Association between Work Related Musculoskeletal Disorders and Fatigue among Female Beauticians in Ahmedabad: An Observational Study

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ABSTRACT

Introduction: Work related musculoskeletal disorders (WRMSD) and fatigue are important issues that are sometimes neglected by every occupation. Prolonged non-neutral postures, repetitive movements, working at a fast pace, general distress or prolonged standing periods make them vulnerable to musculoskeletal symptoms. Moreover, beauticians work long hours and lack of adequate breaks during work which might cause fatigue. So, need of the study to assessing correlation between WRMSD and fatigue among female beauticians.

Methodology: Observational analytical cross-sectional study was conducted by convenience sampling. Total sample size was eighty. Females were selected between age group of 18-40 years with ≥2 years of experience as beautician. Participation was voluntary and informed consent was taken. WRMSD were assessed by Nordic Musculoskeletal Questionnaire (NMQ). Occupational fatigue was measured by multidimensional assessment of fatigue (MAF). Spearman correlation coefficient was used to find association between WRMSD and occupational fatigue among female beauticians. Level of significance was kept at 5%.

Result: Mean age was 26.02 ± 8.53 years. 83% participants reported work related musculoskeletal pain in one or more body parts. The common body parts affected by pain in past one year and one week were neck(36%), shoulders(29%), elbow(14%), wrist/hand(24%), upper back(22%), lower back(45%), Knees(63%) and ankles/feet(33.93%).Significant difference was found between WRMSD and Occupational fatigue ($r=0.658, p<0.005$)

Conclusion and implication: Moderate positive correlation between musculoskeletal disorder and fatigue among female beauticians was observed. Beauticians are at risk of developing musculoskeletal disorders and leads to occupational related fatigue. This study could benefit them from preventive structural and educational measures.

Keywords: Musculoskeletal disorders, Fatigue, Beautician

INTRODUCTION

Beautician in the Cambridge dictionary has been defined as "a trained person whose work is to enhance the appearance of a client's face, body, and hair, by means of make-up and beauty managements, often in a beauty salon" [1]

Work related musculoskeletal disorders (WRMSD) are the commonest cause for occupational health problems and accounts for large number of socioeconomic burdens on the worker as well as the society. WRMSDs are defined as injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and spinal discs associated

with exposure to risk factors in the workplace. These conditions result in pain and functional impairment of musculoskeletal system of the body. [2]

The common risk factors associated with work that are most frequently cited as causative factors for musculoskeletal disorders include rapid work pace, repetitive movement patterns, insufficient recovery time, heavy exertion, improper body mechanics, use of tools and awkward posture. The beautician performs common tasks like facial cleansing, skin, nails and body hydrotherapy and care, acne treatment, make up, massage, face and body hair removal, manicure, pedicure, facial, hairdressing, threading, waxing, etc. on a daily basis.[2]

Work related fatigue as "a subjective feeling of tiredness that is physically and mentally penetrative. It ranges from tiredness to exhaustion creating an unrelenting overall condition that interferes with individuals' physical and cognitive ability to function to their normal capacity." [3] Beauticians work has long hours and lack of adequate breaks during work which might cause fatigue.

Beauticians are exposed to various hazards in the workplace such as awkward posture, use of vibratory tools, repetitive movements and prolonged standing. WRMSD and fatigue are important issues that are sometimes neglected by every beautician. Moreover, beauticians work long hours and lack of adequate breaks during work which might cause fatigue.

MATERIALS & METHODS

Observational analytical study was conducted at different female beauty salon from Ahmedabad, Gujarat, India with Purposive sampling. Data collection from September 2022 to December 2022 A sample size was estimated on the basis of pilot study and the sample size obtained was 80.

