

The relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context

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COMMENTS

The reader is reminded of the following:

- The *editorial style* of this manuscript follows the guidelines of the South African Journal of Industrial Psychology (SAJIP).
- The *referencing* in this mini-dissertation follows the format prescribed by the Publication Manual (6th edition) of the American Psychological Association (APA). These practices are in line with the policy of the Programme in Industrial Psychology of the North-West University (Potchefstroom) to use the APA style of referencing in all scientific documents as from January 1999.
- The mini-dissertation is presented in the form of a research article.

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- Last but not least, thank you to Cecilia van der Walt for the professional language editing service on this dissertation.

DECLARATION

I, Gerhardus Jacobus Engelbrecht, hereby declare that “*The relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context*” is my own work and that the views and opinions expressed in this work are those of the author and relevant literature references as cited in the manuscript.

I further declare that the content of this research was not and will not be submitted for any other qualification at any other tertiary institution.



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Dear Mr Engelbrecht

ETHICAL CLEARANCE

This letter serves to confirm that the research project of Gerhardus Jacobus Engelbrecht, with the title **“The relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context”** has undergone ethical review. The proposal was presented at a Faculty Research Meeting and accepted. The Faculty Research Meeting assigned the project number **EMSMHW16/04/21-01/04**. This acceptance deems the proposed research as being of minimal risk, granted that all requirements of anonymity, confidentiality and informed consent are met. This letter should form part of your dissertation manuscript submitted for examination purposes.

Yours sincerely

Prof PW Buys
Director: WorkWell Research Unit

DECLARATION OF LANGUAGE EDITING



12 APRIL 2017

I, Ms Cecilia van der Walt, hereby confirm that I took care of the editing of the mini-dissertation of Mr Gerhard Engelbrecht titled *The relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context.*

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SUMMARY

Title: The relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context

Keywords: Work intensity, workaholism, burnout, musculoskeletal complaints

Technological advances within the work environment has dynamically changed the tools by means of which work is done lately and the methods applied for doing it, with a large amount of modern work being fast-paced and sedentary in nature, i.e. seated in front of a computer screen. These prolonged hours spent in single statue-like form could have long-term negative effects on employees' health.

Work intensity refers to an experience of high job demands coupled with high time demands, which inhibits employees' ability to effectively recover energy expended during the work day. Workaholism, as a phenomenon of working excessively and compulsively, also hampers effort-recovery in the long term. This erosion of energetic capacity can have detrimental consequences for the afflicted such as burnout and musculoskeletal complaints – which in turn can affect organisational performance.

The general objective of this study was to determine the relationship between work intensity, musculoskeletal complaints, workaholism and burnout. A quantitative and cross-sectional research design was adopted. The data was collected by means of convenience sampling among white-collar office employees within an engineering organisation in the Gauteng province of South Africa ($n = 398$). Confirmatory factor analysis was conducted within a structural equation modelling framework to test the research hypotheses.

The results revealed that a positive interrelatedness of all the concepts, namely i) work intensity, ii) workaholism, iii) burnout, and iii) musculoskeletal complaints exists. Specifically work intensity displayed a positive and significant relationship with musculoskeletal complaints. Work intensity also displayed a significant positive relationship with both workaholism and burnout. Furthermore, Workaholism had a positive relationship with musculoskeletal complaints and with burnout. Lastly, burnout demonstrated a significant and positive relationship with musculoskeletal complaints.

Recommendations were made for further consideration, with the practice in mind. Further to this, limitations of this current research and avenues for future research were discussed.

Opsomming

Titel: Die verband tussen werkintensiteit, werkverslawing, uitbranding en muskuloskeletale klagtes binne die Suid-Afrikaanse konteks

Sleutelwoorde: Werkintensiteit, werkverslaafdheid, uitbranding, muskuloskeletale ongesteldhede

Tegnologiese vooruitgang binne die werksomgewing het dinamies verander met betrekking tot die gereedskap waarmee werk tans verrig word en die wyse waarop dit uitgevoer word. Talle moderne beroepe het snel en sedentêr van aard geraak – met ander woorde gesete voor 'n rekenaarskerm. Hierdie lang uitgerekte ure waartydens 'n konstante standbeeldagtige houding gehandhaaf word, kan op lang termyn nuwe-effekte hê op werknemers se gesondheid.

Werkintensiteit verwys na hoë werkseise gepaard met hoë tyd-eise, wat die vermoë van werknemers om die energie wat hulle gedurende die werkdag verbruik het, effektief te herwin. Werkverslaafdheid – 'n verskynsel wat voorkom by mense wat oormatig en kompulsief werk – belemmer ook op die lange duur die energieherstel-proses. Hierdie erosie van energiekapasiteit kan nadelige gevolge hê vir diegene wat ly, soos uitbranding en muskuloskeletale ongesteldhede, wat op hul beurt organisasie-prestasie beïnvloed.

Die oorkoepelende doel van hierdie studie was om die onderlinge verband tussen werkintensiteit, muskuloskeletale ongesteldhede, werkverslawing en uitbranding te bepaal. 'n Kwantitatiewe en deursnee-navorsingsontwerp is hiervoor aangewend. Die data is ingesamel aan die hand van gerieflikheid-steekproefneming onder witboordjie-werknemers binne 'n ingenieurswese-organisasie in Gauteng, 'n provinsie van Suid-Afrika ($n = 398$). Bevestigende faktorontleding is gedoen binne 'n strukturele vergelyking-modelleringsraamwerk om die navorsingshipoteses te toets.

Die resultate het getoon dat 'n positiewe verband onderling by al die faktore, naamlik i) werkintensiteit, ii) werkverslawing, iii) uitbranding en iv) muskuloskeletale ongesteldhede, voorkom. Werkintensiteit spesifiek hou positief en betekenisvol verband met muskuloskeletale ongesteldhede. Werkintensiteit hou ook betekenisvol positief verband met

beide werkverslawing en uitbranding. Werkverslaafdheid hou verband met beide muskuloskeletale ongesteldhede en uitbranding. Laastens hou uitbranding betekenisvol positief verband met muskuloskeletale ongesteldhede.

Aanbevelings is gemaak met die praktyk in gedagte. Voorts is beperkings van die onderhawige navorsing asook moontlikhede vir toekomstige navorsing bespreek.

CHAPTER 1
INTRODUCTION

Introduction

Work is inexorably linked to human existence (Geldenhuys, Laba & Venter, 2014). However, work has changed dynamically over the last few decades due to the rise in digital technology and the internet. The rapid increases in modern technology has led to computer exposure (both at work and as a leisure activity) being more common, resulting in increases in health-related problems – specifically with regard to neck, back and shoulder pains (Ming, Närhi & Siivola, 2004). Work is a fundamental part of modern society but when employees are (self-) driven too hard with a view to achieve results, their motivation, health, meaning in life as well as economic contribution will be adversely impacted (Boucekkine, Core, Hritokenko & Yatsenko, 2014). The well-being of employees has become a more important subject of research seeing that employers and organisations have come to realise the negative impact it will have on organisational performance if employee health is simply ignored. Not only does a disregard for employee health lead to decreased performance in terms of capacity, but also to an increase in employee turnover and absenteeism (Grant, Christianson & Price, 2007; Spector, 1997).

1.1 Problem statement

The importance of employee health and well-being cannot be disputed, as research has shown that it directly impacts an organisation's efficiency and productivity. For example, when employees are negatively affected it will lead to negative consequences for the organisation such as less engaged staff and increased absenteeism among them (Merrill et al., 2013). Work overload has been shown to lead to work-related stress, which causes workers to become affected (e.g. stress-related ill-health) (De Beer, Pienaar & Rothmann, Jr., 2016), with the eventual need to seek medical advice if the distress does not abate (cf. De Beer, Pienaar & Rothmann Jr., 2013; Kim & Park, 2006). Work overload is an aspect of work intensity and can be described as having more work to do than is realistically possible within a certain timeframe (Boxall & Macky, 2014). Work intensity has a strong negative influence on the work-life balance of employees and leads to increased exhaustion and levels of stress (Boxall & Macky, 2014). Moreover, Burke, Singh and Fiksenbaum (2010) state that work intensity is an underdeveloped construct in research literature in general, but can be described as an amalgamation of emotional demands, job demands and time demands. More recently, work intensity has been described as working at high-pace levels in an attempt to reach strict

deadlines within the working environment (Franke, 2015). For the current study, the Franke (2015) conceptualisation of work intensity is adopted, i.e. working at high-pace levels and time pressure (e.g. deadlines). It should be noted that, no matter the position of an employee within an organisation; if they experience disproportionate work intensity, it can cause harm to their well-being (Boxall & Macky, 2014), e.g. musculoskeletal complaints.

Musculoskeletal complaints can be described as any condition associated with pain or discomfort felt in the bones, muscles, joints, tendons, cartilage and/or nerves, specifically in the areas of the back, arms, neck or legs due to elements at work (Aghilinejad, Mousavi, Nouri & Ahmadi, 2012; Tiaden & Richards, 2013; Engels, Van der Gulden, Senden & Van't Hof, 1996; Van Tulder, Malmivaara & Koes, 2007). Musculoskeletal disorders, specifically pertaining to the lower back and upper extremities are considerable health risks for Western industrialised societies (IJzelenberg, Molenaar & Burdorf, 2004). When employees experience pain they are more likely to be absent from work and therefore less productive (Merrill et al., 2013). Evidence also suggests that interventions for musculoskeletal complaints only alleviate pain; it does not necessarily cure it. The reason for this low recovery success rate could be attributed to the difficulties in the diagnostic processes – even though some interventions may relieve pain there is a lack of evidence-based data on the effectiveness of those interventions in the long term. As such the extent to which employees take less sick leave and return to work faster is minimal (Van Tulder et al., 2007).

Furthermore, musculoskeletal complaints are of widespread concern globally and have repercussions for the individual and for society as a whole. The severity of this disorder is emphasised by the economic cost associated with musculoskeletal conditions for developed and developing countries; in the USA the costs accumulated to 3% GDP in 1995 which can be converted to \$215 billion US dollars and \$240 billion US dollars in 1998 (Yelin, 2003). More recently the projected cost of musculoskeletal disease was 7.7% of the GDP in the USA, which converts to \$849 billion dollars in 2004 (cf. Oh, Yoon, Seo, Kim & Kim, 2011). Furthermore, musculoskeletal complaints not only attribute to loss in productivity in the form of absenteeism, but also in the form of presenteeism in that employees that are not at optimal health and report musculoskeletal complaints are also not functioning optimally at work (De Beer, 2014; Schultz & Edington, 2007). In a study conducted by Jhun, Cho and Park (2004), the results revealed that workload was connected to musculoskeletal symptoms, especially back complaints. Engels et al. (1996) found that work intensity was also positively associated

with most musculoskeletal complaints, i.e. back, leg, arm, and neck symptoms. Other constructs that correlated positively with work intensity included workaholism, hours of work, workload and work-related stress (Burke et al., 2010). Musculoskeletal diagnoses account for the majority of reduced work-capacity cases; the prognosis for recovery is more favourable for less exhausted employees than for workaholics (Schultz, Mostert & Rothmann, 2012).

