ANALYSIS OF HEALTH AND WELL-BEING PRACTICES AMONG OLDER CONSTRUCTION SITE-BASED WORKERS IN SOUTH AUSTRALIA

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There are limited studies undertaken on the prevailing health and wellbeing practices of older construction workers, and how these practices influence the employee satisfaction and performance. To narrow this gap, the study aims to explore how the health and wellbeing practices influence the performance of older construction based workers. A questionnaire based survey was performed among the 85 South Australian older (50 plus years) construction workers involved in site based project work to identify the prevailing health and wellbeing practices and their impact on work ability. The survey data was subjected to descriptive and inferential statistics with regression analysis to predict the impact of the practices on work ability. Eighteen health and wellbeing practices were identified to be significant in influencing the work ability and productivity of older construction site-based workers. The results indicated that the highly ranked five practices were from the 'leadership and organisational support' category as follows: (i) my employer cares about my health; (ii) employers should play an active role in improving the health of their employees; (iii) my company's leader are committed to worker health, safety and well-being; (iv) preventative screening; and (v) my employer provides me with resources necessary to maintain good health. The least ranked practices were drawn from the following 'workplace health promotion (WHP)' programs category: (i) corporate sponsored challenges; (ii) healthy food options on site cafeteria or healthy snack option; (iii) case managers to track disease management; (iv) medication adherence programs; and (vi) monitoring of health goals / biometrics, BMI and weight loss, cholesterol levels and blood pressure. The overall sum of working ability reported by most respondents was found to be good and moderate. The identified practices could be used for the promotion and development of interventional strategies aimed at improving the general and mental wellbeing of older construction workers.

Keywords: health and wellbeing, workability, older workers, South Australia

INTRODUCTION

Construction organisation devote huge amounts of resources for enhancing the well-being of the employees in several ways, from employee recognition and professional development practices to facilitating with health care and benefits (Goetzel *et al*., 2014). More so, the better the general health and wellbeing of the employees, the better will be the productivity levels. This suggests the need for the construction

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Zafar, J and Chileshe, N (2018) Analysis of Health and Well-Being Practices among Older Construction Site-Based Workers in South Australia *In:* Gorse, C and Neilson, C J (Eds) *Proceeding of the 34th Annual ARCOM Conference,* 3-5 September 2018, Belfast, UK, Association of Researchers in Construction Management, 341-350.

industry to implement and practice health and wellbeing programs to improve employee efficiency, attendance and on the job performance. In Australia, and globally, the construction industry drives the economic activity significantly. Its significance is further evidenced by being the third largest industry of Australia after services and contributes 8.1 per cent to the Gross Domestic Product. In 2015-16, it grew by 2.8 per cent in output terms, producing $134.2 billion of output and employing nearly 1.1 million workers directly from all over the globe (Department of Industry, Innovation and Science, 2017). Despite the noted importance of the construction industry, the population of Australia is ageing. This means Australia will have fewer working age people to support the older Australians. More so, the ageing population will cause many issues for Australia in years to come such as, health, size of the working-age population, housing and demand for skilled labor (Australian Bureau of Statistics, 2016), and overall, the construction workers' mental health was poorer than that of the general Australian population (Lingard and Turner, 2015). In addition, older workers have the highest rate of mortality, psychological and cardiovascular diseases (Kunze *et al*., 2013). The construction industry is also beset by a number of issues that affect the workers. For example, several large-scale epidemiological studies of illness among construction workers, such as the work of Stocks *et al*., (2010), reported a high incidence of occupational ill health and a high burden of cancer attributable to occupational factors in the UK construction industry among various trade occupations. Consequently, the work ability of employees may depend upon other factors, such their eating habits, amount of exercise and stress level in their personal lives. Likewise, construction workers have been identified in several studies as a group at high risk of poor health (Lingard and Turner, 2015), with linkages of lifestyle factors such as smoking and drinking alcohol, and lack of normal vigorous activity during leisure time to poor work ability (Alavinia *et al*., 2007). This research particularly targets the blue collared older construction workers in South Australia. The ageing workforce is mainly targeted for this study as they are more subjected to health-related issues (Arndt *et al*., 2006), and are more prone to physical and psychological deprivation (Sivam *et al*., 2018). The construction workers are also susceptible to smoking and alcohol consumption. Numerous studies in the Australian context and other countries have been conducted to investigate the impact of health and well-being practices on the employee satisfaction and productivity of workers, as the development of health promotion programs in organisations. (De Silva *et al*., 2017; Loudoun and Townsend, 2017; Lingard and Turner, 2015; Dickson-Swift *et al*., 2014; Lingard *et al*., 2012). However, majority of these Australian studies have been regional or State specific, and have focussed on the younger workers. Conversely, older construction workers have different challenges in the workplace (Sivam *et al*., 2018). To narrow this knowledge gap, the study aims to explore how the health and wellbeing practices influence the performance of older construction based workers in South Australia.

