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## **HOSPITALIZED MUSLIM TRAUMA PATIENTS IBADAH DISABILITY SCALE (HM[T]-IDS)**

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Received Date: 20 March 2022 • Accepted Date: 30 April 2022

### **Abstract**

The HM[T]-IDS is an assessment tool developed to be used as a standard, objective evaluation scale to determine disability levels of Muslim trauma patients in performing religious physical cleansing and prayer during hospitalization and improve the deliverance of assistance they need. It is constructed based on the patients' and physicians' perspectives on the difficulties in performing religious duties. The use of this assessment tool is to assist physicians and hospital staff in scrutinizing the types of assistance required by the patients. The patients will be assessed based on five major disabilities/ difficulties, which include: A. Pain, B. Mobility, C. Extremity Involvement, D. Bandage/ Cast Application, and E. Toileting. These disabilities/ difficulties are organized in a form of a scoring sheet that utilizes a Linkert scale based on the severity of the disabilities/ difficulties. It was designed in two languages: English and Malay. The total score a patient can be given ranged between 5 and 25. From the total score obtained, the patients are categorized into four categories based on the assistance required by them: Category I (score of 5-8) - patients require least or no assistance, Category II (score of 9-14) - patients require assistance in the form of equipment or aids without the support of an assistant, Category III (score of 15-20) - patients require assistance in the form of equipment or aids with the support of an assistant, and Category IV (score of 21-25) - patients require full support from an assistant as well as supporting equipment. It is hoped that the new assessment tool can provide a new practical measure to evaluate disability among Muslim patients in performing their religious duties. It will provide a balance approach in trauma care.

**Keywords:** assessment tool, disability scale, ibadah-friendly, Muslim patient, trauma care

**Cite as:** Mohd Ariff Sharifudin, Mai Nurul Ashikin Taib, Yuzana Mohd Yusop, Nur Azree Ferdaus Kamudin, Laila Maisarah A. Rahman & Nordin Simbak. 2022. Hospitalized Muslim trauma patients ibadah disability scale (HM[T]-IDS). *Jurnal Islam dan Masyarakat Kontemporari* 23(1): 50-61.

## INTRODUCTION

The Arabic word *al-ibadah* has connotations of submission, obedience, and humility. It is also generally defined as a worship of Allah, performing prayers, or observing formal obligations of Islam (Adul 2001; Ariff 2014; Ariff et al. 2015a, 2015b; Che Mohamad et al. 2015; Mohamed Mohd Yusoff et al. 2011; Sharifudin et al. 2005, 2015, 2018). *Al-ibadah* is the reason for the existence of all humanity. That is, all people exist only to worship Allah. It consequently means following Islamic beliefs and practices (Che Mohamad et al. 2015; Goh et al. 2015; Mohamed et al. 2018). For Muslims, *al-ibadah* is also something that comes from the heart, or sincerity, because of belief in Islam (Ano et al. 2005; Sharifudin et al. 2015). Therefore, *al-ibadah* is something that cannot be forced upon another person. Allah summoned in the Holy Quran “And to every nation, we sent Messengers, ordering them that they should worship Allah alone, obey Him, and make their worship purely for Him; and that they should avoid at-Taaghoot.” [An-Nahl 16:36].

Sickness and ailment do not alleviate the responsibility to perform religious obligations (Adul 2001; Ariff 2014; Ariff et al. 2015a, 2015b; Che Mohamad et al. 2015; Goh et al. 2015; Mohamed et al. 2018; Mohd Yusoff et al. 2011; Reza et al. 2002; Sharifudin et al. 2005, 2015, 2018). However, the degree and level of disabilities caused by traumatic injuries differ between cases in relation to the difficulties faced by the patients (Dowrick et al. 2005a; Simmen et al. 2009; Vranceanu et al. 2014). Sadly, most Muslim patients neglected their religious duties and obligations due to unawareness of the convenience (*rukhsah*) allowed for them during sickness and hardships (Al-Obaidi et al. 2012; Ariff 2014; Ariff et al. 2015a; Che Mohamad et al. 2015; Mohamed et al. 2018; Mohd Yusoff et al. 2011; Reza et al. 2002; Sharifudin et al. 2005, 2015, 2018).

The concept of *rukhsah* and its applications are discussed widely in Islamic literatures. On the other hand, different categories of patients require different needs of assistance in performing their prayer. The combination of the theoretical guidelines and specific medical issues is inevitable to provide an adequate understanding of the complex issues of *rukhsah* in medical practice (Ariff 2014; Ariff et al. 2015a; Sharifudin et al. 2005, 2015, 2018).

