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CULTURAL AND PSYCHOSOCIAL INFLUENCES ON DISABILITY, AND AN INTERVENTION TO REDUCE LOW BACK PAIN AMONG NURSES

By

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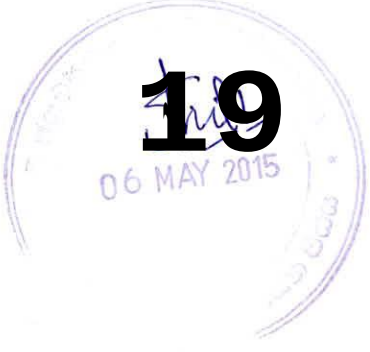

DECLARATION BY THE CANDIDATE

The work describe in this thesis was carried out by me under the supervision of Prof. Roshini Peiris-John, Prof. S Sivayogan, Prof. Nalini Sathiakumar, Prof. A. R. Wickramasinghe, and a report on this has not been submitted to any university for the purpose of evaluation

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Dedicated to my parents, my wife Kumudu, my son & daughter Ashan&Ashara

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LIST OF ABRIVIATIONS

ABH	-	Awissawella Base Hospital
AIHA	-	American Industrial Hygiene Association
ANA	-	American Nurses' Association
ASCC	-	Australian Safety and Compensation Council
BLS	-	Bureau of Labor Statistics
CANS	-	Complaints of arm neck and/or shoulder
CBSQ	-	Curtain Back Screening Questionnaire
CIHI	-	Canadian Institute for Health Information
COAAS	-	Center on an Aging Society, Georgetown University
CO	-	Computer Operator
CSTH	-	Colombo South Teaching Hospital
CLBP	-	Chronic low back pain
CTD	-	Cumulative Trauma Disorder
CI	-	Confidence Interval
CSSD	-	Central Sterile Supplies Department
DALY	-	Disability Adjusted Life Years
DPQ	-	Dallas Pain Questionnaire
DRI	-	Disability Rating Index
EASHW	-	European Agency for Safety and Health at Work
EPF	-	Employee Providence Fund
FEF	-	Friedrich Ebert Foundation
FSQ	-	Functional Status Questionnaire;
GP	-	General Practitioner

HBH	-	Homagama Base Hospital
HESIS	-	Hazard Evaluation System and Information Service
HIV	-	Human Immunodeficiency Virus
HAS	-	Health and safety Authority
HSE	-	Health and Safety Executive
IHE	-	Institute of Health Economics
IHME	-	Institute for Health Metrics and Evaluation
IOF	-	International Osteoporosis Foundation
IHME	-	Institute for Health Metrics and Evaluation
IEA	-	International Ergonomics Association
IHME	-	Institute for Health Metrics and Evaluation
IASP	-	International Association for the Study of Pain
IAPA	-	Industrial Accident Prevention Association
ICD	-	International classification of disease
ILO	-	International labour organization
JOA	-	Japanese Orthopedic Association
LBP	-	Low back pain
LBPR	-	Low Back Pain Rating
MSD	-	Musculoskeletal disorders
MSO	-	Mail Sorting officer
NASS	-	North American Spine Society
NIOSH	-	National Institute for Occupational Safety and Health
NIHCE	-	National Institute for Health and Clinical Excellence
NO	-	Nursing officer

NHSL	-	National Hospital Sri Lanka
NKP	-	Neck Pain
ODI	-	Oswestry Disability Index
OHCOW	-	Occupational Health Clinic for Ontario Workers Inc.
OHSCO	-	Occupational Health and Safety Council of Ontario
OOS	-	Occupational overuse syndrome
OPD	-	Out Patient Department
OR	-	Odds Ratios
OSHA	-	Occupational Safety and Health Administration
QPDS	-	Quebec Back Pain Disability Scale
RMDQ	-	Roland–Morris Disability Questionnaire
RCT	-	Randomized Control Trial
RR	-	Relative Risk
RSI	-	Repeated strain injuries
SD	-	Standard Deviation
SHC	-	Subjective Health Complaints
SLMA	-	Sri Lanka Medical Association
SIP	-	Sickness Impact Profile
SLIIT	-	Sri Lanka Institute of Information Technology
SM	-	Sewing Machinist
SPSS	-	Statistical Package for the Social Sciences
SVQBDS	-	Sinhala Version of Qubece Back Pain Disability Scale
ULD	-	Upper Limb Disorders
USA	-	United State of America

VAS	-	Visual Analogue Scale
WHO	-	World Health Organization
WRMSD	-	Work related musculoskeletal disorders
YLD	-	Years Lost due to Disability

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Cultural and Psychosocial Influences on Disability (CUPID) and an intervention to reduce low back pain among nursing officers

