The Philippine Journal of Orthopaedics

ORIGINAL ARTICLE

Reliability of the Filipino Translated Disabilities of the Arm, Shoulder and Hand (FIL-DASH) Questionnaire Among Hiligaynon Patients with Forearm Fractures

Kutch V. Yasa, MD, FPOA and Lucille P. Detoyato, MD, FPOA

Department of Orthopaedics, Western Visayas Medical Center, Iloilo City, Philippines

ABSTRACT

Background. The Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire is a validated scoring system for distal and diaphyseal forearm fractures. The Filipino translated version (FIL-DASH) is reliable and valid as an outcome measure for adult Filipino patients with brachial plexus injury. However, there is still a paucity of published literature on the reliability of FIL-DASH among Filipinos; hence, this study was conducted to determine its reliability among native Hiligaynon speakers.

Objective. The primary aim of this study was to determine the reliability of the Filipino translated DASH questionnaire (FIL-DASH) among Hiligaynon patients with forearm fractures managed in a public tertiary hospital in Iloilo City, Philippines.

Methodology. A descriptive study was conducted in a public tertiary hospital in Iloilo City, Philippines, from November 2022 to May 2024. Thirty patients with forearm fractures, selected through convenience sampling, were given the FIL-DASH questionnaire twice within 7 to 14 days (mean: 10 ± 3.11 days). Internal consistency was determined using Cronbach's alpha, and test-retest reliability was determined using the intraclass correlation coefficient (ICC).

Results. Internal consistency was high with Cronbach's alpha exceeding 0.8 for all sections: 0.9562 for the overall questionnaire, 0.9469 for the disability/symptom section, 0.8545 for the work module, and 0.9752 for the sport/instrument module. For the test-retest reliability, the intraclass correlation coefficients for each module were: 0.953 for the disability/symptom section, 0.919 for the work module, and 0.982 for the sport/instrument module. Most items within the disability/symptom section of the questionnaire exhibited coefficients exceeding 0.5, with the exceptions of questions 3 and 22 (correlations of 0.472 and 0.471, respectively).

Conclusion. These results showed that the FIL-DASH questionnaire is generally a reliable functional outcome measure for Hiligaynon patients with forearm fractures. However, translation or clarification may be needed for the items with low test-retest ICC.

Keywords. DASH Score, FIL-DASH, Filipino DASH, forearm fractures, patient reported outcome measures, Filipino, Hiligaynon

INTRODUCTION

Background of the study

The Disabilities of the Arm, Shoulder and Hand (DASH) Outcome Measure is a 30-item, self-reported questionnaire designed to measure physical function and symptoms in patients with any or several musculoskeletal disorders of the upper limb. It is effective and useful in assessing disability and symptoms of musculoskeletal disorders of the upper extremity.[1]

This outcome measure has been translated, validated, and culturally adapted to several languages.[2] The Filipino translation was found to be internally consistent, reliable and valid in assessing adult Filipino patients with traumatic brachial plexus injuries.[3]

ISSN 0118-3362 (Print)
eISSN 2012-3264 (Online)
Printed in the Philippines.

Received: November 6, 2025.
Accepted: January 28, 2026.
Published Online: March 6, 2026.
https://doi.org/10.69472/poai.2026.15745

Corresponding author: Kutch V. Yasa, MD, FPOA
Medical Officer IV, Department of Orthopaedics,
Western Visayas Medical Center,
Q. Abeto St., Mandurriao, Iloilo City, 5000, Philippines
Tel. No.: (033) 321-2841
E-mail: kuvsa14@gmail.com
ORCiD: https://orcid.org/0000-0002-2521-7690

Filipino was designated the national language of the Philippines by the 1987 Philippine Constitution. It is defined by the Commission on the Filipino Language as "the native dialect, spoken and written, in Metro Manila, the National Capital Region, and in other urban centers of the archipelago."[4] McFarland estimated that there are 120 languages with distinct ethno-linguistic characteristics spoken in the different regions of the Philippine Archipelago.[5] Hiligaynon, for example, is the primary native language spoken in the Western Visayas Region. Filipino, on the other hand, is structurally based on Tagalog, a language spoken in Manila and in the nearby provinces in Luzon.[6]

There are few studies on the reliability of FIL-DASH among Filipinos whose native dialect is not Tagalog. Hence, this study was conducted to determine the reliability of the Filipino translated DASH Outcome Measure (FIL-DASH) among native Hiligaynon speakers.

