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-RESEARCH ARTICLE-

THE APPLICATION OF THEORY OF PLANNED BEHAVIOR IN THE CONTEXT OF ICT-ENABLED OCCUPATIONAL HEALTH AND SAFETY SYSTEM IN SOUTH AFRICA DURING COVID-19 PANDEMIC

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─Abstract─

The outbreak of the COVID-19 pandemic has profoundly affected the world of work, bringing in new ways of working and the use of alternate work arrangements. Organisations' are seldom prepared for the deterioration and readjustment working conditions in the wake of a global health crisis. The role of Information and Communications Technology in strengthening the organisations' Occupational Health and Safety (OHS) measures cannot be overlooked. Grounded in the Theory of Planned Behavior (TPB), this article therefore assesses the impact of employees' behavior regarding ICT and its use on OHS practices in a South African public sector organization and explores how technology can be leveraged to strengthen OHS practices in the wake of COVID-19 pandemic. From a quantitative research methodology approach, data was collected using a random probability sampling technique from a sample of 103 employees in a government establishment. The collected data is analyzed using the PLS-SEM technique through SmartPLS 3.0. The findings of the study demonstrate the existence of a significant relationship of employee behavior and the use of ICT at work, resulting in enhanced OHS. The study also offers several research implications, limitations, and directions for the future in the concluding sections.

Keywords: Covid-19, Occupational Health and Safety, Information Communications and Technology, South Africa, Public sector, Theory of Planned Behavior (TPB).

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1. INTRODUCTION AND BACKGROUND

The subject of occupational health and safety management in the public sector is on the rise not only because of its position as the highest employers of labour, but also the rise of new governmental agencies, advances in research and an increase in level of education/awareness focusing on safety. Irrespective of employees' familiarity with the OHS concepts, many organizations across the globe continue to record losses and inefficiencies due to non-compliance. Cagno et al. (2014), note that with the huge investments on safety and health, occupational accidents and injuries seem to be on the increase globally. The changes in the nature of work, management and organizations lead to emerging OHS risks associated with physiological, psychosocial, mental and emotional demands (Jespersen et al., 2016). Mohammadfam et al. (2016), accenting the adverse effects of the direct and indirect costs of work-related injuries, accidents and illnesses on the workforce, assets, equipment, environment, and the economy at large.

Globally, workers face occupational hazards in the complex work settings due to rapid industrialization, technological advancement and globalization resulting in injuries, accidents, illnesses, disabilities and death (Ahmad et al., 2016). According to the International Labour Organisation, (ILO) (2020), 340 million occupational accidents and 160 million victims of work-related illnesses occur annually. These figures are in line with the ILO estimate of 2.3 million workers globally succumbing to work-related accidents or diseases on a yearly basis amounting to over 6000 deaths every single day. South Africa is not an exception, though the National Institute for Occupational Health (NIOH) (2020), asserted the unavailability of a national comprehensive data on the occupational diseases, injuries and death, these incidences occur at industry/sector levels. For example, the mining industry recorded 2, 406 injuries in 2019; while in 2018, 3, 458 diseases, and 25 medical deaths were recorded, with 999 annual medical reports being submitted to the department (Department of Mineral Resources, 2020). According to Hrpulse (2018), an estimation of over R2-billion worth of claims are lodged annually with the Department of Labour seeking compensation due to non-compliance. Construction (2020), also note that the construction industry remains one of the three industries with the highest work-related injuries because of exposure to chemicals, physical, biological, ergonomics and psychosocial occupational hazard which reflect in various short- and long-term health consequences of workers. Other sectors such as agriculture/forestry, informal economy and healthcare are not exempted from occupational injuries, diseases, and death.

The International Labour Organisation (ILO) sets forth principles to ensure the protection of workforce from sicknesses, diseases, and injuries that may arise because of the work environment. The ILO standards on Occupational Health and Safety provide guidance and tools for national governments, employers, and workers to ensure maximum safety at workplace. In the context of South Africa, health and safety at

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workplace is well covered in the Constitution of the Republic of South Africa Act 108 of 1996; the Acts of Parliament (e.g. The Occupational Health and Safety Act 85 of 1993, The Compensation for Occupation Injuries and Diseases Act of 130 of 1993, The Labour Relations Act 66 of 1995); and the Regulations and Codes of Practice and Standards, for example, The Environmental Regulations for Workplaces, 1987 (Guide, 2019). With these regulations in place, changes in work practices are creating challenges as well as opportunities for improving the well-being of workers. The outbreak of Coronavirus disease (COVID-19), caused by SARS-CoV-2, has rapidly changed the way we live and work. The fast spread of the Covid-19 has resulted in an increased number of infections, death tolls and thus, gripped fear within the society. To contain the virus, nations embarked on lockdown restrictions, resulting in closure of land and sea boarders as well as air spaces.

