

The prevalence and clustering of non-communicable disease risk factors in a South African financial institution: A challenge to corporate management

M. SWANEPOEL¹, G.L. STRYDOM¹ AND M. COCKERAN²

¹*Physical Activity and Recreation Research Focus Area (PhasRec), Faculty of Health Sciences, North-West University (Potchefstroom Campus), Potchefstroom, South Africa;
E-mail: 12262404@nwu.ac.za*

²*Medicine Usage in South Africa (MUSA), Faculty of Health Sciences, North-West University (Potchefstroom Campus), Potchefstroom, South Africa*

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Abstract

Non-communicable diseases (NCDs) are currently a global epidemic, challenging the individual, corporate environment and health professionals in developed as well as developing countries. It is therefore understandable that comprehensive research has already focused on the detrimental outcomes of NCDs on health, productivity and health care costs in various parts of the world. The aim of this study was to determine the prevalence and clustering of various risk factors associated with NCDs in a financial institution in South Africa. Body mass index (BMI), systolic blood pressure (SBP), diastolic blood pressure (DBP), total cholesterol (TC), casual blood glucose (CBG), stress, smoking habits and physical activity (PA) were determined in a total of 8 132 employees (3097 males and 5035 females) between ages of 18 and 65 years, covering all provinces in South Africa. Groupings were done according to age (< 44 and ≥ 45 yrs.) and gender. Descriptive statistics, prevalence of NCD risk factor and clustering were analysed. The majority of employees assessed were at risk (moderate and high risk) with regard to most of the variables viz. increased BMI (65.8%), SBP (62.1%), DBP (56.6%), stress (58.3%) as well as being low physically active (55.4%). Older males (≥ 45 yrs.) were the most vulnerable group with moderate or high risk in BMI (43.2% overweight and 25.9% obese), SBP (51.3% pre-hypertensive & 26.7% hypertensive), DBP (45.6% pre-hypertensive & 28.5% hypertensive), TC (27.9% borderline high & 7.9% high) and CBG (31.3% borderline high & 23.5% high). Older females showed the highest prevalence of obesity (38.1%), TC (13%), borderline high CBG (35.2%) and stress (31.4%). The risk clustering showed that 42.1% of employees had a clustering of 3-4 risk factors, with older male (48.4%) and female (47.8%) employees experiencing a higher prevalence. Employers should consider the implementation of some health promotion strategies in order to minimize the prevalence of risk factors as well as the migration of employees at risk to higher risk stratum. One strategy, already identified to positively affect most NCD risk factors simultaneously, is the enhancing of physical activity amongst employees.

Keywords: Corporate environment, non-communicable diseases, risk factors, employees' health, productivity.

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Introduction

Employee health and wellness has globally received increased attention due to the enhanced threat of non-communicable diseases (NCDs), which may result in premature morbidity and mortality, leading to severe impact on the corporate environment (WEF, 2013). In this respect it is indicated that in 2008, approximately 63% of all deaths worldwide were attributable to NCDs, with 50% of them in low and middle income countries (WEF, 2013). This situation not only affects productivity (WEF, 2013; Bloom, Cafiero, Jané-Liopis, Abrahams-Gessel, Bloom, Fathima, Feigt,... & Weinstein, 2011), but also the health and health care costs in the corporate environment (Patel, Goetzel, Beckowski, Milner, Greyling, Da Silva, Kolbe-Alexander, Tabrizi & Nossel, 2013). This may contribute to the fact that the focus of occupational health recently shifted to non-communicable diseases and associated risk factors in the workplace (Kolbe-Alexander, Buckmaster, Nossel, Dreyer, Bull, Noakes & Lambert, 2008).

Non-communicable diseases, also labelled as chronic diseases of lifestyle (CDL) (Booth, Gordon, Carlson & Hamilton, 2000), refer to clinical conditions resulting from unhealthy lifestyle, and are slow in progress but long in continuance (Booth *et al.*, 2000). The main causes of CDL which can be modified includes unhealthy diet, tobacco use, physical inactivity and harmful use of alcohol (Bradshaw Steyn, Levitt & Nojilana, 2011; SAMRC, 2011).

The intermediate risk factors for developing NCDs are closely intertwined with common modifiable risk factors and were identified as; elevated blood pressure and blood glucose levels, overweight and obesity and abnormal blood lipid levels (SAMRC, 2011; Van Zyl, Van der Merwe, Walsh, Van Rooyen, Van Wyk & Groenewald, 2010). Suffering from the above-mentioned modifiable risk factors, may contribute to the development of main chronic diseases, e.g. heart disease, stroke, cancer, chronic respiratory disease and diabetes (SAMRC, 2011).

