

ORIGINAL ARTICLE

Integration of Psychological Capital in a Conceptual Work Productivity Model

Iqra JAVED^{1,2*}, Siti Zawiah Md DAWAL¹, Yusoff NUKMAN¹, Ashfaq AHMAD³

¹Department of Mechanical Engineering, Faculty of Engineering, University of Malaya, Kuala Lumpur, Malaysia.

²Department of Informatics and Systems, School of Science and Technology, University of Management and Technology, Pakistan

³Department of Electronics & Electrical Systems, Faculty of Engineering, The University of Lahore, Lahore, Pakistan

* corresponding author (email: iqrajaved9313@gmail.com)

ABSTRACT

Psychological Capital (PsyCap) is a positive construct that deals with the strengths of workers. It has a positive impact on worker performance, psychological well-being, and happiness. It is negatively related to job stress, turnover, burnout, and counterproductive work behaviours. There is a need to consider PsyCap while measuring the working performance of the workers working in a highly interactive hazardous environment. The objective of this study is to propose a work productivity model that not only include work-related risk factors that result in acute or chronic responses to the development of WMSDs but also the positive variables (PsyCap) that may support the worker to abate the associated risks. A review of 11 conceptual work productivity models was conducted to identify the gaps and the relationships between the components of work productivity model. This study introduced a conceptual work productivity model, that not only integrates PsyCap as positive construct, but also highlights the positive and negative association between management system, work environment and the worker that results in either maximizing or minimizing productivity, performance and employee health / well-being. This study will be helpful to understand the importance of PsyCap in the working environment and to explore the mechanism associated with the management system, work-related risk factors, psychological capital, and work productivity.

Keywords: Psychological Capital (PsyCap), Work-related risk factors, Work Productivity

INTRODUCTION

With the advent of the industrial revolution and global competition, maximizing work productivity by optimizing human performance is the common goal in industrial settings (Shoaf et al., 2000). This goal demands employees to put maximum effort into work to achieve set objectives of work productivity. This insistence has increased the physical and mental workload on the worker that not only effects the workers' physiological and psychological condition, but also to the organization itself (Clark, Michel, Zhdanova, Pui, & Baltes, 2016).

Ergonomists propose interventions to reduce occupational risks, but the literature says that their efforts are not fruitful without the support of the management system (Goggins, Spielholz, & Nothstein, 2008; Winkel & Westgaard, 1996). Management in an organization strives to increase work productivity and human performance by structuring the working environment. Decision making, work organization, communication and resource management are key roles of management. New management approaches also include team building, training, development, and skill management (Faucett, 2005; Sobhani, Wahab, & Neumann, 2016).

Psychological Capital (PsyCap) is known as a positive construct that has a direct impact on work productivity, work performance, worker's health, and well-being (V. Krasikova, Lester, & Harms, 2015). PsyCap is related to worker's strengths, not weaknesses and dysfunctions. It acts as a mediator by mediating the effects of occupational risks on workers while achieving the productivity objectives in a highly interactive hazardous environment (Luthans, Norman, Avolio, & Avey, 2008). Therefore, it is imperative to include this construct in the work productivity model.

Positive paradigms do not negate the importance of improvement of negative variables. The worker faces physical or psychosocial risk factors while working at the workplace that has an adverse effect on their performance, health, and productivity. Whereas the common goal of ergonomists is to maximize productivity by minimizing physical and mental risks from workers. Thus, a work productivity model should not only include risk factors (physical, psychosocial) that result in acute or chronic responses to the development of WMSDs but also the positive variables (PsyCap) that may support the worker to reduce the associated risks.

In line with the above motivation, the objective of this short review paper is a) to investigate the association between PsyCap and work

productivity, human performance and well-being, b) to review conceptual work productivity models, c) to scrutinize the relationships between components of work productivity models, and d) to propose a comprehensive work productivity model by integrating PsyCap in it.

Knowledge of these relationships and conceptual framework will indeed be beneficial as it will serve as a reference for industrial designers, ergonomists, and managers. Such a framework will not only be considered for the design of the work environment, but also for policy making, to assure high productivity and highly motivated work force.

METHODOLOGY

The methodology adopted in this paper consists of three steps. At first, the relationship between PsyCap and human performance, well-being and work productivity was identified and proved by review of available literature.