OBJECTIVES

General objective

To determine the reliability of the Filipino translated DASH questionnaire (FIL-DASH) among Hiligaynon patients with forearm fractures managed in a public tertiary hospital in Iloilo City, Philippines.

Specific objectives

1. To describe the clinico-demographic profile of Hiligaynon patients with forearm fractures managed in a public tertiary hospital in Iloilo City, Philippines, as to:
   a. Age,
   b. Sex,
   c. Province,
   d. Occupation,
   e. Handedness,
   f. Educational Attainment,
   g. Mechanism of Injury,
   h. Involved Bone,
   i. Laterality of Injured Bone,
   j. Surgery,
   k. Time from injury to FIL-DASH Administration (months).
2. To determine the reliability of the FIL-DASH questionnaire among Hiligaynon patients with forearm fractures managed in a public tertiary hospital in Iloilo City, Philippines, as to:
   a. Internal Consistency,
   b. Test-retest Reliability.

Significance of the study

This study determined the reliability of the FIL-DASH questionnaire among Hiligaynon patients with forearm fractures managed in a public tertiary hospital in Iloilo City, Philippines. This provides baseline data on whether the FIL-DASH is reliable to use for Hiligaynon patients or if a Hiligaynon translation is warranted to offset the cross-cultural and linguistic differences between Tagalog and Hiligaynon speakers.

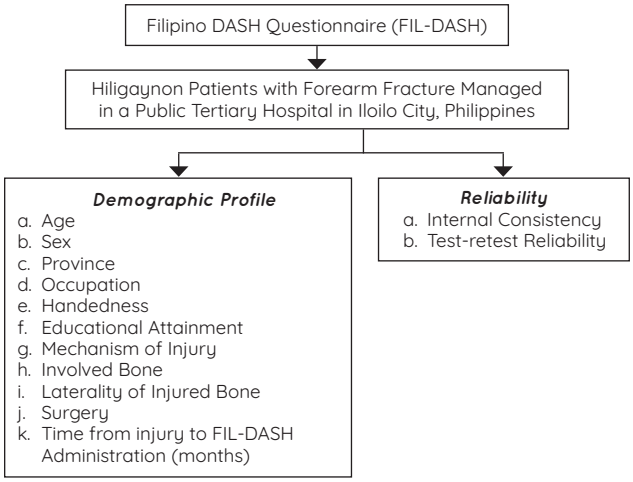

Figure 1. Conceptual framework of the study.

Scope and limitation of the study

We focused on only the reliability of the FIL-DASH questionnaire, and only on Hiligaynon patients with fractures of the radius and/or ulna managed either surgically or conservatively.

METHODOLOGY

Research design

This study used a descriptive research design.

Study population

All patients with radius and/or ulna fractures seen and managed in a public tertiary hospital in Iloilo City, Philippines, were included in the study.

Inclusion criteria

1. Adult patients aged 18 and above with radius and/or ulna fractures
2. Patients seen in the ER or OPD Departments
3. Patients treated either surgically or conservatively
4. Patients born and raised in Western Visayas

Exclusion criteria

1. Patients who refused/failed to return for the second administration of the questionnaire for the test-retest reliability
2. Patients with incomplete responses to the FIL-DASH questionnaire
3. Patients who were unable to fill out the FIL-DASH questionnaire, i.e., patients unable to read, mentally ill patients
4. Patients who refused or were unable to sign consent to participate in the study

Withdrawal criteria

1. Patients who refused to cooperate further in completing the questionnaire
2. Patients who developed pain or discomfort while writing his/her responses

Study setting

This study was conducted in a public tertiary hospital in Iloilo City, Philippines.

Duration of the study

This study was conducted from November 2022 to May 2024.

Sample size and sampling design

The study utilized convenience sampling, recruiting all patients who fulfilled the inclusion criteria during the sampling period.