Globally, many concerns have been voiced regarding the threat of NCDs to the community at large (Booth *et al.*, 2000; UNGA, 2011; Hofman, Maredza, Bertram & Tollman, 2011). This global epidemic (Booth *et al.*, 2000) is also present among the African (DCPP, 2007) as well as South African (Van Zyl *et al.*, 2010; Puaone, Tsolekile, Caldbick, Lgumbor, Meghnath & Sanders, 2013) communities. What is more worrisome, is that except for tobacco use, the other risk factors, e.g. alcohol use, physical inactivity, overweight and obesity, hypertension, diabetes and elevated LDL blood cholesterol are rapidly increasing

among South Africans (Bradshaw *et al.*, 2011). As the economic workforce is usually a reflection of the community, the reported concern regarding the prevalence of NCD and associated risk factors in the corporate environment comes as no surprise (Cowan, McDonnell, Levit & Zezza, 2004; WHO, 2014).

These health-risk factors may not only escalate the health care costs for the employee and for the company (Musich, McDonald, Hirsland & Edington, 2003), but also result in a decrease of work productivity (Berger, Howell, Nicholson & Sharda, 2003). In this regard Edginton (2001) stated that companies should manage the health risks of their employees by implementing intervention and health promoting strategies. If neglected, 2-4% of the employees may annually migrate to a higher risk level (Musich *et al.*, 2003).

A study by Kolbe-Alexander *et al.* (2008) in South Africa, indicated that the prevalence of health-risk factors is indeed perturbing amongst employees, reporting the following viz; 86.3% eating fruit and vegetables less than 5 times/day; 69% reflected low physical activity; 48.6% being overweight and obese; 19.9% smoking; 18.6% having a total cholesterol of $\geq 5 \text{ mmol.L}^{-1}$ and 13.0% having systolic blood pressure of $\geq 140 \text{ mmHg}$.

They also reported some clustering of risk factors, e.g. 20% of the employees showed 4 or more risk factors. This should be of great concern to management, as employees with > 4 risk factors are considered to be high-risk individuals, being 1.75 times more likely to exhibit high rates of absenteeism (Serxner, Gold & Bultman, 2001), as well as increased hypertension, heart disease and diabetes (Nakanishi, Suzuki & Tataru, 2003).

Edginton (2001) reported an increase in health care costs as the participants reported more health-risk factors to be present, while Pollock, Wilmore and Fox (1978) described the exponential increased risk of cardiovascular morbidity and mortality in patients with increasing primary risk factors.

In order to assist corporate management to manage employee health and wellness intervention, it is important to assess the prevalence of health-risk factors in the company as well as to determine the clustering of these factors. This was the motivation for this study which was undertaken in a financial company in South Africa.

Methodology

This study forms part of a comprehensive longitudinal study in one of South Africa's largest financial institutions. The data used for this study are based on a cross-sectional survey.

Participants

Employees between 18 and 65 years were part of this non-randomized availability population. As it is the policy of the company not to differentiate between employees, no selection is made between the ethnic groupings. A total of 8132 participants from all provinces in South Africa took part in this survey with 5035 of them being females and 3097 males.

The groups were further divided into a male and female group, aged ≤ 44 yrs. and ≥ 45 yrs. The age classification was done to distinguish between pre- and post-menopausal females, as well as males and females in the pre- and post-clinical horizon age. The average age of the female group ≤ 44 years was 30.66 ± 4.09 years ($N = 4\,159$), whereas the female group ≥ 45 years was 50.91 ± 5.93 years ($N = 876$). The average age for the male group ≤ 44 years was 30.59 ± 5.82 years ($N = 2606$) and the group ≥ 45 years was 51.09 ± 4.37 yrs. ($N = 491$). All participants agreed to the survey and signed the informed consent documents.

Measurements

Stature was measured by using a stadiometer with the head in the Frankfurt plane (nearest 0.5 cm).

Weight was measured by using a calibrated electronic scale (Krupps®) with minimum clothing and barefoot (nearest 0.5 kg).

Body mass index was calculated as suggested by the ACSM (2014). The following cut-off points were used for this variable, e.g. normal (≤ 24.9), overweight (25- 29.9), obese ≥ 30 (ACSM, 2014).

Blood pressure was taken with patient in the seated position, following the procedures described by the ACSM (2014), using the Omron sphygmomanometer. The following cut-off points were used for this variable: Normal (SBP <120 ; DBP <80 mmHg), Prehypertension (SBP 120-139; DBP 80-89 mmHg), Hypertension (SBP ≥ 140 ; DBP ≥ 90 mmHg).

