Musculoskeletal pain in hairdressers- a study in Durban

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Abstract

Introduction:

Research on occupation related pain and dysfunction is gaining momentum. Hairdressing salons are now owned by small entrepreneurs. The occupation related musculo-skeletal pain in hairdressers has not received attention in South Africa. This study investigated the prevalence and predictors of musculoskeletal pain in hairdressers in the Durban area.

Methods:

A cross sectional survey allowed 110 consenting hairdressers to participate. A questionnaire captured all relevant demographic and pain /dysfunction information. Height and weight of each hairdresser was taken using a tape measure and bathroom scale. Data was analysed using Pearsons correlation and predictors identified by linear regression.

Results:

Response was 68%. Musculokeletal pain was prevalent in 60% of the participants and 89% of this was mechanical. Forty percent reported low back pain. Type of bending, and position of arms were significantly correlated with the presence of pain and predictors of pain.

Conclusion:

Musculoskeletal pain is significantly prevalent in the study population.

Key words: Hairdressers, pain, bending, position of arms

Introduction

The human body is aligned to ensure that the bodyweightis distributedto prevent stress on any one part. Stresson any one partwill eventually resultin pain and dysfunction. During normal function or occupational activities various environmental factors impacton the alignmentof the body or the components that maintain the structural balance. Any factor that affects the ability of a muscle or ligament to support a joint or body part or counter balance any strain will resultin an alteredalignment and subsequentpain and dysfunction. In any occupationwhere the muscles and ligaments are overused, overstretched or expected to function in a position for too long, pain ensues (Arokoski, Juntunen, & Luikku, 2002; Juul-Kristensen, Hansson, Fallentin, Andersen, & Ekdahl, 2001; Shabnam, Jaafar, & Fakher, 2009).

Back, neck and shoulder pain are common consequences of poor occupational ergonomics (McFarlane, Thomas, Papageorgiou, Croft, & Jason, 1997; Shabnam et al., 2009). A strong correlationbetween back pain and occupationalstress in jobs which involve prolonged periods of sitting or repeated and sustained bending, twisting or lifting, has been reported (Shabnam et al., 2009; Arokoski et al., 2002). The musculoskeletalcomplaintsof hairdressers are attributed to poor work postures, repetitive movements and lack of ergonomic equipment in the work environment (Arokoski et al., 2002; Veiersted, Gould, Osteras, & Hansson, 2008)

Hairdressing is an occupation that involves long working hours, many of which are spent in ergonomically inefficient postures (Arokoski et al.

2002). Arokoski et al., (2002) showed a correlation between neck, shoulder and back pain and posture in hairdressers. These investigators went on to show that a program of education and rehabilitation resulted in a 40-45% decrease in the incidence of back and neck pain in this population. In Taiwan, research has confirmed that more than 90% of the hairdressers complained of shoulder pain, over 80% of back pain and over 70% of neck pain (Fang, Chen, Fang, & Xu, 2007; Chuang, 2005). Hairdressers subject their shoulders, backs and necks to repetitive and sustained loading on a daily basis. In addition these professionals work with their backs bent or bent and twisted and with their arms above shoulder level (Nevala-Puranen, Halonen, Tikkanen, & Arokoski, 1998).

Van Dillen et al., (2003) argued that if movements are performed at the optimal kinesiologic standard position, tissue damage doesn't occur. The effect of repeated movements and sustained postures modify the kinesiologic model so that it becomes a kinesiopathologic model (Shabnam et al., 2009).

Hairdressers are found everywhere. In South Africa, anecdotal evidence suggests that hairdressers suffer from back and neck pain. More reports can be found in the scientific literature about hairdressers and their musculoskeletal pain (Arokoski et al., 2002). The majority of the studies were undertaken in Scandinavian countries (Arokoski, Nevala-Puranen, Danner, Holhalonen, & Tikkanen, 1998; Arokoski et al., 2002; Nevala-Puranen et al., 1998; Veiersted et al., 2008) or Taiwan (Guo, 2002; Lin, 2003; Chuang, 2005). The purpose of the present study was to determine the prevalence of musculoskeletal pain and its predictors in hairdressers in the greater Durban area. This study also sought to determine the location of the pain, and what factors if any were related to the pain

Methods

A cross sectional survey on pain and its predictors in hairdressers in Durban was conducted. A sample of convenience was obtained by telephoning as many hairdressers as possible in the Durban area (through the use of a telephone list obtained from the telephone directory). African hairdressers who did not own telephones were accessed in the city business district. Female hairdressers between the ages of 20 to 60 years (mean = 32 years) were invited to participate since some literature indicated that more female hairdressers suffered from musculoskeletal pain (Loodh & Ohlson, 1997). Race ratios were based on the latest census information for the region namely 80% African, 10% Indian, and 6% White. Any subject with leg length discrepancy, arthritis, pre-existing neck and back injury sustained as a result of non-hairdressing activities or pregnancy was excluded.