Instrument

The study used the Filipino translated version of the Disabilities of the Arm, Shoulder and Hand (FIL-DASH) Outcome Measure published by Estrella et al.[3]

Data collection procedure

Patients with radius and/or ulna fractures who consulted at either the emergency department or outpatient department were treated and discharged. Their eligibility for inclusion in the study was assessed upon follow-up at the outpatient department.

The senior orthopaedic resident on duty at the OPD introduced the study to the patient and secured informed consent. The patient was given at least 30 minutes to complete the self-administered FIL-DASH questionnaire.

Respondents were monitored for any pain, anxiety, or stress. Patients with writing difficulties were assisted by a relative or an investigator who transcribed their answers. The assisting kin or investigator were strictly instructed not to give any translations, feedback, or comments, and the respondents were also instructed to answer based only on their own comprehension and assessment of their condition.

Patients were given the questionnaire a second time within the next seven to 14 days for test-retest reliability.

Ethical consideration

Informed consent was secured from all participants. All information, documents and pictures gathered in the study were kept secure and confidential.

Data analysis procedure

Data are presented as mean ± standard deviation (SD), frequencies and percentages. Internal consistency was determined using Cronbach's alpha for internal consistency with a 95% confidence interval. Test-retest reliability was determined using the intraclass correlation coefficient (ICC) with a 95% confidence interval.

RESULTS

A total of 30 patients in a public tertiary hospital in Iloilo City, Philippines, participated in the study. The average patient age was 35 years (± 14.74), and most participants were males (86.7%). Geographically, patients originated mostly from Iloilo Province (46.7%) and Iloilo City (43.3%), and the most common occupation was driver (30.0%). Most

Table 1. Clinico-demographic profile of Hiligaynon patients with forearm fractures managed in a tertiary hospital in Iloilo City, Philippines (n = 30)

Profile	Mean	Std. Dev.	Min	Max
Age	35	14.74	18	71
Injury to FIL-DASH administration (months)	3	2.31	1	11
Profile	**N**		**%**	
Sex				
Male	26		86.67	
Female	4		13.33	
Province				
Aklan	1		3.33	
Capiz	1		3.33	
Iloilo City	13		43.33	
Iloilo Province	14		46.67	
Negros Occidental	1		3.33	
Occupation				
Student	8		26.67	
Driver	9		30.00	
Others	9		30.00	
None	4		13.33	
Handedness				
Left	4		13.33	
Right	26		86.67	
Educational attainment				
Elementary undergraduate	1		3.33	
Senior high school	4		13.33	
High school undergraduate	1		3.33	
High school graduate	9		30.00	
College undergraduate	9		30.00	
College graduate	6		20.00	
Mechanism of injury				
Vehicular accident	16		53.33	
Fall	9		30	
Sports injury	5		16.67	
Involved bone				
Distal radius	17		56.67	
Radius shaft	7		23.33	
Both shaft	4		13.33	
Proximal ulna	2		6.67	
Laterality of injured bone				
Left	15		50.00	
Right	13		43.33	
Bilateral	2		6.67	
Surgery				
No	14		46.67	
Yes	16		53.33	

patients (86.7%) were right-handed and were either high school graduates (30.0%) or college undergraduates (30.0%). Vehicular accidents were the leading cause of injuries (53.3%), with the distal radius being the most frequent site of injury (56.7%), followed by the radial shaft (23.3%), and both bone fractures of the radial and ulnar shafts (13.3%). Injuries were distributed evenly between the left and right forearms. Surgery was indicated and performed for approximately 53.3% of injuries. The average time from injury to FIL-DASH administration was three months (± 2.31).

The questionnaire's reliability was assessed using two methods: Cronbach's alpha for internal consistency with 95% confidence interval and intraclass correlation coefficient (ICC) for test-retest reliability with 95% confidence interval.

Results indicated high reliability with Cronbach's alpha exceeding 0.8 for all sections: 0.9562 for the overall questionnaire, 0.9469 for the disability/symptom section, 0.8545 for the work module, and 0.9752 for the sport/instrument module (Table 2). These high alpha values suggest strong internal consistency among the items in the questionnaire.