Then, the existing conceptual models that considers work productivity and work-related musculoskeletal disorders (WMSDs), were reviewed. For this purpose, 11 conceptual models were selected. These models were compared and reviewed to identify the gap and the relationships between different components of models like management system, work environment, acute responses, long term responses and work productivity.

And finally, a new conceptual work productivity model is proposed that not only integrates psychological capital as a positive construct alongside the risks associated with a working environment as well as to assess their positive or negative impact on work productivity, human performance, and health.

PSYCAP AND WORK PRODUCTIVITY

Psychological Capital (PsyCap) is described as “an individual’s positive psychological state of development” (Luthans, Youssef, & Avolio, 2007). This concept of psychological capital helps to take positive psychology to the work environment. PsyCap is a core positive construct that can be developed, managed, measured, and validated for measurable outcomes at the individual or the organizational level. PsyCap has both research and theory based psychological implications (Luthans, 2002).

PsyCap has four constructs: Hope, self-efficacy, resilience, and optimism. Self-efficacy means having confidence on his/her abilities to take on and put in the necessary effort to effectively execute a certain task within a given setting; Optimism is building a positive attribution about achieving success at present and in the future;

Hope is about being persistent toward objectives and, when needed, redirecting paths to objectives to accomplish goals; and when surrounded by difficulties and problems, withstanding and bouncing back and even ahead of this to get success is resiliency (Luthans et al., 2007). (I think for better flow the explanations of the terminology should follow the order as listed - Hope, self-efficacy, resilience, and optimism)

The impact of the concept of PsyCap on behavioural and attitudinal measurable outcomes can be observed in the literature. Explicitly, PsyCap has a positive association with employee performance, employee attitude (Nafei, 2015), organizational citizenship behaviors, organizational commitment, job satisfaction (Avey, Reichard, Luthans, & Mhatre, 2011; Bogler & Somech, 2019), perceived employability (Chen & Lim, 2012), psychological well-being (Avey, Luthans, Smith, & Palmer, 2010; V. Krasikova et al., 2015), and happiness (Culbertson, Fullagar, & Mills, 2010). Moreover, PsyCap has negative associations with undesirable phenomena such as job stress, turnover intentions, cynicism, deviance, anxiety (Avey et al., 2011), job search behaviours (Avey, Luthans, & Jensen, 2009), personal accomplishment, depersonalization, burnout, emotional exhaustion (Cheung, Tang, & Tang, 2011) and counterproductive work behaviours (Avey, Luthans, & Youssef, 2010) as shown in Figure 1.

Gurbuz and Bozkurt Yildirim (2019) conducted a study among army aircraft mechanics to investigate the effect of psychological capital (PsyCap) on work performance, job satisfaction, affective commitment, and organizational citizenship behaviours. The study showed that the workers with higher PsyCap were more obligated to their organization, more prospective to depict work performance, highly satisfied with their roles, involved highly in organizational citizenship behaviours that are beneficial to army aviation settings. Another research conducted by Brunetto et al. (2016) for nurses, it was found that having more psychological capital results in better safety outcomes.

Avey et al. (2011) conducted a meta-analysis and concluded that psychological capital and multiple performance measures (self, supervisor evaluations, and objective) have a substantial positive association. A strong evidence-based recommendation has been provided in this study for the use of PsyCap in human resource development and performance programs. Workers with higher PsyCap are more motivated, enthusiastic, and successful at work, that results in higher performance. It has also been proved that higher work performance leads to higher work productivity that results in higher profit (Boles, Pelletier, & Lynch, 2004; O'Donnell, 2000).

Hence, it is concluded that psychological capital, a core positive psychological construct, has significant positive impact on work performance, work productivity, employee health and wellbeing. Whereas it has negative impact on job stress, turnover and counterproductive behaviours. Work-related psychological risk factors can be minimized, and worker performance can be increased by flourishing PsyCap constructs among workers. Therefore, it is essential to consider PsyCap while assessing the risks associated with the worker that effect on their performance.