Workaholism has become a prevalent phenomenon within organisations, which needs to be managed more effectively to offset its damaging effects on employee health and productivity (Horton, 2011). Oats (1971) defines workaholism as ‘the compulsion or uncontrollable need to work incessantly’ (p.11). Workaholism is also described as a need to spend an extraordinary amount of time on work and work-related tasks; more than is sensibly expected by an organisation (Schaufeli, Taris & Van Rhenen, 2008). Burke et al. (2010) found that work intensity was unrelated to the different mechanisms of workaholism, but that it was related to stress. However, Schaufeli et al. (2008) found that ‘workaholism was related to excess working time (over-work and percentage overtime), poor quality of social relations (negative reactions of others), health problems (distress and psychosomatic complaints), job demands, and positive work outcomes (organisational commitment)’ (p. 191) – indicating a contradiction in that work intensity may well be related to workaholism. Noteworthy associations have been established between workaholism, absenteeism, psychological ill health, physical ill health and back pain (Matsudaira et al., 2013). Musculoskeletal complaints have been correlated with perceived stress along with computer usage of equal to or longer than 4 hours per day and it is safe to assume that workaholics work even longer periods of time (Hess, 1997). Furthermore, Horn (2015) found a significant positive correlation (large effect size) between workaholism and burnout.

Maslach (1982) presented that burnout comprises three components, namely emotional exhaustion, depersonalisation and reduced personal accomplishment. Emotional exhaustion is a feeling of being beleaguered and worn out by those emotional stressors placed on individuals by their work. Depersonalisation refers to having a general contemptuous and disconnected outlook towards those one works for and/or works with, and reduced personal accomplishment is a negative subjective feeling individuals have towards their effectiveness, the quality of their work or their capacity to fulfil their job roles (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Demerouti et al. (2001) contend that it is reasonable to expect

work intensity to have a positive correlation with both workaholism and burnout. When employees are consistently faced with high work demands, their energy is depleted faster and they subsequently need longer periods of rest in order to recuperate to normal functionality and if the recovery process is not adequate or is interrupted by work demands, it causes employees to spiral down into a position of constantly needing more recovery but never truly recovering all the energy expended, leading to burnout (Schultz et al., 2012). A longitudinal study conducted by Armon, Melamed, Shirom and Shapira (2010) concluded that burnout is a significant predictor of musculoskeletal complaints and that this relationship is unidirectional, i.e. musculoskeletal complaints do not increase burnout. Therefore evidence indicates that burnout is a predictor of musculoskeletal complaints and not vice versa.

To summarise, the aim of this study is to investigate a conceptual model for testing the relationships between work intensity, workaholism, burnout and musculoskeletal complaints. What this study proposes is that when employees are experiencing higher work intensity than is normal it should increase workaholism and burnout levels which will have detrimental consequences for employee health in the form of increased musculoskeletal complaints. Within the South African context some studies have been performed on the individual factors of workaholism (Horn, 2015), burnout (Pretorius, 1994; Van der Colff & Rothmann, 2009) and musculoskeletal complaints (Naidoo, Kromhout, London, Naidoo & Burdorf, 2009; Schierhout, Myers & Bridger, 1993). However, no research exists that considers the combined relationship of these factors in one model. This study will address this gap in an attempt to shed more light on these relationships which could assist employees and organisations to function optimally and more efficiently.

1.2 Research questions

- How is work intensity, musculoskeletal complaints, workaholism and burnout conceptualised in the literature?
- What is the relationship between work intensity and musculoskeletal complaints?
- What is the relationship between work intensity, workaholism and burnout?
- What is the relationship between workaholism, burnout and musculoskeletal complaints?
- What recommendations can be made for future research and practice?

1.3 Expected contribution of the study

The current study expects to contribute towards the individual, the organisation and the literature.

1.3.1 Contribution to the individual

By gaining a clearer understanding of the relationship between the factors of work intensity, workaholism, burnout and musculoskeletal complaints, the risks associated with prolonged intense work, specifically the physical effects (musculoskeletal complaints) and psychological effects (burnout and workaholism), can be established. Relevant professionals could become more aware of these relationships through popular journal publications and could implement organisation-wide awareness campaigns to combat the negative impacts employees are likely to experience in the future. Thus, by gaining a better understanding of these factors' interrelationships, recommendations can be made for the individual in order to alleviate the pain experiences of musculoskeletal complaints, and inform employees about the risks associated with workaholic behaviour and burnout. This in turn could lead to a rise in the individual's productivity, mental health and physical health. Clearer insight into the relationship between these factors could also equip employees to take more responsibility for their personal well-being by adjusting their lives so as to address the development of workaholism, burnout and musculoskeletal complaints by lowering the work intensity they place on themselves and negotiating with their employers to work more reasonable hours.

1.3.2 Contribution to the organisation

By analysing the relationship between work intensity, workaholism, burnout and the effects thereof on musculoskeletal complaints, this study could assist organisations to better understand musculoskeletal complaints that are experienced in their environment, the effects it has on employees within the organisation as well as the contributing effects the other factors of burnout, workaholism and work intensity have by causing the employee's health and functionality to deteriorate. This could lead to the development of interventions (e.g. policies and awareness campaigns) that might alleviate these factors and increase eventual organisational performance stemming from less pain experienced by employees and them

functioning optimally. This could then potentially lower absenteeism as well as presenteeism stemming from work intensity, musculoskeletal complaints, workaholism and burnout.

1.3.3 Contribution to Industrial Psychology literature

Currently, literature on the relationship between all the constructs, *work intensity, workaholism, burnout and musculoskeletal complaints* in one study is lacking. According to literature, various different areas of the body can be affected by musculoskeletal complaints. This study contributes to the body of knowledge concerning those musculoskeletal complaints specifically affecting the hands, wrists, fingers, forearms, elbows, upper back, shoulders, neck, lower back and the eyes. This study will shed light on how these constructs function in relation to one another in an attempt to better comprehend the dynamics of musculoskeletal complaints within the South African context. This study also creates a basis on which future research can build to determine the causality behind workaholism, burnout and musculoskeletal complaints resulting from work intensity.

1.4 Research objectives

The research objectives are divided into a general objective and specific objectives.

1.4.1 General objective

To determine the relationship between work intensity, musculoskeletal complaints, workaholism and burnout.

1.4.2 Specific objectives

- To determine how work intensity, musculoskeletal complaints, workaholism and burnout are conceptualised in literature.
- To determine the relationship between work intensity and musculoskeletal complaints.
- To determine the relationship between work intensity, workaholism and burnout.
- To determine the relationship between workaholism, burnout and musculoskeletal complaints.
- To make recommendations for future research and practice.

1.5 Research hypotheses

H_{1a}: Work intensity has a positive relationship with musculoskeletal complaints.

H_{1b}: Work intensity has a positive relationship with workaholism.

H_{1c}: Work intensity has a positive relationship with burnout.

H₂: Workaholism has a positive relationship with musculoskeletal complaints.

H₃: Workaholism has a positive relationship with burnout.

H₄: Burnout has a positive relationship with musculoskeletal complaints.

1.6 Research design

1.6.1 Research approach

A quantitative, cross-sectional approach was adopted by using survey questions regarding the constructs in order to reach the goals of this study, the intent of which was to establish, confirm, explain and validate the relationships of the constructs (cf. De Vos, Strydom, Fouché & Delpont, 2011). For the purpose of this specific study a cross-sectional design was adopted and therefore it was non-experimental in nature in that no control group or experimental groups were utilised and the data was collected at only one specific point in time (De Vos et al., 2011).

1.6.2 Research method

Two phases were implemented, namely a literature review and an empirical study. The results are presented in the form of a research article.

1.6.3 Literature review

Literature regarding work intensity, musculoskeletal complaints, workaholism and burnout was thoroughly reviewed. Various sources were consulted to gather information. Several research engines were used, namely Google Scholar, EbscoHost (Academic search premier, business source premier, E-Journals, CINAHL with full text, EconLit, ERIC, PsychARTICLES, PscyINFO) and LexisNexis. As part of this search the following journals

are examples of what was used: *South African Journal of Industrial Psychology*; *Stress and Health*; *Burnout Research*; *Work and Stress*; *Journal of Occupational Health Psychology*; *The International Journal of Human Resource Management*; *International Journal of Stress Management*; *Journal of Occupational and Organisational Psychology*; *Journal of Organisational Behaviour*; *Organizational Psychology and Organizational Behaviour*; *Journal of Applied Psychology*; *Journal of Personality Assessment*; *Journal of Psychosomatic Research*, *Journal of Social Issues*; *Journal of Occupational and Environmental Hygiene*; *Psychology & Health*; *Journal of Health Psychology*.

1.6.4 Research participants

Convenience sampling was done to gather data amongst employees ($n = 398$). This sampling method aimed at including individuals that vary in terms of age, gender and ethnicity in order to gain a representative sample which is comparable with the greater South African population sample. All participants had to be proficient in English in order to be able to complete the questionnaire, i.e. grade 10 or above. Participants were limited to white-collar employees (office workers) who spend the majority of their working day seated in front of a computer in order to reach their job requirements. Furthermore, research participants included in this study were employees within the engineering sector of South Africa. Employees within this industry met the criteria of the study as the vast majority of the organisations' employees spend their working day in an office behind a computer.

1.6.5 Measuring instruments

Biographical information was obtained using a biographical questionnaire to gather all relevant information concerning the participants, such as: age, gender and ethnicity.

Work intensity was measured as a single factor consisting of perceived role overload and time demands. *Role overload*, defined as 'having too much work to do in the time available' (Beehr, Walsh & Taber, 1976, p. 42), uses a six-item scale (e.g. 'It often seems like I have too much work for one person to do'). *Time demands* refers to the expectations management places on an employee's time that might interfere with non-work activities, and was measured using a slightly modified (where 'my' and 'organisation' were originally referred to, the words 'your' and 'manager' were substituted) four-item measure developed by

Thompson, Beauvais and Lyness (1999) (e.g. ‘To get ahead in my organisation, employees are expected to work more than their contracted hours each week’). The Cronbach’s alpha coefficients had satisfactory reliability with time demands being 0.82 and overload 0.87. Responses were measured on 7-point Likert-type scales, bounded from 1 = Strongly disagree to 7 = Strongly agree.

Workaholism was measured with The Dutch Work Addiction Scale (DUWAS-10) (Schaufeli, Shimazu & Taris, 2009). The scale includes a total of 10 items: two 5-item subscales measuring *working excessively* (e.g. ‘I spend more time working than on socializing with friends, on hobbies, or on leisure activities’) and *working compulsively* (e.g. ‘I feel obliged to work hard, even when it is not enjoyable’). The DUWAS-10 is scored on a four-point Likert-type scale, ranging from 1 (Almost never) to 4 (Almost always). The Cronbach’s alpha coefficients for these sub-scales varied between 0.80 and 0.86 (Del Líbano, Llorens, Salanova & Schaufeli, 2010). This scale has been validated in South Africa, but was found to be a one-factor structure, with acceptable reliability (Horn, 2015). This current study will compare the two-factor and one-factor model to ascertain the best-fitting model.

Burnout was measured as a single factor comprising the items of its core components: Exhaustion and depersonalisation (De Beer & Bianchi, 2017), using the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981). Thus 14 items from the scale, scored on a 7-point frequency-rating scale ranging from 0 (Never) to 6 (Every day), were used, specifically: *Exhaustion* (9 items, e.g. ‘I feel emotionally drained from my work’) and *Depersonalisation/Cynicism* (5 items, e.g. ‘I worry that this job is hardening me emotionally’). The original Cronbach’s alpha coefficients were 0.90 and 0.79 (Maslach et al., 1996). Aguayo, Vargas, De la Fuente & Lozano (2011) examined the Cronbach’s alphas for the dimensions across 45 empirical studies and found the average Cronbach’s alpha for these dimensions to be 0.88 and 0.71 respectively, indicating a reliable scale.

Musculoskeletal complaints were measured using an adapted scale from the South African Health and Wellness Survey (SAEHWS, Rothmann & Rothmann, 2007) to clearly distinguish between the conditions. Four questions were stipulated in order to determine the experience of eyestrain, muscle stiffness and neck, shoulders and/or lower and upper back pain, including: ‘Over the last three months, how often did you experience pain and/or spasms in the upper back, shoulders, or neck?’, ‘Over the last three months, how often did

you experience discomfort or stiffness in the hands, wrists, fingers, forearms or elbows?'; 'Over the last three months, how often did you experience eyestrain?'; and 'Over the last three months, how often did you experience pain and/or spasms in the lower back?' The items are rated on a four-point Likert scale, ranging from 0 (Almost never) to 4 (Almost always).

