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**The Impact of Basic Needs Satisfaction on Work Engagement and
Turnover Intentions**



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The Impact of Basic Needs Satisfaction on Work Engagement and Turnover Intentions

¹Pearson Mwale, ²Dr. Sande Ngalande, ³Dr. Gift Masaiti,

¹Doctor of Philosophy in Business and Management Candidate
Institute of Distance Education, University of Zambia, Lusaka

mwalepiya2000@yahoo.com

^{2,3} University of Zambia, Lusaka

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Abstract

Purpose: The purpose of the research was to determine how basic needs satisfaction (BNS) impacted work engagement (WE) and turnover intentions (TI) of employees at the mine.

Methodology: The author used positivist research philosophy and survey research design and collected data from 100 employees through a well-structured questionnaire comprising scales for BNS, WE, and TI. The questionnaires were delivered to 100 employees based on stratified random sampling after receiving listing of 300 eligible research participants. Data was analysed using SPSS. Cronbach's alpha for the scales was 0.793, 0.872, and 0.702 respectively for BNS, WE, and TI. Qualitative research was conducted to get views regarding turnover intentions and what should be done to retain employees.

Results: The three variables in the study were strongly correlated and significant at $p < .01$. The correlation between BNS and WE was .544, between WE and TI it was -.519, and between BNS and TI, it was -.459. With WE controlled, impact of BNS on TI was insignificant at $p < .01$. Regression coefficient for BNS decreased from -.710 to -.388, indicating reduction in influence of BNS on TI when WE was controlled. According to Baron and Kenny (1986), reduction in regression coefficient for BNS and the insignificant regression result confirmed that WE was a mediator between BNS and TI. However, partial, and not full mediation was achieved since the direct path of BNS to TI was non-zero. Using BNS and WE as independent variables and TI as dependent variable, Pearson correlation coefficient (R) was .560, giving coefficient of determination (R^2) of 0.314, indicating that BNS and WE contributed 31.4% towards variance in TI.

Unique contribution to theory, practice and policy: The study has provided empirical evidence that TI can be studied through BNS and WE and that WE works as a generative mechanism (mediating variable) through which BNS operates to impact TI. Management at the mine must promote BNS and WE through improvement in compensation, supervisor-subordinate

relationship, training and development opportunities, and recognition of competent employees to reduce TI.

Keywords: *Basic Needs Satisfaction; Work Engagement; Turnover Intentions; Correlation; Regression*

1.0 Introduction

Employees are a critical resource in the business model of organizations. This is on account of the influence of the skills, knowledge, abilities, experience, and behaviour of employees in providing services and products needed by clients. Competitive services and products will only be provided through highly productive employees. These services and products must be provided on a consistent level. One of the ways to ensure that there is consistency in supply of high-quality services and products is by ensuring that highly productive employees are retained in the employment of the organizations on a long-term basis. Employers must do their best to retain productive employees. Job satisfaction is touted as one of the ways of ensuring that employees endear themselves to the jobs they are doing. However, extant literature indicates that the construct that provides a win-win situation for the organization and the employee is work engagement. Deci and Ryan (2017) assert that every organization must necessarily look into providing basic core needs to employees so that employees can be satisfied with the jobs they are doing and the organization they are working for. Provision of basic needs to satisfy autonomy, competence, and relatedness needs of employees will promote work engagement so that an organization has well-engaged employees with low turnover intentions.

1.1 Background

This study is about the impact of basic needs satisfaction on work engagement and turnover intentions on employees at the mine. Extant literature provides evidence for the relation between work engagement and turnover intentions (Van Schalkwyk, Du Toit, Bothman and Rothman, 2010), and psychological capital and work engagement, (Avey, Luthans and Jensen, 2009; Bhatnagar, 2012). In the article entitled Leaders, teams and work engagement: a basic needs perspective, Robijn et al. (2020) utilized the Job Demands-Resources theory (JD-R) to study work engagement but conceded that the JD-R is only a prescriptive theory for work engagement that does not provide a mechanism to understand how job and personal resources and job demand variables impact work engagement. Robijn et al. (2020) provide basic needs satisfaction as a mechanism through which certain variables act to influence work engagement. However, there is very little study on mediating effects of work engagement between basic needs satisfaction and turnover intentions.

1.2 Statement of the problem

The mine has experienced high turnover over the years. Actual reasons for turnover have not been documented so that appropriate intervention could be taken according to actual research results regarding turnover. Since actual reasons for turnover cannot be determined because the people who have quit their jobs over the years may not easily be contacted for various reasons, the author determined to measure turnover intentions of current employees as a proxy for actual turnover since turnover intentions is the best predictor of actual turnover. Some of the adverse effects of turnover are reduced productivity in operations and maintenance of plants and costly recruitment, orientation and training of new employees.

Rothmann and Joubert (2007) researched antecedents of work engagement in the mining industry in South Africa. They found that organizational support, represented by (a) managerial support, (b) communication, (c) role clarity, and (d) extent of autonomy, was a significant predictor of work engagement. Palo and Rothmann (2016) found supervisor support and co-worker support to have a positive relationship with work engagement in the platinum mining industry in South Africa. In a study of the impact of perceived organizational support on workers in the South African Mining Industry, Mphahlele, Els, de Beer, and Mostert (2018) found that perceived organizational support for deficit correction of employee weakness was positively correlated with work engagement in the short and long term while perceived organizational support for employee strength use was positively related with work engagement in the short term and not long term.