Further containment strategies saw many governments' (including, the government of South Africa's) closure of organisations, except for essential services. As the restrictions ease and workers return to work, many organisations adopted a blended work arrangement allowing employees to work from home as well as from office spaces where possible. As workers return, workplaces become a major concern area for community transmission thus bringing the health and safety issues to the spotlight. Organisations' management is therefore challenged with stricter strategies and changes to their existing Occupational Health and Safety (OHS) measures to circumvent the Covid-19 local transmission. This has led to many if not all organisations integrating Covid-19 prevention and control measures into their comprehensive OHS policies and management systems. It is believed that a safe working environment is relevant to the biological, physical, and psychological well-being of the workers irrespective of pandemic. Some of the initial changes adopted by organisations' to manage the Covid-19 pandemic situation, reflected on both physical and non-physical modifications which may include but not limited to the use of face mask, health screening of workers/others entering the premises, sanitization, maintaining social distancing and encouraging employee well-being initiatives. These initiatives are deemed important for controlling workplace hazards. In addition, technological tools have modified the nature of the workplace in terms of interaction, communications, dissemination of information, and in improving the working life etcetera. During the Covid-19 pandemic, Information and Communication Technology (ICT) services are seen to have played a significant role in managing the situation. Various governments resorted to a combination of smart-working approach, developed ICT based services for health-related checks, and aligned these changes with OHS policies. In view of the foregoing, Covid-19 therefore presents a new challenge for workers as well the workplace.

As previously stated by several researchers, job conditions can foster chronic sources of strain, and that the correlations between chronic sources of strain and distress are

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significant, outpacing the influence of stressful life events and traumatic experiences (Huang et al., 2019). However, we know very little about whether and how information and communication technology (ICT) practices influence specific workplace situations in ways that contribute to poor employee outcomes. Some researchers believe that the use of information and communications technology (ICT) can increase the pace of work (Akdol et al., 2017), the rate of interruptions, or the rate of multitasking (Varghese et al., 2018), resulting in increased employee stress and burnout in some cases (Berg-Beckhoff et al., 2017).

South Africa conforms to best international practices and improved OHS legislation and regulations, yet the injury-on-duty rate has been on the increase showing a disproportionally higher health and safety statistics than those of First World countries (News, 2019). With the government's greater emphasis on and progress in reducing workplace injuries, it has been documented that work-related deaths, due to disease, have been on the increase over the past 29 years (News, 2019). In addition, from the economic perspective, work-related sicknesses such as depression cost South Africa 5.7% of the country's GDP (Citizens, 2018). In view of the prevalence of the coronavirus pandemic, workplaces are becoming areas of concern due to the possibility of being a transmission hub. Therefore, continuous research on occupational health and safety is necessary to improve the OHS performance especially in this era of Covid-19 pandemic. The (Council, 2013) notes that investments in employees' health and safety is considered an investment for organizational success and continuity. It is indeed necessary to maintain a healthy workplace for the benefit of the individual, organizations, and the country at large

Against this background, this article sheds light into the knowledge and views of employees on the state of OHS practices in a South African public sector organization. Based on the Theory of Planned Behavior, the article explores the employee's behavior regarding technologically enabled-services that could improve the implementation of OHS practices in the wake of Covid-19 pandemic. Following the introductory section, the author of the article first presents a comprehensive review literature on OHS and its components namely: risk assessment and management, control and monitoring, communication and health and safety culture. A further review provided a synergy on OHS, Covid-19 and ICT. After this, a detailed outline of the research methodology/approach followed by a discussion of the results of the study. In the concluding sections, several practical implications and limitations of the study are highlighted.

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2. LITERATURE REVIEW

2.1 Occupational Health and Safety

The World Health Organisation (Organization, 2010), considers safety at work a priority for health promotion in the 21st century. This is because, in many settings, work remains hazardous, and injuries, sicknesses and fatalities inflicted on humans, societal fabric, as well as the economy remain a major concern. As a result, the quality, health, knowledge, and safety requirements in workplaces today are more stringent than they were previously. One of the mitigating policies approaches organisations adopt is Occupational Health and Safety. The South African OHS policy provides guidelines for the health and safety of persons at work, in connection with the machinery or hazards which may arise while carrying out the job task (RSA, Government Gazette, 1993). According to İnan et al. (2017), OHS is concerned with the tasks of protecting workers and the worksites, by reducing the number of accidents, minimizing insufficient information, and improving awareness of employees. Research in OHS has grown tremendously over the years but the outbreak of Covid-19 pandemic and technological advancements, have called for more commitment to its policy and practices. OHS is a multidisciplinary concept field of research, which interacts with a broad spectrum of stakeholders (Beus et al., 2016; Bhagawati, 2015). Because OHS promotes health, safety and welfare of the workforce, it thereby encapsulates the emotional, mental and physical well-being needs of workers (Amponsah-Tawiah et al., 2016), thus, a broader concept pertaining to quality of life (Hartas, 2021).