Total cholesterol and *blood glucose* were determined by using the Accutrend® GCT device and a blood sample was collected from a finger prick under non-

fasting condition (casual sample) (ACSM, 2014). The cut-off points for total cholesterol were: Normal ($< 5.2 \text{ mmol.L}^{-1}$), borderline high (Moderate) ($5.2 - 6.2 \text{ mmol.L}^{-1}$) High risk ($\geq 6.3 \text{ mmol.L}^{-1}$) (ACSM, 2014). For blood glucose the following cut-off points were used, bearing in mind that it was a casual (non-fasting) blood glucose assessment that could be affected by numerous factors; therefore this must be seen only as a screening value (NHMRC-AUS, 2005). The following cut-off points for casual blood glucose were used in this study, e.g. $< 5.5 \text{ mmol.L}^{-1}$ = low risk, $5.5 - 11 \text{ mmol.L}^{-1}$ = moderate risk; $\geq 11.1 \text{ mmol.L}^{-1}$ high risk (NHMRC – AUS, 2005).

The physical activity, stress and smoking habits were derived from the coronary risk index questionnaire (Bjurström & Alexiou, 1978).

Physical activity. In this section participants reported their on-job as well as off-job physical activity index on a Likert scale ranging from 0 – 8, with 0 referring to an intensive occupational and leisure-time physical activity profile, and 8 to a sedentary occupational and leisure-time lifestyle. Participants were divided into the following 3 groups, e.g. low physically active (6-8), moderately active (3-5), high physically active (0-2) (Sangala, 2000).

Stress. This was determined by means of the perceived stress the individuals are experiencing, rated on a Likert scale ranging from 1-7, with 1 referring to a situation where no stress is being experienced and 7 indicating a condition of constant high stress. The following cut-off points were set for this variable, e.g. low stress (1-2), moderate stress (3-4), high stress (5-7) (Sangala, 2000).

Smoking. Participants were requested to report their smoking habits according to the following; non-smoker, smoking < 10 cigarettes/day, smoking 10-20 cigarettes/day, smoking 21-30 cigarettes/day and smoking > 30 cigarettes/day. Categorical grouping was done as follows: 0 = non-smoker, 1-20 cigarettes/day = moderate smoker, ≥ 21 cigarettes/day = heavy smoker (Sangala, 2000).

Risk clustering

The clustering of risk factors among the employees were analysed and stratified as suggested by Musich *et al.* (2003) viz: employees with 0-2 risk factors stratified as low risk, 3-4 as moderate risk and ≥ 5 as high risk.

Procedure

The information was gathered from employees in all 9 provinces of South Africa, providing a good reflection of all regions, serviced by the financial institution. Although participation in this health-risk appraisal was optional, it was highly expected by management for the employees to participate. The

assessment was done by qualified biokineticists registered with the Health Professions Council of South Africa (HPCSA), after attending an induction course, offered by the chief biokineticist of the company. The procedure was as follows: participants were invited to take part in the health screening and requested to complete the informed consent as well as the demographic and coronary risk index questionnaire. Weight and height were taken, followed by the resting blood pressure and the finger prick to determine blood glucose and total cholesterol concentration. Calibrations of equipment were done at regular intervals, following the guidelines of the manufacturing company to ensure high-quality measurements.

Ethical approval

Ethical approval for this study was granted by the Institution's Ethics Committee.

Statistical analysis

The data were analysed by using the IBM SPSS version 22 programme. Descriptive statistics included; the mean, standard deviation, minimum and maximum values. The total group was divided into a male and female subgroup according to two age categories (≤ 44 yrs. and ≥ 45 yrs). Statistical (two-tailed *t*-test) and practical significance (effect sizes) were determined by using *p*-values (<0.001) and Cohen's *d*-value, respectively. Effect size (ES) classification was interpreted as follows; 0.2 = small effect, 0.5 = medium effect, 0.8 = large effect size (Sullivan & Feinn, 2012).

Results

Table 1 presents the descriptive statistics of the employees, whereas Figure 1a-h provides the prevalence of the risk factors according to normal, moderate and high classification.

We've also indicated the employees at risk, representing all who show moderate and high risk. Figure 2 displays the clustering of risk factors within the employees. Older males showed a statistically significant higher BMI, SBP, DBP, TC and CBG values compared to younger males (Table 1). Weight, SBP, DBP, TC and CBG values also showed a medium practical significant difference between the groups (Table 1). Older females had a statistically significant higher weight SBP, DBP, TC and CBG compared to younger females, with the SBP, DBP, TC and CBG showing a medium practical significant difference between groups.