LITERATURE REVIEW

Goetzel *et al*., (2012) defines employee wellbeing as "including the combination of different mental factors such as frustration, stress and anxiety and physical indicators like heart condition, blood pressure and general physical health". According to a number of studies such as Goetzel *et al*., (2014), most construction firms devote huge amount of resources for enhancing the well-being of the employees in several ways, from employee recognition and professional development practices to facilitating with health care benefits. For instance, many organizations adopt one of the two ways for

influencing health of the employees, with the first by ensuing that a workplace that promotes or is at least not unfavorable to health. The second involves encouraging the employees to practice a healthier lifestyle in general by facilitating with incentives or opportunities such as arranging a healthy eating seminar or giving subsidy for joining a fitness center. The number of benefits of implementing these health and well-being practices by organisations is well documented in literature (Schwatka *et al*., 2012; McDaid and Park, 2011). For example, such health and well-being practices, and strategies have been found to contribute a lot towards the economic benefits for employers and a positive health effects for employees (McDaid and Park, 2011). The other notable benefit is through the ability of employees facing health problems to receive the payments from the public transfer system like the welfare schemes, disability insurance or unemployment insurance as they are at the higher risk of becoming unemployed either temporarily or permanently (Wright and Huang, 2012). While many studies have identified the challenges facing the younger workers, in contrast older employees specifically must face different challenges in the workplace. It is also well established that they may be treated as less valuable in comparison with the young employees particularly when working in non-managerial position. For example, studies by Jokela *et al*., (2010) indicated the psychosocial environment in which older workers work encourage them to retire at a specific age. In addition, a number of longitudinal studies indicates that health is influenced by psychological and physical demands of job such as the psychological job stress includes mortality, early exit from work, coronary heart disease whereas the physical job demands comprise of awkward posture, repetitive movements, disability retirement (Jones *et al*., 2013). In summary, the literature review highlighted the limited empirical South Australian construction specific health and well-being studies. Hence, to fill that knowledge gap, this present study investigates the health and well-being practices amongst the older construction workers and how this influences their employee satisfaction, performance and workability

RESEARCH METHODS

To explore how the health and wellbeing practices influence the performance of older construction based workers, the following research methods were employed in the study.

Measurement Instrument

The questionnaire comprised the following three distinct sections: Section 1 encompassed the general demographics of the study (i.e. age, and trades background); Section 2 was aimed at capturing the respondent's perceptions on the importance of the health and well-being practices prevailing on their sites. In total, 21 items were included as identified from literature and mostly based on McCleary *et al*., (2017) and was composed of 2 sub instruments. The first comprised 8 '*Leadership and Organisational Support*' items, and the second, thirteen '*Workplace health promotion (WHP) programs*' type of items. For both sub instruments, respondents were asked to rate their opinions on these 'health and well-being practices' using a five point Likert-scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). Section 3 comprised the modified version of the workability index (WAI) as proposed by Ilmarinen (2007) and is designed as a good predictor of a person's employability now and in the future. The 7 WAI questions ranged from current work ability demand (0-10); work ability in relation to the demands of the job (2-10) current diseases as diagnosed (1-7); estimated work impairment due to diseases (1-6); sick

leave during the past year (1-5); own (personal) prognosis of work ability 2 years from now (1-7); and mental resources (1-4). The number in parentheses against each item indicates the scoring range. This study reports only on the overall WAI as computed, as it is beyond the scope of this study to discuss the individual sub-questions or items. The classification of the WAI as captured in section 3 resulted in the following 4 categories and associated total score (in parentheses): Poor (7-27); Moderate (28-36); Good (37-43); and Ideal (44-49). In summation, these ratings provide a final result that ranged between 7-49 points which is called work ability rating (WAR). The work ability rating enables us to understand the ability of worker to do his work. The total score is the sum of score obtained for each question.

Justification for adopting the WAI and measurement instrument
The study employed the WAI as primarily proposed by Ilmarinen (2007) and the health and wellness program questionnaire as used in the study of McCleary *et al*., (2017) were used for this research. It is the most popular measure for determining the ability of workers to continue with their job and responsibility. Secondly, the WAI instrument has numerous usages in conducting research into different industries. For example, this instrument has been adopted among railway construction workers (Capanni *et al*., 2005); aging (de Zwart *et al*., 2002); and construction industry (Welch *et al*., 2010).