After obtaining institutional ethical approval every participating subject signed a fully informed consent form. Each subject completed a questionnaire (based on anecdotal information from hairdressers) which elicited information about any medical condition, some relevant personal information namely leisure time activities, number of children, marital status, history of pain, time spent in a standing or sitting position and ergonomics of their task. Subjects completed their questionnaires in their salons, with the researchers on standby to clarify any question. The questionnaire was piloted on 5 non-participating hairdressers to ensure that all the relevant questions to achieve the aims of the study were covered. No expert opinion was obtained because the hairdressers were considered to be the best people from whom content validity could be ascertained.

The researchers used a non-elastic measuring tape to measure the heights of each hairdresser with shoes off. A bathroom scale, calibrated using dumbbells and weights within the weight range (40 to 120 kg) of the participants was used to measure body weight in kilograms. Three readings were taken and the highest reading was used as data. A builder's level was used to ensure that the bathroom scale was placed on level ground in each salon. Body mass index was calculated using the height and weight data. Pain was classified as mild (1-3), moderate (4-6) or severe (7-10) on the numerical rating scale (Jacques, 2009). Site of the pain was also requested. Position of the arms during hairdressing was classified as above shoulder level or below shoulder level. Bending was classified as bending using the back, or hips and knees. Pain was identified as being of mechanical origin or other (inflammatory or ischemic) and whether it arose out of activities outside

hairdressing. To determine whether the pain was mechanical, subjects were asked whether their pain was aggravated by movement and eased by rest (Petty and Moore, 1998)

Data was first analyzed descriptively by converting them into percentages. Pearson's Chi Square tests and correlations were used to determine the relationship between pain and selected variables such as age, race, body mass index, hours spent working per week, position of the arms, bending type, hand dominance and smoking. Linear regression allowed for the identification of predictors of pain in hairdressers. Probability was set at p< 0, 05.

Results

Out of 200 hairdressers that were contacted 110 females volunteered to participate in this study. Of these, 75 returned their completed questionnaires and allowed measurement of the identified parameters, resulting in a 68% return rate. Sixty five percent (49) of the participants were Black, 17% (13) Indian, 6% (5) Coloured and 11% (8) White. The participants' age ranged from 20 to 63 years with a mean of 32 years. As shown in Table 1, 85% of the participants were less than or equal to 40 years of age.

participated in sport and other recreational activities. Seventy three percent of the participants were sedentary. A sedentary lifestyle correlated significantly (p= 0, 03) with body mass index (BMI) mass index (classification by the World Health Organization suggests that persons with a BMI between 25- 29, 99 Kg/m^2 are overweight and >29, 99 as obese) which correlated significantly (p=0, 02) with the position of the arms during the task of hairdressing. In this study 31 % of the participants were overweight and 21% obese. Twenty eight percent of the hairdressers reported being smokers and 24% had young children (less than 15 years of age). Of the hairdressers who smoked, 71% complained of pain, while 56% of the non- smokers complained of pain. No relationship existed between smoking and pain but smoking. Ninety one percent of the participants spent more than 75% of their working day standing.

Sixty percent of the participants experienced some pain in the back, or neck or both as shown in Figure 1.