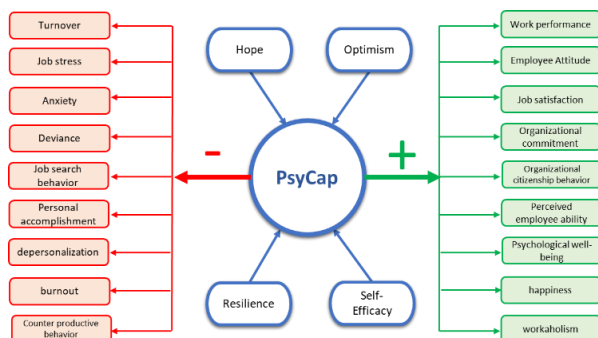


Figure 1 Positive and Negative impact of Psychological Capital (PsyCap) on health and measurable outcomes. (Maybe should provide the reference to this Figure, unless it was developed by this team.)

WORK PRODUCTIVITY MODELS

Work Productivity is a measurable term used in this study to assess the economic growth of an organization. The scope of the term “Productivity” is broader and has different definitions like number of hours worked to the number of units made. Productivity is also taken in terms of efficiency - the number of output units given the usual or less input hours. Absenteeism (a state of being away from work due to an illness) and presenteeism (a state of working while ill) are important parameters used to assess work productivity (Escorpizo, 2008). Work productivity depends on human performance. If the worker is physically and mentally fit, work performance will be high that in turn increase the work productivity and profit of the organization. In this study, we have compared and analyzed already proposed conceptual models that are relating measurable outcomes like work productivity, performance, efficiency, absenteeism and presenteeism with health risks, musculoskeletal disorders (MSDs), strain, injuries, and accidents. The analysis of these models will be helpful to identify the relationship between work-related risk factors (biomechanical, environmental, psychosocial, individual), health risk, WMSDs and work productivity. The models that provided valuable insight and included for review were Winkel and Westgaard (1996), Helander (1997), O'Donnell (2000), Boles et al. (2004), Faucett (2005), Escorpizo (2008), Darr and Johns (2008),

Rolander (2010), Mohd Nur, Dawal, and Dahari (2013), Rose, Orrenius, and Neumann (2013) and Sobhani et al. (2016). Table 1 is drawn to compare the existing models and to identify the gap between these available work productivity models. For comparison, work related risk factors (physical, psychosocial, individual), acute responses (Physiological and psychological), WMSD, positive psychological construct and measurable outcome (Productivity, efficiency, performance, absenteeism, presenteeism) were selected variables.

Armstrong et al. (1993) proposed a dose-response model that shows the MSDs progress in the form of dose and response relationship. Every response act as a dose for the next level. This basic concept was used by other models showing the pathogenesis of WMSDs. Work-related risk factors that act as a dose for muscular fatigue have been considered by most of the models in the form of biomechanical, environmental, and psychosocial risk factors.

Association of one component with another component of the model was assessed. The major components of models were management system, measurable outcome like productivity, efficiency, absenteeism and presenteeism, work environment, WMSDs/Health, and acute responses. The frequency of utilization of these relationships or links from one component to another component was collected and represented in Figure 2.

Figure 2(a) shows that Management system has a high impact on the work environment. The role of the management system and management in an organization is acknowledged by Faucett (2005); Sobhani et al. (2016); Winkel and Westgaard (1996). Faucett (2005) proposed a dynamic structural model by giving a feedback loop from work productivity to the management system. When the outcome increases, the work environment is upgraded by the management system.

Work environment that consists of work-related risk factors, affect physiologically as well as psychologically in the form of muscle fatigue, worker strain, pain, worker perception about comfort and discomfort. All these responses lead to WMSDs, disability over time that acts as a dose for loss of productivity, performance, efficiency and absenteeism (Darr & Johns, 2008; Faucett, 2005; Helander, 1997; Mohd Nur et al., 2013) as shown in Figure 2(b), 2(c) and 2(d). Individual factors were taken as an effect modifier by Faucett (2005), Rolander (2010), Helander (1997), National Research Council (2001), that not only modify the effect of work environment on acute responses but also boosts the WMSDs caused due to acute responses.

All these models pointed out in table 1, have helped to develop the relationship between management system, work-related risk factors and work productivity. These models have considered only the risks, or the negative variables associated with the worker. Sobhani et al. (2016) considered organizational commitment, job satisfaction, motivation as an intermediate outcome of human resource management practices and ergonomic considerations.

Table 1 Comparison of Previous Work Productivity Models.

