Translation, Cultural Adaptation and Validation of Cardiff Acne Disability Index in Nepali Language

Sushil Paudel,[1] Niraj Parajuli,[2] Shraddha Shrestha,[3] Shashi Hirachan[3]

[1]Civil Service Hospital, Kathmandu, Nepal, [2]National Academy of Medical Sciences, Kathmandu, Nepal,[3]Bharatpur Hospital, Chitwan, Nepal.

ABSTRACT

Background: Acne causes significant impairment in the quality of life of patients, but clinicians in Nepal lack a simple validated tool to measure the psychological side of acne. We planned to translate and validate Cardiff Acne Disability Index, a five item questionnaire into Nepali language to address this need.

Methods: A linguistic translation with semantic equivalence to the original English language Cardiff Acne Disability Index was achieved through standard forward and backward translation into Nepali language. All eligible patients were requested to fill the Nepali translated version of both Cardiff Acne Disability Index and Dermatology Life Quality Index questionnaires. Reliability and validity of the newly translated questionnaire were established, based on statistical analyses of factor structure, item correlations and concurrent correlations.

Results: This validity study included 94 patients with male: female ratio of 1:3.27 and mean age 21.29 ($\pm$3.92) years. Reliability analysis revealed a Cronbach's alpha of .72 and mean inter item correlation coefficient of .337. A single factor was extracted on Principal Component Analysis explaining 48.40% of variance. A strong correlation of Cardiff Acne Disability Index scores to the Dermatology Life quality Index score ($r_s > .7$) indicated good concurrent validity.

Conclusions: The newly translated Nepali Cardiff Acne Disability Index is a valid tool to measure the impact of acne in Nepalese patients. This short and simple assessment tool will help clinicians understand the patient's perspective of her acne.

Keywords: Acne; cardiff acne disability index; quality of life; validity.

INTRODUCTION

Acne is known to cause significant compromise in the quality of life.[1] Patients with acne experience numerous psycho-social complications including low self-esteem,[2] embarrassment, anger, anxiety, impaired social functioning and poor academic achievements.[3] In some the disability extend to depression and suicide.[4-8] During adolescence, which is the age of rapid physical and mental changes, almost all people get some degree of acne.[9] But the dermatologist's assessment of disease severity does not always reflect the patient's perspective of his/her disease.[10]Thus, a holistic management of acne should consider visible clinical severity and psychological severity from patients' perspective.

Several instruments are used to assess the patient reported severity of the acne. The Cardiff Acne Disability Index (CADI),[11] is a simple and well validated tool to measure the impact of acne in the quality of life and is being widely translated and validated in different languages.[12-16] We planned for translation, adaptation and validation of the Nepali version of CADI in Nepalese patients of age 16 years and above with acne.

METHODS

The original English version of CADI was translated into Nepali language following standard procedure of forward and backward translations.[17] The translation process is summarized in the flow diagram (Appendix

Correspondence: Dr Sushil Paudel, Department of Dermatology, Civil Service Hospital, Kathmandu. Email: paudelsushil@gmail.com, Phone: +9779841552227.

1), and the final Nepali version of CADI (Appendix 2).

A cross-sectional prospective validation study was planned. After the approval from the Institution Review Committee, intake of the patients with acne was initiated. All consenting patients more than 16 years of age were enrolled from December 2020 to May 2021.

The disability caused by acne was assessed by Cardiff Acne disability index (CADI) Nepali version. The total score of all the five questions ranged from 0–15 (score for each question 0-3), with higher score representing higher disability.

The clinical severity of acne was assessed using the Global Acne Grading Scale (GAGS) scoring.[18] It consists of summation of severity over six acne prone locations (forehead, right and left cheek, nose, chin and trunk), which is given a fixed factor to be multiplied by the score assigned to highest grade of acne lesion of that area. A comedone is scored as 1, a papule 2, a pustule 3 and a nodule 4. The sum thus obtained is graded as mild (1–18), moderate (19–30), severe (31–38), and very severe >39.

Dermatology Life Quality Index (DLQI) is a well validated tool to measure the quality of life in several aspects of cutaneous diseases.[19,20] For the concurrent validity, Nepali version of Dermatology Life Quality Index (DLQI) was used which is being widely used in clinical and research practices.[21,22] It consists of 10 questionnaires each having four responses valued from 0 to 3, with total score of 30. DLQI scores have been banded for the ease of interpretation as, no effect (0-1), small effect (2-5), large effect (6-10), very large effect (11-20) and extremely large effect (>20).

