAIR USE OF UNPUBLISHED RESEARCH

THE DEVELOPMENT OF PRAYING ABILITY SCALE FOR MUSLIM WITH DIABETIC FOOT PROBLEM

I declare that the copyright holders of this dissertation are jointly owned by the student and IIUM.

Copyright ©2019 Muhammad Jasfizal Bin Jasni and International Islamic University Malaysia. All rights reserved.

No part of this unpublished research may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior written permission of the copyright holder except as provided below.

1. Any material contained in or derived from this unpublished research may be used by others in their writing with due acknowledgement.

2. IIUM or its library will have the right to make and transmit copies (print or electronic) for institutional and academic purposes.

3. The IIUM library will have the right to make, store in a retrieval system and supply copies of this unpublished research if requested by other universities and research libraries.

By signing this form, I acknowledged that I have read and understand the IIUM Intellectual Property Right and Commercialization policy.

Affirmed by Muhammad Jasfizal Bin Jasni

............................................. .............................................
Signature                          Date
ACKNOWLEDGEMENTS

I would like to extend thanks to the many people, especially my thesis supervisor, Associate Professor Dr. Nazri Mohd Yusof for being supportive.

Despite his commitments, he took time to listen and attend to me whenever requested. The moral support he extended to me is in no doubt a boost that helped in building and writing this thesis.

Once again, we glorify Allah for His endless mercy on us one of which is enabling us to successfully round off the efforts of writing this thesis. Alhamdulillah.

Finally, but by no means least, thanks go to my mother, father and my lovely wife for almost unbelievable support. They are the most important people in my world, and I dedicate this thesis to them.
# TABLE OF CONTENTS

Abstract .............................................................................................................................. ii  
Approval page .................................................................................................................. iii  
Declaration ...................................................................................................................... iv  
Copyright Page ............................................................................................................... v  
Acknowledgements ........................................................................................................ vi  
List of Tables ................................................................................................................... ix  
List of Figures ................................................................................................................ x  

## CHAPTER ONE: INTRODUCTION ........................................................................... 1  
1.1 Introduction .............................................................................................................. 1  
1.2 Objectives ............................................................................................................... 2  
  1.2.1 General Objective ........................................................................................... 2  
  1.2.2 Specific Objective .......................................................................................... 2  

## CHAPTER TWO: LITERATURE REVIEW ................................................................. 3  
2.1 Evaluating Patient Outcome ................................................................................... 3  
2.2 Patient Reported Outcome Assessment .................................................................. 3  
2.3 The Concept of Praying In Islam .......................................................................... 4  
2.4 Disability In Diabetic Foot Problem Patient ......................................................... 5  
2.5 Lower Extremity Functional Scale (LEFS) .............................................................. 6  

## CHAPTER THREE: MATERIALS AND METHODS .................................................. 7  
3.1 Methodology .......................................................................................................... 7  
3.2 Research Design .................................................................................................... 7  
3.3 Study Population ................................................................................................... 9  
  3.3.1 Inclusion Criteria ............................................................................................ 9  
  3.3.2 MHQ Scoring ................................................................................................ 10  
3.4 Variables .............................................................................................................. 10  

## CHAPTER FOUR: RESULTS AND FINDINGS ......................................................... 11  
4.1 Demographic Analysis .......................................................................................... 11  
  4.1.1 Case and Control ............................................................................................ 12  
  4.1.2 Age and Gender ............................................................................................. 31  
  4.1.3 Education ...................................................................................................... 12  
  4.1.4 Diabetic Duration ......................................................................................... 13  
4.2 Factor Analysis ....................................................................................................... 13  
4.3 Reliability ............................................................................................................... 13  
4.4 Validity Test ......................................................................................................... 14  
  4.4.1 Construct Validity Test .................................................................................. 14  

## CHAPTER FIVE: DISCUSSION AND CONCLUSION ............................................. 17  
5.1 Discussion .............................................................................................................. 17  
  5.1.1 Demographic .................................................................................................. 17  
  5.1.2 Exploratory Factor Analyses ........................................................................... 18  
  5.1.3 Reliability Analyses ....................................................................................... 19
5.2 Limitation ........................................................................................................ 20
5.3 Conclusion ........................................................................................................ 20