Models	Winkle and Westgaard (1996)	O'Donnell (2000)	Boles (2004)	Helander (2005)	Faucett (2005)	Escorpizo (2008)	Darr and Johns (2008)	Rolander (2010)	Mohd Nur (2013)	Rose (2013)	Sobhani (2016)
Factors											
Measurable Outcomes	Quality, Productivity, Efficiency	Productivity, Absenteeism, Presenteeism, Human Performance, Profit	Productivity, Absenteeism, Presenteeism, Human Performance, Profit	Productivity, Quality, Time, Subjective	Performance, Productivity, Absenteeism	Productivity, Absenteeism, Presenteeism	Absenteeism (Voluntary, Involuntary)	Productivity	Work Productivity	Productivity, Performance, Efficiency, Quality	Performance Improvement
Management System	Technology, Work Organization	Disease management, health promotion, employee assistance			Culture, Resources, workforce, Decision making, Communication, Operations.			Technology, Work Organization			Incentive, training, Employee participation, Information sharing
WMSDs/ Health Risk	Musculoskeletal health	Health risk, Substance Abuse, Controllable diseases,	Modifiable Health Risks, Lifestyle, Work-life balance	Errors, Accidents, Injuries, Subjective, Physiological	WRMSD outcomes	Health condition, health risk, WMSDs	Work Strain, Psychological or physical illness	MSDs, work ability, sick leave	WMSDs	Workload, Fatigue, Injuries, Health	Health, Well-being
Positive Psychological constructs				Motivation							Job control, job satisfaction, Motivation, organizational commitment
Specific task								Dentists	Manual Repetitive tasks		
Work Environment	Biomechanical, Psychosocial exposure	Organizational Climate, Morale, Relationships	Organizational Climate	Environmental, Job Satisfaction, organizational factors	Functional, Physical, Temporal, Interpersonal		Occupational status, Macro social context	Biomechanical, Psychosocial factors	Working Environment	Working Environment	Biomechanical, Psychosocial factors
Individual Factors			BMI, diet, physical inactivity, tobacco and alcohol use.	Attitude, Competence, Expertise, Age, gender, BMI, and strength	Individual Factors		Attribution, Disposition, Gender.	Individual resources			
Acute Responses				Physiological response	Worker strain, Worker perceptions		Work strain, Psychological illness		Muscle fatigue		

Other than this, none of these work productivity models have considered the positive psychological movement that has a positive impact on workers performance and well-being. Whereas, based on literature, it is hypothesized that occupational stress can be minimized by thriving the PsyCap constructs. Furthermore, the positive psychology movement does not deny the importance of the negative. The risks associated with physical and psychosocial risk factors should be investigated, evaluated, and curtailed.

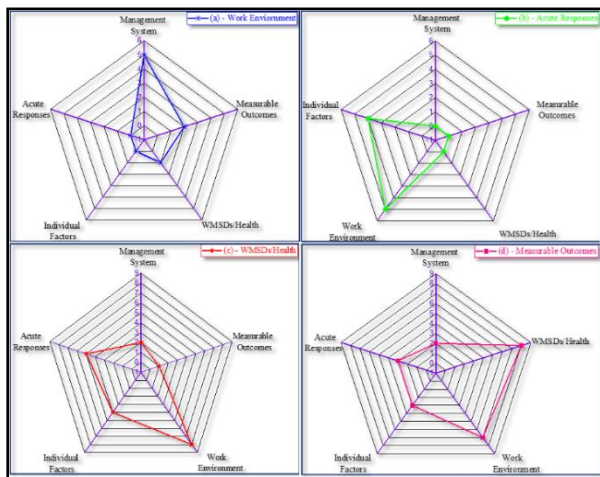


Figure 2 Frequency of Relationships considered From Management system, WMSD/health, Work environment, Individual factors, Acute responses to 2(a) Work Environment, 2(b) Acute Responses, 2(c) WMSDs/Health and 2(d) Measurable outcomes in conceptual models. (Maybe should provide the reference to this Figure, unless it was developed by this team.)

PROPOSED CONCEPTUAL MODEL

Worker plays a critical role in an organization. They perform their work-related tasks in a specified working environment with the support of the management system. Management systems consists of the principles, rules, regulations, and approaches that give direction to an organization. The primary goal of the management system and management is to enhance company productivity by increasing the work performance of the worker. This goal can only be achieved by structuring the working environment, reducing psychosocial pressure from worker, enhancing psychological capital constructs. Management in collaboration with ergonomists strives to improve the working environment by upgrading the design, technology, layout, communication, skill development and training.