1.6.6 Research procedure

Prior to data collection, approval for the research project and ethical authorisation was sought from the research committee of North-West University's Faculty of Economic and Management Sciences. Upon receiving ethical clearance, permission from the CEO of the engineering firm was obtained for collecting the data. Appointments were arranged to meet with the CEO and managers in person after which they were presented a letter which explained the overall goal of the study. Participant-informed consent was provided by informing candidates that participation was voluntary and that anonymity and confidentiality is guaranteed as no follow-up information is required. Appointments were made with the organisation to deliver the questionnaires to the participants by hand, since this raises the response rate due to the personal contact and the participants not being inconvenienced due to scheduling of appointments prior to the delivery of the questionnaires (De Vos et al., 2011). Questionnaires were presented to participants and they were given a work week (5 days) to complete and submit their questionnaires. Envelopes were provided in which the questionnaires were to be placed after completion thereof, prior to depositing it in a sealed container located at each department's exit on the premises of the organisation involved. It took approximately 15 minutes to complete the questionnaire. The CEO and management received an email three days prior to the collection date so that they could remind participants to complete the voluntary survey. The data was collected, after which it was captured in a Microsoft Excel spread-sheet and statistically analysed.

1.6.7 Statistical analysis

Mplus 7.4 was used to investigate the research objectives (Muthén & Muthén, 2015). First a confirmatory factor analysis (CFA) was conducted with structural equation modelling methods to establish the measurement model. The fit of the CFA model was considered with the: Comparative fit index (CFI), Tucker-Lewis index (TLI), and Root mean square error of

approximation (RMSEA); acceptable values for the CFI and TLI were considered to be 0.90 and above – and for the RMSEA 0.08 or below (Van de Schoot, Lugtig & Hox, 2012). Cronbach’s alpha reliability coefficients were calculated for all of the constructs. A correlation matrix was also generated to consider the relationships between the study variables and effect sizes for the correlations were regarded as being practically significant at $r > 0.30+$ for a medium effect, and $r > 0.50$ for a large effect (Cohen, 1992). Thereafter a structural model was specified as per Figure 1 to establish the regression coefficients for the specified relationships. For this model, the size and direction of the beta coefficients were considered and the stated hypotheses accepted.

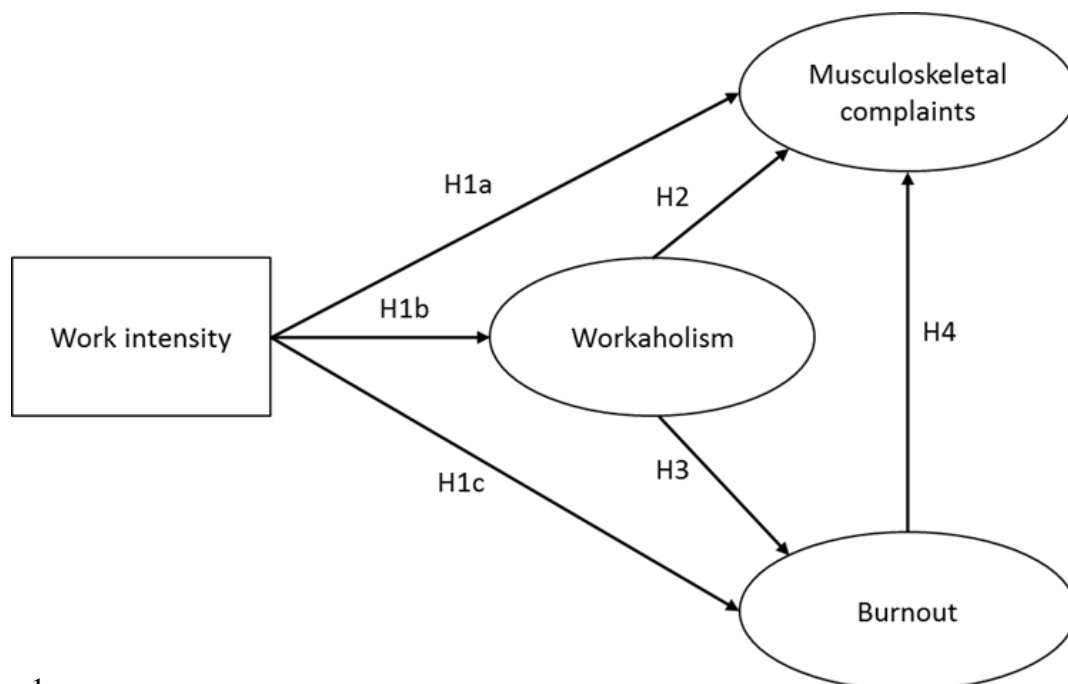


Figure 1.
The structural model with the research hypotheses.

1.6.8 Ethical considerations

Ethical clearance (Reference: EMSMHW16/04/21-01/04) to conduct the research was obtained from the Faculty Research Committee. Ethical conduct was strictly adhered to at all times during the execution of the study. Firstly, informed consent was obtained from all participants (Foxcroft & Roodt, 2013). The researcher did not deceive, mislead or harm the participants. Participants were notified two days prior to receiving the questionnaires by means of email regarding the voluntary nature of the study, and were informed that all information provided would be kept strictly confidential and that their personal anonymity was ensured (De Vos et al., 2011; Foxcroft & Roodt, 2013). The first page of the

questionnaire contained all the information pertaining to the study, including the participants' rights and responsibilities. With a view to ensure their anonymity, participants were not required to provide their names. Envelopes were provided in which the questionnaires were to be placed prior to depositing it into sealed containers which were placed on the premises of the organisations involved, further ensuring anonymity. After the data had been collected it was safely and securely stored at North-West University (Foxcroft & Roodt, 2013).

1.7 Chapter division

The chapters in this mini-dissertation will be presented as follows:

Chapter 1: Introduction

Chapter 2: Research article

Chapter 3: Conclusions, limitations and recommendations

1.8 Chapter summary

This chapter comprised the following: The problem statement, research objectives and the research hypotheses. The measuring instruments used were described as well as the research methods applied, followed by a brief overview of the chapters comprising the mini-dissertation.

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CHAPTER 2
RESEARCH ARTICLE

The relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context

Abstract

Orientation: Technological advances within the work environment have dynamically changed the tools by means of which work is done lately and the methods applied for doing it, with a large amount of modern work being fast-paced and sedentary in nature, i.e. being seated in front of a computer screen. These prolonged hours spent in a single statue-like form could have long-term negative effects on employees' health.

Research purpose: This study investigated the relationship between work intensity, workaholism, burnout and musculoskeletal complaints.

Motivation for the study: The results of this study could assist organisations in gaining a clearer understanding of how each of these constructs influences the other, promoting a healthier, and ultimately more productive workforce.

Research design, approach and method: A cross-sectional research design was adopted and implemented by means of a survey that was conducted amongst office employees within the engineering sector ($n = 398$). Structural equation modelling methods were applied to analyse the data.

Main findings: The results revealed that work intensity was positively related to workaholism and that workaholism was in turn also positively related to employees' burnout and musculoskeletal complaints. Lastly, burnout was also shown to be significantly related to musculoskeletal complaints.

Practical/Managerial implications: It is important for organisations to consider the effects of work intensity and workaholism within their organisation. Awareness of the phenomenon and the promotion of effort-recovery is important to obviate the effects that it may have on employee health and well-being in the long term.

Contribution/Value-add: The results indicate that working prolonged and strenuous hours can have negative effects on individuals' health with regard to workaholic behaviour, experiencing burnout and musculoskeletal complaints, which could adversely impact the organisation's triple bottom line.

Keywords: *Work intensity, workaholism, burnout, musculoskeletal complaints*

Introduction

Organisations are profit driven. This directly relates to how productive employees can be for an organisation, and as such employees are expected to provide the maximum amount of input without the necessary consideration as to what these strenuous working tasks and hours may have on the employees' health and well-being. Some organisations simply consider human capital to be a means to an end, until these employees eventually burn out and/or leave the organisation in search of a more meaningful and less demanding career (Malik & Rowley, 2015; Romano, Catalfo & Nicotra, 2014).

Organisations do not always realise the huge costs associated with this continual process of turnover, recruitment and training for a position they had already previously filled (Loquercio, 2006). The technological innovations and advances that have developed, despite the goal which is to make our lives more comfortable, can have an adverse effect in the sense that advances in technology have made us more capable of completing multiple tasks at the same time or have increased our capacity to work after normal labour hours, and organisations have taken advantage of this fact by placing more demands on employees (Boucekkine, Core, Hritoneko & Yatsenko, 2014). Hence as technology advances it can also increase the intensity of work demands placed on employees, e.g. being able to perform multiple tasks, working away from the office and also after hours.

This tendency to overextend the capacity of employees can lead to detrimental consequences for both the employee – in the form of burnout and musculoskeletal conditions – and the organisation – in the form of productivity/performance loss resulting from employees being unable to come to work efficiently or at all, due to being chronically disabled by the physical pains of musculoskeletal complaints or due to suffering from burnout (Maslach, Schaufeli & Leiter, 2001; Armon, Melamed, Shirom & Shapira, 2010). Additionally, when employees consistently work strenuously long hours, for prolonged periods of time and are rewarded for such behaviours instead of their behaviour being discouraged and it being deemed negative, it will only serve to reinforce those workaholic type tendencies (NG, Sorensen & Feldman, 2007).

The importance of technology's role in musculoskeletal complaints is further highlighted by the fact that the most technologically advanced countries, with United States of America and Japan being the top two (Khan, 2016), have found that 21.3% of Japanese and 10-15% of United States employees, respectively, are working 49 hours or more per week. This high percentile of work hours has detrimental consequences for both the employee and organisational in the form of strokes, heart attacks and suicides, all originating from excessive work demands which can lead to absenteeism and possible turnover in the organisation (Bell, Otterbach & Sousa-Poza 2012; Virtanen, Ferrie, Singh-Manoux & Shipley, 2011). This phenomenon has been termed '*karoshi*', which translates to 'death from overwork', and has claimed 2 159 victims resulting from suicides in 2015 (The Guardian, 2016). Hence this area of research is timely and important.

Literature Review

Work intensity

Work intensity has been described as working with increased time demands, having a heavier aggregate workload and subsequently experiencing higher levels of stress within the work environment (Burke, Koyuncu, Fiksenbaum & Acar, 2009). When employees experience high levels of work intensity it leads to exhaustion and distress and places additional pressure on their work-life balance (Floro & Pichetpongsa, 2010). This occurs in every occupational position within an organisation; thus the experience of excessive job demands alongside constrained time demands chip away at all employees' well-being (Boxall & Macky, 2014). Consequently, when attempting to gain optimal performance from employees, a balance needs to be found between their capacity and the amount of work intensity placed upon them, to ensure that their levels of well-being are promoted or maintained (White, Hill, McGovern, Mills & Smeaton, 2003).

For the purpose of this study the conceptualisation of work intensity as per Boxall and Macky (2014) was acknowledged, depicting work intensity as having too much work to perform for the amount of time given; thus a form of role or work overload, coupled with time demands placed on the employee. Work intensity has been argued to have a negative effect on employee well-being in terms of increasing fatigue, stress and work-life interference (Boxall

& Macky, 2014). Therefore employee health is likely to be damaged when exposed to high levels of work intensity over extended periods of time, caused by stress resulting from time pressures and role overload (Floro & Pichetpongsa, 2010). A higher incidence of work intensity is reported among women and could be explained by their additional household responsibilities which they face after a full day at work, whereas men tend to relax more when they arrive home (Floro & Pichetpongsa, 2010). Increases in work intensity lead to further distress due to employees being unable to realistically complete their work within a normal timeframe, causing them to not detach and subsequently work after hours to complete unfinished tasks (Parris, Vickers & Wilkes, 2008).