Data Analysis

Data as collected was analysed using the IBM SPSS software (*version* 25). Four methods were employed: (i) *Parametric tests* were undertaken to measure the significance of the 'health and well-being practices', (ii) *descriptive statistics tests such as measures of central tendencies and frequency analysis* enabled further ranking analyses to obtain the relative importance of the health and well-being practices; (iii) *regression* analysis was used to predict the impact of the practices on work ability; and (iv) the *coefficient of variation* (CV) is used as a general measure of the standardised skewness or variability of the responses. This was computed using the standard deviation as a percentage of the mean score.

Population and Sampling

The questionnaire was distributed to older site-based construction workers in South Australia. The survey method is the most suitable for conducting this type of study as it helps in measuring knowledge, behavior and opinions, and has remained popular in the construction industry (De Silva *et al*., 2017). To maintain the privacy of the participants due to the complex and sensitive nature of information, the survey was administered face to face. The survey instrument that was already designed and validated was used for this study as it ensures that accurate data is being gathered (Metwally, 2012). The snowball sampling technique was used for this study which entailed participants recruiting other participants for survey questionnaire. This technique has been used in construction studies (De Silva *et al*., 2017).

Participant selection
The participants particularly those who were 50 years and over as this age group are classified as 'older workers' (Eaves *et al*., 2016), and work on the site were contacted through paper and electronic medium. The rationale for the selection of this age group is nested within the assertion that older workers have the highest rate of mortality, psychological and cardiovascular diseases (Kunze *et al*., 2013). The unit of analysis for the study was the 'construction worker'. As asserted by McCleary *et al*., (2017, pg. 257), in studying WHP (Wellness) programs, an important population to

research is the employees themselves. Black *et al*., (2017) participation criterion for survey respondents was applied: 1) those who had a history of metabolic or cardiovascular disease were not included in the survey. 2) Rather, only the individuals not taking any type of prescribed medication and are free from illness or infection and do not had any previous medical conditions were invited to the survey.

Characteristics of the Sample

From a total of 180 questionnaires distributed, a total of 85 usable responses were obtained equating to an overall response rate of 47 %. Based on the respondents to questionnaire, (54.1 %) of them were aged between 50 and 54, followed by 35 (41.2 per cent) in the 55 to 64 years category. The minority 4 (4.7 %) fell into the 65 to 74 years. The inclusion of these three categories was to take into consideration the definitions and possible indicators of functional age. From the trade's perspective; the majority (42.3 %) of respondents were either plasterers (23.50 %) or plumbers (18.80 %). This was followed by 10 (11.80 %) of painters. There was also a fair distribution of trades such as carpenters (6); roofers (8); bricklayers (9); electricians (7); and general labourers (9). Of these, the inclusion of roofers, bricklayers and general labourers is of importance as these trades are defined as outdoor trades due to their work being outside in the early construction phases, and therefore prone difficult conditions such as heat (Eaves *et al*., 2016).

SURVEY RESULTS AND DISCUSSIONS

Ranking of Health and Well-Being Practices

Table 1 presents the descriptive results of analysis for the 21 health and well-being practices. As illustrated, the mean agreement scores ranged from 4.01 to 2.04. The COV of the health and well-being practices ranged between 16.9 and 53.7 with the least ranked practices unsurprisingly demonstrating lower levels of agreement between the respondents. It is beyond the scope of this study to discuss all the 21 practices. Therefore, only the top four scoring above 3.5 and the least ranked due to the relevance of the practice have been singled out.

My employer cares about my health and wellbeing

The practice "my employer cares about my health and wellbeing" (mean = 4.4) is the most important health and well-being practice influencing the older construction workers. This practice was also statistically significantly different from the population mean score of 3.5 ($t = 8.139$, $p = 0.000 < 0.05$). More so, this finding is also consistent with the well-being literature regarding senior management support or workplace health promotion programs (WHPPs), the impact of the employee's general well-being on the overall productivity of the firms (organisations), as well as associated benefits of health programs (Loudoun and Townsend, 2017; Goetzel *et al*., 2014; Lingard *et al*., 2012; Goetzel *et al*., 2012; McDaid and Park, 2011). For example, McDaid and Park, (2011) found that the organization's implementing such health and well-being promotion strategies are contributing a lot towards the economic benefits for employers and a positive health effects for employees.

Employers should play an active role in improving the health of the employees

"Employers should play an active role in improving the health of the employees" (mean = 4.07) was ranked as the second most important health and wellbeing practice necessary for improving the workability and performance of older construction workers.