In a working environment, worker is exposed to physical and psychosocial risk factors. Whereas biomechanical and environmental risk factors are subsets of physical risk factors. Biomechanical risk factors include workstation, tools, posture, repetition, force, and duration. Whereas environmental risks include noise, temperature,

light, and vibration (Nunes & Bush, 2012). Large number of studies are available that highlight the effect of these work-related risk factors on workers (Armstrong et al., 1993; Bernard, 1997; Evanoff, Dale, & Descatha, 2014). These risk factors have been found as a potential source of WMSDs that leads to disability. Other than biomechanical and environmental risk factors, psychosocial risk factors have also been found as a source of sustained and intensified muscle activation among workers in the work environment (Nieuwenhuijsen, Bruinvels, & Frings-Dresen, 2010).

Psychosocial factors that instigate stress include work pressure, lack of job variety, task demands, job uncertainty, work/rest cycle, social support from colleagues and management, which may also lead to job dissatisfaction. A mix of psychosocial, environmental and biomechanical risk factors may increase the muscular fatigue that leads to musculoskeletal disorders related to the neck, shoulder, back and upper extremity (Marras, 2004; National Research Council, 2001; Van Rijn, Huisstede, Koes, & Burdorf, 2010). Individual risk factors like age, gender, BMI, marital status, habits, activities at home, economic situation, physical exercise, fitness, and previous WMSD act as a modifier for short-term and long-term responses of the worker (National Research Council, 2001; Westgaard & Winkel, 1996). These work-related risk factors instigate short term or acute response of the muscles. These acute responses are indicators of WMSD. The ability to monitor acute responses helps to minimize or prevent WMSDs in the long term. Acute responses can be categorized as physiological and psychological responses. Physiological acute responses include muscle fatigue, muscle endurance, muscle strength and heart rate (energy expenditure), whereas psychological acute responses are the levels of comfort and pain experienced by workers (Westgaard & Winkel, 1996). The increase in muscle activity over time leads to muscle fatigue and the accumulation of muscle fatigue causes functional disability, which is also known as musculoskeletal disorders. These MSDs results in loss of work productivity.

Managerial decisions, policies and procedures show a clear influence on working environment that may increase or decrease the stress from workers. Better policies and decisions can reduce the work strain from worker that will help to increase their performance and well-being while unfavourable decision will have the negative effect on employee's health and performance that may cause absenteeism, presenteeism and loss of productivity (Faucett, 2005).

“What is good about life is as genuine as what is bad and therefore deserves equal attention” (Peterson, 2006). PsyCap is a positive construct that can be used to increase employee

performance at the workplace. Management helps to flourish this construct (Youssef-Morgan & Luthans, 2009). Psychosocial pressure from worker can be reduced by increasing the positive values among workers. In this context, we can

claim that escalation of PsyCap is as important as the reduction in risks associated with working environment.