Therefore, the need for a systematic assessment tool to assist healthcare providers in identifying and evaluating the difficulties encountered by patients during hospitalization is paramount (Dowrick et al. 2005b; Margolis et al. 2003; Meghani-Wise 1996; Sharifudin et al. 2005, 2018; Yeung et al. 2009). The current paper describes the development of the Hospitalized Muslim Trauma Patients Ibadah Disability Scale (HM[T]-IDS), an assessment tool to identify and scrutinize Muslim trauma patients based on their disabilities and difficulties in performing their religious obligations during hospitalization, thus ameliorate the delivery of assistance they need.

## STAGES OF DEVELOPMENT OF THE HM[T]-IDS

The HM[T]-IDS was developed in five stages (Figure 1). Stage 1 involved identifying common and specific difficulties encountered by the patients based on the level of their disabilities. The recruitment of participants for data collection adopted a similar approach with the functional evaluation developed by Binkley et al. (1999). In Stage 2, items (disabilities/ difficulties) were constructed into a preliminary scoring scale by removing non-applicable and duplicate items. These were organized in a form of a scoring sheet that utilizes a Linkert scale of 1 to 5 based on the severity of the disabilities/ difficulties. It was designed in two languages: English and Malay. In Stage 3, the preliminary scoring scale was tested on a group of patients as a pilot study. The focus was to refine the scores and identify specific problems in administering the scale on patients as assessment. This includes difficult terms and responsiveness of the scoring tool.

The final version of the scoring system was field tested on a different cohort of trauma patients in Stage 4. Prior to the field testing, the scoring tool was discussed with a focus group among orthopaedic surgeons, medical officers and nurses for face and construct validity. Reliability testing and internal consistency were evaluated by means of statistical analyses. Stage 5 involved categorization of disabilities/ difficulties and the level of assistance needed based on the patients' score. The triage concept practiced in the various hospital services was adopted to prioritize and optimize delivering the assistance by healthcare providers to the patients (Iserson and Moskop 2007).

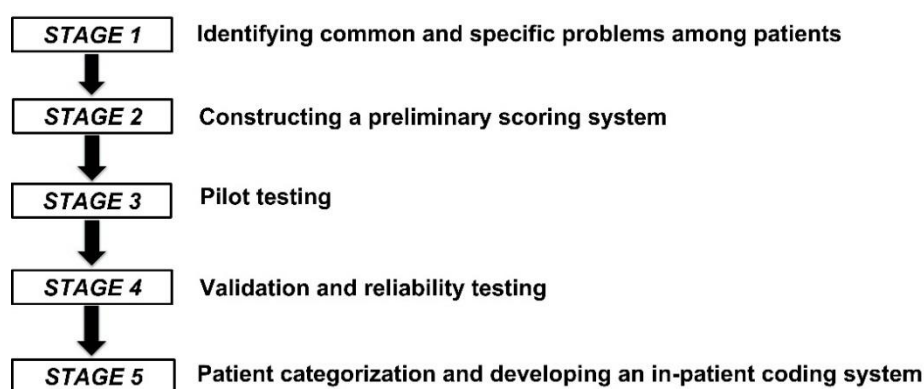


Figure 1: Flowchart of stages of development of the HM[T]-IDS

### Statistical Analysis

Associations between categorical variables were analyzed using Chi-square test. We evaluated the inter-observer reliability between raters of similar and different levels of qualification (surgeons, medical officers, housemen, and nurses). Parallel-forms reliability was evaluated between the scoring using different languages by the same raters. Cohens or Fleiss' kappa statistics was calculated for ordinal variables (items of the scoring system) and intra-class correlation coefficient was calculated for continuous variables (total score of patients). Internal consistency was measured using Cronbach's alpha.

**RESULTS**

From the first stage, we had identified five major disabilities/ difficulties that hindered most patients to perform their physical cleansing (ablution or *tayammum*) and prayers: A. Pain, B. Mobility, C. Extremity Involvement, D. Bandage/ Cast Application, and E. Toileting. Forty patients were recruited for a pilot study using the preliminary score involving four surgeons and two staff nurses as assessors. Using the preliminary scoring scale (Figure 2), the mean time taken to assess a patient was 6.4 minutes (ranged between 4 and 10.3 minutes). As the scale was physician reported scoring system, no specific problems faced during administration.