Table 1: Ranking of health and well-being practices amongst older construction workers in South Australia

Health and well-being practices	MS	Std. dev	COV (%)	OR[1]	R[2]
Leadership and organisational support practices					
WB1 = Lower health insurance premiums should be offered for participation in health promotion programs	3.51	1.211	34.5	6	5
WB2 = Employers should play an active role in improving the health of their employees	4.07	0.737	18.1	2	2
WB3 = My company's leader are committed to worker health, safety and wellbeing	4.01	0.681	16.9	3	3
WB4 = My employer cares about my health and wellbeing	4.14	0.726	17.5	1	1
WB5 = My work environment allows me to maintain good health	2.98	0.816	27.4	12	7
WB6 = My employer provides me with resources necessary to maintain good health	3.65	0.841	23.0	5	4
WB7 = Our CEO and senior leaders are committed to improving the health of their employees	3.29	0.651	19.8	8	6
WB8 = Our CEO and senior leaders feel it is their responsibility to take care of their employees' health insurance needs	2.78	0.822	29.6	15	8
Workplace health promotion (WHP) programs					
WB9 = Preventative screening and vaccinations	3.67	0.746	20.3	4	1
WB10 = Exercise programs-either on site or discounts for local gyms	3.35	1.066	31.8	7	2
WB11 = Monitoring of health goals/biometrics-BMI/weight loss, cholesterol levels, blood pressure etc.	2.04	1.096	53.7	20	12
WB12 = Smoking cessation programs	2.00	1.035	51.8	21	13
WB13 = Completing a health risk appraisal	2.99	1.286	43.0	11	5
WB14 = Managed programs for substance abuse or mental health	2.91	1.087	37.4	14	7
WB15 = Healthy food options on site cafeteria or healthy snack option	2.69	1.215	45.2	17	9
WB16 = Corporate sponsored challenges	2.71	0.843	31.1	16	8
WB17 = Ergonomic workstations (e.g. standing desks, adjustable workspace furniture)	3.04	1.229	40.4	9	3
WB18 = Lunchtime lectures/ education on healthy behavior	3.00	0.951	31.7	10	4
WB19 = On site health clinic for routine visits at my job	2.98	1.154	38.7	13	6
WB20 = Case managers to track disease management	2.09	0.610	29.2	18	10
WB21 = Medication adherence programs	2.07	0.686	33.1	19	11

Notes: N = 85,[1]OR = Overall ranking of the 21 well-being practices based on the mean score (MS) where 1 = Strong disagree, 2 = disagree, 3 = Neutral, 4 = Agree, and 5 = strongly agree; [2] R=Ranking based on the individual categories

The higher ranking of this practice is further evidenced by being statistically significantly different from the population mean score of 3.5 ($t = 7.142$, $p = 0.000 < 0.05$). This finding is also consistent with health and wellbeing literature regarding the measures and investment undertaken by construction firms and other sectors in enhancing their employee's wellbeing (Choi, 2015; Goetzel *et al*., 2014; Ross, 2010). Similarly, the organization needs also to promote health and safety practices to improve loyalty, satisfaction and motivation of older employees (Ross, 2010).

My company's leaders are committed to worker health, safety and wellbeing
The third most important health and well-being practice is "my company's leaders are committed to worker health, safety and wellbeing" (mean = 4.01). This practice was also statistically significantly different from the population mean score of 3.5 (t = 6.926, $p = 0.000 < 0.05$). The literature is replete of studies which highlights employers or organizational support to employees through the proactive implementation of a number of programs such as health promotion programs, wellness programs, stress management programs, fitness programs and health management programs (Choi, 2015; Dickson-Swift *et al*., 2014). For example, Dickson-Swift *et al*., (2014) identified organizational culture which includes organisation support among the contributing feature to making a positive impact upon the health of both employees and employers. Similarly, within the US construction industry context, the study by Choi (2015) recommended specific proactive preventative intervention ergonomics programs aimed at the older construction workers such as lifting training programs.

Preventative screening and vaccinations
The fourth most important health and well-being practice is "Preventative screening and vaccinations" (mean = 3.67). This was also the most highly ranked from the 'WHP programs' practices. As with the preceding three practices, the higher ranking of this practice is also further evidenced by being statistically significantly different from the population mean score of 3.5 ($t = 2.108$, $p = 0.038 < 0.05$). Support of this finding is also consistent with construction specific literature (Loudoun and Townsend, 2017) and other fields and disciplines (Zwetsloot *et al*., 2010; McCleary *et al*., 2017). For example, according to Frick and Zwetsloot (2009 cited in Zwetsloot *et al*., 2010), health screening at recruitment can be used as a mechanism for managing the impact of health on production. Likewise, "workplace screening, ideally linked to medical care to ensure follow-up treatment as necessary" is acknowledged as one key element crucial to WHPPs (McCleary *et al*., 2017, p. 256).