Workaholism

Various motivational forces have been researched in an attempt to determine causality behind employees working extended hours. These include aspects such as financial problems, avoiding an unhappy home life, the culture within the organisation, direct management placing additional responsibilities on employees, or even a personal drive to progress further in one's career, but they do not necessarily lead to workaholism (Schaufeli, Taris & Van Rhenen, 2008). However, Schaufeli and colleagues also found that workaholism has shown correlation with excessive working time, increasingly negative social relationships, increased physical and mental stress and lastly increased job demands.

Workaholism has differing definitions, elements, and meanings. For researchers there is no clear consensus with regard to a definition, and the following are some of the more widely used descriptions of workaholism. Workaholism has been described as consisting of three components, namely i) compulsion or obsession, in that the lives of workaholics are consumed by thoughts of work when they are at home, as well as them being reluctant to extricate themselves out of the work environment, both physically and mentally; ii) excess, in that workaholics occupy themselves with work-related tasks whenever they have the opportunity to do so – thus spend a vast amount of their time working beyond what the organisation reasonably expects from them; and iii) the addiction component of workaholism which refers to employees becoming addicted to the adrenaline rush as well as the actual work process, which could be attributed to individual personality aspects, cultural or social environment, and the reinforcement of such behaviours (Tabassum & Rahman, 2012). NG et al. (2007) have also described workaholism as consisting of three dimensions, namely first of

which is 'affective' which relates to the incumbents' passion for their work, which prompts them to put in excessive working hours and leaves them feeling anxious or guilty when they are not working. Secondly, 'cognitive' relates to the incumbents' compulsion to work excessively or even think about work when they are not at work; and lastly, the 'behavioural' dimension relates to the incumbents' physical amount of time spent at work or the work-related thoughts they have – thus interconnecting their personal and work life.

Workaholism relates to a negative compulsivity, in the sense that the incumbent surrenders to the need to work, despite the negative consequences of lower life satisfaction, heightened incidences of ill health and a decrease in performance (Shimazu & Schaufeli, 2009). The term 'workaholic' is used to refer to a person that is addicted to work, having a craving and/or an overwhelming/unmanageable desire to work ceaselessly (Yaniv, 2011). Workaholism has shown an association with a lack of job resources, specifically a lack of job control and supervisor support which may be caused by supervisors that only want to see the results and subsequently give their subordinates a surplus of work, giving them a lack of autonomy in how they manage their work (Schaufeli et al., 2008).

Workaholism has also been described as having high levels of work involvement, being driven along with low scores on enjoyment of work (Spence & Robbins, 1992). Although more recent literature presents workaholism in a negative light, some contradictions can be found within literature which paints the picture of being a workaholic as a sought-after trait in an employee, as it can be associated with various other positive aspects such as a strong drive to further one's career prospects, a strong drive to achieve success or even fuelled by the need to be seen as an asset within the organisation's culture (Taris, Schaufeli & Verhoeven, 2005).

Therefore there are those who consider workaholism as a potentially positive characteristic in an employee. However, this view is problematic in the sense that those who find meaning and motivation in their long hours of work are regarded as being engaged (work engagement), whereas workaholics have an obsessive-compulsive need which they cannot contend with (Schaufeli, Shimazu & Taris, 2009). Workaholism is an addiction and as with every addiction there are negative consequences (Tabassum & Rahman, 2012). Workaholism leads to a reduction in the quality of the addict's relationships as workaholics place more value on their work than on personal relationships and as such they are less caring, which in turn leads to a reduction in feelings or even in levels of attraction towards their partners. An over-

commitment to work leaves less time for family, which leads to work-family conflict (Tabassum & Rahman, 2012). Moreover, workaholism negatively impacts well-being. This is a consequence of never truly detaching, and recovering from exerted effort during work hours. Since addicts think about work even when they are not at work they become mentally, emotionally and physically exhausted over time, and the well-being of the addicts' partners are also affected as a result of the additional demands placed on them at home as well as the resulting work-life conflict (Tabassum & Rahman, 2012). Therefore, given this information, workaholism cannot possibly be considered a positive phenomenon.

Consequently, for the purpose of this study, workaholism was conceptualised as comprising two components, namely i) working excessively, which refers to working more than is reasonably expected, and ii) working compulsively, which refers to having an inherent need that forces the incumbent to obsess about work, even at home (Schaufeli et al., 2009). Moreover, workaholism has also been described as one of the core causes of burnout (Maslach, 1986).

Burnout

Burnout is a popular concept, and has been described as a syndrome that arises when an individual works with other people, which results in the individual becoming emotionally exhausted – thus feeling psychologically impaired at the prospect of interacting further with people; developing a cynical outlook and/or mood towards others; as well as experiencing a rise in negative valuation of one's own capabilities, leading to further hopelessness and discontentment with their work (Maslach & Jackson, 1981; Schaufeli & Bakker, 2004). Research has shown that burnout can develop in all types of careers, regardless of the human interaction requirement originally stated, and that it is directly related to health problems and turnover intention (Schaufeli & Bakker, 2004). According to the literature, burnout consists of three main components, namely i) exhaustion, ii) depersonalisation (cynicism) and iii) reduced personal accomplishment (Bakker, Demerouti & Euwema, 2005; Maslach & Jackson, 1981). However, when measuring the presence of burnout, the dimensions of exhaustion and depersonalisation are the core factors required (De Beer & Bianchi, 2017; Lee & Ashforth, 1990). Hence, for purpose of this study, the conceptualisation of burnout consists of exhaustion and depersonalisation (De Beer & Bianchi, 2017). Maslach, Jackson & Leiter (1997) describe these dimensions as follows: Exhaustion refers to weariness and stress

experienced by the incumbent due to the deterioration/impoverishment of their mental and emotional resources; Depersonalisation/Cynicism is described as a sense of indifference or even negative feelings towards work, stemming from an incapacity to effectively deal with the demands placed on the individual by the work.

Burnout occurs when people are exposed to stressors over an extended period of time and do not effectively recover from the experienced stress or demands (Els, Mostert & De Beer, 2015). These stressors/demands refer to factors such as toxic work environments, conflict situations at the workplace (or home), individuals not receiving the recognition they feel they deserve, them being overloaded with work, or when they experience an imbalance in their work-home life, which makes it challenging or even impossible for the individuals to disconnect themselves from; thus inhibiting their ability to relax and recover their personal resources (Bakker & Demerouti, 2007; Els et al., 2015).

According to Langballe, Innstrand, Hagtvet, Falkum and Aasland (2009), burnout has a strong relationship to musculoskeletal complaints, specifically in the information technology industry as a possible result of employees sitting in stationary positions for prolonged periods of time – this relationship was to be strongest with the dimension of exhaustion. Thus it can be construed that when employees experience excessive job demands in relation to their job resources they will become increasingly exhausted, cynical and thus eventually suffer from burnout, which will then start influencing their health, specifically in terms of musculoskeletal complaints.

Musculoskeletal complaints

Musculoskeletal complaints result from repeated physical movements or (static) postures which in turn cause damage to various areas of the body such as tendons, bones, nerves, muscles and other soft tissue (Cho, Hwang & Cherng, 2012). The main areas of the body afflicted by musculoskeletal complaints resulting from computer usage are the shoulders, neck and upper back. Shoulder and upper back complaints are also substantially related to higher psychological distress (Cho et al., 2012). Musculoskeletal complaints has been referred to as an experience of pain, tingling, numbness that may be experienced all the time in extreme cases, which could be caused by inflammation in the muscles or neural compression (Zakerian & Subramaniam, 2009). Musculoskeletal complaints have negative

effects on both the individual and the organisation as a whole, which subsequently impacts the economy due to the fact that those afflicted with musculoskeletal complaints score a higher rate of absenteeism and turnover intentions and experience lower life satisfaction (Tinubu, Mbada, Oyeyemi & Fabunmi, 2010).

Franke (2015) found that when work intensity increases, musculoskeletal complaints also increase – albeit only slightly, and that there are stronger associations with ambient and physically demanding work. Lower back pain is one of the most prevalent forms of musculoskeletal complaints in adults, with 60-80% of individuals expected to suffer from this form of musculoskeletal complaints at some point in their lives (Tinubu et al., 2010). Musculoskeletal complaint occurrences increase as both age and tenure increase (Tinubu et al., 2010).

Studies have shown that tissue micro traumas occur as a result of these repetitive or intense tasks which cause mechanical tissue injury, leading to inflammation. When these tissue injuries are not given enough time to recover, additional stress is placed on the inflamed tissue in a never-ending cycle which could lead to chronic inflammation or even deterioration of the tissue resulting in pain or even loss of motor function (Barbe & Barr, 2006).

Again, the main causal factor of musculoskeletal complaints within the areas of the neck, back, shoulder and elbow areas are due to awkward posture and for the areas of the forearms, wrists and fingers is the repetitive nature of tasks. Another possible contributing factor towards musculoskeletal complaints may be due to people spending their free time passively in front of a TV/computer screen instead of being more active in performing physical activities and other hobbies (Cho et al., 2012).

Barbe and Barr (2006) point out that various factors are found within the work environment which could cause musculoskeletal complaints or could exacerbate already present symptoms such as physical, biomechanical, psychosocial conditions and individual predispositions, and intensity and repetition of work-related tasks, especially when these tasks are performed for extended periods in uncomfortable, static postures or in cold temperatures. Stressful factors within the work environment such as job demands, control and social support also impact musculoskeletal complaints, as well as physical demands and high stress levels at home (National Research Council, 2001).

Cho et al. (2012) found that men and women experience the predominance of musculoskeletal complaints in different areas of the body. Cho and colleagues state that men tend to experience musculoskeletal complaints more prevalently within the neck area and women in the shoulder area. The prevalence for men might be explained by poor ergonomics seeing that men are on average taller, while desks and chairs are designed for the general populace, causing greater strain in the form of needing to compensate by flexing the neck in an awkward position for extended periods of time. Women's affinity to musculoskeletal complaints in the shoulder region could be attributed to their need to lift their shoulders in order to compensate for a comparatively elevated desk height. Therefore the importance of ergonomics in the workplace is an imperative factor to consider with regard to musculoskeletal complaints. For the purpose of this study musculoskeletal complaints was conceptualised as the frequency with which employees experience work-related pain, discomfort or stiffness in the i) hands, wrists, fingers, forearms or elbows, ii) upper back, shoulders, lower back or neck, and iii) eye strain.

The relationship between work intensity and musculoskeletal complaints

Wergeland et al. (2003) established that musculoskeletal complaints could be combatted by reducing the time spent at work, by lowering the length of time employees are expected to be at work, and thereby giving employees more time to recover from their strenuous tasks. Evidence also exists that if the workload of a normal 8-hour day is completed within a 6-hour day, it actually increases reports of musculoskeletal complaints; thus the element of workload plays an important role in perceived musculoskeletal complaints alongside time demands (Wergeland et al., 2003). Thus, if such intervention is to be effective, the volume of workload and the time demands should be reduced to reflect a true 6-hour working day.

Higher levels of psychological distress is meaningfully related to musculoskeletal complaints within the upper back, neck and shoulder regions and musculoskeletal complaints shows a higher prevalence within the area of the lower back when people are exposed to higher levels of workload (Cho et al., 2012). Cho and colleagues found no significant difference in variance between the group of employees experiencing musculoskeletal complaints due to working more than 3 hours seated in front of a computer (but less than 7 hours) and the group that spent more than 7 hours seated in front of a computer. However, at less than 3 hours working in front of a computer, the risk for musculoskeletal complaints is significantly

lowered. Moreover, in a study by Sprigg, Stride, Wall, Holman and Smith (2007) it was found that when employees experience high workload their likelihood of developing musculoskeletal complaints increases due to the employees' inability to rest because they are constrained to their desks requiring them to perform repetitive actions. This then specifically affects the areas of the upper body and lower back because one position is held for lengthy periods of time.