After the clinical evaluation, every patient was requested to respond to each question in CADI and DLQI Nepali. Patients or guardians (in cases less than 18 years) not giving consent, incomplete response in either of the evaluation forms were excluded from the study.

Dimensionality and the factor structure of CADI was analyzed using Principal Component Analysis (PCA) with varimax rotation. Internal validity was assessed using Cronbach's alpha and inter-item correlation. A Cronbach's alpha of >.7 was considered satisfactory.[23] A Criterion related concurrent validity of the newly translated CADI questionnaire was assessed by analyzing the correlation between DLQI and CADI scores using Spearman correlation coefficient. Same analysis was used to correlate the CADI and GAGS score. A correlation coefficient >.4 was considered satisfactory.[24] Means between groups were compared. Descriptive analyses were done whenever necessary and summarized in table. Normality of data was checked using Kolmogorov-Smirnov test. For all analyses alpha was set at 5%.

RESULTS

Total 94 patients were included in the study (females=72, males= 22). Most of the patients had mild to moderate acne based on GAGS scoring. The mean age of the study population was 21.29 (±3.92) years, mean duration 24.72 (±18.83) months, mean CADI score 6.54(±2.74), and mean DLQI score was 8.23(±5.56) (Table 1).

Table1. Clinico-demographic characteristics of the study population.

Patients Characteristics	Frequency (%)	Mean±SD	Range
Sex			
Male	22 (23.4)		
Female	72 (76.6)		
GAGS severity			
Mild	46 (48.9)		
Moderate	45 (47.9)		
Severe	3 (3.2)		
Very severe	0		
Age (years)		21.29±3.92	16-35
Duration (months)		24.72±18.83	1-120
CADI score		6.54±2.74	2-12
DLQI score		8.23±5.56	0-26

The scoring of all five items were comparable with the original validation data presented by Motely and Finlay,[11] as shown in table 2.

Table 2. Comparison of the scoring of original English CADI and newly translated Nepali CADI.

	Findings of current study, using Nepali CADI (n=94)			Original English study by Motely and Finlay (n=66)		
Question	Mean	Median	Range	Mean	Median	Range
1	1.46±.82	1	0-3	1.24	1	0-3
2	.82±.67	1	0-3	.97	1	0-3
3	.65±.88	0	0-3	.82	0	0-3
4	1.79±.85	2	0-3	1.86	2	1-3
5	1.82±.74	2	1-3	1.58	2	0-3
Total	6.54±2.74	6	2-12	6.47	6	2-14

The mean CADI scores between the sexes was comparable and Mann-Whitney U test showed no

significant difference.

Reliability:

On reliability test Cronbach's α was .72 based on standardized items. The inter item correlation coefficient mean was .337, (range .148-.582) (Table 3). Both of these findings suggest a good reliability of the newly translated questionnaire.

Table 3. Inter-item correlation matrix.

	Item 1	Item 2	Item 3	Item 4	Item 5
Item 1	1.000	.345	.221	.582	.502
Item 2		1.000	.199	.214	.148
Item 3			1.000	.368	.227
Item 4				1.000	.563
Item 5					1.000

Item=Question

Validity:

Construct validity: The Kaiser-Meyer-Olkin test for sample adequacy for the exploratory factor analysis had coefficient of .72 and Bartlett's test of Sphericity was also favorable (x^2 =104.85, P<.001).

An exploratory factor analysis with PCA extracted only one component with eigenvalue >1 with explained variance of 48.40%. This set of CADI questionnaire was found to be one-dimensional. All five questionnaires try to map the feelings and emotions of a patient suffering from acne. The loading of items is shown in table 4.

Table 4. Loading of the items on the extracted factor.