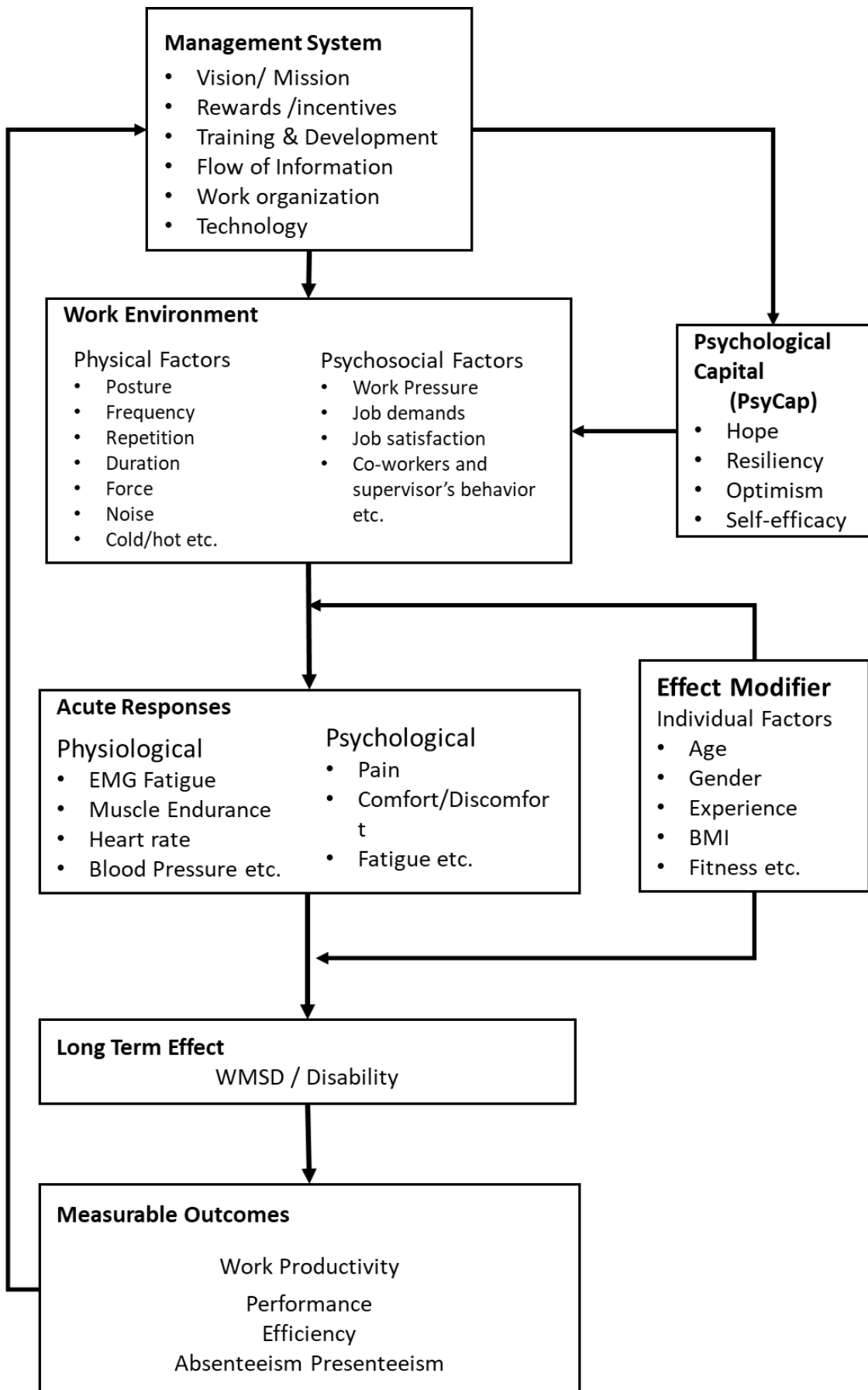


Figure 3 Conceptual Work Productivity Model by Integration of Psychological Capital (PsyCap). (Maybe should provide the reference to this Figure, unless it was developed by this team.)

By improving the working environment and boosting the psychological capital among

workers, the goal of maximizing productivity can be achieved. On the basis of this concept, a

conceptual work productivity model is proposed in this study as shown in Figure 3, that not only integrates PsyCap as positive construct, but also highlights the positive and negative association between management system, work environment and worker that results in either maximizing or minimizing productivity, performance and employee health/ well-being.

This is an effective and comprehensive conceptual framework that is developed and validated through previous models, that clearly highlight the direct influence of the management system on working environment and workers. Management decisions may help to improve the working environment, to reduce the psychosocial pressure on the worker by thriving the psychological capital that consists of hope, optimism, resilience, self-efficacy. Ergonomists can help to improve the working environment by collaborating with the management system. A better working environment with good managerial decisions will reduce the physical and psychosocial pressure from worker that in turn will impact on worker's performance resulting in high productivity, efficiency, and better quality of life. Whereas unfavourable decisions, policies, design, environment, low PsyCap may also lead to loss of productivity, poor working performance, health, and well-being.

CONCLUSION

This study proposes a conceptual work productivity model that integrates psychological capital as a positive construct alongside the risks associated with working environment to assess their positive or negative impact on work productivity, human performance, and health. Worker and management system are stakeholder in an organization. Management has an objective of maximizing productivity and performance by improving the working environment in collaboration with ergonomists and by flourishing psychological capital constructs among workers that energizes, motivates workers to give their best performance. By boosting PsyCap and by reducing work-related risks, the goal of maximum work productivity, human performance and health can be significantly achieved. For the successful implementation of this tool, a close cooperation among ergonomists, industrial designers and managers is needed. This study will act as an aid to understand the pathways of achieving the goal of work productivity, human performance, and well-being.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the Higher Education Commission of Pakistan for awarding HRDI-UESTPS fellowship scheme to Ph.D. Scholars that helped to carrying out this re-search.