Smoking cessation programs
Despite the importance attached to WHP programmes and numerous studies that have highlighted the impact of smoking among the construction workers (Alavinia *et al*., 2007; Lingard *et al*., 2015; Dickson-Swift *et al*., 2014; Australian Government Department of Health, 2016), this study revealed some contradictory findings with the practice of "smoking cessation programs" being ranked the least important health and wellbeing practice (mean = 2.00). For instance, according to the statistics by the Australian Government Department of Health (2012), 31% of the construction workers smoked when compared to the entire working population with a National average of 21%. This is despite the significance of the Lingard and Turner (2015) study which prioritized smoking cessation and physical exercise as priority areas for intervention amongst the male, blue collared construction workers. Similarly, earlier Australian studies such Dickson-Swift *et al*., (2014) also identified that conducting health information session (such as quitting smoking) amongst the promoting features in organisations that had a positive impact upon the health of both employees and employers. Likewise, Alavinia *et al*., (2007) found some association between lung obstructions arising from smoking with scores on the Work Ability Index (WAI).

Overall Workability and Regression Analysis

Based on the classification of the WAI as discussed in the research methodology section, the results the construction workers WAI were computed. Most of the

participants had a good (51.8%) and moderate (41.1%) work ability respectively. Subsequently, a multiple linear regression was calculated predicting the older construction workers workability scores based on their health and well-being practices (Table 1). The results of the model summary are presented in Table 2.

Table 2: Model summary stepwise regression predicting workability

Model	*R*	R^2	Adjusted R^2	Standard error of the estimate
1	.179[a]	.032	-.070	0.655
2	.518[b]	.269	.025	0.625

Notes: [a] Predictors: (Constant), WB8, WB2, WB3, WB6, WB5, WB7, WB4, WB1; [b] Predictors: (Constant): WB8, WB2, WB3, WB6, WB5, WB7, WB4, WB1; WB17, WB12, WB19, WB21, WB15, WB10, WB20, WB18, WB13, WB11, WB14, WB9, WB16

The ANOVA results (not included here) showed that for both models, the regression equations were not significant (F (8, 76) = .313, p = .959 > 0.05 with an R^2 of .032 and (F (21, 63) = 1.102, p = .959 > 0.05 with an R^2 of .269 for models 1 and 2 respectively. However, the results indicate that the aggregated 21 health and well-being practices (model 1) account for 26.9% of population variance of the overall workability success. This finding suggests modest degree of contribution of the health and well-being practices to overall workability.

CONCLUSIONS

Through a questionnaire survey, this study sought the perception of the older construction site-based workers on how the health and wellbeing practices influence their performance in South Australia. Based on the work of McCleary *et al*., (2017), 21 health and well-being practices categorised into 8 "Leadership and organisational support practices" and 13 "WHP programs" were revised and adopted. The findings conclude that the following 3 "leadership and organisational support practices" as highly ranked and significant: "my employer cares about my health", "employers should play an active role in improving the health of their employees" and "my company's leader are committed to worker health, safety and well-being". In contrast, the 3 highly ranked WHP programs" practices were "preventative screening and vaccinations", "exercise programs-either on site or discount for local gyms" and "ergonomic workstations". Surprisingly, contrary to the literature, the overall 2 least ranked practices were drawn from the following WHP programs category' as follows: "monitoring of health goals / biometrics, BMI and weight loss, cholesterol levels and blood pressure" and "smoking cessation programs". The overall sum of working ability reported by most respondents was found to be good and moderate. The findings of the present study is not only one of the few empirical academic works investigating the health and well-being practices, and the workability index of older workers within the South Australian construction sector, but could also be used for the promotion and development of interventional strategies aimed at improving the general and mental well-being of older construction workers. Most importantly, the workplace well-being as investigated not only deals with all the working life aspects of employees, but encompasses the safety and quality of the physical environment to whether the employees feel positive or negative about their work. This study has some limitations. First, the population sample was restricted South Australia only, and one industry namely construction, consequently, the findings may not generalize to other states and countries or older construction workers on site. Second, there could be a possibility of biased answers due to self-reporting nature of the questionnaire and this might not provide reliable estimates of the health and wellbeing practices.

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