Description	1	2	3	4	5	Markah (Score)
1 Kesakitan (Pain)	Tiada kesakitan/ tiada keperluan ubat tahan sakit <i>(No pain/ no need analgesics)</i>	Kesakitan yang ringan/ Perlu ubat tahan sakit tetapi tidak berterusan <i>(Modest pain/ intermittent analgesics)</i>	Kesakitan yang sederhana/ Perlu ubat tahan sakit yang berterusan <i>(Moderate pain/ continuous analgesics)</i>	Kesakitan yang teruk/ Perlu ubat opioid tetapi tidak berterusan <i>(Severe pain/ intermittent opioids)</i>	Kesakitan yang melumpuhkan/ Perlu opioids selalu <i>(Disabling pain/ continuous opioids)</i>	
2 Keupayaan Bergerak* (Mobility)	Mampu berjalan tanpa bantuan <i>(Walking without aid)</i>	Mampu berjalan dengan alat bantuan berjalan <i>(Walking with walking aid)</i>	Perlu bantuan orang lain untuk berjalan <i>(Need others' assistance to walk)</i>	Perlu menggunakan kerusi roda <i>(Need to use wheelchair)</i>	Terlantar di katil/ dipindah sekitar katil <i>(Bed bound/ bed transfer only)</i>	
3 Anggota Badan Terlibat (Extremity Involvement)	Tiada anggota badan terjejas <i>(No extremity affected)</i>	Sebelah anggota kaki terjejas <i>(Unilateral lower limb)</i>	Kedua-dua anggota kaki terjejas <i>(Bilateral lower limbs)</i>	Sebelah atau kedua dua anggota tangan terjejas <i>(Single or bilateral upper limb affected)</i>	Tiga atau empat anggota badan terjejas <i>(Three or four limbs affected)</i>	
4 Balutan/ Simen Pada Badan** (Bandage/ Cast Application)**	Tiada balutan atau simen <i>(None/ no cast or bandage applied)</i>	Balutan/ simen bukan pada anggota wudhu' <i>(Bandage/ cast not involving body parts for ablution)</i>	Balutan/ simen pada anggota wudhu' <i>(Bandage/ cast involving body parts for ablution)</i>	Balutan/ simen pada anggota tayammum <i>(Bandage/ cast involving body parts for 'tayammum')</i>	Balutan yang sentiasa berdarah/ bernanah <i>(Bandage applied on any body parts persistently soaked)</i>	
5 Keupayaan Menggunakan Tandas (Toileting)	Tiada masalah/ tidak perlu dibantu <i>(No problem/ no need assistance)</i>	Memerlukan alat bantuan berjalan/ kerusi roda ke tandas <i>(Need walking aid/ wheelchair to toilet)</i>	Memerlukan pembantu <i>(Need others' assistance)</i>	Menggunakan bekas untuk membuang air <i>(Using bed pan/ urine bottle)</i>	Menggunakan tiub kencing/ lampin <i>(Using CBD/ pampers)</i>	
<b>Jumlah Markah (Total Score)</b>						

Figure 2: The preliminary scoring scale used in the pilot study

However, there were several terms that were confusing for non-Muslim assessors. Thus, the term “physical cleansing” was changed to either ablution or *tayammum*. Ablution and *wudhu* were used concurrently. Another difficult faced was the scale for item “Pain”. The scale used in the preliminary scoring scale was practically subjective to most of the assessors as their assessments differ between individuals. To standardize the scale and assessment between assessors, we adjusted the scale for the specific item (Table 1).

Table 1: Adjustment to the scale for item “Pain” in the preliminary score

Scale	Description
1	No pain/ no need analgesics <i>(Tiada kesakitan/ tiada keperluan ubat tahan sakit)</i>
2	Chronic pain/ intermittent exacerbation <i>(Kesakitan yang kronik/ keterukan berkala)</i>

3	Mild acute pain/ requires analgesics but not regular ( <i>Kesakitan akut tapi ringan/ memerlukan ubat tahan sakit tetapi tidak berterusan</i> )
4	Moderate to severe pain/ regular analgesics ( <i>Kesakitan sederhana atau teruk/ memerlukan ubat tahan sakit berterusan</i> )
5	Disabling pain/ requires intramuscular, intravenous or opioids ( <i>Kesakitan yang melumpuhkan/ memerlukan suntikan intramuskular, intravena, atau opioid</i> )

The final version of the scoring scale was verified by a group of experts including orthopedic consultants and senior staff nurses for face and content validity. Reliability testing was performed by evaluating the inter-observer agreements using the final version of the scoring scale. Table 2 and 3 summarized the results for the reliability testing.