In essence, work environment consists of a triad of environment (organisation), man and machine, associated with risk factors or hazards (in physical, chemical, biological, ergonomic and psychosocial form), having the potential to harm the health, safety and welfare of workers (Ahmad et al., 2016). In this triad relationship, (Gan, 2019), stresses that hazards could emanate from job factors (i.e. a match between job and worker); individual factors (which may include competences, attitude, and risk perception); and organisational factors (consisting of work schedule, quality of communications, safety culture, and leadership). Addressing these hazards entails a critical OHS program following steps of risk identification; risk analysis (whom might be harmed and how); risks evaluation (decision and record control measure); and risk treatment (implement plan, monitor, review and update continuously to ensure measures are adequate and effective) (Gan, 2019; Podgórski et al., 2017; De Jager et al., 2014). In line with the set-out research questions and the OHS steps, further literature covers risk assessment and management, control and monitoring, communication, and health and safety culture.

Risk assessment is the process of evaluating risks arising from a hazard, taking into account the adequacy of any existing controls and deciding whether or not the risk is acceptable (Institutions, 2007). Because hazards cannot be completely eliminated, the

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goal would be to reduce it to the barest acceptable minimum level (Rout et al., 2017). Risk assessment and management in the context of OHS has become of key importance of late due to the nature of activities in the workplaces, and nature of regulatory and legal measures (Sousa et al., 2015). The concepts of risks assessment and management relate to hazards and/or harmful factors posed by the working environment which underpins most organisations OHS policies. Risk assessment is important as it highlights the hazards and foresees the likelihood of incidents happening in the workplace as well as possible control approaches to be adopted.

Similarly, Salguero-Caparrós et al. (2020), note that control and monitoring identify sources of risk and determines the use of control measures before an injury happens. In other words, a risk control system involves risk identification and assessment (You, 2003). Communicating the control and monitoring measures adopted is essential for a safe work environment. Scott & Lewis (2017), described a communication climate as a subset of organizational climate that refers to the relationships and interactions within the workplace. Safety in such climate becomes a paramount and major concern for organisations. Because of the associated financial and nonfinancial cost implications of unsafe workplace, communication becomes an important and central feature of and a contributing factor to a healthy safety climate (Newnam, 2016; Yousefi et al., 2016). With this, one can rightly say that communication is well-suited for examining OHS issues in organizations, because many workplace injuries and incidents may be related to communication challenges (Schulte et al., 2018). In essence, communication entails access to and availability of safety information (Atkins et al., 2017), is considered an intervention tool for achieving programmatic activities in OHS (Ford et al., 2018), and is one of the ways of improving safety culture and preventing injuries in an organization (Williams et al., 2018). Effective communication is therefore deemed necessary for all stakeholders (employees, management etcetera). Alongside communication is the aspect of culture at a workplace that concerns health and safety, risks and hazards, which is called safety culture by (Nordlöf et al., 2015). Suhanyiova et al. (2017), asserts that culture relates to peoples' beliefs, feelings, thinking and behavior, and how these reflect in collective habits, rules, norms, symbols, and artefacts. There is a general consensus that organisations are involved in social processes which either enhance or hinder certain behavioural outcomes regarding OHS (Edwards et al., 2013). Culture remains one of those factors that influence behavior (Myers et al., 2014), given that a workplace allows for socialization, it therefore entails shared values and norms amongst workers. Since a workplace comprises of the individual, job tasks and the environment, it requires a collective effort from all the stakeholders involved - employers, supervisors, and workers. Communication to enhance such collective efforts implies a strongly shared health and safety value system and, involvement and ownership by all members of the organisation (Zwetsloot et al., 2017). This is why Shakdwipee et al. (2017), notes that direct engagement with employees is the best way to comprehend a risk culture. A

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commitment to health and safety culture is therefore a critical element of an OHS programme.

2.2 Theoretical Framework

Organisations are equipped with human and other tangible resources which call for safety behavior and apply these resources to ensure a safe working environment. Human behavior towards the application of organizational resources determines-to an extent-the level of workplace safety. One of the psychological theories mostly applied across disciplines in understanding human behavioral changes is Aijzen's Theory of Planned Behavior (TPB). According to Ajzen (1991), TPB provides a framework to examine the path between beliefs and behavior. The model explains how individual factors lead to someone engaging in a specific behavior. The latter posits that three elements of TPB, namely attitude towards behavior, subjective norms, and perceived behavioral control, influence one\s behavior. Hence the intention to exhibit an action is determined by one's attitude towards behavior (ATB, i.e. behavioral beliefs), subjective norms (SN, i.e. normative beliefs or social influences) and perceived behavioral control (PBC, i.e. ease/difficulty of engaging in an action) (Ajzen, 1991). The power of an individual's intention in a behavior is a result of a combination of these factors, as shown in Figure 1.1