REFERENCES ......................................................................................................... 21

APPENDIX I: PROFORMA .................................................................................... 23
APPENDIX II: PERSONAL INFORMATION/MAKLUMAT PERIBADI........ 27
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table 4.1</th>
<th>Total Participants</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 4.2</td>
<td>Age and Gender</td>
<td>12</td>
</tr>
<tr>
<td>Table 4.3</td>
<td>The level of education of all participants</td>
<td>12</td>
</tr>
<tr>
<td>Table 4.4</td>
<td>The duration of diabetes mellitus diagnosis</td>
<td>13</td>
</tr>
<tr>
<td>Table 4.5</td>
<td>Exploratory factor analysis, factor loading on each item</td>
<td>14</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

| Figure 3.1 | Overview of the process of developing the Muslim praying ability scale | 8 |
CHAPTER ONE
INTRODUCTION

1.1 INTRODUCTION

The principles of prayer in Islam requires compliance and obedience to everything that Allah prescribes through His Messenger p.b.u.h. Solat or prayer is one of the pillars of Islam and a fundamental component of ibadah. Muslim prayer involves physical motions and recitations. It requires cleansing of body, ablution, and proper clothing before the prayer. For Muslim patients, illness does not alleviate the obligation to perform the religious duty.

Hospital admissions due to trauma constitute the majority of patients in orthopedic practice. Disabilities caused by traumatic injuries differs between cases. The degree of difficulties varies according to the types and level of disability. Hence, different categories of patients require different needs of assistance in performing their prayer. The majority of Muslim patients are not aware of the convenience (rukhsoh) allowed for them in performing their prayer and other religious’ duties during hardships and illnesses, leading to negligence in implementing them.

While the concept of rukhsoh has been explained widely in Islamic literatures, most of the discussions kept an open concept for the applications in most disabilities and handicaps. This rukhsoh is to make ease in applying the principles in various difficult situations. Healthcare providers, particularly doctors and nurses, play a significant role in identifying and categorizing patients according to their disabilities. Many functional evaluation scores have been used to evaluate patients with musculoskeletal conditions and limitations (Bandalamente, 2013).
Patient with diabetic problems is the most common admission in orthopedic ward. Some of them was unable to clean or to perform ablution due to the diabetic foot problem. Therefore, this patient did not practice any prayer due to the foot problem. Most of the clinician did not aware of this patient’s difficulty in practicing prayer. With new tools, it is expected to be able to quantify the ability of patient to perform solah objectively and this data can be used to monitor patient’s progress, measuring the outcome and compare with other patients.

1.2 OBJECTIVES

1.2.1 General Objectives

To develop a reliable and validated prayer ability scale for Muslim with diabetic foot problem.

1.2.2 Specific Objectives

1. To construct a new scale called Muslim prayer ability scale that can be used to assess the ability of Muslim who suffered from diabetic foot problem to pray

2. To validate Muslim prayer ability scale

3. To determine the Muslim prayer ability scale reliability
CHAPTER TWO
LITERATURE REVIEW

2.1 EVALUATING PATIENT OUTCOME

WHO has defined that Quality of Life is an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHO group 1998). However, health related-quality of life (HRQoL) is defined as an individual’s satisfaction or happiness with domains of life as they affect or affected by health (Sararaks et al., 2005). In clinical setting, functional status measurement and the evaluation of health status are essential. Utilization of the appropriate outcomes assessment, questionnaires, and tools enhances clinical practice by identifying and quantifying body function and structure limitations. It is also can be used formulating diagnosis and prognosis at the same time assisting in evaluating the patient progress towards the goal and validating the benefits of treatment (Lesher et al., 2017). Valid outcome measurement is essential to obtain the accurate evaluation of a patient as compared to the patient’s baseline status.