Table 2: Inter-observer reliability results

Level of Observers	Items <sup>a</sup>					Total Score <sup>b</sup>
	Pain	Mobility	Extremity Involvement	Bandage/ Cast Application	Toileting	
Specialists	0.387	0.752	0.701	0.470	0.623	0.753
Medical Officers	0.294	0.703	0.723	0.452	0.716	0.898
House Officers	0.255	0.584	0.710	0.328	0.605	0.780
Staff Nurses	0.725	0.902	0.843	0.869	0.872	0.931
All Observers	0.203	0.573	0.623	0.327	0.541	0.703

<sup>a</sup> Intra-class correlation (ICC) coefficient; <sup>b</sup> Cohen's or Fleiss' kappa (k)

Table 3: Parallel-forms reliability evaluation between scoring of different languages (Malay and English) by the same observers

Level of Observers	Items <sup>a</sup>					Total Score <sup>b</sup>
	Pain	Mobility	Extremity Involvement	Bandage/ Cast Application	Toileting	
Specialist 1	0.608	0.851	0.771	0.630	0.732	0.918
Specialist 2	0.660	0.803	0.865	0.607	0.685	0.925
MO 1	0.719	0.829	0.673	0.673	0.749	0.961
MO 2	0.493	0.829	0.639	0.639	0.775	0.963
HO 1	0.632	0.711	0.518	0.518	0.664	0.940
HO 2	0.506	0.730	0.488	0.488	0.689	0.934
SN 1	0.878	0.903	0.848	0.921	0.875	0.980
SN 2	0.847	0.952	0.924	0.895	0.899	0.976

MO=medical officer; HO=house officer; SN=staff nurse

<sup>a</sup> Intra-class correlation (ICC) coefficient; <sup>b</sup> Cohen's or Fleiss' kappa (k)

Statistical analyses showed moderate (k=0.40 to 0.59) to almost perfect agreements (k=0.80 to 1.00) in almost all domains, except some fair agreements (k=0.20 to 0.39) for pain and bandage/ cast application. Cronbach's alpha for all observer was 0.951 indicating good internal consistency. A commonly cited scale to represent the values to understand kappa is presented in Table 4.

Table 4: Interpretation of Kappa (Landis and Koch 1977)

Scale	Description
< 0	Less than chance agreement
0.01 – 0.20	Slight agreement
0.21 – 0.40	Fair agreement
0.41 – 0.60	Moderate agreement
0.61 – 0.80	Substantial agreement
0.81 – 0.99	Almost perfect agreement

The total score a patient can be given ranged between 5 and 25. From the total score given, patients are categorized into four categories based on the assistance required by them: Category I (score of 5-8) - patients require least or no assistance, Category II (score of 9-14) - patients require assistance in the form of equipment or aids ( for example walking aids, water

spray, and others) without the support of an assistant, Category III (score of 15-20) - patients require assistance in the form of equipment or aids with the support of an assistant, and Category IV (score of 21-25) - patients require full support from an assistant as well as supporting equipment. In addition to the total score obtained by the patients, any patient who scores “3” for items B (*Mobility*), C (*Extremity Involvement*), D (*Bandage/ Cast Application*), or E (*Toileting*) would directly categorize under Category III, who requires help from an assistant, regardless of the total score he or she obtained.

The final version of the HM[T]-IDS in the form of scoring sheets and guidelines on how to score the patients are shown in Figures 3.1 and 3.2, respectively.

**HOSPITALIZED MUSLIM TRAUMA PATIENTS IBADAH DISABILITY SCALE  
(HM[T]-IDS)**

Name of Patient (*Nama Pesakit*) : \_\_\_\_\_  
 Age (*Umur*) : \_\_\_\_\_  
 Ward/ Bed No. (*Wad/ Katil No.*) : \_\_\_\_\_  
 Diagnosis/ Injuries (*Diagnosis/ Kecelakaan*) : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Date of Ward Admission (*Tarikh Dimasukkan ke Wad*) : \_\_\_\_\_  
 Day of Admission (*Bilangan Hari Kemasukan*) : \_\_\_\_\_