Test-retest reliability analysis using the intraclass correlation coefficient (ICC) revealed a range of 0.4 to 0.9 between the two questionnaire administrations. Most items within the disability/symptom section of the questionnaire exhibited coefficients exceeding 0.5, with the exceptions of questions 3 and 22 (correlations of 0.472 and 0.471, respectively). The work module demonstrated consistently high correlations, with coefficients ranging from 0.779 to 0.839. Similarly, the sport/instrument module displayed strong correlations, with coefficients ranging from 0.842 to 0.981. These findings indicate high consistency in responses across the two administrations for items within each module.

Overall, the ICC for each module was: 0.953 for disability/symptom section, 0.919 for the work module, and 0.982 for the sport/instrument module. These high ICC values suggest good reliability for each section of the questionnaire (Table 3).

Table 2. Internal consistency of the FIL-DASH questionnaire using Cronbach's alpha with 95% confidence interval (CI)

Items	Cronbach's alpha	95% CI		No. of items
		LB	UB	
Overall questionnaire	0.9562	0.8703	1.0420	38
Disability/ Symptom section	0.9469	0.8963	0.9975	30
Work module	0.8545	0.7445	0.9646	4
Sport/ Instrument module	0.9752	0.9347	1.0158	4

Table 3. Test-retest reliability of the FIL-DASH questionnaire using intraclass correlation coefficient (ICC) with 95% CI

Item	ICC	95% CI	
		LB	UB
Disability/ Symptom section	0.953	0.904	0.977
Question 1	0.835	0.683	0.918
Question 2	0.907	0.814	0.955
Question 3	0.476	0.145	0.711
Question 4	0.863	0.732	0.932
Question 5	0.610	0.325	0.793
Question 6	0.772	0.574	0.885
Question 7	0.756	0.548	0.876
Question 8	0.809	0.638	0.904
Question 9	0.843	0.696	0.922
Question 10	0.875	0.754	0.938
Question 11	0.916	0.832	0.959
Question 12	0.966	0.930	0.984
Question 13	0.960	0.917	0.981
Question 14	0.895	0.791	0.949
Question 15	0.928	0.855	0.965
Question 16	0.796	0.615	0.898
Question 17	0.865	0.736	0.933
Question 18	0.936	0.871	0.969
Question 19	0.824	0.664	0.912
Question 20	0.942	0.882	0.972
Question 21	0.954	0.904	0.978
Question 22	0.471	0.139	0.707
Question 23	0.772	0.574	0.884
Question 24	0.588	0.295	0.780
Question 25	0.664	0.404	0.824
Question 26	0.699	0.457	0.844
Question 27	0.510	0.189	0.732
Question 28	0.595	0.305	0.785
Question 29	0.749	0.536	0.872
Question 30	0.948	0.894	0.975
Work Module	0.919	0.826	0.964
Question 1	0.839	0.668	0.926
Question 2	0.810	0.615	0.911
Question 3	0.779	0.560	0.896
Question 4	0.832	0.655	0.922
Sport/ Instrument Module	0.982	0.946	0.994
Question 1	0.981	0.942	0.994
Question 2	0.842	0.579	0.947
Question 3	0.927	0.789	0.976
Question 4	0.919	0.768	0.973

DISCUSSION

The DASH scoring system has been validated and used as a scoring system for distal and diaphyseal forearm fractures.[7-11] This study used the Filipino version, which was translated and validated by Estrella et al. in 2019. They determined the validity, reliability and internal consistency of the cross-cultural adaptation of the FIL-DASH questionnaire among Filipino patients with traumatic brachial plexus injuries.

The questionnaire's Cronbach's alpha scores for all domains were greater than 0.8. A Cronbach's alpha greater than 0.70 is considered acceptable.[3] The internal consistency for the overall questionnaire in this study (0.9562) is comparable with Estrella et al.'s results (0.94). These high alpha values suggest a strong average correlation between patients' scores on different items within each module, indicating that they all measure the same disability, symptom and ability to perform certain activities consistently. The intraclass correlation coefficients (ICC) for the 30-item disability/symptom section, the 4-item work module and the sport/musical instrument module were 0.953, 0.919, and 0.982, respectively. An ICC greater than 0.75 is deemed acceptable.[3] Similar to the study by Estrella et al., the questionnaire in this study was given within the period of seven to 14 days. The average test-retest gap in this study was 10 (± 3.11) days.