COMPETING INTERESTS

There is no conflict of interest.

REFERENCES

- M., Jonsson, B., Kilbom, A., Kuorinka, I. A., Silverstein, B. A., Sjøgaard, G., Viikari-Juntura, E. R. (1993). A conceptual model for work-related neck and upper-limb musculoskeletal disorders. *Scandinavian Journal of Work, Environment and Health*, 19(2), 73-84. doi:10.5271/sjweh.1494
- Avey, J. B., Luthans, F., & Jensen, S. M. (2009). Psychological capital: A positive resource for combating employee stress and turnover. *Human resource management*, 48(5), 677-693.
- Avey, J. B., Luthans, F., Smith, R. M., & Palmer, N. F. (2010). Impact of positive psychological capital on employee well-being over time. *Journal of Occupational Health Psychology*, 15(1), 17.
- Avey, J. B., Luthans, F., & Youssef, C. M. (2010). The additive value of positive psychological capital in predicting work attitudes and behaviors. *Journal of Management*, 36(2), 430-452.
- Avey, J. B., Reichard, R. J., Luthans, F., & Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. *Human resource development quarterly*, 22(2), 127-152. doi:10.1002/hrdq.20070
- Bernard, B. P. (1997). *Musculoskeletal disorders and workplace factors: a critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back*: National Institute for Occupational Safety and Health.
- Bogler, R., & Somech, A. (2019). Psychological Capital, Team Resources and Organizational Citizenship Behavior. *The Journal of Psychology*, 1-19. doi:10.1080/00223980.2019.1614515
- Boles, M., Pelletier, B., & Lynch, W. (2004). The relationship between health risks and work productivity. *Journal of Occupational and Environmental Medicine*, 46(7), 737-745.
- Brunetto, Y., Xerri, M., Farr-Wharton, B., Shacklock, K., Farr-Wharton, R., & Trincherro, E. (2016). Nurse safety outcomes: old problem, new solution-the differentiating roles of nurses' psychological capital and managerial support. *Journal of advanced nursing*, 72(11), 2794-2805.
- Chen, D. J., & Lim, V. K. (2012). Strength in adversity: The influence of psychological capital