DISABILITY (Ketidakupayaan)		1	2	3	4	5	SCORE (Markah)
A	Pain (Kesakitan)	No pain/ no need of analgesic <i>(Tiada kesakitan/ tiada keperluan ubat tahan sakit)</i>	Mild acute/ requires analgesic but not regular <i>(Akut tetapi ringan/ ubat yang tidak berterusan)</i>	Chronic/ intermittent exacerbation <i>(Kronik/ keterukan berkala)</i>	Moderate to severe/ regular analgesics <i>(Sederhana atau teruk/ ubat secara berterusan)</i>	Disabling/ require IM, IV, or opioids <i>(Melumpuhkan/ memerlukan IM, IV, atau opioid)</i>	
		Walking without aid <i>(Mampu berjalan tanpa bantuan)</i>	Walking with aid <i>(Mampu berjalan dengan alat bantuan)</i>	Need others' assistance to walk <i>(Perlu bantuan orang lain untuk berjalan)</i>	Need to use a wheelchair <i>(Perlu menggunakan kerusi roda)</i>	Bed bound/ bed transfer only <i>(Terlantar di katil/ dipindah sekitar katil)</i>	
B	Mobility* (Keupayaan Bergerak)	No extremity affected <i>(Tiada anggota badan terjejas)</i>	Unilateral lower limb <i>(Sebelah anggota kaki terjejas)</i>	Bilateral lower limbs <i>(Kedua-dua anggota kaki terjejas)</i>	Uni- or bilateral upper limb affected <i>(Sebelah atau kedua-dua anggota tangan terjejas)</i>	Three or four limbs affected <i>(Tiga atau empat anggota badan terjejas)</i>	
		No cast or bandage applied <i>(Tiada balutan atau simen pada Anggota)</i>	(Not involving body parts for ablution or tayammum) <i>(Tiada pada anggota wudhu atau tayammum)</i>	Involving body parts for ablution <i>(Melibatkan anggota wudhu)</i>	Involving body parts for tayammum <i>(Melibatkan anggota tayammum)</i>	Bandage persistently soaked <i>(Balutan sentiasa berdarah/ bermanah)</i>	
C	Extremity Involvement (Anggota Badan Terlibat)	No problem/ no need assistance) <i>(Tiada masalah/ tidak perlu dibantu)</i>	Need walking aid/ wheelchair to toilet <i>(Memerlukan alat bantuan berjalan/ kerusi roda ke tandas)</i>	Need others' assistance <i>(Memerlukan pembantu)</i>	Using bed pan/ urine bottle <i>(Menggunakan bekas untuk membuang air)</i>	Using urinary catheter/ pampers <i>(Menggunakan tiub kencing/ lampin)</i>	
		<b>TOTAL SCORE</b> ( <i>Jumlah Keseluruhan</i> )					
<b>CATEGORY OF PATIENT***</b> ( <i>Kategori Pesakit</i> )							

**ABBREVIATION** (*Singkatan*)

- IM : intramuscular injection (*suntikan intraotot*)
- IV : intravenous injection (*suntikan intravena*)

Figure 3.1: The final version of the HM[T]-IDS in the form of a scoring sheet



**HOSPITALIZED MUSLIM TRAUMA PATIENTS IBADAH DISABILITY SCALE  
(HM[T]-IDS)**

**SCORING GUIDE** (Panduan Pemarkahan)

- i. \* Walking aids include all types of walking stick, crutches, and walking frame  
(Alat bantuan berjalan termasuk semua jenis tongkat, topang ketiak, dan bingkai untuk berjalan)
- \*\* Body parts for ablution include the face, hands up to the elbows, part of the head, and feet up to the ankle  
(Anggota wudhu' termasuk muka, tangan hingga ke siku, sebahagian daripada kepala, dan kaki hingga ke buku lali)  
Body parts for *tayammum* include the face and hands up to the elbows  
(Anggota *tayammum* termasuk muka dan tangan hingga ke siku)
- ii. For every Disability Items (A-E) in the scale, choose the highest score observed in the patient whom is being assessed  
(Bagi setiap Item Ketidakupayaan (A-E) di dalam skala di atas, pilih markah tertinggi yang dilihat pada pesakit yang dinilai)
- iii. \*\*\* The patient will be categorized according to the total HM[T]-IDS scored  
(Pesakit akan dikategorikan berdasarkan jumlah keseluruhan markah HM[T]-IDS)