Table 1: Descriptive statistics of employees in a South African financial institution

Variable	Males ≤ 44 yrs					Males ≥ 45 yrs					Females ≤ 44 yrs					Females ≥ 45 yrs				
	$\bar{X}$ [N]	SD	Min	Max	$\bar{X}$ [N]	SD	Min	Max	p [ES]	$\bar{X}$ [N]	SD	Min	Max	$\bar{X}$ [N]	SD	Min	Max	$\bar{X}$ [N]	SD	Min
Weight (kg)	79.56 [2537]	16.01	50.00	150.00	85.29 [473]	16.17	50.00	143.00	0.024 [0.35]**	73.13 [3849]	16.19	50.00	150.00	76.97 [837]	17.01	50.00				
Stature (m)	1.74 [2595]	0.07	1.51	2.05	1.73 [486]	0.08	1.50	1.94	<0.001 [0.11]	1.62 [3998]	0.06	1.50	1.89	1.62 [838]	0.06	1.50				
BMI (kg m ⁻²)	26.54 [2521]	4.86	15.83	50.03	27.36 [474]	4.68	17.37	44.82	<0.001 [0.17]	28.15 [3739]	6.17	16.33	57.87	28.93 [795]	6.36	17.64				
SBP (mmHg)	123.66 [2543]	13.48	100.0	182.00	129.65 [480]	15.87	100.0	181.00	<0.001 [0.38]**	117.78 [3738]	12.67	100.0	188.00	126.55 [836]	15.61	100.0				
DBP (mmHg)	79.97 [2250]	9.77	60.00	120.00	84.18 [478]	10.67	60.00	120.00	<0.001 [0.40]**	76.04 [3961]	9.73	60.00	120.00	80.83 [850]	10.14	50.00				
TC (mmol.d L ⁻¹)	4.55 [2589]	0.82	2.50	7.90	4.88 [480]	0.95	2.59	8.60	<0.001 [0.35]**	4.55 [4041]	0.87	2.50	8.30	5.05 [849]	1.03	2.59				
CBG (mmol.d L ⁻¹)	5.42 [2596]	1.32	2.10	17.00	6.26 [485]	2.18	2.40	17.20	<0.001 [0.39]**	5.34 [4123]	1.32	2.00	17.90	5.89 [866]	1.74	2.70				

SBP = Systolic Blood Pressure; DBP = Diastolic Blood Pressure; TC = Total Cholesterol; CBG = Casual Blood Glucose ES = Effect Size: 0.2 = small effect (*); 0.5 = medium