Hypothesis 1a: Work intensity has a positive relationship with musculoskeletal complaints.

The relationship between work intensity and workaholism

Work intensity has been shown to be positively and significantly related to longer working hours along with higher perceived workload, but not to the components of workaholism (conceptualised as consisting of the factors of work involvement, feeling driven to work and work enjoyment) (Burke, Singh & Fiksenbaum, 2010). Workaholism correlates positively with the number of hours spent working per week (Andreassen, Hetland, Molde & Pallesen, 2010).

When employees have intense work demands in terms of role overload and time demands they are placed in a state that is conducive to the development of workaholic tendencies, and as previously discussed, workaholism consists of three components, namely obsessive/compulsive, excess and addiction (Tabassum & Rahman, 2012). When an organisation fosters a culture that praises, rewards and values employees that work intensely, the employees start adopting this culture which systematically increases the excess to which they work, because employees start placing additional value on working harder and longer hours through incentives and castigations (Griffiths & Karanika-Murray, 2012; Liang & Chu, 2009). When this culture becomes a norm within organisations, employees are more likely to start portraying addictive tendencies because their negative behaviours are being reinforced with rewards and are seen to be appropriate behaviour; peer competition occurs; and the adrenaline rush from reaping the rewards (monetary and personal excitement) for each completed task further compels the employees to become addicted. Such organisations are directly responsible for reinforcing the behavioural component of workaholism (Liang & Chu, 2009). Once these two components have set in it becomes more likely that employees

will start obsessing about work (Tabassum & Rahman, 2012). Within the South African context, the construct of workaholism has shown evidence of being positively correlated with aspects of work intensity, i.e. work overload and time demands (Horn, 2015). Hence it is argued and expected in this study that work intensity will exacerbate or contribute to workaholic behaviour in employees.

Hypothesis 1b: Work intensity has a positive relationship with workaholism.

The relationship between work intensity and burnout

When employees experience high job demands (e.g. work overload and time demands) their levels of burnout increase (Hakanen, Bakker & Schaufeli, 2006). Horn (2015) found that burnout is positively related to both work overload and hours of work, thus related to work intensity as conceptualised in the current study. Time demands and work overload relate to emotional exhaustion which is one of the core elements of burnout (Schaufeli & Bakker, 2004). Therefore the more time employees spend on strenuous work tasks, the less time they will have to recover all of their energy, which will result in eventual burnout for the employee (Bakker & Demerouti, 2007). Time demands as well as work overload also correlate positively with burnout (Hakanen et al., 2006; Kokkinos, 2007; Peeters & Rutte, 2005; Schaufeli & Bakker, 2004; Skaalvik & Skaalvik, 2008).

Time demands as well as role overload are job demands, and when these demands become too taxing they eventually lead to exhaustion, which causes burnout (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). In a study undertaken by Skaalvik and Skaalvik (2010) it was established that time demands was the strongest predictor of emotional exhaustion among teachers. When time demands lead to stress it reduces the incumbent's attitude towards others due to a lack of emotional resources. This stress correlates highly with depersonalisation and negatively with personal accomplishments, which both are elements of the construct *burnout* (Abel & Sewell, 1999). A study executed by Purdy, Lemkau, Rafferty and Rudisill (1987) found that time demands was overwhelmingly perceived by staff as the greatest cause of burnout.

Hypothesis 1c: Work intensity has a positive relationship with burnout.

The relationship between workaholism and musculoskeletal complaints

Workaholism has been shown to be related to musculoskeletal complaints, specifically to the experience of back pains (Matsudaira et al., 2013). When employees become over-engaged in their work life for extended periods of time it can lead to them experiencing higher levels of exhaustion, resulting from the loss of effort-recovery time, missing breaks or ignoring the pain, which further leads to psychological and physical distress, in turn heightening their experiences of musculoskeletal complaint symptoms (Schultz, Mostert & Rothmann, 2012).

A study performed by Andreassen et al. (2010) found significant correlations between musculoskeletal complaints and two of their three workaholism components (work involvement, drive, work enjoyment) – those that reported experiencing lower work enjoyment and higher work drive also reported more musculoskeletal complaints. Workaholics have the tendency to overload themselves with unnecessary work by creating or taking on additional tasks such as re-evaluating already completed work and/or striving for unrealistic perfection (Horn, 2015; Stoeber & Damian, 2016). This additional workload leads to the workaholic experiencing additional negative psychosocial factors such as anxiety and depression, which subsequently leads to them experiencing musculoskeletal complaints (Sprigg et al., 2007).

Musculoskeletal complaints have become a more prevalent disease in the last few decades as employees' responsibilities are mainly found behind a computer screen. These physically static and repetitive computer-based tasks have led to an increased prevalence of musculoskeletal complaints (Sharan et al., 2011). It can thus be inferred that musculoskeletal complaints are related to workaholism, because workaholics place greater job demands on themselves and tend to spend more time working seated in front of a computer, which will cause eventual musculoskeletal complaints.

Hypothesis 2: Workaholism has a positive relationship with musculoskeletal complaints.

The relationship between workaholism and burnout

Literature states that a positive relationship exists between workaholism and burnout in that individuals who exhibit workaholic behaviour are inclined to overwork and thus work

themselves into an eventual state of burnout (Schaufeli et al., 2008). Within the South African context, it has also been found that workaholism and burnout are highly correlated (Horn, 2015). Workaholics tend to place excessive work demands on themselves due to their incapacity to detach from the work environment, their obsessive nature and their addiction, and when employees are working at consistently high levels of work demands it may lead to burnout (Schaufeli et al., 2008). The workaholic is incapable of managing time- and work demands effectively, which leads to an imbalance in the process of recovering personal resources or energy. If this cycle continues over extended periods of time, the incumbent will experience burnout. Workaholics love their work. However, due to their monotonous activities and addictive personality their behaviours exhaust their physical and mental resources (Bakker & Oerlemans, 2011).

Furthermore, workaholics tend to strive for perfection (unobtainable standards) in their work, which leads them to recheck and redo their work over and over again, never truly being satisfied with the end product, subsequently placing additional demands on themselves (Horn, 2015; Stoeber & Damian, 2016). This process of incessant inclination to place unexpected demands upon themselves leads to exhaustion (Molino et al., 2016). When placed in such a state of consistent stress it becomes problematic for the workaholic to recover the lost energy; this is when exhaustion leads to burnout (Bakker & Demerouti, 2007; Sonnentag, 2001).

Hypothesis 3: Workaholism has a positive relationship with burnout.

The relationship between burnout and musculoskeletal complaints

Burnout increases the risk of developing musculoskeletal complaints by as much as twofold, and this relationship is unidirectional in that musculoskeletal complaints have been found to not predict the development of burnout (Armon, Shirom, Melamed & Shapira, 2010; Langballe et al., 2009; Jaworek, Marek, Karwowski, Andrzejczak & Genaidy, 2009). Research on musculoskeletal complaints indicates that there is a moderate to strong relationship with all the dimensions of burnout (Langballe et al., 2009). However, it is unclear what the exact cause is behind the increased experience of musculoskeletal complaints when a person is suffering from burnout, but research has shown that burnout is correlated with increased cortisol levels and that burnout invokes somatic responses in the

body that disturb metabolic processes (i.e. catabolic and anabolic) (Ekstedt, 2005; Ekstedt et al., 2006; Melamed et al., 1999). Moreover, burnout has also been shown to disturb the hypothalamic–pituitary–adrenal-axis (HPA) which is implicated in various illnesses and could be a potential explanation for the link as well (Mommersteeg, Heijnen, Verbraak & Van Doornen, 2006). Static working positions or lifting heavy objects also increases the risk of developing musculoskeletal complaints due to the strain placed on the affected areas through micro traumas while those suffering from burnout already have trouble recuperating from the exhaustion of their mental and physical resources due to ineffective effort recovery (Langballe et al., 2009).

Hypothesis 4: Burnout has a positive relationship with musculoskeletal complaints.

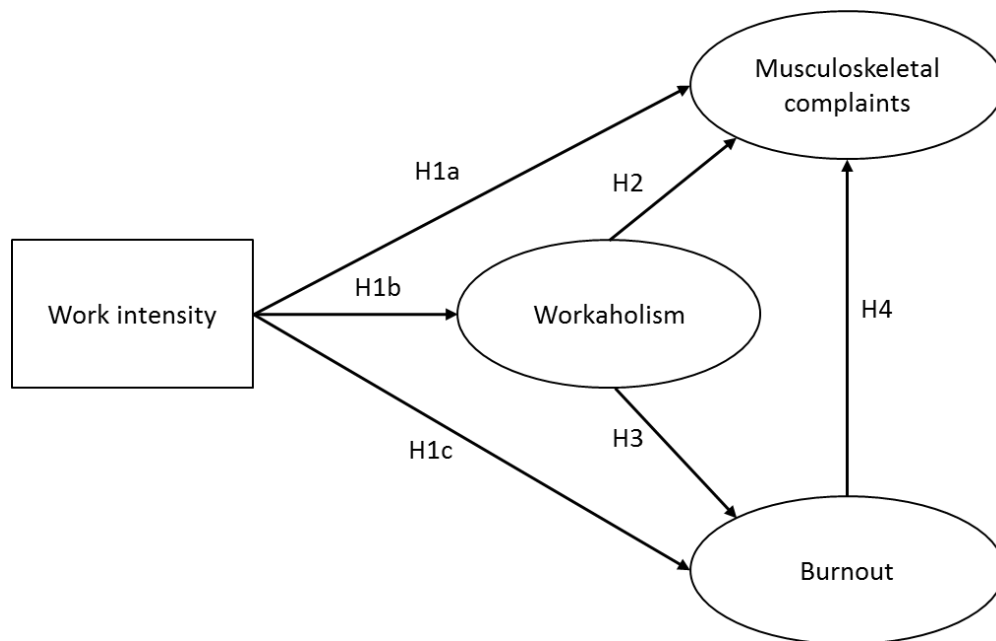


Figure 1. *The structural model with the research hypotheses*

Research design

Research approach

The research approach followed for this study was quantitative in that a sample of participants was utilised with regard to the collection of data by means of questionnaires (items with ordered scale choices) in order to use statistical techniques in an attempt to prove the relationships hypothesised by this study (Hopkins, 2008). The study also applied a cross-

sectional design to measure the differences of the participants at a specific point in time (Mann, 2003).

Research method

Research participants

Convenience sampling was applied to collect the data in a large South African engineering organisation due to the nature of the study being quantitative. A minimum of 300 participants were sought, but more was acquired ($n = 398$). The engineering sector was an appropriate target population due to the nature of the work and the targeted participants being only white-collar employees (office workers) falling within the criteria of spending extended hours seated in front of a computer screen. Due to the industry's tough work demands it was expected that the intensity of work, along with burnout, workaholism and musculoskeletal complaints would be prevalent among the participants (Frankson, 2015). The participants were diverse in terms of the departments in which they work, gender, age and ethnicity.

The average (mean) age of the participants was 39.82 years with a standard deviation (SD) of 10.57 years. Other characteristics of the participants are displayed in Table 1. The majority of the sample comprised female employees ($n = 216$; 54.27%) with the overall group consisting of mostly black ($n = 235$; 59.05%) and white ($n = 97$; 24.37%) employees.