A reliable DASH questionnaire given to the same group of patients a week apart should have low variability in responses and a high ICC.[1] These overall high ICC findings showed high

consistency between the test and retest administration and suggested good reliability for all sections of the questionnaire. Despite this, items 3 and 22 showed a low test-retest ICC, indicating inconsistent responses for these specific items.

For item number 3, the authors did not find any major nuance in the statement in both context and meaning. The contextual meaning of using (*gumamit*) a key (*susi*) to open (*pagbukas*) a door (*pinto*) or car (*kotse*) is clear. The Tagalog word *susi* (key) also has a direct Hiligaynon translation, which is *yábi*. However, the word *susi* (*súsi'*) is also a Hiligaynon word which means "to investigate, to look into, to try to discover, to research"[12] which may confuse Hiligaynon speakers.

For item number 22, the word *pakikisalamuha* (to socialize) is a deep Tagalog term which has no direct Hiligaynon translation. This may have confused the respondents, leading to a low test-retest ICC. Even if this word were understandable to a native Hiligaynon speaker, it might not directly measure the outcome of interest. Hiligaynon equivalents such as *pakig-upod* meaning "companionship" (*upúd:* companion[12]) and *pakig-istorya* meaning "to converse with" (*istórya:* conversation[12]) are more specific terms.

A limitation of this study is that the authors did not establish the level of comprehension of the subjects of the Filipino language. Most respondents, however, have at least a high school education, with only one respondent having an elementary education. Respondents were expected to have a basic grasp of the Filipino language as a medium of instruction in Philippine schools starting at the elementary level.

However, despite a basic understanding of the Filipino language, specific terms may be difficult to fully comprehend, requiring clarification or translation. Further studies may determine the factors affecting the low test-retest reliability of items 3 and 22.

Other than the Estrella et al. study, there is no other literature on the reliability of the FIL-DASH. This topic should be further explored, taking into account the multi-linguistic and multi-cultural nature of the Philippines.

For example, the Chinese translation of the DASH has different cross-cultural and linguistic versions taking into account the differences among the major Chinese populations. The DASH-HKPWH[13] (Hongkong, Cantonese Chinese: Cronbach's alpha = 0.94; ICC = 0.77; test interval: 1-2 weeks), DASH-CHNPLAGH[14] (Mainland, Mandarin Chinese: Cronbach's alpha = 0.96; ICC = 0.94; test interval: 3 weeks) and Taiwan-DASH[15] (Taiwan, Traditional/Cantonese Chinese: Cronbach's alpha = 0.96; ICC = 0.9; test interval: less than 10 days) have shown very high Cronbach's alpha and intraclass correlation coefficient when tested among specific populations.

CONCLUSION

The FIL-DASH questionnaire had an acceptable Cronbach's alpha for internal consistency and intraclass correlation coefficient (ICC) for test-retest reliability with a 95% confidence interval. The FIL-DASH questionnaire was generally a reliable functional outcome scoring measure for Hiligaynon patients with forearm fractures. However, specific items and terms in the questionnaire may require translation or clarification to native Hiligaynon speakers in the clinical setting, especially the items with low test-retest ICC.

ACKNOWLEDGMENTS

The authors would like to thank the following for their invaluable contribution and support to this study: Ms. Angelie Camposagrado – statistician; for her help in doing the statistical analysis of the study; Dr. Raoul R. Cañonero – Department Chairperson, Department of Orthopaedics, Western Visayas Medical Center; the residents and Medical Officer IVs of the Department of Orthopaedics for their help in the data gathering; and the members of the Western Visayas Medical Center Technical and Ethics Review Board.

STATEMENT OF AUTHORSHIP

All authors certified fulfillment of ICMJE authorship criteria.

CREDIT AUTHOR STATEMENT

KVY: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data Curation, Writing – original draft preparation, Writing – review and editing, Visualization, Supervision, Project administration; **LPD:** Conceptualization, Methodology, Validation, Writing – review and editing, Visualization, Supervision, Project administration.

DATA AVAILABILITY STATEMENT

The datasets generated and analyzed in this study are included in the published article.

AUTHOR DISCLOSURE

The corresponding author declared no conflict of interest. Dr. Lucille P. Detoyato is an Editorial Board Member of PJO.