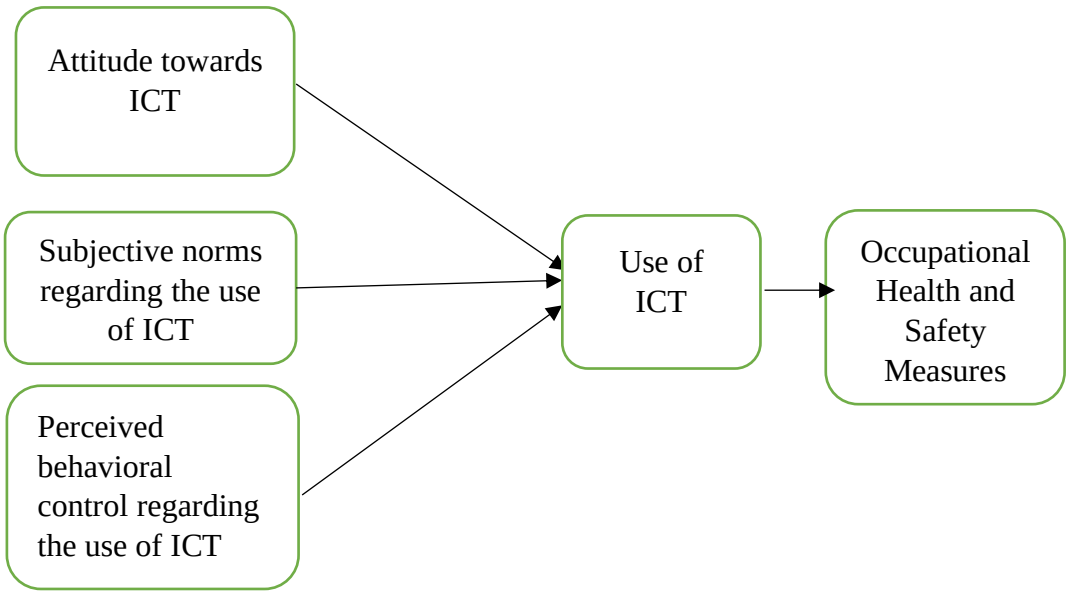

Figure 1.1: Research Framework

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Thus, Attitude towards ICT, Subjective norms regarding the use of ICT, and Perceived behavioral control regarding the use of ICT are assumed proximal predictors of an individual's intention to engage in a certain behavior (Ajzen, 1991; Montano et al., 2015). The outcome of such behavior could be positive or negative. Linking this to OHS, unsafe behavior is viewed as one of the major contributors of accidents in a workplace, and the concept of 'behaviour' has attracted considerable research efforts in OHS practices. There is a dearth of evidence in research studies linking behavior to workplace safety (Guerin & Toland, 2020), leading to researchers to applying TPB framework to OHS practices (Kim & Jeong, 2021; Guerin & Sleet, 2020; Prussia et al., 2019). In essence, OHS behavior refers to employees' adaptation to behavioral safety routines (Çiftçi & Bilgin, 2019).

Since the outbreak of Coronavirus, safety behavior has taken the center stage in debates amongst stakeholders, governments, health professionals, etcetera. The pandemic saw many, if not all, governments across the globe introduce various mitigating measures which include, physical distancing, hygiene measures, wearing masks, et cetera. The individual and collective application of these measures in controlling the virus has been widely linked to human behavior. As such, a growing number of studies have applied the TPB framework in understanding human behavior factor towards mitigating measures against Covid-19 pandemic. Studies by Chan et al. (2021) and Godbersen et al. (2020), show how TPB elements of ATB, SN and PBC, impact on the protection and practicability of anti-Corona measures in the workplace and society at large. Similarly, other studies, Das et al. (2021) and Frounfelker et al. (2021), demonstrate that attitude, subjective beliefs and perceived behavioural control influence an individual's behavioral intention towards maintaining social distancing containment measure for Covid-19. Again, Park & Oh, (2021), applied TPB in their study and found that adherence to the preventative measure of wearing masks is associated with an individual's normative belief, perceived behavioral control, and intention to act amongst others. This is in line with Aschwanden et al. (2021), study who found that perceived behavioral control, attitudes, and subjective norm had independent significant associations with an individual's Covid-19 preventive behavior. Furthermore, Mao et al. (2021), demonstrate that improving Covid-19 preventative measure has a significant correlation with an individual's attitude towards the behavior, subjective norms and perceived behavioral control.