Table 1

Characteristics of the participants

Item	Category	Frequency	Percentage (%)
Gender	Male	171	42.96
	Female	216	54.27
	Missing values	11	2.76
Ethnicity	Black employees	235	59.05
	White employees	97	24.37
	Coloured employees	26	6.53
	Indian employees	23	5.78
	Missing values	13	3.27
	Other employees	3	0.75
	Asian employees	1	0.25

Measuring instruments

Biographical information was obtained using a biographical questionnaire to gather all relevant information concerning the participants, such as: age, gender and ethnicity.

Work intensity was measured as a single total score consisting of the mean values of perceived role overload and time demand scores. A six-item scale was used for measuring *Role overload*, defined as ‘having too much work to do in the time available’ (Beehr, Walsh & Taber, 1976, p. 42) (e.g. ‘It often seems like I have too much work for one person to do’). *Time demands* refers to management’s expectations regarding an employee’s time, which might interfere with non-work activities, and was measured using a four-item measure developed by Thompson, Beauvais and Lyness (1999) (e.g. ‘To get ahead in my organisation, employees are expected to work more than their contracted hours each week’). The Cronbach’s alpha coefficients had satisfactory values, with time demands being 0.82 and overload 0.87. Responses were measured on 7-point Likert-type scales, bounded from 1 = Strongly disagree to 7 = Strongly agree.

Workaholism was measured using the Dutch Work Addiction Scale (DUWAS-10) (Schaufeli et al., 2009). The scale includes a total of 10 items: two 5-item subscales measuring *working excessively* (e.g. ‘I spend more time working than on socializing with friends, on hobbies, or on leisure activities’) and *working compulsively* (e.g. ‘I feel obliged to work hard, even when it is not enjoyable’). The DUWAS-10 is scored on a four-point Likert-type scale, ranging from 1 (Almost never) to 4 (Almost always). The Cronbach’s alpha coefficients for these sub-scales varied between 0.80 and 0.86 (Del Líbano, Llorens, Salanova & Schaufeli, 2010). This scale has been validated in South Africa, but was found to be a one-factor structure in the afore-mentioned study, with acceptable reliability (Horn, 2015). This current study will compare the two-factor and one-factor model to ascertain the best-fitting model.

Burnout was measured as a single factor comprising the items of its core components *exhaustion* and *depersonalisation* (De Beer & Bianchi, 2017) by using the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981). Therefore 14 items, scored on a 7-point frequency-rating scale ranging from 0 (Never) to 6 (Every day), were used from the scale, specifically: *Exhaustion* (9 items, e.g. ‘I feel emotionally drained from my work’) and *Depersonalisation/Cynicism* (5 items, e.g. ‘I worry that this job is hardening me

emotionally'). The original Cronbach's alpha coefficients were 0.90 and 0.79 (Maslach et al., 1996); Aguayo, Vargas, De La Fuente and Lozano (2011) examined the Cronbach's alphas for the dimensions across 45 empirical studies and found the average Cronbach's alpha for the these dimensions to be 0.88 and 0.71 respectively.

Musculoskeletal complaints were measured using an adapted scale from the South African Health and Wellness Survey (SAEHWS, Rothmann & Rothmann, 2007) to clearly distinguish between the conditions. Four questions were stipulated in order to determine the experience of eyestrain, muscle stiffness and neck, shoulders and/or lower and upper back pain, including 'Over the last three months, how often did you experience pain and/or spasms in the upper back, shoulders, or neck?'; 'Over the last three months, how often did you experience discomfort or stiffness in the hands, wrists, fingers, forearms or elbows?'; 'Over the last three months, how often did you experience eyestrain?'; and 'Over the last three months, how often did you experience pain and/or spasms in the lower back'. The items were rated on a four-point Likert scale, ranging from 0 (Almost never) to 4 (Almost always).

Research procedure

Ethical clearance was obtained for the study from the North-West University's Faculty Research Committee (EMSMHW16/04/21-01/04). The human capital manager and other relevant managers of a large South African engineering organisation were contacted in order to gain clearance to proceed with the research process within their working environment. The organisation has seven broad departments, all of which were given questionnaires to enable them to participate in the study so that the researcher could gain insight into the organisation as a whole. A total of 580 booklets were printed and distributed by hand to individual participants within all of the departments. A total of 398 booklets were completed and collected from the organisation, indicating a response rate of 69% and the majority of the booklets were also collected by hand. Moreover, each department had at least one sealed box placed at common areas where participants were encouraged to submit their completed questionnaires once they had completed the questionnaire booklet. The data were captured in Microsoft Excel after which it was examined for potential errors. The statistical analysis then followed.

Statistical analysis

The research hypotheses were inspected by employing Mplus 7.4 (Muthén & Muthén, 2015). The measurement model was created by utilising confirmatory factor analysis (CFA) alongside structure equation modelling methods. The adequacy of the CFA model was established using the Comparative fit index (CFI), Tucker-Lewis index (TLI), and Root mean square error of approximation (RMSEA); the satisfactory values for the CFI and TLI were considered at 0.90 and higher. For the RMSEA a value of 0.08 or lower was deemed satisfactory (Van de Schoot, Lugtig & Hox, 2012). The Cronbach's alpha reliability coefficient displayed appropriate measurements for each of the constructs. Furthermore a correlation matrix was also created in order to study the relationships between all of the variables in this study, the effect sizes for these correlations were seen to be practically significant at $r \geq 0.30$ for a medium effect, and $r \geq 0.50$ for a large effect (Cohen, 1992). Finally, a structural model was created as per Figure 1 in order to investigate the regression coefficients for the stated relationships in the hypotheses. The sizes and directions of the beta coefficients of this model were calculated, which proved the stated hypotheses. Bootstrapping was used to determine the existence and strength of the potential indirect relationships with 10 000 draws and 95% confidence intervals (Preacher & Hayes, 2008).

Ethical considerations

Ethical clearance was provided by a North-West University's Faculty Research Committee to proceed with this study as per the following reference: EMSMHW16/04/21-01/04. All facets of this study were conducted in an ethical manner; participant identity was kept anonymous within the results and both in the report and during the process of conducting the questionnaires. Voluntary participation and informed consent was achieved since the overview of the study was communicated to all the parties involved and they were subsequently afforded the opportunity of deciding on whether or not they would like to participate. Once participants had completed their anonymous questionnaires they each sealed their questionnaire in an envelope and placed it in a securely sealed box. No harm was done to any participant or organisation during any stage of the research process, seeing that no incidents occurred and none were reported. Once the data had been collected and captured in Microsoft Excel, the questionnaires were stored safely at North-West University.

Results

CFA measurement models: Workaholism (DUWAS-10)

A one- and two-factor model for workaholism was estimated due to the original scale consisting of two factors and the recent validation study of Horn (2015) indicating that the scale is best operationalised as a one-factor structure due to a high correlation between working excessively and working compulsively within the South African context. This study found the same evidence. Both models fit the data, but the correlation between the working excessively and working compulsively dimensions was 0.92, indicating problematic discriminant validity (Brown, 2015), and that the workaholism factor is best operationalised as a one-factor structure. Furthermore, in line with Horn's (2015) research, this study also found that the item 'I feel that there is something inside of me that drives me to work hard' did not function adequately in explaining variance in the latent variable and was also excluded from further analysis in this study.

CFA measurement model: Factor structure and item loadings of the total model

The full measurement research model fits the data well (CFI = 0.94; TLI = 0.93; RMSEA = 0.05). It is important to note that work intensity was operationalised as a single mean score based on the total (sum) scores from work overload and time demands. Hence workaholism, burnout and musculoskeletal complaints were latent variables.

Table 2 below presents the factor loadings for the items for the latent variables.

Table 2

Standardised loadings for the latent factors

Factor	Item	Loading	S.E.	<i>p</i>	<i>R</i> ²
Workaholism	Excess1	0.74	0.04	0.001	0.55
	Excess2	0.56	0.04	0.001	0.31
	Excess3	0.54	0.04	0.001	0.30
	Excess4	0.45	0.05	0.001	0.20
	Excess5	0.69	0.04	0.001	0.47
	Compulse1	0.73	0.04	0.001	0.53
	Compulse2	0.55	0.05	0.001	0.30
	Compulse4	0.61	0.04	0.001	0.37

	Compulse5	0.55	0.05	0.001	0.30
Burnout	EE1	0.67	0.03	0.001	0.45
	EE2	0.69	0.03	0.001	0.48
	EE3	0.73	0.02	0.001	0.53
	EE4	0.49	0.04	0.001	0.24
	EE5	0.78	0.02	0.001	0.61
	EE6	0.79	0.02	0.001	0.63
	EE7	0.48	0.04	0.001	0.23
	EE8	0.58	0.04	0.001	0.33
	EE9	0.80	0.02	0.001	0.64
	DP1	0.46	0.05	0.001	0.21
	DP2	0.74	0.03	0.001	0.55
	DP3	0.84	0.02	0.001	0.70
	DP4	0.44	0.05	0.001	0.20
	DP5	0.62	0.03	0.001	0.39
Musculoskeletal complaints	MSC1	0.80	0.03	0.001	0.64
	MSC2	0.94	0.02	0.001	0.88
	MSC3	0.75	0.03	0.001	0.56
	MSC4	0.88	0.02	0.001	0.77

Notes: S.E. = Standard error; All p -values < 0.001; Work intensity not included as it was operationalised as a total score.

All of the items loaded significantly on their respective factors (average $\lambda = 0.66$; SD = 0.12) and the latent factors explained a significant amount of variance in all of the corresponding items (average $R^2 = 45.81\%$; SD = 15.77%). The standard errors of the estimates were also relatively low, indicating accuracy in the estimation process.

Reliability coefficients and correlation matrix for the study variables

Table 3 below displays the correlation matrix for the study variables.

Table 3

Reliabilities and correlation matrix for the latent variables

Variables	1	2	3	4
1. Work intensity	(0.72)			
2. Workaholism	0.42 ^a	(0.80)		
3. Burnout	0.38 ^a	0.56 ^b	(0.89)	
4. Musculoskeletal complaints	0.36 ^a	0.45 ^a	0.52 ^b	(0.87)

Notes: Cronbach's reliability coefficients in brackets on the diagonal; All correlations statistically significant $p < 0.001$; a = Medium effect size; b = Large effect size

As can be concluded from Table 2, all the variables were reliable ($\alpha > 0.70$), statistically significant and related positively to one another, as expected. Specifically work intensity was correlated positively with workaholism ($r = 0.42$; medium effect), burnout ($r = 0.38$; medium effect) and musculoskeletal complaints ($r = 0.36$; medium effect). Workaholism correlated positively with burnout ($r = 0.56$; large effect) and musculoskeletal complaints ($r = 0.45$; medium effect). Lastly, burnout also correlated positively with musculoskeletal complaints ($r = 0.52$; large effect). These results provided initial support for all of the research hypotheses.

Structural model fit and regression results

Regression paths were added to the measurement model aligned with the study hypotheses, and the following was found: The model was a good fit to the data (CFI = 0.93; TLI = 0.93; RMSEA = 0.06). The results of the regressions are given in Table 4 and Figure 2.

Table 4

Regression results for the structural model

Structural path	β	S.E.	p	Result
Work intensity → Musculoskeletal complaints (MSC)	0.14	0.05	0.007	Significant
Work intensity → Workaholism	0.42	0.05	0.001	Significant
Work intensity → Burnout	0.17	0.06	0.002	Significant
Workaholism → Musculoskeletal complaints (MSC)	0.20	0.08	0.007	Significant
Workaholism → Burnout	0.49	0.06	0.001	Significant
Burnout → Musculoskeletal complaints (MSC)	0.34	0.07	0.001	Significant

Notes: β = Beta coefficient; S.E. = Standard error; p = Two-tailed statistical significance

The regression results showed that all of the hypotheses were supported, i.e. all regressions were significant at the $p < 0.05$ level and even at the level of $p < 0.01$. Specifically work intensity showed significant positive path relationships to musculoskeletal complaints ($\beta = 0.14$, S.E. = 0.05; supporting H_{1a}), workaholism ($\beta = 0.42$, S.E. = 0.05; supporting H_{1b}) and burnout ($\beta = 0.17$, S.E. = 0.06; supporting H_{1c}). Workaholism in turn showed positive path relationships to musculoskeletal complaints ($\beta = 0.20$, S.E. = 0.08; supporting H_2) and burnout ($\beta = 0.49$, S.E. = 0.06; supporting H_3). Finally, burnout had a significantly positive path relationship to musculoskeletal complaints ($\beta = 0.34$, S.E. = 0.07; supporting H_4).