$N = \{Z\alpha + Z\beta) / C^2\}$ Where; $C = 0.5 \times$ in $\{(1+r)/(1-r)\}$, r=correlation coefficient

Inclusion and exclusion criteria:

18-40 years old females, With ≥2 years of experience as beautician, Practicing as beautician for minimum 2 hours/day were included whereas those who have any neurological disorders (stroke, Parkinson, multiple sclerosis etc.), severe cardiovascular or pulmonary disease (PVD, COPD, asthma and pulmonary TB etc.) , recent traumatic conditions , any type of recent surgery (last 3 months), dementia, depression, etc., any assistive device (cane, crutch, walker, orthosis etc.), malignancy were excluded in present study.

PROCEDURE

This observational analytical study included 80 beauticians who worked as female beauty salon. Total 98 individuals were screened, out of which 12 individuals did not match the inclusion criteria and 6 were not interested in this study. So total 80 female beauticians included in the study. They were explained about the study. Written informed consent was taken from those willing to participate and fulfilling inclusion and exclusion criteria and was included in the study. Assessment was done according to the proforma. Each female individual asked Nordic Musculoskeletal Questionnaire (NMQ) and Multi-dimensional assessment of fatigue (MAF) respectively.

(1)Nordic Musculoskeletal Questionnaire (NMQ):

The NMQ is completed by self-administration or face-to-face interview and provides reliable information on the onset, prevalence and outcomes of musculoskeletal problem in nine body regions (the neck, shoulder, upper back, elbow, wrist/hand, low back, hip/thigh, knee, and ankle/foot). The NMQ interrogates ache, pain or discomfort experienced in the nine body parts to date, for the last 12 months, for the last four weeks and on the day of the administration, with binary choice questions (yes or no).[4]

(2) Multidimensional assessment of fatigue (MAF):

MAF scale contains 16 items that assess various aspects of fatigue. This scale is a self-administered questionnaire to assess four dimensions of fatigue, including degree and severity, amount of distress it causes, its timing, and the degree to which fatigue interferes with daily living activities. Respondents are asked to reflect their experiences of fatigue in the past week. Indeed, the convergent validity ranged from 0.466 to 0.948 for all subscales. [5]

STATISTICAL ANALYSIS
Data analysis was done using SPSS version 20 and Microsoft excel 2007.

Prior to statistical tests, the data was screened for normality. As the sample size was more than 50 in Kolmogorov – Smirnov test (KS test) was used to check normality.

Prevalence for work related musculoskeletal disorder using Nordic Musculoskeletal Questionnaire (NMQ) was done by Microsoft excel. Data of all the outcomes were not normally distributed. Correlation between Nordic Musculoskeletal Questionnaire (NMQ) and Multidimensional assessment of fatigue (MAF) was done by non- parametric test – Spearman's correlation. Level of significance was kept at 5% ($p<0.05$).