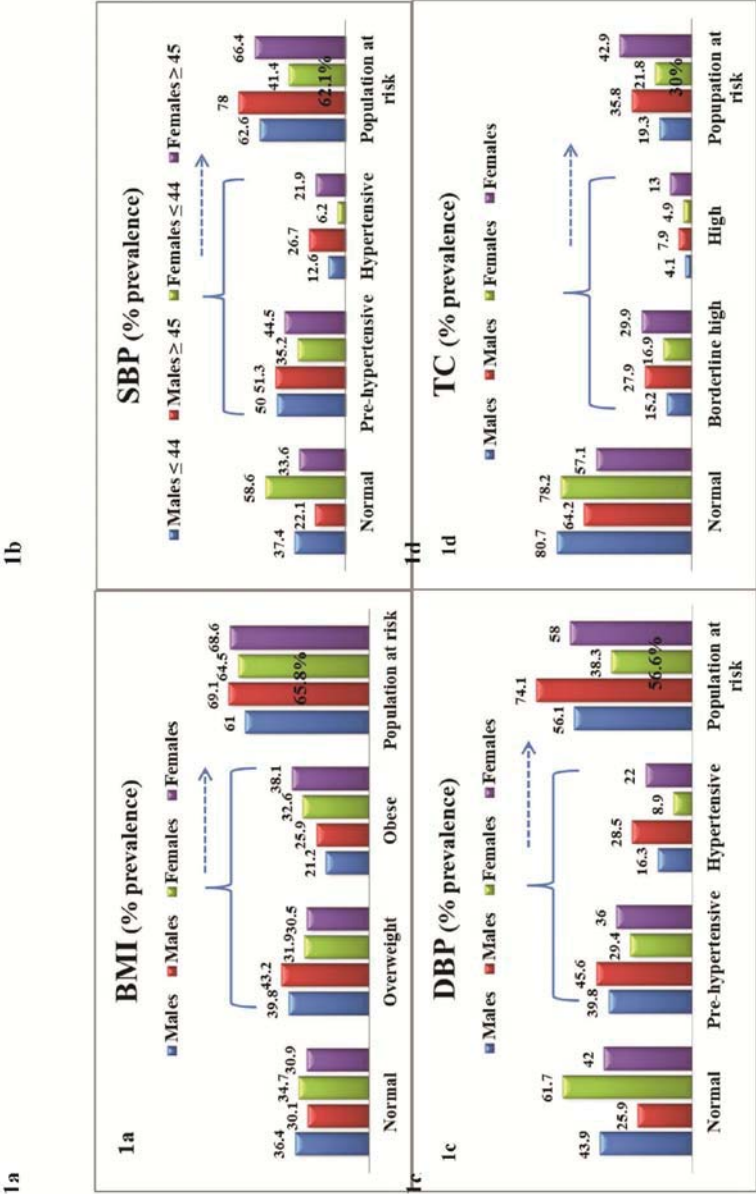


Figure 1 a-d: Profile stratification of employees in a South African financial institution regarding body mass index (BMI), SBP (Systolic blood pressure), DBP (diastolic blood pressure), TC (total cholesterol), CBG (casual blood glucose), stress, smoking and PA (physical activity).

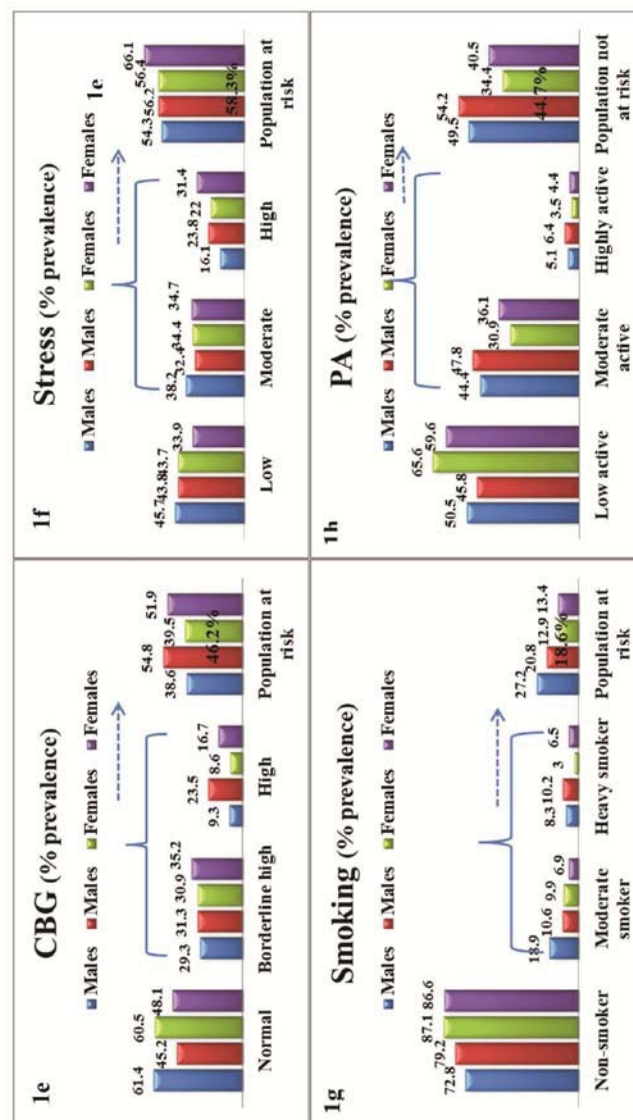


Figure 1 e-h: Continue/ Profile stratification of employees in a South African financial institution regarding body mass index (BMI), SBP (systolic blood pressure), DBP (diastolic blood pressure), TC (total cholesterol), CBG (casual blood glucose), stress, smoking and PA (physical activity).

Figure 1a-h presents the profile stratification of the employees. Males showed a higher prevalence of overweight (43.2% in older males, 39.8% in younger males) whereas females had a higher prevalence of obesity (38.1% in **1b** females, 32.6% in younger females). The overall prevalence of employees at risk (adding the moderate and high category) was high, with a prevalence of 65.8% (Figure 1a).

Older males showed the highest prevalence of pre-hypertension (SBP) (51.3%) and hypertension (26.7%). Males in general showed a greater prevalence of being pre-hypertensive and hypertensive compared to female employees. The overall prevalence of employees at risk (SBP) was 62.1% (Figure 1b). Diastolic blood pressure showed similar tendencies, with older males having the highest prevalence of pre-hypertension (45.6%) and hypertension (28.5%). The overall prevalence for employees at risk for DBP was slightly lower (56.6%) than that of SBP (62.1%) (Figure 1 b & c).