FUNDING SOURCE

None.

REFERENCES

1. Beaton D, Davis A, Hudak P, McConell S. The DASH (Disabilities of the Arm, Shoulder, and Hand) Outcome Measure: What do we know about it now? Br J Hand Ther. 2001;6(4): 109–18. DOI: 10.1177/175899830100600401
2. Institute for Work and Health. Available translations. DASH. Accessed on January 2026. https://dash.iwh.on.ca/available-translations
3. Estrella EP, Orillaza NS Jr, Castillo-Carandang NT, Cordero CP, Juban NR. The validity, reliability and internal consistency of the cross-cultural adaptation of the FIL-DASH (Filipino Version of the Disability of the Arm, Shoulder and Hand) questionnaire in patients with traumatic brachial plexus injuries. J Hand Surg Asian Pac Vol. 2019;24(4):456–61. PMID: 31690189 DOI: 10.1142/S2424835519500590
4. Pineda P, Cubar E, Buenaobra N, et al. "Resolusyon Blg 92-1" [Resolution No. 92-1]. Commission on the Filipino Language; 1992.
5. McFarland CD. A linguistic atlas of the Philippines. Manila, Philippines: Linguistic Society of the Philippines; 1980.
6. Gonzales A. The language planning situation in the Philippines. J Multiling Multicult Dev. 1998;19(5):487–525. DOI: 10.1080/01434639808666365
7. Finsen V, Rod O, Rød K, Rajabi B, Alm-Paulsen PS, Russwurm H. The relationship between displacement and clinical outcome after distal radius (Colles') fracture. J Hand Surg Eur Vol. 2013;38(2): 116–26. PMID: 22618559 DOI: 10.1177/1753193412445144
8. Abramo A, Kopylov P, Tägil M. Evaluation of a treatment protocol in distal radius fractures. Acta Orthop. 2008;79(3):376–85. PMID: 18622842 DOI: 10.1080/17453670710015283
9. Westphal T, Piatek S, Schubert S, Schuschke T, Winckler S. Reliabilität und validität des fragebogens "upper-limb-DASH" bei patienten mit distalen radiusfrakturen [Reliability and validity of the upper limb DASH questionnaire in patients with distal radius fractures]. Z Orthop Ihre Grenzgeb. 2002;140(4):447–51. DOI: 10.1055/s-2002-33396
10. Goldfarb CA, Ricci WM, Tull F, Ray D, Borrelli J Jr. Functional outcome after fracture of both bones of the forearm. J Bone Joint Surg Br. 2005;87(3):374–9. PMID: 15773649 DOI: 10.1302/0301-620x.87b3.15509
11. Kim SB, Heo YM, Yi JW, Lee JB, Lim BG. Shaft fractures of both forearm bones: the outcomes of surgical treatment with plating only and combined plating and intramedullary nailing. Clin Orthop Surg. 2015;7(3):282–90. PMID: 26330948 PMCID: PMC4553274 DOI: 10.4055/cios.2015.7.3.282
12. Motus CL. Hiligaynon dictionary. Honolulu, HI: University of Hawaii Press; 1971. https://onlinebooks.library.upenn.edu/webbin/book/lookupid?key=olbp85857
13. Lee EW, Lau JS, Chung MM, Li AP, Lo SK. Evaluation of the Chinese version of the Disability of the Arm, Shoulder and Hand (DASH-HKPWH): cross-cultural adaptation process, internal consistency and reliability study. J Hand Ther. 2004;17(4):417–23. PMID: 15538683
14. Chen H, Ji X, Zhang W, Zhang Y, Zhang L, Tang P. Validation of the simplified Chinese (Mainland) version of the Disability of the Arm, Shoulder, and Hand questionnaire (DASH-CHNPLAGH). J Orthop Surg Res. 2015;10:76. PMID: 25998377 PMCID: PMC4450450 DOI: 10.1186/s13018-015-0216-6
15. Liang HW, Wang HK, Yao G, Horng YS, Hou SM. Psychometric evaluation of the Taiwan version of the Disability of the Arm, Shoulder, and Hand (DASH) questionnaire. J Formos Med Assoc. 2004;103(10):773–9. PMID: 15490028