RESULT
The present study was conducted to find correlation between Nordic Musculoskeletal Questionnaire (NMQ) and Multidimensional assessment of fatigue (MAF) among female beauticians.
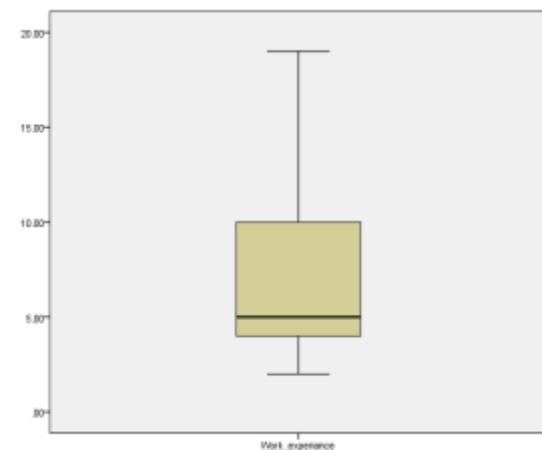
Total 80 participants, completed the study. The mean age of participants was 31.69 ±5.65 years (Graph 1).Graph 2 shows work load (hour/day) in female beauticians. Graph 3 shows work experience (in years) among female beautician.
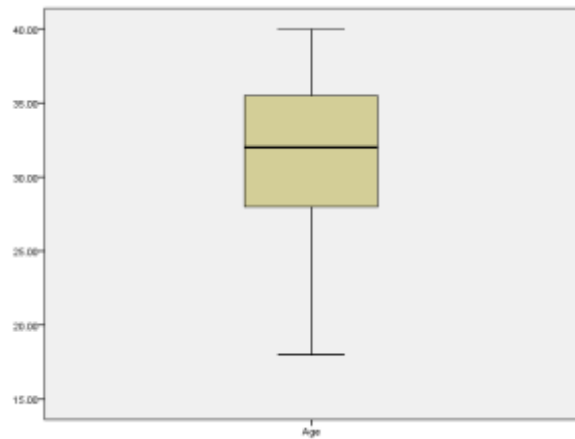
Graph 1: Age distribution in female beauticians
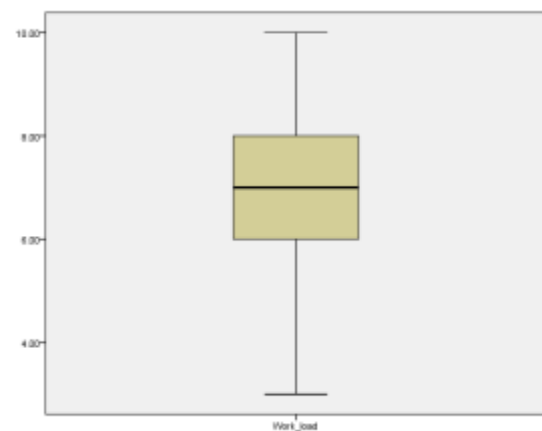
**Graph 2: Work load (hour/day) distribution in female beuticians**

Graph 3: Work experience (in years) among female beauticians

Prevalence for work related musculoskeletal disorder among female beauticians:
The common body parts affected by pain in past one year and one week were neck (36%), shoulders (29%), elbow (14%), wrist/hand (23%), upper back (22%), lower

back (45%), hip/thighs (18%), knees (63%) and ankles/feet(34%).Graph 4 shows

prevalence for WRMSD among female beauticians.
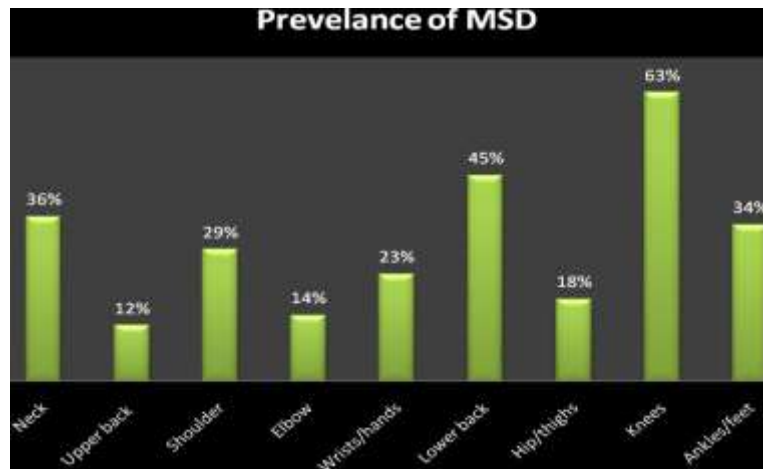
Graph 4: Prevalence of musculoskeletal disorder among female beauticians

Correlation between NMQ and MAF among female beautician:
Data was found to be non-parametric, so Spearman correlation coefficient was used to find correlation of musculoskeletal disorder and fatigue as shown in Table 1.

Outcome measures	Spearman correlation coefficient (r - value)	p – value
NMQ and MAF	r=0.658	<0.001

Table 1: Correlation between NMQ and MAF

DISCUSSION

The objectives of the present study were to find prevalence work related musculoskeletal disorder using Nordic Musculoskeletal Questionnaire among female beauticians. And to find correlation between work related musculoskeletal disorder using Nordic Musculoskeletal Questionnaire and fatigue using multidimensional assessment of fatigue among female beauticians.