The majority (70.1%) of employees showed normal total cholesterol values (Figure 1d), with younger employees showing the highest prevalence (79.5%). Older females (29.9%) and males (27.9%) had a higher prevalence of borderline high values (5.2-6.23 mmol.dL⁻¹). The overall prevalence of high total cholesterol was low, with the lowest value in younger males (4.1%) and females (4.9%). Older females had the highest prevalence (13.0%) of high total cholesterol. Employees at risk showed a prevalence of 30%.

Casual blood glucose levels showed similar tendencies as TC, with younger employees showing the highest prevalence (61%) of normal values (≤ 5.1 mmol.dL⁻¹) and older employees having a higher prevalence of borderline high (33.3%) and high (20.1%) casual blood glucose values (≥ 7.0 mmol.dL⁻¹). Borderline high values of casual glucose levels showed a higher (14.5%) prevalence in the total group compared to total cholesterol borderline high values (7.5%). The overall prevalence of employees at risk was 46.2% (Figure 1e).

The majority of employees (81.4%) were non-smokers (Figure 1g), with females in both age groups showing a higher percentage of non-smokers, viz. 87.1% (≤ 44 yrs.) and 86.6% (≥ 45 yrs.).

Males showed a greater prevalence of moderate smokers (14.8%) compared to females (8.4%). Older males showed the highest percentage (10.2%) of heavy smokers, followed by younger males (8.3%), older females (6.5%) and lastly younger females (3.0%). The overall prevalence of employees at risk was fairly low (18.6%) (Figure 1g).

Forty four percent of younger employees showed low levels of stress (Fig.1f). In both genders and across age groups moderate stress varied between 32.4% and 38.2%. Older females reported the highest prevalence (31.4%) of high stress, followed by older males (23.8%). The overall prevalence of employees at risk was relatively high with 58.3% (Figure 1f).

Physical activity status exhibited similar tendencies as smoking patterns with the majority (55.4%) of participants being low active. Females were the least active group, with a low activity prevalence of 62.6%.

In both genders and across age groups employees were moderately active, varying between 30.9% and 47.8%. Males showed a higher prevalence (5.8% vs. 4.0%) of being highly active than females, with older males (6.4%) being the most active group, followed by younger males (5.1%), older females (4.4%) and lastly, younger females (3.5%). The overall prevalence of employees at risk was 55.4% (Fig. 1h).

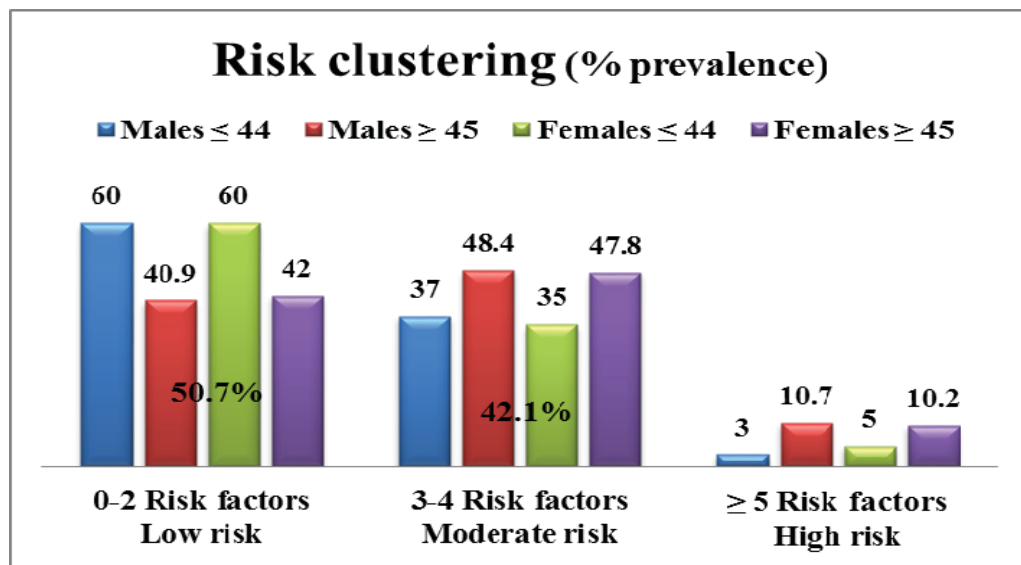


Figure 2: Risk-factor clustering in relation to age and gender.