- on job search. *Journal of Organizational Behavior*, 33(6), 811-839.
- Cheung, F., Tang, C. S.-k., & Tang, S. (2011). Psychological capital as a moderator between emotional labor, burnout, and job satisfaction among school teachers in China. *International Journal of Stress Management*, 18(4), 348-371.
- Clark, M. A., Michel, J. S., Zhdanova, L., Pui, S. Y., & Baltes, B. B. (2016). All work and no play? A meta-analytic examination of the correlates and outcomes of workaholism. *Journal of Management*, 42(7), 1836-1873.
- Culbertson, S. S., Fullagar, C. J., & Mills, M. J. (2010). Feeling good and doing great: The relationship between psychological capital and well-being. *Journal of Occupational Health Psychology*, 15(4), 421-433.
- Darr, W., & Johns, G. (2008). Work Strain, Health, and Absenteeism: A Meta-Analysis. *Journal of Occupational Health Psychology*, 13(4), 293-318. doi:10.1037/a0012639
- Escorpizo, R. (2008). Understanding work productivity and its application to work-related musculoskeletal disorders. *International Journal of Industrial Ergonomics*, 38(3), 291-297. doi:10.1016/j.ergon.2007.10.018
- Evanoff, B., Dale, A. M., & Descatha, A. (2014). A conceptual model of musculoskeletal disorders for occupational health practitioners. *International Journal of Occupational Medicine and Environmental Health*, 27(1), 145-148.
- Faucett, J. (2005). Integrating 'psychosocial' factors into a theoretical model for work-related musculoskeletal disorders. *Theoretical Issues in Ergonomics Science*, 6(6), 531-550.
- Goggins, R. W., Spielholz, P., & Nothstein, G. L. (2008). Estimating the effectiveness of ergonomics interventions through case studies: Implications for predictive cost-benefit analysis. *Journal of Safety Research*, 39(3), 339-344. doi:10.1016/j.jsr.2007.12.006
- Gurbuz, S., & Bozkurt Yildirim, H. (2019). Working in the hangar: The impact of psychological capital on work outcomes among army aircraft mechanics. *Military Psychology*, 31(1), 60-70.
- Helander, M. (1997). *Anthropometry in workstation design. A Guide to the Ergonomics of Manufacturing*. Taylor & Francis, London, 17-28.
- Luthans, F. (2002). Positive Organizational Behavior: Developing and Managing Psychological Strengths. *Academy of Management Executive*, 16(1), 57-72. doi:10.5465/AME.2002.6640181
- Luthans, F., Norman, S. M., Avolio, B. J., & Avey, J. B. (2008). The mediating role of psychological capital in the supportive organizational climate—employee performance relationship. *Journal of Organizational Behavior*, 29(2), 219-238. doi:10.1002/job.507
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*: Oxford University Press.
- Marras, W. (2004). State-of-the-art research perspectives on musculoskeletal disorder causation and control: the need for an intergraded understanding of risk. *Journal of electromyography and kinesiology: official journal of the International Society of Electrophysiological Kinesiology*, 14(1), 1.
- Mohd Nur, N., Dawal, S., & Dahari, M. (2013). A Conceptual Model of Work Productivity Associated with Work-Related Musculoskeletal Disorders in the Industrial Repetitive Task. *Advanced Materials Research*, 845, 623-626. doi:10.4028/www.scientific.net/AMR.845.623
- Nafei, W. (2015). The Effects of Psychological Capital on Employee Attitudes and Employee Performance: A Study on Teaching Hospitals in Egypt. *International Journal of Business and Management*, 10(3), 249-270. doi:10.5539/ijbm.v10n3p249
- National Research Council. (2001). *Musculoskeletal disorders and the workplace: low back and upper extremities*: National Academies Press.
- Nieuwenhuijsen, K., Bruinvels, D., & Frings-Dresen, M. (2010). Psychosocial work environment and stress-related disorders, a systematic review. *Occupational medicine (Oxford, England)*, 60(4), 277-286.
- Nunes, I. L., & Bush, P. M. (2012). Work-related musculoskeletal disorders assessment and prevention. In *Ergonomics-A Systems Approach: InTech*.
- O'Donnell, M. P. (2000). Health and productivity management: the concept, impact, and opportunity: commentary to Goetzel and Ozminkowski. *American Journal of Health Promotions*, 14(4), 215-217.
- Peterson, C. (2006). *A primer in positive psychology*: Oxford University Press.
- Rolander, B. (2010). Work conditions, musculoskeletal disorders and productivity of dentists in public dental care in Sweden: Are dentists working smarter instead of harder? (Medical Dissertation), Linköping University, Sweden.

- Rose, L. M., Orrenius, U. E., & Neumann, W. P. (2013). Work environment and the bottom line: Survey of tools relating work environment to business results. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 23(5), 368-381.
- Shoaf, C., Genaidy, A., Haartz, J., Karwowski, W., Shell, R., Hancock, P. A., & Huston, R. (2000). An adaptive control model for assessment of work-related musculoskeletal hazards and risks. *Theoretical Issues in Ergonomics Science*, 1(1), 34-61. doi:10.1080/146392200308462
- Sobhani, A., Wahab, M. I. M., & Neumann, P. W. (2016). Integrating Ergonomics Aspects into Operations Management Performance Optimization Models: A Modeling Framework. *IIE Transactions on Occupational Ergonomics and Human Factors*, 4(1), 19-37.
- V. Krasikova, D., Lester, P., & Harms, P. (2015). Effects of Psychological Capital on Mental Health and Substance Abuse. *Journal of Leadership & Organizational Studies*, 22, 1-12. doi:10.1177/1548051815585853
- Van Rijn, R. M., Huisstede, B. M., Koes, B. W., & Burdorf, A. (2010). Associations between work-related factors and specific disorders of the shoulder—a systematic review of the literature. *Scandinavian Journal of Work, Environment and Health*, 36(3), 189-201.
- Westgaard, R. H., & Winkel, J. (1996). Guidelines for occupational musculoskeletal load as a basis for intervention: a critical review. *Applied Ergonomics*, 27(2), 79-88. doi:10.1016/0003-6870(95)00062-3
- Winkel, J., & Westgaard, R. H. (1996). Editorial: A model for solving work related musculoskeletal problems in a profitable way. *Applied Ergonomics*, 27(2), 71-77.
- Youssef-Morgan, C., & Luthans, F. (2009). *An Integrated Model of Psychological Capital in the Workplace*: Oxford University Press.