Furthermore, the health and safety at workplace which is a global concern especially in the era of Covid-19 has resulted in increasing deployment of ICT to contain the virus. Further developments in this field have drawn much focus on the use of ICT to improve or enhance OHS practices. Podgórski et al. (2017), note several attempts in applying technological solutions to OHS areas. Across disciplines and industries, technology has been used to enhance the OHS processes. Jilcha (2020) assert the evidence of new

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technologies improving the workplace through communication, standardization of processes, and enhancing workflow. Similarly, innovations in ICT have shown positive impact on the quality of work by improving performance of both people and system, and the overall transformation of the society (Aly et al., 2014; EUOSHA, 2013). Across disciplines and industries, technology has been utilized to enhance OHS areas. Deep-learning algorithms help to detect and manage workers behavioral patterns to avoid work accidents in real time (Heng et al., 2016; Sachin, 2018). Jilcha et al. (2016) assert the application of technology in knowledge diffusion to create awareness and change the workers mindset towards workplace health and safety. In addition, automated systems, mobile devices and drones, help to capture on time data, manage incident reports, connect with teams, and identify potential risk areas, (Hes, 2018). Furthermore, technological applications in OHS predicts the weather/temperature conditions of the work environment (Yi et al., 2016), and sends sensing and warning safety alert to workers and management (Antwi-Afari et al., 2019; Hes, 2018). Other technological advances in OHS manifest in the use of virtual reality technology and smart glass in safety education/training (Grant, 2020; Kim et al., 2016), and wearables electronics to prevent musculoskeletal disorders (Ciullo et al., 2019), amongst many other functions. In essence, technological applications in OHS practices helps to alert workers on risks and hazards (toxins, varying temperatures, noise), emergency stops for heavy machineries, ergonomic issues, and cognitive and physical workloads.

The reflections on the changing nature of work and workplaces as a result of Covid-19 has called for a more innovative technologically driven OHS practices. Workplace needs to prioritize health and safety by adjusting existing policies, conducting regular risk assessments, and monitoring to reduce the likelihood of community transmission. Amendments in organisations OHS practices have obliged the need to evaluate risks, implement standard work procedures and provide relevant trainings where necessary. Application of technological solutions is being used for examining workers and visitors' body temperatures before entering the organisation's premises, capturing data related to the workers for possible tracing, protective wearables, trainings and many more. As the scientific understanding of the virus increases, organisations would be challenged with their OHS practices to reduce the likelihood of exposure and prevent transmission. It is therefore believed that in-built technological designs in tools associated with job tasks and the workplace environment can help reduce workplace injuries and illnesses. Thus, ICT applications allows facilitating of other key functions of OHS management related to hazard identification and risk management and control (Podgórski et al., 2017).

Given the foregoing, the general safety environment is assumed to influence the intention to act or display of an individual specific behavior. Considering that TPB can be helpful in predicting and understanding the environmental and individual factors affecting behavior, this justifies the suitability of the modified TPB framework which

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incorporates Ajzen (2019), Theory of Planned Behavior (TPB) and Benach et al. (2007), model of work conditions as shown in Figure 1.1, for addressing OHS challenges especially in the coronavirus, and thus the following hypotheses have been developed:

H1: The attitude towards the use of ICT has significantly associated with the use of ICT at work.

H2: Subjective norms regarding the use of ICT has significantly associated with the use of ICT at work.

H3: Perceived behavioral control regarding the use of ICT has significantly associated with the use of ICT at work.

H4: The use of ICT at work has significantly associated with Occupational Health and Safety Measures.

3. METHODOLOGICAL APPROACH

3.1 Research Strategy

The research study site is a South African government department located in KwaZulu-Natal. The study is descriptive in nature and the researcher adopted a simple random probability sampling strategy. The choice of this sampling method allows for every individual member of the population to be included in the study. A quantitative research approach was adopted for the study using questionnaire as a data collection instrument. The questionnaire consisted of close-ended questions aligned to the study research objectives indicating the respondents' levels of agreement with each item on a five-point Likert scale ranging from 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A) to 5 = Strongly Agree (SA). The questionnaire comprises of 4 sections with questions covering the demography, perceptions on TPB element, perception of use of ICT at work and OHS practices. The constructs of attitude towards ICT, subjective norms regarding the use of ICT and perceived behavioral control regarding the use of ICT were measured using 5 items, 4 items and 5 items, respectively (Agbonlahor, 2008). Similarly, the construct of use of ICT was measured using 3 items (Chesley, 2014). Finally, the dimensions of OHS i.e., job safety, management safety practices and safety program were measured using 3 items each (Suárez-Albanchez et al., 2021). The construct of OHS in the present study was measured as reflective-reflective higher order constructs. A sample size of 103 (based on the characteristics of the respondents) was derived from a target population of 140 using the Yamane Formula.

$$n = \frac{N}{1 + N(e)^2}$$

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Where n = corrected sample size; N = population size (Target); e = Margin of error (MoE), e = 0.05 based on the research condition. Adopting a simple random sampling strategy, the questionnaire was administered to and collected from 103 respondents' but only 73 of the questionnaires were comprehensively answered and considered ideal for analysis. Of the sampled 73 respondents, a response rate of 71% was achieved which is considered adequate for the study. The collected data was then analyzed using SmartPLS 3.0 by adopting the PLS-SEM technique.