Given the significant regression results, three potential mediating effects were possible and warranted further investigation. The first potential mediating effect was the mediating role of workaholism in the relationship between work intensity and musculoskeletal complaints. Results from bootstrapping resampling (10 000 replications) (cf. Rucker, Preacher, Tormala & Petty, 2011), with the three potential indirect effects specified, revealed that the first indirect effect was indeed significant (Estimate = 0.08, SE = 0.03; $p = 0.011$; 95% CI[0.03, 0.15]) and, as the direct relationship from work intensity to musculoskeletal complaints was also significant. This indicated a complementary mediation model (Zhao et al., 2010), more traditionally known as a partial mediation model.

The second potential indirect effect was for workaholism in the relationship between work intensity and burnout. The bootstrapping showed a significant indirect effect (Estimate = 0.06, SE = 0.02; $p = 0.013$; 95% CI[0.02, 0.11]) here as well, and this could then also be classified as a complementary mediation model.

The third and final potential indirect effect was for burnout in the relationship between workaholism and musculoskeletal complaints. This was also found to be significant by means of the bootstrapping of the model (Estimate = 0.21, SE = 0.04; $p = 0.001$; 95% CI[0.14, 0.29]) also a complementary mediation model. This standardised indirect effect was also the largest, indicating the important role burnout plays in the relationship between workaholism and musculoskeletal complaints in employees.

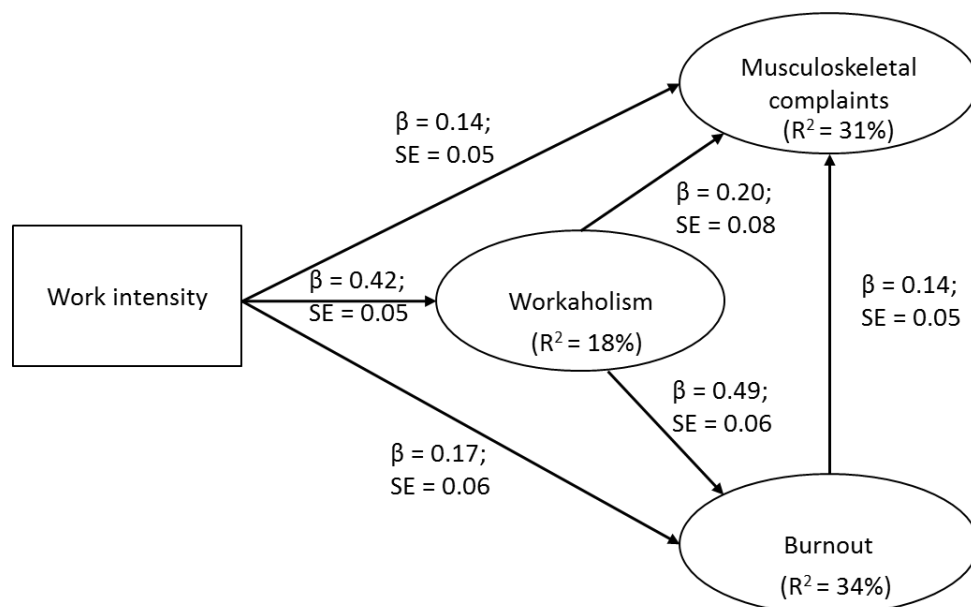


Figure 2. The structural model with regression results

Discussion

Outline of the results

This study investigated the relationships between work intensity, workaholism, burnout and musculoskeletal complaints. This is the first study to take into consideration all of these factors in a single study within the South African or other context. This study contributes to the body of literature in the establishment of empirical data, which provides evidence of the positive relationships between work intensity, workaholism, burnout and musculoskeletal complaints.

Work intensity had a significant positive relationship with musculoskeletal complaints (H_{1a} supported), indicating that having greater job demands in an unrealistic timeframe increases the likelihood that employees will develop musculoskeletal complaints. This is in line with literature that states that when employees experience high levels of work intensity it is expected that they will be more prone towards developing and reporting an increase in musculoskeletal complaints (Cho et al., 2012; Franke, 2015; Stride, Wall, Holman & Smith, 2007). Work intensity also displayed a significant positive relationship with workaholism (H_{1b} supported), indicating that employees who are working at heightened levels of intensity are more likely to increase their workaholic behaviour, as opposed to employees whose work is less intense (Andreassen et al., 2010; Tabassum & Rahman, 2012; Burke et al., 2010; Horn, 2015). This is contrary to the results of a past study which showed that only one of the three components of workaholism (work involvement) significantly correlated with work intensity (Burke et al., 2009). A possible reason why the result of the current study contradicts this, could be due to the current study conceptualising workaholism and work intensity (and therefore measurement) somewhat differently; with workaholism consisting of the items of working compulsively and working excessively as a one-factor structure and work intensity consisting of role overload and time demands, whereas Burke and colleagues utilised a conceptualisation of workaholism consisting of work involvement, feeling driven to work and work enjoyment and conceptualised work intensity as consisting of time demands, job demands and emotional demands. Therefore employees perceiving work to be more intense, coupled with strenuous hours, may adopt this work style and subsequently increase their workaholic behaviour. Moreover, work intensity showed a significant positive

relationship with burnout (H_{1c} supported), which suggests that when employees are working intensely they are more likely to experience higher burnout scores (Bakker & Demerouti, 2007; Hakanen et al., 2006; Horn, 2015; Schaufeli & Bakker, 2004). Recent research has shown that inordinate job demands lead to burnout over time (De Beer, Pienaar & Rothmann, 2016) and that sufficient effort-recovery is needed to offset this occurrence (Sonnentag, 2001). Thus, in line with current literature, when employees experience too high job and time demands they have less time to recover their spent energy, which will subsequently lead to exhaustion and then burnout.

Workaholism had a significant positive relationship with musculoskeletal complaints (H_2 supported), which indicates that employees who score higher on workaholic behaviour have a higher tendency to report musculoskeletal complaints, which is in line with current literature (Andreassen et al., 2010; Matsudaira et al., 2013). Additionally, workaholics overexert themselves over extended periods of time, leading to a lack of recovery time needed, that would otherwise combat the development of musculoskeletal complaints. It can be deduced that workaholics spend larger amounts of time seated in front of computer screens compared to non-workaholics, and these static positions will cause eventual micro traumas in the various soft tissues, tendons, muscles and/or cartilage which subsequently leads to a higher incidence of musculoskeletal complaints (Blatter & Bongers, 2002). Further to this, workaholics are addicts in essence, therefore it can be ascertained that their behaviours will not reflect healthy habits such as taking regular body breaks, worrying about ergonomic impact on their health, or engaging in regular exercise (which could help combat the onset of musculoskeletal complaints), as a result of the majority of their time is spent working (Aziz & Uhrich, 2014).

A positive significant relationship between workaholism and burnout was also found (H_3 supported). This indicates that employees with higher workaholism scores could be overexerting themselves by spending more time with work and work-related thoughts than is required, which causes exhaustion for them; consequently they do not fully recover the energy they spend daily, leading to the development of burnout (Bakker & Demerouti, 2007; Bakker & Oerlemans, 2011; Horn, 2015; Molino et al., 2016; Schaufeli et al., 2008; Stoeber & Damian, 2016). Burnout also showed a significant positive relationship with musculoskeletal complaints (H_4 supported), implying that when employees suffer from burnout they are more likely to report musculoskeletal complaints than employees that do not

experience burnout. This could be due to the burnout sufferer being in such a state of impaired well-being that they participate in detrimental behaviour such as unhealthy work-life balance, static positions, irregular sleep patterns, not being able to recover enough of their physical energy, which further increases their likelihood to develop musculoskeletal complaints (Armon et al., 2010; Langballe et al., 2009; Jaworek et al., 2009). Therefore all of the hypotheses of this study have been supported.

Lastly, even though not an explicit objective of the study, evidence of three potential (indirect) mediation relationships were investigated for thoroughness, utilising bootstrapping (cf. Rucker et al., 2011). The results showed that workaholism had a complementary (previously referred to as partial) mediating effect in the relationship between work intensity and musculoskeletal complaints (Zhao et al., 2010). Additionally, workaholism also displayed a complementary mediating effect in the relationship between work intensity and burnout. Evidence also supported a complementary mediating effect in the relationship between workaholism and musculoskeletal complaints through burnout. This indicated additional dynamics at work in the relationships, which may warrant longitudinal investigation in future research.

Practical implications

This study contributed towards the body of knowledge of literature by describing how work intensity, workaholism, burnout and musculoskeletal complaints are interrelated. The study assists in informing organisations about the effects work intensity has with regard to their employees' experiences of becoming burned out, their risk towards becoming workaholics as well as their danger of being afflicted with musculoskeletal complaints.

Awareness of these detrimental consequences resulting from the promotion of high-intensity work could help organisations reduce future costs that would otherwise be unavoidable if no such actions are taken to help protect their employees from the outcomes of musculoskeletal complaints, burnout and workaholism (Andreassen et al., 2010; Tabassum & Rahman, 2012; Bakker & Demerouti, 2007; Burke et al., 2010; Cho et al., 2012; Franke, 2015; Horn, 2015; Hakanen et al., 2006; Schaufeli & Bakker, 2004; Stride et al., 2007). Rather than promoting long and intense work hours as a part of organisational culture, emphasis should be placed on

working efficiently, i.e. utilising resources effectively to obtain the best possible results with the least amount of effort expended in the process and by sufficient effort-recovery (Sonnentag, 2001). Employees should be made aware of the dangers of workaholic behaviour, and of burnout and the negative effects it can have on their work/personal life/health. A better work-life balance should be encouraged and a culture established where employees try to relax and rest when not at work (Bakker & Demerouti, 2007; Bakker & Oerlemans, 2011; Horn, 2015; Molino et al., 2016; Schaufeli et al., 2008; Stoeber & Damian, 2016). This could be achieved by something as simple as giving employees flexitime at work, or as intricate as policies and organisation-wide culture changes.

Lastly, the long-term detrimental effects of musculoskeletal complaints need to be brought to the attention of the employees by means of awareness campaigns and by encouraging employees to take short breaks to stretch their bodies as well as the possibility of establishing ergonomic training sessions to learn the correct posture and usage of computers, keyboards, mice, chairs and how to sit at their desks in order to minimise the musculoskeletal complaint effects to which incorrect usage will ultimately lead (Barbe & Barr, 2006; Cho et al., 2012; National Research Council, 2001; Tinubu et al., 2010; Zakerian & Subramaniam, 2009).

Limitations and recommendations for future research

The first limitation of the study was that it was only conducted within a single organisation within a single sector of South Africa, which should be noted as a concern in terms of the external validity of the results, i.e. generalisation. A recommendation for future research would be to replicate the study within different sectors of the South African market or different and/or multiple organisation. Even though the target population, the study was also limited to white-collar workers (office workers that use computers). Future studies could include blue-collar workers or could refrain from limiting participation to certain criteria at all. Future studies could also implement the same questionnaire a second time in a longitudinal design to establish an average between responses to ensure that external factors of the first day did not influence the participants' responses and to provide evidence of causality (Taris & Kompier, 2003).