S.S.P. Warnakulasuriya, Roshini Peiris-John, S.Sivayogan, N.Sathiyakumar, A.R Wikramasinghe

ABSTRACT

Work-related musculoskeletal disorders (WRMSDs) are a significant public health problem because of their impact on disability, personal suffering, and absence from work. Increasingly, evidence of work-related MSDs is emerging from developing countries. Most developed countries have to a large extent addressed this, although many developing countries lag behind. In Sri Lanka, musculoskeletal disorders among working populations have not been sufficiently investigated. This study was carried out to assess WRMSD in four selected occupational groups and to evaluate an intervention to reduce LBP among nurses in three stages. The prevalence of WRMSD and its associated factors among mail sorting officers (MSOs), sewing machinists (SMs), nursing officers (NOs) and computer operators (COs) were determined. The study also describes nursing officers' knowledge attitudes and practices related to work ergonomics. The efficacy of the combined educational and exercise intervention in reducing low back pain among nurses was evaluated. The Sinhala version of the Quebec back pain disability scale (QBDS) was validated to measure improvement in disability related to back pain in the evaluation of the intervention programme.

In the first stage, 852 participants were interviewed using a validated questionnaire to ascertain demographic characteristics, MSD symptoms and associated disabilities from four occupational groups including 250 (MSOs), 213 (SMs), 236 (NOs) and 153 (COs). In the second stage, 861 nursing officers were randomly selected from four hospitals including two

teaching hospitals and two base hospitals in the Colombo district according to the nurses' ratio in each hospital. A pre-tested self administered questionnaire was administered to the participants after obtaining informed written consent to ascertain the knowledge, attitudes and practices of nursing officers on work related ergonomics.

In order to validate Sinhala version of the QBDS a sample of 140 patients with low back pain (LBP) who attend orthopedic clinics at two teaching hospitals and 140 people with no LBP from among relatives of patients who accompanied the patients to the same clinic were selected. After obtaining informed verbal consent from the participants, the pre-tested Sinhala version of the QBDS and the validated Sinhala version of SF-36 health outcome questionnaire were administered. The SF-36 was administered to correlate the findings with the Sinhala version of the QBDS as a "gold standard" to assess disability related to LBP in Sri Lanka.

In stage 3, a quasi experimental pre-test post-test study was carried out among nurses in two teaching hospitals in Colombo, one with the intervention and one without the intervention. Each arm of the study had 72 nurses with non-specific LBP at the time of the study. The intervention comprised a comprehensive two-day educational workshop on back discipline and correct work techniques and ergonomic principals by a group of experts including a rheumatologist, a physiotherapist, an occupational health & ergonomics specialist, a psychologist and a professional nurse. The workshop was followed by a series of 30-minute exercise sessions two days a week for three months. Participants were trained for the exercises and the sessions were supervised by an experienced physiotherapist and two trained staff nurses. The study group was given guidelines to continue exercises at home and a pre-

designed exercise diary to record pain symptoms and details of home exercises was given to each participant. The control group was given a pre-designed symptom diary with instructions to record back pain symptoms. Both groups recorded the leave taken and visits to doctors, and any medication taken for back pain.

Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS) (Windows Version 16.0 Chicago IL, USA). In stage 1, frequency distributions were obtained and associations tested using the Chi-square test and ANOVA. In stage 2, the socio-demographic profile of the nurses was tabulated. Knowledge of, attitudes towards and practice of, work related ergonomics were assessed using descriptive statistics and were described as percentages. To validate the Sinhala version of QBDS, Pearson correlation coefficients were used to determine the correlation between the QBDS results and the SF-36 variables to determine construct validity of QBDS. The Student's *t*-test was used to determine whether there was a statistically significant difference between scores of back pain disability and quality of life in the study and reference groups. Internal consistency was assessed using Chronbach alpha coefficient. To test the effectiveness of the intervention, Student's *t*-test and paired t- test were used to compare the mean QBDS scores within and between intervention and control groups.

852 employees from four occupational groups (250 Mail Sorting Officers, 213 Sewing Machinists, 236 Nursing Officers and 153 Computer Operators) participated in the study giving a response rate of 86%. LBP was the commonest site of musculoskeletal pain in all occupational groups except COs. Elbow was the least affected pain site in all occupational groups. Neck pain was highest among COs (25%) but lowest among MSOs. Shoulder pain

was the commonest WRMSD reported by MSOs (26.8%) but the lowest reported by NOs (16%). NOs reported the highest prevalence of low back pain (44.6%) during the past 12 months while COs reported the lowest prevalence of LBP (21.5%). The prevalence of wrist and arm pain was low in all four occupational groups ranging from 9.8%-13%. The prevalence of knee pain was highest among NOs (29.6%) and lowest among COs (12.4%). The prevalence of disabling pain, dominated by LBP, was highest among NOs (22%) followed by MSOs (18%) and SMs (14%). The most disabling pain among COs was neck pain. Disabling shoulder pain was highest among MSOs and lowest among NOs. The prevalence of disabling pain in the wrist and hand was similar in all four occupational groups (7%-8%). The prevalence of disabling knee pain was 29.6% in NOs and 20.8% in MSOs.