4. ANALYSIS AND DISCUSSION OF RESULT

The PLS-SEM technique was used to empirically analyse this model as it is the most appropriate technique for this type of study due to its prediction capability (Hair et al., 2019). This method, which is now considered to be the most developed of the variance-based systems for SEM, is used in a wide variety of fields and is currently under development. The analysis was carried out in two stages: first, the evaluation of the measurement model was carried out, followed by the evaluation of the structural model.

4.1 Measurement Model

We used the PLS-SEM approach in conjunction with the SmartPLS software because of the complexity of the model, the dependability of this method, and the predictive capability of this method (Hair et al., 2019). It was necessary to validate several different model factors in order to conduct an evaluation of the model. The model has a 95% confidence level in terms of significance. Cronbach's alpha and composite reliability were used to examine the internal consistency of the model, while the indicator reliability and average variance extracted were used to test the convergent validity of the model (AVE). The Fornell–Larcker criterion and HTMT criterion were used to determine whether the model has discriminant validity. Also examined were the cross-loadings that existed between indicators and latent variables. After that, we are able to confirm that all variables understudies had a sufficient Cronbach's alpha value [62], as can be seen in Table 1, Table 2, Table 3 and Figure 2, to ensure that the model was internally consistent and valid.

4.2 Structural Model

After assessing and validating the measurement model, the next step in PLS-SEM is to assess the structural model. The structural model is used to assess the hypotheses of the study. The results of the structural model are presented in Figure 3 and Table 4. The findings of the analyses confirm the significant relationships between attitude towards ICT ($\beta = 0.195$; T-Value = 2.961; $p < 0.05$), subjective norms regarding the use of ICT

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Table 1: Measurement Model

Construct	Items	Loadings	rho_A	CR	AVE
Attitude towards ICT	A_ICT1	0.858	0.941	0.947	0.781
	A_ICT2	0.840			
	A_ICT3	0.850			
	A_ICT4	0.930			
	A_ICT5	0.935			
Subjective norms regarding the use of ICT	SN_ICT1	0.876	0.923	0.945	0.812
	SN_ICT2	0.929			
	SN_ICT3	0.915			
	SN_ICT4	0.883			
Perceived behavioral control regarding the use of ICT	PBC_ICT1	0.951	0.947	0.973	0.879
	PBC_ICT2	0.954			
	PBC_ICT3	0.957			
	PBC_ICT4	0.923			
	PBC_ICT5	0.900			
Use of ICT	U_ICT1	0.898	0.909	0.942	0.845
	U_ICT2	0.924			
	U_ICT3	0.935			
Job safety	JS1	0.940	0.923	0.951	0.866
	JS2	0.939			
	JS3	0.913			
Management safety practices	MSP1	0.904	0.915	0.946	0.854
	MSP2	0.939			
	MSP3	0.930			

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Table 1: Continues

Safety program	SP1	0.822	0.747	0.852	0.658
	SP2	0.787			
	SP3	0.824			
Occupational Health and Safety*	Job safety	0.758	0.889	0.915	0.580
	Management safety practices	0.723			
	Safety program	0.736			
*Second Order Construct					

Table 2: Fornell & Larcker Criterion

	A_ICT	**JS**	**MSP**	**PBC_ICT**	**SP**	**SN_ICT**	**S_ICT**
A_ICT	0.884						
JS	-0.2	0.931					
MSP	-0.15	0.742	0.924				
PBC_ICT	0.066	0.103	0.123	0.937			
SP	-0.163	0.225	0.299	0.055	0.811		
SN_ICT	0.202	0.436	0.473	0.292	0.179	0.901	
U_ ICT	0.166	0.632	0.598	0.14	0.034	0.373	0.919

Note: A_ICT = Attitude towards ICT, JS = Job safety, MSP = Management safety practices, PBC_ICT = Perceived behavioral control regarding the use of ICT, SP = Safety program, SN_ICT = Subjective norms regarding the use of ICT, U_ICT = Use of ICT

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Table 3: HTMT Criterion for Discriminant Validity

	A_ICT	JS	MSP	PBC_ICT	SP	SN_ICT	S_ICT
A_ICT							
JS	0.294						
MSP	0.217	0.825					
PBC_ICT	0.078	0.101	0.122				
SP	0.218	0.26	0.344	0.109			
SN_ICT	0.255	0.471	0.513	0.307	0.234		
U_ ICT	0.142	0.682	0.643	0.134	0.105	0.407	

Note: A_ICT = Attitude towards ICT, JS = Job safety, MSP = Management safety practices, PBC_ICT = Perceived behavioral control regarding the use of ICT, SP = Safety program, SN_ICT = Subjective norms regarding the use of ICT, U_ICT = Use of ICT