2.2 PATIENT REPORTED OUTCOME ASSESSMENT

Patient-reported outcome assessment aims to measure patients’ perspectives of health, illness, health care intervention effects that has certain criteria such as reliable, valid, acceptable, and feasible (Fitzpatrick et al. 1998). They are usually a self-completed questionnaire, variously referred to as measures of health status or health-related quality of life. Patients and health care providers are generally accepted about the use of PROs in routine practice, as shown by the evidence in several studies. The health care
providers have found that utilizing PROs in daily practice is feasible, acceptable, and informative (Skevington et al. 2005). Patients generally have good feedback to the systems that routinely use PROMs. However, they reported that patient reporting systems must be well utilized and not mislead the focus of the clinician, burden patients, time-consuming, or focus only on the aspect that benefits to the clinician. Relevant and validated measures must be considered in any system designed to assess and respond to patient-reported outcomes. These patient-reported outcomes should be analyzed and reported appropriately.

A systematic analysis of published research was conducted to investigate how health care providers use PROMs in routine practice can improve patient care and outcomes. As with earlier studies (Greenhalgh & Meadows 1999; Espallargues et al. 2000), the analysis was restricted to well-designed studies that could be viewed confidently. The findings compared the standard procedures and outcomes in routine practice with an experimental intervention in which the health care provider received information from patients’ completion of a PROM.

### 2.3 THE CONCEPT OF PRAYING IN ISLAM

Islam demands its believers to comply and oblige to all that has been prescribed by Allah through His messenger p.b.u.h. Salah or praying is the second most important out of five pillars in Islam. (Ariff, 2016). It is the fundamental component in Islam. When Muslims do their prayer, there is some involvement of physical movement and recitation. Prior to the praying activity, a Muslim need to do ablution, where the Muslim required to apply water on to certains part of the body. During ablution, they have to wash the oral and nasal cavities, face, raise the hands up to elbows, and feet up to the ankle. They are also required to wear clean and proper cloth while praying. Movement
during praying involves standing, bowing, prostration, and sitting (Reza, Urakami, & Mano, 2002). Praying is not necessarily confined at the mosque, it can be done everywhere, which a mat all that needed (Al obaidi, 2011). However, a Muslim who is having an illness may encounter difficulty in doing prayer.

2.4 DISABILITY IN DIABETIC FOOT PROBLEM PATIENT

About 6% of people with diabetes affected by foot disease, including inflammation, ulceration, deformity, or soft tissue damage. Diabetic foot ulcer (DFU) is caused by the presence of neuropathy, angiopathy or immunopathy. The diabetic foot patient that require amputation was estimated between 0.03% and 1.5% (Zhang et al., 2016). Commonly the patient that indicated for amputations was initially presented with ulcers, which can be prevented with good foot care and early screening to assess the risk for foot complications (Singh, 2015). The amputation risk is a lifetime threat to the patient with diabetes, and the cost of diabetic ulcers and amputation is high.

Psychological and social factors are related to the overall quality of life (QoL) in a general population of the diabetic patient, while physical problems have less impact. It indicates that having diabetic foot changes the range of factors affecting QoL, with an increase in the effect of limitations related to physical functioning and mobility. The strong association between risk profile and QoL indicates that the decline in physical functioning and mobility in foot disease patients was triggered by physical restrictions due to the DFU itself or by signs and symptoms of risk factors such as neuropathy or angiopathy (Rose et al., 1998).
2.5 LOWER EXTREMITY FUNCTIONAL SCALE (LEFS)

LEFS is one of the patient-reported outcomes, and it is a region-specific type measuring health status proposed by Binkley (Binkley, 1999) according to the limitation of existing generic and disease measures. This type of tool is easy to administer and score, which can be applied to a broad range of patients with multi-spectrum of lower extremity problems to measure their functional status.

It consists of twenty items or questions with a total score of four in each question. The overall total score is eighty indicate a high functional level of the lower extremity. The scale has a simple appearance only on a single page, and it has to be self-filled by the patient. It is scored by the maximum answer for all questions, usually can be done manually. It can be used to measure a patient’s initial function, monitoring ongoing lower limb disease, and the outcome of treatment given as well as to set a functional goal. There is a claim that LEFS is a better tool as compared to SF-36 in assessing lower extremity function (Binkley, 1999).
CHAPTER THREE
MATERIAL AND METHODS

3.1 METHODOLOGY

This study is divided into two phases, which are the development of the Muslim prayer ability scale and the dissemination of the questionnaire for validation.