Eighty percent of the participants who reported pain presented with mild pain (1-3), 17% had moderate pain (4-6) and three percent had severe pain (7-10). More hairdressers (93%) who stood for 75-100% of the time complained of pain compared to those who stood for 50% (6%) of the time. A significant

Table 1: Participant information (n=75)

Race	Age (n= 75)		No. of Smokers	Hours worked /week		Number active	No. with pain
	≤40	> 40		≤40	>40		
African	42	7	10	7	42	14	27
Indian	13	0	6	3	10	5	10
Colored	3	2	2	2	3	2	1
White	6	2	3	3	5	7	7
Total	64 (85%)	11	21 (28%)	15 (20%)	60 (80%)	28 (37%)	45 (60%)

The majority of the participants (80%) worked more than 40 hours per week Hours spent working per week correlated significantly (p=0,002) with the manner in which participants bent during their tasks, using their backs rather than their hips and knees. Thirty seven percent of the hairdressers

correlation was found between time spent standing and pain (p=0,002). Sixty one percent of the participants had to bend forward for 50% or more of the time. About 80% of these hairdressers complained of pain. A significant correlation existed between the manner in which participants bent

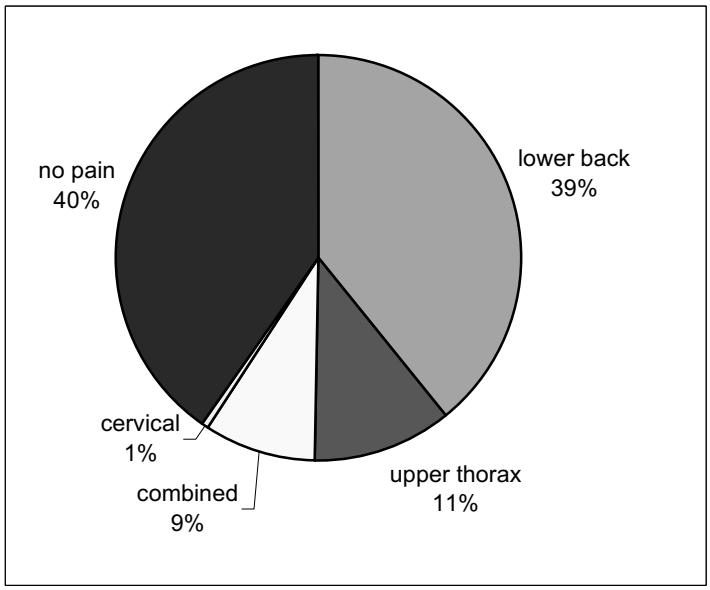

Figure 1 : Pie graph showing proportion of participants with pain in specific areas of the back.

(using their backs) and hours worked per week (p=0,002), pain (p=0,000), site of pain (p=0,000), severity of pain (p=0,000) and position of arms (p=0, 02).

The prevalence of pain was significantly lower in those hairdressers who sat on ergonomically adjusted chairs. Significantly more (87%) of those who worked with their arms at or above shoulder level complained of back pain. Position of arms during hairdressing correlated significantly with age (p=0, 04) pain (p= 0, 00), site of pain (p=0, 00), severity of pain (p=0, 00) and bending type (p=0, 02). Position of the arms was a predictor for pain in hairdressers. Position of arms was related to body mass index ((p=0, 02) and race (0, 04).

Only 12 of the 75 participants practiced their profession using ergonomically constructed chairs. Of these 16, 7% complained of back pain.

In summary, smoking, hours spent working per week, type of bending and position of the arms during hairdressing were significant predictors for pain in hairdressers.

Discussion.

Musculoskeletal pain is commonly associated with muscle weakness, imbalance, injury, poor posture, habits and body mechanics during everyday activities and occupations. It may be a symptom of the ageing, inactive or overactive body but it does not spare anyone, regardless of age or gender. More studies are focusing their attention on musculoskeletal pain in hairdressers (Arokoski et al., 2002; Nevala-Puranen et al., 1998; Veiersted et al., 2008; Guo, 2002; Lin, 2003; Chuang, 2005). In South Africa, no published evidence of research on musculoskeletal dysfunction or pain in hairdressers exists despite it being the third highest risk for occupation related back pain in Taiwan (Guo, 2002). In South Africa hairdressers can begin their business with minimal equipment on a street corner or run exclusive highly rated salons. Regardless of the sophistication of the venue, the motions involved in carrying out the task are essentially the same, posing the same risks. However, the volume of work requires the hairdresser to consider the ergonomics of the furniture used as well as the body mechanics involved to ensure a pain-free career.

This study found that 60% of hairdressers who participated in the study experienced back pain. This is lower than that reported from Taiwan (Chuang, 2005; Fang et al., 2007). Research in Scandinavian countries placed more emphasis on

shoulder pain since working with the arms above shoulder level posed a great risk for shoulder pain (Nevala-Puranen et al., 1998). The participants in our study also worked with their arms above shoulder level for significant periods of time. A significant correlation existed between reports of back pain and working with arms above shoulder level.