Figure 2 indicates that younger employees had a greater prevalence of low risk clustering than the older group (60% vs. 41.5%), whereas older employees had a greater prevalence of moderate (48.1% vs. 36%) and high risk (10.5% vs. 4%). The overall risk prevalence clustering for the total group indicated that the majority of employees could be classified as having low (50.7%) risk, followed by moderate (42.1%) and high risk clustering (7.2%).

Discussion

According to the WHO, 43% of deaths in SA are caused by NCDs, with cardiovascular disease showing the highest prevalence (18%), followed by cancer (7%) and diabetes (6%) (WHO, 2014). Major risk factors associated with the onset and development of NCDs are closely linked to behaviour choices and include; smoking, physical inactivity, elevated blood pressure, cholesterol and blood glucose, overweight, chronic stress and alcohol abuse (Booth *et al.*, 2000; Bradshaw *et al.*, 2011; SAMRC, 2011).

Elevated body mass index, blood pressure, total cholesterol, blood glucose, stress, smoking and physical inactivity increase the likelihood of developing NCDs which are associated with increased direct as well as indirect health care and other costs (Edington, 2001; Musich *et al.*, 2003; Wright, Adams, Beard, Burton, Hirschland, McDonald, Napier, Galante, Smith & Edington 2004; Hofman, 2014).

Poor health also results in a higher prevalence of absenteeism and presenteeism, accounting for two to three times the direct medical costs (Musich *et al.*, 2003; Wright *et al.*, 2004). The accumulated losses in South Africa's gross domestic product between 2006 and 2015 from diabetes, stroke and coronary heart disease were estimated at US\$1.88 billion (Abegunde, Mathers, Adam, Ortegon & Strong, 2007).

Employees from our study mirrored the prevalence of risk factors (BMI, BP, TC, BG and physical inactivity) reported by the WHO for the South African population (WHO, 2014) which confirm the negative impact of poor health on companies' most precious resource, namely employees' health, effectiveness and optimal performance.

The mean BMI of all employees can be classified as overweight (BMI between 25.0 and 29.9 kg.m⁻²) with females showing higher values (Table 1). Female employees also showed a higher prevalence of obesity (Figure 1a), with older females displaying the highest prevalence.

Employees at risk for overweight and obese were higher in the older employees compared to the younger group (Figure 1a). Older employees are valuable and experienced assets to companies, as they may be in senior positions and well acquainted with company policies, systems and protocols and contribute significantly to ensure economic sustainability and wealth growth (Joe, Yoong & Patel, 2013; Pitt-Catsoupes, James & Matz-Costa, 2015). Hence special care should be taken to enhance these employees' health status.

Overweight or obese individuals are at greater risk of developing metabolic (glucose intolerance, type 2 diabetes mellitus, dyslipidaemia) and non-metabolic disorders (polycystic ovary syndrome, non-alcoholic fat liver disease, glomerulopathy & bone fragility) (Castro, Kolka, Kim & Bergman, 2014). A systematic review presented by Dee, Kearns, O'Neil, Sharp, Staines, O'Dwyer, Fitzgerald and Perry (2014) indicated a relationship between increasing BMI and direct health care costs as well as indirect costs due to reduced productivity and premature morbidity and mortality.

Furthermore, obesity is associated with more pronounced changes in blood pressure variability during a 24-hour cycle, higher systolic, diastolic, and pulse pressure, indicating autonomic dysfunction or hypertension (Heo, Cho, Lee, Kim & Kosin, 2015). All these risk factors may contribute to increase the prevalence of chronic diseases, presenteeism and absenteeism (Prater & Smith, 2011; Van Nuys, Globe & Ng-Mak, 2014).

The mean SBP and DBP of older male employees can be classified as pre-hypertensive (Table 1) and they also showed the highest prevalence of hypertension placing them at a higher risk (Figure 1b & c). Increased blood pressure is a major risk factor for cardiovascular disease and an indirect cause of death in SA, with a prevalence of 39.9% in males and 34.9% in females (WHO, 2014). Pre-hypertension is a risk factor for the development of hypertension and also an independent risk factor for cardiovascular disease (Veerabhadrapa, Weiss, Bhat & Alweis, 2014).

It is therefore of critical importance to manage or decrease the number of employees that might migrate to the hypertensive category. Veerabhadrapa *et al.* (2014) also indicated that pre-hypertensive individuals were more likely to be obese and have impaired fasting glucose levels. This suggests that pre-hypertension is associated with other cardiovascular risk factors and therefore increase the cardiovascular risk of individuals.