For the first phase, four experts, each from orthopedic, psychiatry, Islamic studies, and Science, were gathered and have construct the new scale to measure a Muslim ability to pray objectively. Meanwhile, the second phase involves the dissemination of the finalized questionnaire and validation analysis. This study is hoped to help healthcare providers to optimize the deliverance of assistance depending on the priority and needs of the patients.

The research committee, as well as ethical committee approval, was obtained prior to the study.

3.2 RESEARCH DESIGN

This is a cross-sectional study with all the subjects recruited by stratified quota sampling. The process of developing a Muslim praying ability scale is summarized in figure 3.1 below.
In the earlier stage (stage one and two), we identified few factors that affect a Muslim’s ability to pray, which include preparatory, physical function, spirituality, and pain. Based on stage one, twenty-three items formulated and compiled into a questionnaire. Subsequently, the questionnaire was sent to the language institute (Institut Terjemahan dan Buku Malaysia - ITBM) for language review.

The following stage (stage 3) after the language review was focusing on pre-test of pre-final items. This stage was intended to look at any vague pre-final questionnaire.
words and sentence structures before a pilot study was begun by researchers. The pre-test was to ensure the well-understood and non-ambiguous meaning of the sentence in each question. The pre-test was carried out on a small volunteer group. Each sentence reviewed to see if the sentences and terms used is easily interpreted. In stage four, the aim of the pilot study was to test the final version of the scale of Muslim praying ability prior to the full validation recruitment scale. The pilot study was conducted on medical students of International Islamic University of Malaysia by using stratified quota sampling. A total of 250 participants were recruited in the validation stage (stage 5). All of the subjects are Muslim.

3.3 STUDY POPULATION
The target participants are 250 respondents, which consist of those who present in the Orthopedic clinic and those who admitted to Orthopedic ward in IIUM Medical Centre. For validation purposes, the rule of thumb requires ten respondents for each question tested. In view of 23 questions intended to be validated, we multiplied it by 10 to make it 230. About 20 respondents were added to take into account for refusal or incomplete data.

Those participants include patients and their relative, staff nurses, medical students, medical officers, and physiotherapists. They were divided into two groups, namely the case group, which is those who suffer from a diabetic foot problem, and the control group who has no limb pathology.

3.3.1 Inclusion Criteria
i. 18-70 years old
ii. Muslim
iii. Able to communicate and literate in Bahasa Malaysia

iv. Able to give written consent independently.

v. Those who have perform the obligation of prayer

3.3.2 MHQ Scoring

i. Muslim who are unable to understand the questionnaires or not to perform or don’t know how to perform the obligation prayer.

3.4 VARIABLES

i. All the demographic data such as; age, gender, race and sociodemographic profiles (age, level of education, gender, duration of having diabetes).

ii. Muslim prayer ability scale scoring system
CHAPTER FOUR
RESULTS AND FINDINGS

4.1 DEMOGRAPHIC ANALYSIS

4.1.1 Case and Control

This study involves participants who were divided into two groups; those with diabetic foot problem and those without diabetic foot problem. A total of 250 questionnaires were distributed, unfortunately only 212 questionnaires were completely filled up to be included in this study. About \( n = 87 \) (41\%) participants were from the case group while in the other and \( n = 125 \) (59\%) were from control group. In the case group, participants are known to have diabetic foot problem. All were Muslim, actively practicing the Islamic faith and able to understand Bahasa Melayu.

Table 4.1 Total Participants

<table>
<thead>
<tr>
<th></th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants with no lower limb pathology</td>
<td>125</td>
<td>59</td>
</tr>
<tr>
<td>Participants with Diabetic foot problem</td>
<td>87</td>
<td>41</td>
</tr>
<tr>
<td>Total (N)</td>
<td>212</td>
<td>100</td>
</tr>
</tbody>
</table>
4.1.2 Age and Gender

From the 212 participants studied, n= 108 (50.9%) participants were the male and n=104 (49.1%) were female. The mean age of participants was 37.4 years (SD ± 15.17). The minimum age was 19 years old while the maximum age was 70 years old.