CADI Questions (Items)	Component 1
Item 1	.806
Item 2	.474
Item 3	.529
Item 4	.837
Item 5	.751
% of variance	48.403

Concurrent validity: The Spearmen correlation coefficients between CADI scores and DLQI as well as GAGS score were as shown in Figure 1 and 2. The correlation coefficients with DLQI score was strong (r_s>.7), and that with GAGS score was acceptable (r_s>.4)
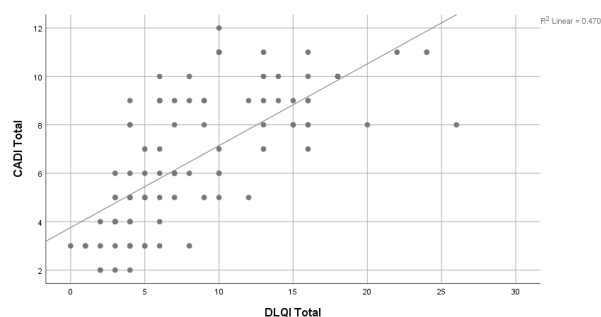

Figure 1. Correlation between ADI and DLQI scores Spearman's rho=746 (p<001)
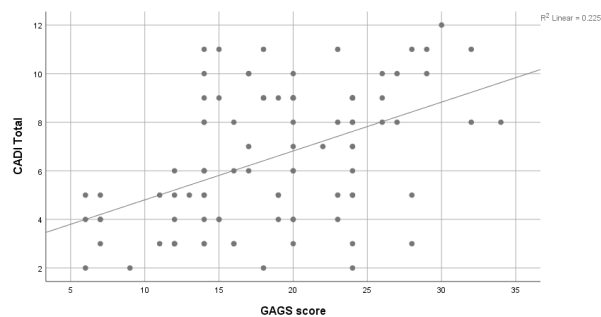

Figure 2. Correlation between ADI and DLQI scores Spearman's rho=454 (p<001)

DISCUSSION

Acne is a disabling condition in many of the sufferers. The clinical appearance in many of the cases may not represent the actual psychological impact in the patient. As majority of the patient of acne are from teen age group, the importance of psychological impact in them is even higher. A simple patient reported severity measure like CADI is very useful for the better evaluation of patient, which can even be instituted in busy out-patient setting like ours.

Our study showing a female predominance (Male: Female=1:3.27), was probably because girls are more concerned with acne and its pigmentation.

The mean CADI score of 6.54, was comparable to the hospital based studies from Britain[11] and India[25] but higher than the community or school based studies from Serbia[15] and China.[12] The DLQI scores of 8.23 was comparable to another study done in Nepalese population[26] and also in other non- Nepalese population.[27]

We translated the English version of CADI into simple Nepali language tool. The semantic equivalence rather than linguistic translation alone, was achieved through

rigorous efforts.

The reliability tests found this translation to be reliable one with Cronbach's α of .72, and inter-item correlation coefficient mean of .337.

The construct validity tested with PCA revealed CADI Nepali to be one-dimensional (single component explaining 48.4% of variance), and probably representing the feeling and emotions of a patient towards his/her acne. This is in contrast to the finding in Serbian[15] and Brazilian[13] studies, where the CADI in their respective languages yielded two components, however the loading of items in these components was different. This finding suggest that the different population may feel about their acne in different way.

The concurrent validity analysis was acceptable when correlated to DLQI scores (Spearman's rho as .74), and similar analysis with severity of acne using GAGS score (Spearman's rho .45).

The overall validity and reliability of the Nepali CADI was found to be satisfactory and can be used in all settings. This tool will improve the physician's understanding of acne from patient's perspective and treat accordingly. The clinical characteristics may vary when this is used in different settings.

CONCLUSIONS

The newly translated Nepali version of CADI is a valid tool to measure the patient's perspective of his/her disease.

ACKNOWLEDGEMENTS

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Gieler U, Gieler T, Kupfer JP. Acne and quality of life - Impact and management. J Eur Acad Dermatology Venereol. 2015;29(S4):12–4. [DOI]

2. Hosthota A, Bondade S, Basavaraja V. Impact of acne vulgaris on quality of life and self-esteem. Cutis. 2016;98(2):121–4. [PubMed]

3. Koo J. The psychosocial impact of acne: Patients' perceptions. J Am Acad Dermatol. 1995;32(5 PART 3):26–30. [DOI]

4. Hull PR, D'Arcy C. Acne, depression, and suicide. Dermatol Clin. 2005;23(4):665–74. [DOI]

5. Halvorsen JA, Stern RS, Dalgard F, Thoresen M, Bjertness E, Lien L. Suicidal ideation, mental health problems, and social impairment are increased in adolescents with acne: A population-based study. J Invest Dermatol. 2011;131(2):363–70. [DOI]

6. Öztekin C, Öztekin A. The association of depression, loneliness and internet addiction levels in patients with acne vulgaris. Biopsychosoc Med. 2020;14(1):1–7. [DOI]