Total Score (Jumlah Keseluruhan)	Category (Kategori)	Assistance Required by the Patient (Bantuan yang Diperlukan oleh Pesakit)
5 -- 8	I	Patients require least or no assistance (Pesakit hanya memerlukan sedikit atau tiada bantuan diperlukan)
9 -- 14	II	Patients require assistance in the form of equipment or aids (walking aids, water spray, etc.) without the support of an assistant (Pesakit memerlukan bantuan berbentuk peralatan (untuk bergerak atau bersuci) tanpa sokongan pembantu)
15 -- 20	III	Patients require assistance in the form of equipment or aids (walking aids, water spray, etc.) with the support of an assistant (Pesakit memerlukan bantuan berbentuk peralatan (untuk bergerak atau bersuci) beserta sokongan pembantu)
21 -- 25	IV	Patients require full support from an assistant as well as supporting equipment (Pesakit memerlukan bantuan sepenuhnya daripada seorang pembantu dan peralatan-peralatan sokongan yang lain)

- iii. Patient who scores "3" for Disability Items B, C, D, or E, will be directly categorized under Category IV, whom requires help from an assistant, regardless of the total score the patient obtained.  
(Pesakit yang diberi markah "3" bagi Item Ketidakupayaan B, C, D atau E, akan terus dikategorikan di bawah Kategori IV, yang mana memerlukan bantuan daripada seorang pembantu, tidak kira apa pun jumlah keseluruhan yang diperolehnya)

Figure 3.2: The scoring guide on how to score the HM[T]-IDS

**DISCUSSION**

Most of the available functional or disability assessment tool were developed based on the patients' ability to conduct activities of daily living (ADL) (Al-Obaidi et al. 2012; Binkley et al. 1999; Dowrick et al. 2005b; Mock and Cherian 2008). ADL is defined as activities that are essential to attain a quality and healthy living (Mullholland and Wyss 2001). These are universal activities performed on daily basis including ability to groom, fee, and toileting. However, differences exist according to various cultures (Margolis et al. 2003). Most of the domains included in available functional scores are abilities to groom, self-care, and social interactions. The ADL of Eastern and Asian populations differ from that of the Western



populations as the latter utilize different static positions more in their daily lives, such as sitting, cross-legged, kneeling, and squatting (Ariff et al. 2015b; Margolis et al. 2003; Mullholland and Wyss 2001). Research done so far were biased as they were more focused on the daily activities of Western cultures (Gurr et al. 1998). Most of the Eastern populations are Muslims, and it is required for every Muslim to perform their prayers at least five times a day from the age of 7 years old (Meghani-Wise 1996). Prayer is the central part of the life of a practicing Muslim. Thus, measuring patients' ability to prepare and perform their prayers can be utilized in setting up targets for therapeutic and rehabilitative aims.

Muslim prayer consists of a number of sequences or positions and as in other physical movements and activities, they require healthy and functional locomotor system of the body (Ariff et al. 2015b; Mohd Safee 2011). Thus, mobility is an important factor that can affect performance of prayer by Muslims (Al-Obaidi et al. 2012; Ariff et al. 2015b; Che Mohamad et al. 2015). For example, patients with fractures involving the upper extremities will have dysfunctional limbs either due to the injuries sustained or immobilization prescribed as part of the management (Dowrick et al. 2005a, 2005b, Simmen et al. 2009). In such cases, this will affect the ability to perform ablution on the contralateral side. On the other end, fractures or injuries involving the lower extremities may lead to more limitations on their ability to perform specific positions and weight-bearing rather than performing ablution, which can be replaced by performing *tayammum*.

Healthcare providers can play a significant role in assisting and guiding hospitalized patients in fulfilling their religious obligations (Ariff 2014; Che Anuar et al. 2015; Mohd Yusoff et al. 2011). On the other hand, the situation is far more difficult when organizing and assisting patients in ward of 40 to 50 occupants. Healthcare providers will be burdened with the complexity of the situation (Mock and Cherian 2008; Yeung et al. 2009). Thus, it is important to harmonize the most convenient way for the patients (Che Anuar et al. 2015), with the optimization of the best assistance that can be given by the healthcare providers in return without jeopardizing their core duties as health practitioners.

## CONCLUSION

The proposed *ibadah* disability scale provides a new practical measure to evaluate disability among Muslim patients in performing their religious duties during hospitalization. It will provide a balance approach in trauma patients' care and deliverance of assistance wherever required. It is not without limitation and further research work can be focused on implementing it in various health institutions.

## ACKNOWLEDGEMENT

The HM[T]-IDS received a Silver Medal during *Minggu Penyelidikan dan Inovasi* (MPI) 2021 under the Education, Community Development & Social Innovation Theme, and the Silver Award under the Basic and Applied Sciences Theme during the IIUM Research Day 2021. The disability scoring system is also registered under the Intellectual Property Corporation of Malaysia (MyIPO) since the 2<sup>nd</sup> of February 2021 (LY2021W00345).

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