The association between pain symptoms and work related risk factors were investigated separately among the four occupational groups. Adverse beliefs about physical activity was the only significant predictor of wrist and arm pain among MSOs (OR=2.4; 95% CI=1.1-5.5). Low job security among SMs was significantly associated with neck pain in the past 12 months and time pressure to complete tasks was significantly associated with low back pain (OR=2.0; 95% CI=1.1-3.9) and neck pain (OR=2.4; 95% CI=1.1-5.2). Among the nursing officers, time pressure to complete tasks (OR=1.9; 95% CI=1.0-3.5) and lifting more than 25kg (OR=2.2; 95% CI =1.3-3.9) during working hours were significantly associated with LBP. Lifting more than 25kg (OR = 2.5; 95% CI = 1.0 -6.0) and low job control (OR=2.3; 95% CI=1.0-5.3) were significantly associated with wrist and arm pain among NOs. Among COs, job insecurity was significantly associated with low back pain (OR=2.36; 95% CI=1.0-5.3) and time pressure to complete tasks was significantly associated with neck pain (OR=2.6; 95% CI=1.1-6.1).

53% of nurses had poor knowledge (<50%) of work related ergonomics; knowledge was moderate (50 -74%) in 281 (46.6%) and none had "good" knowledge (>75%). Most nurses had negative attitudes towards the work related ergonomics. Out of fourteen statements that reflect attitudes related to work ergonomics, only four were marked favourably by the participants. 12 practices related to nursing jobs, assumed as desired practices to work related ergonomics, were included in the questionnaire. The majority reported that they practice five desired practices during normal day shifts. The seven practices not marked by the majority were considered as "undesirable" practices.

The Sinhala version of QBDS showed that the instrument was easy to understand, reliable and a valid condition specific outcome measure of disability related to LBP among the Sinhala speaking population. The outcomes were significantly correlated with the Sinhala version of SF-36 quality of life questionnaire [r=-0.75; p<0.05] indicating good construct validity. There was also significant internal consistency (Cronbach's alpha coefficient = 0.91).

The effectiveness of the exercise intervention progrmme to reduce LBP among nurses was evaluated .A total of 144 nurses participated in the intervention study (n=72 in the intervention group and n=72 in the control group). Most nursing officers were aged 31-40 years. The dropout rate in the intervention group was higher (30.5%) compared to the control group (16.6%), though not significantly (p=0.074). A pre-test before the intervention, and tests after six weeks of the initiation of, during and after three months of, the intervention were carried out. There were significant differences between the groups in knowledge (p<0.001) and attitudes (p<0.001) after 3-months of the intervention; however, there were no differences in practices between the intervention and control groups (p=0.111). There were

no significant differences in the VAS (p=0.78) and SVQBDS (p=0.74) at pre-test between intervention and control groups. After six weeks of the intervention, there was a significant decrease in the VAS in the intervention group (Mean=32.8, SD=16.5) as compared to the control group (mean=43.8, SD=13.7). Scores of the SVBDS indicated that disability improved at six weeks in both the intervention (mean=32.5, SD =13.8) and the control groups (mean=37.9, SD =13.6, t(58) =-2.2, p=0.029). At the post test at three months after the intervention, there was no significant difference in pain intensity measured by the VAS in the intervention (mean=43.7, SD =14.6) and the control groups (mean=43.2, SD=14, t (59) = 0.5, p=0.571). Disability scores measured by the SVQBDS also indicated that there was no significant difference in disability scores between the intervention (mean=38.7, SD=15.0) and the control groups (mean=37.2, SD=16.1) (t_{50} =0.4; p=0.635).

Preventive strategies for work-related musculoskeletal disorders in Sri Lanka should take account of psychological and physical risk factors. Knowledge related to work ergonomics among nurses leading to more positive attitudes work related ergonomics need to be enhanced in training programmes. Hospital related ergonomic risk factors should be mitigated through system-wise work organization for all staff. The Sinhala translation of the QBDS provides is easy to understand, reliable and a valid condition specific outcome measure of disability related to LBP among the Sinhala speaking population. Knowledge of nurses on work-related ergonomics can be significantly improved through educational workshops which should be utilized in professional education of nurses. Further research needs to be done to identify interventions that would reduce LBP among nursing officers.