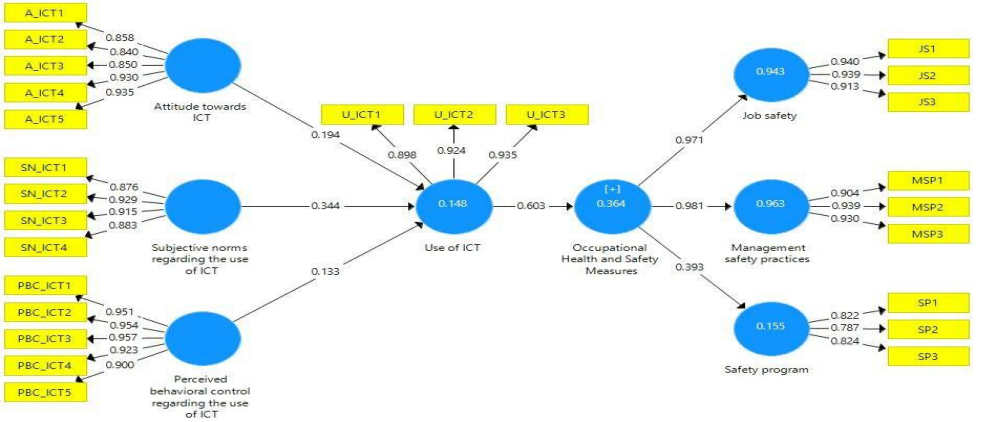

Figure 2: Measurement Model

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Table 4: Hypotheses testing

Variables	Path coeff.	Std. Dev	T-value	*p*-values	CI^{BC} High	CI^{BC} Low	Results of hypothesis
Attitude towards ICT -> Use of ICT	0.195	0.098	2.961	0.004	0.165	0.295	Supported
Subjective norms regarding the use of ICT -> Use of ICT	0.344	0.056	6.147	0.000	0.231	0.453	Supported
Perceived behavioral control regarding the use of ICT -> Use of ICT	0.133	0.073	2.456	0.016	0.102	0.198	Supported
Use of ICT -> Occupational Health and Safety Measures	0.605	0.033	18.122	0.000	0.536	0.666	Supported

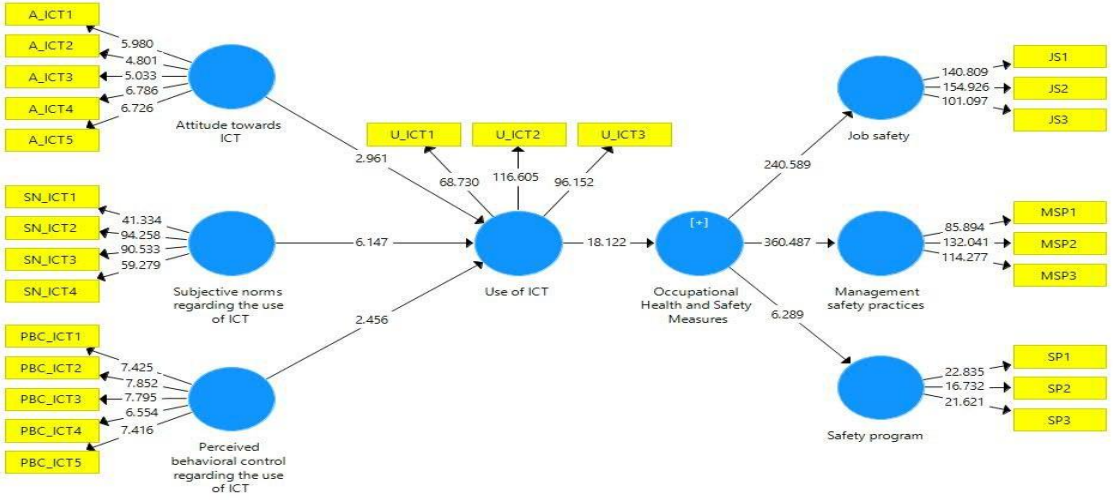

Figure 2: Structural model

($\beta = 0.344$; T-Value = 6.147; $p < 0.05$) and perceived behavioral control regarding the use of ICT ($\beta = 0.133$; T-Value = 2.456; $p < 0.05$) with use of ICT at work. Similarly, the relationship of use of IT and occupational health and safety ($\beta = 0.605$; T-Value = 18.122; $p < 0.05$) is also found to be significant.

4.3 Discussion of Research Findings

The study unearths issues pertaining to OHS management practices and evaluates the impact of the element of TPB related to ICT with the use of ICT and OHS. These factors are crucial and play fundamental roles in addressing OHS issues at the workplace. The result of the study shows significant relationships of attitude towards ICT, subjective norms regarding the use of ICT and perceived behavioral control regarding the use of ICT with use of ICT at work. These findings are consistent with other similar research studies across sectors in various aspects of OHS (Agumba et al., 2018; Bonafede et al., 2016; Esau, 2015; Esterhuyzen, 2019; Fernández-Muñiz et al., 2017; Ferreira, 2015; Kaynak et al., 2016; Marahatta et al., 2018; Mohammadfam et al., 2017; Simukonda et al., 2020; Wachter et al., 2014). These findings are also in line with the South African OHS Act 85 of 1993 which requires employers to identify hazards, evaluate risks, protect workers from risks exposures and carry out appropriate health and safety control measures and monitoring. This provision of health and safety includes elements related to Covid-19 containment and prevention at workplace.