Moreover, employees may have reported pains which they mistakenly consider to be musculoskeletal complaints from work, when in fact it could be simply due to aging, old

sports, posture while performing hobbies, disabilities (such as scoliosis) or accident injuries. Future studies could include a section that poses question concerning injuries or whether or not the participants attribute the complaints to work. A further concern is that the employees who are workaholics or working very intensely might have negatively affected the response rate, due to perceiving the questionnaire as a waste of time while having their own workloads to deal with – thus not participating and affecting the true picture of results. Another limitation to this study is that all of the questions were the participants' own subjective perceptions and no medical diagnoses were available to ascertain whether participants were afflicted by musculoskeletal complaints or burnout. Hence a future recommendation would be to collaborate the perceptual data gathered with factual data gathered by means of medical diagnoses in order to obtain a more factual representation of the participants' conditions.

Future studies should also emphasise the creation, implementation and effects of interventions in an attempt to decrease the prevalence of unhealthy work intensity as well as the interventions to combat the experiences of musculoskeletal complaints and burnout. Lastly, this study was also limited because there are certain aspects which influence workaholism such as the individual's personality, the culture and social environment, and these individual factors were not explicitly measured (Tabassum & Rahman, 2012).

Conclusion

The aim of this study was to determine the relationships between work intensity, workaholism, burnout and musculoskeletal complaints. After conclusion of the research, evidence has been established that significant positive relationships exist amongst all of the factors. Organisations need to take into account that when employees consistently face high levels of work intensity it could affect workaholic behaviour, burnout and musculoskeletal health. These factors need to be addressed within organisations as they will negatively impact employee health as well as the organisation's performance and ultimately the organisation's bottom line.

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CHAPTER 3
CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

3. Conclusions, limitations and recommendations

In this chapter gives an overview of the conclusions, limitations and recommendations of this study. The conclusions present the outcomes of the study in accordance with the specified research objectives. The limitations of the study present potential confounding factors that could have affected the study, that need to be considered and to ensure transparency. Recommendations are given to organisations and also future researchers; addressing the ways in which the study can help organisations improve upon their employees' health and performance, and also ways in which future researchers can delve deeper into the relationship between work intensity, workaholism, burnout and musculoskeletal complaints with improved study designs.

3.1 Conclusions

This study aimed addressing the gap in South African literature regarding the individual factors of work intensity, workaholism, burnout and musculoskeletal complaints by investigating the coalesced interrelationship between these factors. Therefore, the general objective of this study was to determine the relationship between work intensity, workaholism, burnout and musculoskeletal complaints within the South African context. In order to achieve this, specific objectives were generated to investigate these factors in greater depth.

The first specific objective of this study was to determine how work intensity, musculoskeletal complaints, workaholism and burnout are conceptualised by literature. Objective one was completed by conducting a thorough literature review in chapter two which heralded to the following conceptualisations of these factors. *Work intensity* was conceptualised as consisting of an excessive amount of work demands placed upon employees to be completed in an unrealistic amount of time given; thus consisting of time demands and work overload (Boxall & Macky, 2014). *Workaholism* is a term first described by Oats (1971) as an uncontrollable and/or compulsory need to spend a disproportionate time working. For the purpose of this study workaholism was conceptualised as consisting of working both excessively and compulsively, this means the workaholic has a tendency to spend much more time working than is reasonably expected by employers as well as having a

drive which compels them to work, despite the consequences of deteriorating social relationships and health (Schaufeli, Shimazu & Taris, 2009). Maslach and Jackson (1981) originally described *burnout* as consisting of three subscales, namely emotional exhaustion, depersonalization and personal accomplishment. For the purpose of this study burnout was conceptualised as a one-factor model and measured by the items of exhaustion - which refers to physical and psychological depletion of energy due to a lack of or ineffective use of recovery time - as well as items of depersonalisation which refers to a state of detachment and indifference towards others and one's work (cf. De Beer & Bianchi, 2017; Maslach & Jackson, 1981). *Musculoskeletal complaints* was conceptualised in this study as work-related pains in the muscles, bones, tendons, cartilage, nerves and other soft tissue experienced by employees in the specific areas of the shoulders, neck or back (Cho, Hwang & Cherng, 2012).

The second specific objective was to determine the relationship between work intensity and musculoskeletal complaints. The correlation results showed that work intensity had a positive and statistically significant relationship with musculoskeletal complaints ($r = 0.36$; medium effect). Therefore, when employees are experiencing high levels of work intensity over extended periods of time they will be more likely to report an increase in musculoskeletal complaints; this could be due to employees maintaining a static posture for extended periods of time together with the added stress tension experienced resulting from the additional workload (Kim et al., 2004; Langballe, Innstrand, Hagtvet, Falkum & Aasland, 2009; National Research Council, 2001).

Objective three was to determine the relationship between work intensity, workaholism and burnout. The results showed that work intensity had a positive and statistically significant relationship with both workaholism and burnout. Work intensity displayed a positive correlation with workaholism ($r = 0.42$; medium effect) and burnout ($r = 0.38$; medium effect). Regarding workaholism, when employees are exposed to prolonged working hours coupled with high job demands they are expected to develop workaholic tendencies. This could be due to the employees' prolonged work hours and demanding work load causing them to experience stress even while they are not working, leading them to feel the compulsion to spend more and more time working. Alternatively it could be the result of adopting these strenuous work demands as the norm; thus continuing to overwork to their detriment (Tabassum & Rahman, 2012; Burke & El-Kot, 2009; Horn, 2015). When

employees experience strenuous work schedules and workloads they have less time to effectively recover energy lost during the working day, which leads to a state of always needing more time to rest but never truly recovering fully. This causes increased exhaustion and depersonalisation – burnout (Lee & Ashforth, 1993).

Objective four was to determine the relationship between workaholism, burnout and musculoskeletal complaints. The results of this study showed that workaholism, burnout and musculoskeletal complaints are positive and statistically significantly related to one another. Workaholism also displayed a positive correlation with burnout ($r = 0.56$; large effect) and musculoskeletal complaints ($r = 0.45$; medium effect). Thus workaholics are more likely to spend a larger than normal amount of time on work, placing additional work demands on themselves, which are more than the organisation expects of them. This leads to a lack of sufficient rest and recovery time, which leads to burnout, and when employees spend too much time in static positions coupled with their lack of necessary relaxation it increases the experience of musculoskeletal complaints. The findings of this study therefore emphasise the impact of subjecting employees to high time demands and role overload, which could subsequently lead to increased workaholic behaviour, burnout and musculoskeletal complaints.

Although not an explicit objective of the study, indirect effects were also tested for thoroughness, and it was found that: i) workaholism had a mediating effect between work intensity and musculoskeletal complaints, ii) workaholism also played a mediating role in the relationship between work intensity and burnout, and iii) burnout mediated the relationship between workaholism and musculoskeletal complaints (Estimate = 0.21, SE = 0.04; $p = 0.001$). All of these were complementary mediation models, indicating a direct effect but also dynamics through other variables.

The final objective was to make recommendations for future research and practice. This objective was achieved by providing limitations and recommendations in chapter two and also in the following subsections below.

3.2 Limitations

The first limitation of this study was that it was conducted within a single organisation within the engineering sector of South Africa; thus a convenience (non-probability) sampling method was utilised for purposes of this study. The study sample also focused on specific participants, namely white-collar office workers. Therefore generalisation to other occupations and industries is cautioned due to external validity concerns.

Secondly, the questionnaires were based on cross-sectional self-reports; thus the reliability and validity of the participants' responses could be contended as the answers were their own subjective opinions. Certain aspects that could also play a role in the prevalence of workaholism, such as personality, culture and social environment, were not measured in this study (Tabassum & Rahman, 2012). Employees may have mistakenly attributed old sports injuries, car accident, other nonwork-related injuries or simple pains related to the aging process as musculoskeletal complaints. Moreover, employees that were suffering from workaholism might have disregarded the questionnaire and did not participate because they viewed it as a waste of time and thus affected the results of the study. Similarly, extremely burned-out employees might just not have had the energy to complete the questionnaire. Finally, the questionnaire was only administered at a single point in time; thus drawing inferences regarding causality is cautioned.

Notwithstanding the mentioned limitations, the results contribute to literature, to engineering organisations as well as to future studies.

3.3 Recommendations

3.3.1 Recommendations for practice

When employees are in a state of unwell-being (e.g. workaholism, burnout, musculoskeletal complaints) their performance (eventually) suffers. Thus, for the sake of the performance of the organisation, it becomes imperative for organisations to take into consideration the effects work intensity and the work environment can have on their employees. As such organisations should invest more in the well-being of their employees in order to keep productivity as

optimal as possible, and turnover, absenteeism and presenteeism as low as possible (Kubota et al, 2010).

Organisations within the engineering sector of South Africa should consider the impact employee assistance programmes could offer to employees suffering from or displaying initial symptoms of burnout, workaholism and musculoskeletal complaints, in an attempt to minimise the negative impact thereof and, based on the evaluation implement it. This can be done by implementing tried and tested surveys that identify risks in the employee population, at least once a year. Furthermore, when implementing interventions, workshops, counselling or coaching to combat the effects of burnout, workaholism and musculoskeletal complaints, consideration should also be given to the workplace factors as well as the factors at home and personal life that could influence employees' experiences of these factors (Bianchi, 2016; Thuynsma & De Beer, 2017).

All of the factors (i.e. work intensity, workaholism, burnout, musculoskeletal complaints) have positive and statistically significant relationships with each other, indicating that if any of these factors should be present within an employee's work environment it heightens the risk of the presence or the chance of developing any or all of these ailments. Thus it becomes imperative for the organisation to help ensure that employees are working within an environment which minimises the incidences of these factors with a view to ensure the well-being and optimal performance of their workforce. Therefore it is recommended that awareness be raised by the applicable professionals (e.g. OD consultants) with regard to the influence work intensity and the other factors of this study may have on employee well-being and that employees know where to seek assistance when needed.

3.3.2 Recommendations for future research

The first recommendation for future research would be to conduct the study on multiple organisations, so as to gain a clearer understanding of South Africa as a whole as opposed to conducting the study within a single organisation within a single sector. The participation criterion was also limited to white-collar employees (office workers); thus future researchers might benefit from incorporating organisations in their entirety- this will help create data that can be generalised.

Future researchers should attempt to include self-report questionnaires and to measure the factual prevalence of employees' reported incidences of work intensity, workaholism, burnout and musculoskeletal complaints. This will help in increasing the validity and reliability of the data. Objective data can be obtained through medical examination of participants to determine the prevalence of musculoskeletal complaints and burnout. Performance reviews and time log-sheets could be consulted to determine participants' actual number of hours worked per week rather than the hours they perceive to work, as these hours could be exaggerated or underestimated. Another recommendation would be to highlight to participants that the questions regarding musculoskeletal complaints are not pains related to old accidents or injuries, but especially experienced since working at the organisation or can be attributed to work. When attempting to elicit buy-in from participants, the potential positive outcomes the study could have for employees in practice could be focussed on more strongly so as to ensure that even those that are overwhelmed with work load and time demands and suffering from workaholism, burnout or musculoskeletal complaints will voluntarily participate in future research.

The measurement of these factors should also be administered at least a second time in order to acquire longitudinal data, to enable researchers to determine the causality behind the relationships these factors displayed (Taris & Kompier, 2003). Another recommendation for future research would be to incorporate a questionnaire which also measures individual characteristics, such as cultural aspects, personality traits and psychosocial aspects in order to gain a better understanding of the reasons for employees to experience work intensity and workaholism (Tabassum & Rahman, 2012). Lastly, ways to alleviate the effects of work intensity and musculoskeletal complaints/conditions, i.e. intervention studies, should be focussed on more strongly in future research.

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