Table 4.2 Age and Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>108</td>
<td>50.9</td>
</tr>
<tr>
<td>Female</td>
<td>104</td>
<td>49.1</td>
</tr>
<tr>
<td>Total (N)</td>
<td>212</td>
<td>100</td>
</tr>
</tbody>
</table>

4.1.3 Education

The education levels of all participants are summarized in the table below. More than half of the participants has completed their secondary school.

Table 4.3 The level of education of all participants

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Frequency</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school</td>
<td>18</td>
<td>8.5</td>
</tr>
<tr>
<td>Secondary school</td>
<td>100</td>
<td>47.2</td>
</tr>
<tr>
<td>Diploma / STPM / A-level</td>
<td>53</td>
<td>25</td>
</tr>
<tr>
<td>Degree</td>
<td>40</td>
<td>18.9</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100</td>
</tr>
</tbody>
</table>
4.1.4 Diabetic Duration

In this study, among 87 of participants in the case group, 33 respondents are diagnosed Diabetes Mellitus for less than 5 years, 23 respondents are within 5 to 10 years and 31 respondents are diagnosed more than 10 years.

Table 4.4 The duration of diabetes mellitus diagnosis

<table>
<thead>
<tr>
<th>Duration</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years</td>
<td>33</td>
<td>38</td>
</tr>
<tr>
<td>5-10 years</td>
<td>23</td>
<td>26.4</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>31</td>
<td>35.6</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2 FACTOR ANALYSIS

The Kaiser-Meyer-Olkin (KMO) value was 0.72 and Bartlett’s test of sphericity was statistically significant p=0.001. Both of these results indicated the sample of 212 was adequate.

4.3 RELIABILITY

Reliability is the degree to which the results of measurement are consistent, in control group who has no diabetic foot problem and those who suffered from diabetic foot problem, across repeated measurement. Cronbach’s alpha is used in this study to measure the internal consistency on this newly developed scale. Most of the items had strong Cronbach alpha values based on analysis of 23 initial items. The lowest Cronbach’s value of initial 23 items is 0.737. Based on exploratory factor analysis with Varimax rotation on initial 23 items, we decided to drop off four items which had poor factor loadings in view of redundancy, poor outcome based on feedbacks during pre-
test and other statistical analyses. The subsequent analysis is based on 19 finalized items. Cronbach’s alpha values on finalized 19 items was 0.788 which signify good scale reliability.

4.4 VALIDITY TEST

4.4.1 Construct Validity Test

The confirmatory factor analysis was used to evaluate the construct validity. Based on the table 4.5, the analysis has been done with Varimax rotation without force, we have obtained and identified 19 good items with 5 domains and minimal 3 items in each domain. The 19 analysed items were having good factor loadings as displayed in table 4.5. The factor loading is nicely fit into their respective domains. The 5 identified domains are namely Preparatory of praying (factor 1), Physical movement (factor 2), Spirituality (factor 3), Cognitive & Tayamum (factor 4) and Disturbance (factor 5). The Cronbach’s alpha for each domain was 0.83 for factor 1, 0.903 for factor 2, 0.773 for factor 3, 0.699 for factor 4 and 0.76 for factor 5.

Table 4.5 Exploratory factor analysis, factor loading on each item

<table>
<thead>
<tr>
<th>Item</th>
<th>Preparation</th>
<th>Physical function</th>
<th>Cognitive &amp; Tayamum</th>
<th>Spirituality</th>
<th>Disturbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Berdiri ketika solat</td>
<td></td>
<td>.850</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2 Melakukan rukuk dalam solat</td>
<td></td>
<td></td>
<td>.852</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3 Melafazkan bacaan rukun dalam solat</td>
<td>.706</td>
<td></td>
<td>.303</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>