In present study 36% reported pain in neck, 29% beautician had pain in shoulders. Beauticians having pain in their elbow were 14% , wrist were 23% Whereas reporting of low back pain in beauticians were 45% and 18% hip or pelvic pain was present. 63% beauticians were complaining of knee pain and pain in ankle was reported by 34% of the beauticians. Anjum H et al found that common body parts affected by pain in past

one year and one week were neck (43.9%), shoulders (42.2%), elbow (48.1%), wrist/hand (54.8%), upper back(22%), lower back(59.9%),hip/thighs (40.1%) ,knees(52.4% %) and ankles/feet(45.9%). [6] In present study moderate positive correlation between work related musculoskeletal disorder and fatigue (r=0.658, p<0.001) among female beauticians. Younan L et al found that musculoskeletal disorders were significantly correlated with chronic occupational fatigue.[7] Alaca N et al found that severity of musculoskeletal discomfort/pain in different body regions was correlated to different aspects of fatigue, including degree and severity, distress that it causes degree of interference with activities of daily living, and timing of fatigue. Indeed, the severity of musculoskeletal discomfort/pain in neck, shoulders, lower back, and thighs was associated with total fatigue. In other studies, researchers found that musculoskeletal discomfort/ pain was associated with fatigue, psychosocial distress, sleep disruption, and stress. Furthermore, the findings of other studies have shown that holding a static and awkward posture for long periods during the work could lead to discomfort/pain and chronic fatigue.[4] Daneshmandi H et al

indicated a close relationship between musculoskeletal discomfort/pain and fatigue among workers. [5]

Limitation of study were multivariate analysis using confounding factors could not be done. Medical conditions details were not taken in assessment. Subjective assessment like most common position used during work, specialist (hair stylist, makeup artists etc.) in beautician, physical load of individuals etc., cannot be done.

CONCLUSION

Most common affected musculoskeletal disorders were knees, lower back, neck, ankles/feet in beauticians. Moderate positive correlation between musculoskeletal disorder and fatigue among female beauticians was observed. Beauticians are at risk of developing musculoskeletal disorders and lead to work related fatigue. This study could benefit them from preventive structural and educational measures.

REFERENCE
1. Piri H, Hajian M, Mirkarimpour SH, Sheikhhoseini R, Rahimi M. The Effect of 12-Week Corrective Exercises on the Postural Angles of Beautician Females with Upper Crossed Syndrome: a Clinical Trial Study. Women's Health Bulletin. 2021 Apr 1;8(2):91-7.
2. Vaidya S, Pagare R. Effect of Ergonomic Advices and Neck Exercises on Neck Pain in Beauticians.
3. Rahman HA, Abdul-Mumin K, Naing L. Psychosocial work stressors, work fatigue, and musculoskeletal disorders: comparison between emergency and critical care nurses in Brunei Public Hospitals. Asian nursing research. 2017 Mar 1;11(1):13-8.
4. Alaca N, Safran EE, Karamanlargil AİI, Timucin E. Translation and cross-cultural adaptation of the extended version of the Nordic musculoskeletal questionnaire into Turkish. Journal of Musculoskeletal & Neuronal Interactions. 2019;19(4):472.
5. Daneshmandi H, Choobineh AR, Ghaem H, Alhamd M, Fakherpour A. The effect of musculoskeletal problems on fatigue and productivity of office personnel: a cross-sectional study. Journal of preventive medicine and hygiene. 2017 Sep;58(3):E252.
6. Anjum H, Qazi W, Rehman H, Shafique MS. Frequency of Musculosketelal Problems in Beauticians of Rawalpindi and Islamabad. Pakistan Journal of Medical & Health Sciences. 2022 Oct 2;16(08):490-.
7. Younan L, Clinton M, Fares S, Jardali FE, Samaha H. The relationship between work-related musculoskeletal disorders, chronic occupational fatigue, and work organization: A multi-hospital cross-sectional study. Journal of advanced nursing. 2019 Aug;75(8):1667-77.

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