When smoking was combined with a chronic cough there was more likelihood of the individual developing back pain (Levangie, 1999; McFarlane et al., 1997). Coughing increases intradiscal pressure and when combined with poor postures and long-standing strain on ligaments, and muscles, back problems are inevitable (Levangie, 1999). Cough as a risk factor for musculoskeletal pain in hairdressers was not addressed in any of the published literature on this topic. In the current study, coughing was not reported by the participants even though 71% of the 21 smokers complained of pain.

A significant proportion of the participants complained of back pain which is consistent with the unacceptable ergonomics of the furniture used as well as the poor attention paid to body mechanics during the tasks undertaken during lifting, bending and twisting (Arokoski et al., 2002;Guo, 2002). Prolonged standing was associated with back pain similar to the study by Omokhodion, Balogun, & Ola-Olorun (2009). Bending was more strongly associated with pain in this study. As the proportion of time spent bending forward using the back, to perform their tasks increased, the proportion of participants who complained of back pain increased. Bending incorrectly places mechanical strain on the posterior longitudinal ligament, which results in stress on the facet joints thereby resulting in pain. In addition, muscle fatigue will result in injury and imbalance (Waddell, 1998).

More hairdressers who stood for 50-100% of the time complained of pain compared to those who stood for 50% or less of their work time. Bennett, Gillis, Romanow, & Sanchez, (1989) reported greater activity in the erector spinae muscles during standing compared to sitting. If this activity is sustained for long periods e.g. a full working day then fatigue is likely to ensue and result in injury and pain. Activities that require sustained forward flexion of the spine result in increased electromyographic activity of the spinal muscles (Bennett et al., 1989). The incidence of back pain was significantly lower in those hairdressers who sat on ergonomically adjusted chairs. An ergonomically correct chair is easily adjustable and maneuverable and allows for easy and regular changes in posture, thereby breaking the chain of a sustained position. Position of the arms also affected the prevalence of back pain. Significantly more (87%) of those who worked with their arms at or above shoulder level complained of back pain. Use of the arms above shoulder level was reported as a risk factor for shoulder, back and neck pain by Arokoski et al., (2002) and Fang et al., (2007).

Putative evidence shows that performing a particular movement more often than others may expose the muscles to strain and thereafter injury. Ischaemic pain may also result due to poor circulation in the overused area where toxic waste products may accumulate. Arokoski et al., (1998) have shown that correctional measures aimed at encouraging hairdressers to work with arms below the shoulder level reduced the incidence of back pain by 40-45 %. The significant prevalence of pain in hairdressers who undertook their tasks in standing may confirm this. An ergonomically designed chair for a hairdresser should allow for easy adjustability and maneuverability and allow regular changes in posture. The chair should have an adjustable backrest to support the normal lumbar lordosis. The height of the chair should be sufficient to allow the feet to rest flat on a surface with the thighs horizontally supported. The seat pan should be horizontal or anteriorly tilted to ensure normal tilt of the pelvis and lordosis of the lumbar spine.

Significantly more participants complained of low back pain. Incorrect body mechanics during tasks such as bending, turning and focusing on the task of ensuring an optimal haircut/style places stress on the highly mobile lumbosacral or the lower cervical joints. Due to the nature of the task, greater stress induced loading could be affecting the lower back more than the cervical joints hence the greater incidence of low back pain (Guo, 2002). In addition the nature of the task, which includes long hours of repetitive movement in sustained postures, may

also be a precursor to overuse strain and injury (Van der Windt et al., 2000).

Conclusion

This study has shown that the prevalence of back pain in hairdressers is significantly high. In addition, hours worked per week, smoking, and position of arms during the task and type of bending were predictors of pain in hairdressers. Since this study focused primarily on pain, there is a need for more in-depth studies to identify additional risk factors in this patient population. This could inform the development of specific preventative programs for hairdressers especially when hairdressing seems attractive as a career to the increasing number of unemployed South Africans. Physiotherapists could initiate and support this need.

The limitations of this study include the scope of the questions covered in the study, the sample size as well the qualitative aspects of the quality of life of the participants which could have been explored.

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