DIABETIC ULCER DISEASE: EFFECT OF LEG AND FOOT EXERCISES ON ULCER HEALING, ITS IMPACT ON PATIENTS' HEALTH RELATED QUALITY OF LIFE AND NURSES' KNOWLEDGE AND ATTITUDES ON ULCER CARE

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ABSTRACT

Diabetic foot ulcer (DFU) disease causes substantial morbidity imposing significant burden on the individual, family and the country. Although novel approaches are available, healing impairment in DFU is still a considerable problem. Though positive healing response is known with ankle exercises, its role on diabetic ulcer healing has not been studied. Health related quality of life (HRQoL) is affected in patients with diabetic ulcers. However, it cannot be assessed in an objective manner due to the absence of a validated tool for Sri Lankan patients. Although diabetic ulcers should be managed ideally by a multidisciplinary healthcare team, principal responsibility lies with the nurses in regular hospital practice. Therefore, it is important to assess nurses' knowledge, attitudes and practices on diabetic ulcer care. Literature on this area is limited in Sri Lankan setting as well as globally. Therefore the present study was aimed 1) to determine the effect of leg and foot exercises on ulcer healing of type 2 diabetes mellitus (T2DM) patients, 2) to validate a Sinhala version of Cardiff Wound Impact Schedule (CWIS) for Sri Lankan patients with DFU disease and assess the HRQoL of these patients using the validated tool, and 3) to assess nurses' knowledge and attitudes on diabetic ulcer disease.

Study I was a prospective study with an intervention group and a control group. Subjects in the intervention group (n=80) performed home-based non-weight bearing leg and foot exercises till the wound was healed or for a maximum period of 12 weeks in addition to usual care while subjects in the control group (n=79) received only usual care. Sensory neuropathy status was assessed using 5.7/10g Semmes-Weinstein monofilament (for pressure sense) and 128-Hz tuning fork (for vibration sense). Joint position sense was also assessed. Glycosylated hemoglobin (HbA1c) level was assessed to ensure glycemic control. Wounds were assessed at baseline and at 4, 8 and 12 weeks. Median percent reduction of ulcer surface area (cm^2) was measured at four weekly intervals for a maximum period of 12 weeks. Results showed that the percent reduction of ulcer surface area was significantly greater in the intervention group than the control group (p=0.025) in the first four week period. In the same time, the percent reduction of ulcer surface area of forefoot ulcers was significantly higher in the intervention group than control group (p=0.037). In comparison to the control group, a significantly higher proportion of subjects in the intervention group had reduction in the number of insensate sites in the foot (10/27 vs. 18/23; p=0.001). However, there was no difference in ulcer healing with the level of HbA1c and BMI between the two groups (>0.05).

Study II phase I was a cross sectional study. English version of CWIS was examined for cultural compatibility, translated into Sinhala and pre-tested. To evaluate the construct validity of the instrument, Sinhala version CWIS was administered along with the validated Sinhala version of SF-36 on patients with diabetic leg and foot ulcers (n=140) at baseline. To test-retest stability, Sinhala version of CWIS re-

administered in two weeks to a subsample of 33 patients, and to determine the ability of the instrument in discriminating between healed vs. non-healed status, same instrument was re-administered in three months to a sub sample of 50 patients with healed ulcers. The construct validity demonstrated moderate significant correlations between related subscales of CWIS and SF-36 (Spearman's rho=0.318–0.514, p=0.021– <0.001). Internal consistencies (Cronbach's alpha=0.681–0.860) and test-retest stability (0.560–0.703) were good and acceptable. The instrument was able to discriminate the impact of the wound on HRQoL between healed versus non-healed status ($p<0.001$) and showed good acceptability.

Study II Phase II was a cross-sectional study performed on consecutively recruited 301 diabetic leg and foot ulcer patients admitted to the surgical wards. HRQoL was assessed through interviewer administered validated Sinhala version of CWIS. Results showed low HRQoL according to the scores of total HRQoL (162.22/300), and of all domains, PSDL (60.0/100), SL (58.45/100) and WB (43.29/100). Demographic factors such as being a female, being unemployed and living dependent on others and ulcer related factors such as ulcer grade (Wagner scale$\geq$3), ulcer surface area (>5cm^2) and the presence of necrotic tissue were associated with significantly poor HRQoL as indicated by low scores of CWIS.

Study III was a descriptive cross sectional survey conducted among purposively recruited 147 nurses who were directly involved in wound care of patients with diabetic ulcers. Data were collected using a self-designed, content validated and pretested questionnaire. Results showed that no formal wound care training was

obtained by 91.2% of nurses. The mean±SD overall knowledge score was 77.91±10.6. Only 57.8% of nurses were adequately knowledgeable (score range 80–100). Significant higher knowledge was found in nurses who had more experience (≤5 years vs. >5 years) in nursing career (p=0.009) and in wound care (p=0.007). Nurses employed in surgical wards had statistically significant higher knowledge than those employed in outpatient setting (p=0.036). The median attitude score was 41.00 (range 23-50). Younger nurses (≤40 years) had more positive attitudes than older nurses (p=0.041). Nurses' interest in wound care was significantly associated with the knowledge (p=0.044) and attitudes (p=0.0001), whereas there was no correlation between nurses' knowledge and attitudes. Most nurses updated their knowledge through in-service education (77.2%) and sharing with peers (77.9%). The majority of nurses (98.6%) were interested in wound care but only a minority (8.3%) wished to engage in research.