7. Tasoula E, Gregoriou S, Chalikias J, Lazarou D, Danopoulou I, Katsambas A, et al. The impact of acne vulgaris on quality of life and psychic health in young adolescents in Greece: results of a population survey. An Bras Dermatol. 2012;87(6):862–9. [DOI]

8. Samuels D V., Rosenthal R, Lin R, Chaudhari S, Natsuaki MN. Acne vulgaris and risk of depression and anxiety: A meta-analytic review. J Am Acad Dermatol. 2020;83(2):532–41.[DOI]

9. Williams HC, Dellavalle RP, Garner S. Acne vulgaris. Lancet. 2012;379(9813):361–72.[DOI]

10. Renzi C, Abeni D, Picardi A, Agostini E, Melchi CF, Pasquini P, et al. Factors associated with patient satisfaction with care among dermatological outpatients. Br J Dermatol. 2001;145(4):617–23. [DOI]

11. Motley RJ, Finlay AY. Practical use of a disability index in the routine management of acne. Clin Exp Dermatol. 1992;17(1):1–3.[DOI]

12. Law MPM, Chuh AAT, Lee A. Validation of a Chinese version of the Cardiff Acne Disability Index. Hong Kong Med J. 2009;15(1):12–7.[PubMed]

13. Grando LR, Horn R, Cunha VT, Cestari TF. Translation, cultural adaptation and validation for Brazilian Portuguese of the Cardiff acne disability index instrument. An Bras Dermatol. 2016;91(2):180–6.[DOI]

14. Kim KH, Lee SC, Park YB, Park YJ. Cardiff acne disability index: cross-cultural translation in Korean and its

relationship with clinical acne severity, pathological patterns, and general quality of life. J Tradit Chinese Med. 2017;37(5):702–9.[DOI]

15. Jankovic S, Vukicevic J, Djordjevic S, Jankovic J, Marinkovic J, Basra MKA. The Cardiff Acne Disability Index (CADI): Linguistic and cultural validation in Serbian. Qual Life Res. 2013;22(1):161–6. [DOI]

16. Raju B, Nagaraju U. Quality of life among adolescents with acne in a tertiary referral centre in Bangalore, South India. Indian J Paediatr Dermatol. 2017;18(2):94.[DOI] [Article]

17. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al. Principles of good practice for the translation and cultural adaptation process for patient-reported outcomes (PRO) measures: Report of the ISPOR Task Force for Translation and Cultural Adaptation. Value Health. 2005;8(2):94–104.[DOI]

18. Doshi A, Zaheer A, Stiller MJ. A comparison of current acne grading systems and proposal of a novel system. Int J Dermatol. 1997;36(6):416–8. [DOI]

19. Finlay A, Khan G. Dermatology Life Quality Index (DLQI)—a simple practical measure for routine clinical use. Clin Exp Dermatol. 1994;19(3):210–6. [DOI]

20. Basra MKA, Fenech R, Gatt RM, Salek MS, Finlay AY. The Dermatology Life Quality Index 1994-2007: A comprehensive review of validation data and clinical results. Br J Dermatol. 2008;159(5):997–1035. [DOI]

21. Agrawal S, Rijal A, Bhattarai S. Impact of patch testing on quality of life in patients with hand eczema: A follow-up study. Kathmandu Univ Med J. 2013;11(43):216–20. [DOI]

22. Paudel S, Parajuli N, Sharma RP, Dahal S, Paudel S. Chronic urticaria and its impact on the quality of life of Nepalese patients. Dermatol Res Pract. 2020;2020:6694191. [DOI]

23. Taber KS. The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. Res Sci Educ. 2018;48(6):1273–96.[DOI] [Article]

24. Schober P, Schwarte LA. Correlation coefficients: Appropriate use and interpretation. Anesth Analg. 2018;126(5):1763–8. [DOI]

25. Gupta A, Sharma YK, Dash K, Verma S. Cultural adaptation of the Cardiff Acne Disability Index to a Hindi speaking population: A pilot study. Indian J Dermatol. 2015;60(4):419.[DOI]

26. Parajuli N, Kayastha BMM. Quality of Life in Patients with Acne: A Questionnaire Study. Nepal Journal of Dermatology, Venereology & Leprology. 2018;16(1):45–8. [DOI]

27. Ghaderi R, Saadatjoo A, Ghaderi F. Evaluating of life quality in patients with acne vulgaris using generic and specific questionnaires. Dermatol Res Pract. 2013; 2013:108624.[DOI]