A deeper insight into these findings poses a difficult workplace environment especially during the Covid-19 pandemic. Koh et al. (2020) acknowledge the occupational health threat posed by Covid-19. George et al. (2020), suggesting the need for a comprehensive strategy to contain the spread of Covid-19 at workplace. Such strategy involves acquisition of resources (tangible and intangible), conducting risk assessments, determining intervention strategies, developing a project plan, consultation, evaluation and improvement (George et al., 2020). The World Health Organisation (Organisation, 2020) suggests that workplace risk assessment in Covid-19 pandemic should consider the environment, the task, the threat, resources available, and the feasibility of protective measures. In view of Sinclair et al. (2020), and from an organizational standpoint, providing resources can protect employees' physical and mental health and drive efficiency. From other scholarly viewpoints, Fernández-Muñiz et al. (2017), note that planning in OHS involves evaluating risks and establishing the necessary measures to avoid accidents and injuries. Studies have shown that planning in OHS reduces injuries and accidents (Bonafede et al., 2016; Fernández-Muñiz et al., 2017), involving employees in planning activities influences OHS performance positively thereby reducing accidents (Agumba et al., 2018; Ali et al., 2018; Varghese et al., 2018) and helping build a strong OHS culture in an organization (Glendon et al., 2016). Non-compliance with OHS practices poses both direct and indirect costs affecting the individual, organisation, environment and economy. Non-compliance with OHS practices is found to be associated with human factors (Esterhuyzen, 2019) and the use

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of training (da Silva et al., 2019) enhances positive behavioral change towards OHS compliance as well as the containment of the spread of Covid-19 at workplace (George et al., 2020). The issue of behavioral change with respect to ICT when it comes to OHS practices in Covid-19 pandemic has been well-tested using Ajzen's TPB as discussed earlier in this article. In terms of safety signs and workstation conditions, it is noted that controlling hazard situations and appropriate working conditions support workers fitness in job (Kaynak et al., 2016), boost efficiency, and reduce the incidence of accidents and injuries.

5. CONCLUSION

The current study aims to assess the relationship of attitudes towards ICT, subjective norms regarding the use of ICT and perceived behavioral control regarding ICT with the use of ICT at work. In addition, the relationship of use of ICT with OHS is also assessed. The findings of the study confirm all four hypotheses of the study. With Covid-19 still affecting life in the workplace, the adoption, and the alignment of technology to the organizations OHS policies will play a significant role in improving the OHS practices. Given the findings of the study, aligning technologically enabled-services to assessment and monitoring, communication, and health and safety culture, will not only improve safety knowledge/awareness levels, but also improve the conditions of workplaces as well as help in containing the spread of Covid-19. Therefore, reducing the Covid-19 transmission at workplace facilitates safe transition to post-coronavirus era towards better prevention of accidents and injuries.

5.1 Research Implications

The current quantitative study raises opportunities for future research to refine and further elaborate on the study findings. This paper seeks to add to the analysis of various aspects of OHS practices envisaging ICT as an opportunity for improvement especially during the Covid-19 pandemic. Thus, it intends to offer an opportunity to foster further scientific research work aiming to understand the actual application of ICT enabled-services in organisations during the Covid-19 pandemic. First, the study contributes towards the Theory of Planned Behavior (TPB) by exploring the elements of TPB (i.e., attitude towards behavior, subjective norms and perceived behavioral control) in context of the use of ICT. Second, the findings adds to the existing literature by explaining the role of TPB in enhancing the OHS measures in the context of ICT. Finally, the findings help the practitioners and HR managers understand the role of planned behavior regarding ICT in terms of enhancing the use of ICT by employees at work and its consequence impact on OHS measures.

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6. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The present study has several limitations. First, under the shadow of TPB, this study explores the antecedents of OHS in the context of ICT. Further studies should extend the present research model by determining the influence of OHS performance in reducing accidents, injuries, death and damage to property, and to improve measures for containing the spread of the coronavirus pandemic. Second, this research only focuses the ICT related elements of planned behavior. In order to have a deeper insight, further research could help shed light on the dynamics of knowledge circulation, sharing and exchanging among managers, supervisors and workers. Top management's commitment to health and safety practices is needed to address the OHS non-compliance issues emerging from the study. The insight would help in developing an understanding of the need for full involvement of the workers in the areas of health and safety planning and meetings, and how OHS should be improved to manage similar crisis situations in future. Finally, this study was conducted at the head office of the South African public sector organization located in KwaZulu-Natal. Further research study should be carried out to accommodate other branches of the same department within the province to ascertain the levels of OHS compliance and other management practices.

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