Older male employees in this study showed a lower prevalence of borderline high cholesterol and casual blood glucose (31.3%) compared to the females (35.2%) (Figure 1d & e). More than twenty three percent (23.5%) of older males and 16.7% of older females showed high casual blood glucose levels; these values were higher in comparison with the broader SA population, viz. 11.9% in males and 11.7% in females (WHO, 2014).

Elevated blood glucose levels is a strong indicator of being pre-diabetic, which forms the third leading cause of deaths in SA and also plays a profound role in the development of stroke, the second leading cause of deaths in SA (WHO, 2014). The increased levels of both cholesterol and blood glucose are well-established factors for increasing blood pressure, hence also increases the likelihood of a cardiovascular incident (Jermendy, Horváth, Littvay, Steinbach, Jermendy, Tárnoki, Tárnoki, Météneki & Osztoivits, 2011).

The majority of employees in both genders and in age groups reported low physical activity levels (Figure 1h) with younger females being the least active, followed by older females. It is documented that an active lifestyle is not only associated with overall health benefit, improved functional capacity and quality of life (Arena, Harrington & Despres 2015), but also protects against the development of cardiovascular disease (Myers, McAuley, Lavie, Deprés, Arena & Kokkinos, 2015).

Physical activity levels globally have greatly decreased over the last five decades mainly due to means of transportation, automation as well as social and environmental changes (Archer & Blair, 2011).

This tendency could also be seen in our study, with 55.5% of the total group being physically low active (Figure 1h). This warrants profound consideration from management to ensure enhanced health related physical activity for the employees, in order to improve health and quality of life, hence addressing the growing burden of NCDs in the work place. Research indicated that keeping employees healthy and in the low-risk cluster holds great cost-saving potential (Edington, 2001; Musich *et al.*, 2003).

Employers need to take note of the prevalence of these risk factors and strategize accordingly. Edington (2001) and Musich *et al.* (2003) advise companies to keep low-risk employees at low risk and in good health since this approach is more cost effective than focusing on high-risk populations.

Special attention should further be focused on managing the migration of employees from a moderate, to a high-risk cluster (Figure 2) since productivity and health care costs are directly linked to poor health status (Musich *et al.* (2003).

Reducing or preventing only one health risk, increases an employees' productivity and reduces absenteeism (Musich *et al.*, 2003). Enhancing opportunities for employees to be more physically active could serve as a cost effective catalyst used to address a combination of risk factors directly and indirectly.

Living a physically active lifestyle not only influences various body systems (especially the cardiovascular system and body composition) positively, but may also affect other lifestyle habits such as diet, alcohol consumption, sleep and smoking patterns (Blair, Jacobs & Powell, 1985; Booth *et al.*, 2011; Powell, Paluch & Blair, 2011).

Eliminating or decreasing a physically inactive lifestyle could account for a decrease of between 6-10% of the major NCDs of chronic heart disease, type 2 diabetes, breast and colon cancer (Lee, Shiroma, Lobelo, Puska, Blair & Katzmarzyk, 2012).

Special note should also be taken because employee's risk profile is not static, therefore regular health screenings and health programmes, optimizing employee's health should be a constant priority for employers. Physical activity holds beneficial value for about 23 diseases or health conditions and should therefore be the cornerstone of health promotion strategies (Pratt, Norris, Lobelo, Roux & Wang, 2012).

Employers wanting to adopt an effective health promotion strategy should take note that a programme's success strongly depends on the programme goals, design, implementation and evaluation and should also fit the culture of the organization (Goetzel, Henke, Tabrizi, et al., 2014).

Limitation

Results of this study represent only one financial institution in South Africa and could therefore not be extended to other companies in the financial sector. This study also includes a cross sectional available sample, where random stratified selection may provide more reliable results

Conclusion

Globally as well as in SA, NCDs are rapidly growing challenges. Older males and females are especially vulnerable, and risk factors in all groups, linked to CVD and metabolic diseases (blood pressure, smoking, TC and CBG) should be monitored to prevent increases in health care cost and decreases in productivity and quality of life of the employees.

The number of employees at risk for the various health-risk factors should be of concern to management – as except for smoking (18.6%), all other risk factors are moderate (30%, TC) to very high (65.8%, BMI) and according to WEF (2013) this situation could deteriorate in the decade to come.

Appropriate intervention programmes in the workplace become critically important since employees spend the majority of their time at work. Encouraging employees to be physically more active could serve as a cost effective strategy to target multiple risk factors associated with the development of NCDs.

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