In Zambia, the closest to a study on work engagement in the mining industry is the research by Machungwa and Schmitt (1983). The conclusion by Machungwa and Schmitt (1983) was that bad interpersonal relations with (a) superiors, (b) co-workers, and (c) subordinates demotivated performance. Nature of work, recognition, promotion, and training was found to motivate performance.

While the studies by Rothmann and Joubert (2007), Palo and Rothmann (2016), and Mphahlele et al. (2018) studied work engagement and its antecedents, and Machungwa and Schmitt (1983) studied work factors that demotivated and motivated performance in the mining industry, none of these studies utilized basic needs satisfaction as a working mechanism through which work engagement can be promoted. In addition, these studies did not involve studying work engagement and impact on turnover intentions. Robin et al. (2020) have studied the impact of basic needs satisfaction in influencing the importance of engaging leadership and open conflict support in promoting work engagement. However, Robin et al. (2020) did not study work engagement and its impact on turnover intentions. This research builds on the relevance of basic needs satisfaction as predictor variable and underlying mechanism through which work engagement may be promoted so that turnover intentions may be minimized. This current research is intended to add to the body of knowledge at the university of Zambia and mining industry by researching basic needs satisfaction as an antecedent and working mechanism through which work engagement may be promoted, and in the process, turnover intentions may be reduced.

1.3 The objectives of the study

The objective of this study is to examine the mediating role of work engagement between basic needs satisfaction and turnover intentions. The sub-objectives are (a) to examine the impact of basic needs satisfaction on turnover intentions, (b) to examine the impact of basic needs satisfaction on work engagement, and (c) to examine the impact of work engagement on turnover intentions.

1.4 **Significance of the study**

This study is the first of its kind in our country to theorize turnover intentions based on the basic needs satisfaction of autonomy, relatedness, and competence, which form the central aspects of self-determination theory (SDT) espoused by Deci and Ryan (2000) and Work Engagement which is one of the core aspects of JD-R theory (Bakker and Demerouti, 2017). The study contributes to the body of knowledge by using Work Engagement as the generative mechanism through which Basic Needs Satisfaction could operate to impact Turnover Intentions.

Based on the study results that Basic Needs Satisfaction and Work Engagement were both negatively correlated with Turnover Intentions and that Basic Needs Satisfaction was positively correlated with Work Engagement, management at the mine can use the identified promoters of Basic Needs Satisfaction and Work Engagement to reduce Turnover Intentions.

2.0 **Literature Review and Hypothesis Development**

Literature review and hypothesis development is presented in this section. The literature review covers basic needs satisfaction aspect of Self-Development Theory (SDT), Work Engagement as developed under the Job-Demands-Resources theory (JD-R), and Turnover Intentions. Four hypotheses are developed regarding (a) impact of basic needs satisfaction on turnover intentions, (b) impact of basic needs satisfaction on work engagement, (c) impact of work engagement on turnover intentions, and (d) work engagement mediating the relation between basic needs satisfaction and turnover intentions.

2.1 **Basic Needs Satisfaction, Work Engagement, and Turnover Intentions**

2.1.2 **Basic Needs Satisfaction and Turnover Intentions**

Deci and Ryan (2000) proposed that human beings need fulfillment of basic needs for them to function very well. Deci and Ryan (2000) regard basic psychological needs as ‘innate psychological nutrients that are essential for ongoing psychological growth, integrity, and well-being’ (p.229). Psychological basic needs have to be satisfied for humans to realize their potential, to optimize their performance and make progress in what they are engaged in. Satisfaction of basic needs enables employees to feel engaged, and be protected from the negative effects of stress or ill health arising from lack of support for proper functioning at a place of work. Deci and Ryan (2000) identified three core basic needs as being (a) autonomy, (b) relatedness, and (c) competence. Providing autonomy at a place of work is about an employee experiencing choice and freedom in how to go about work they are engaged in, enabling employees to willingly avail

themselves in work they have to execute. Micromanaging employees takes away the ability of employees to exercise their freedom in how work has to be done and may limit potential of exploitation and exploration of ideas by employees. Employees may end up just waiting for instructions, and execute jobs according to how they have been instructed. Some employees may not like this, especially those who feel that they are being limited in how they have to execute jobs. Other employees may not have issues regarding the involvement of their supervisors in the work execution. There is the importance of role identity in promoting autonomy in employees. Zhang and Bartol (2010) define role identity as ‘the extent to which an individual view himself – or herself as a person who wants to be empowered in a particular job’ (p.108). The supervisor, while promoting the need for employees to take part in decision making regarding the jobs they do, must take cognizance of the impact of employee capabilities and desires to have autonomy in their jobs. Forrester (2000) warns of the dangers of careless empowerment of employees that may cause more problems than the desired motivation among employees and high performance desired when the ‘wrong’ employees are left to have autonomy in the jobs they have to do. Therefore, Ford and Fottler (2005) advise that role empowerment must not be absolute but must depend on the capabilities and desires of an employee, as assessed by a supervisor who actively engages with subordinates to know their capabilities and desire to be empowered in their role. Ahearne, Mathieu, and Rapp (2005) advise that employees will need empowerment readiness so that supervisor promotion of autonomy produces a win-win result for an organization and the employee. Supervisors or managers may improve the empowerment readiness to embrace autonomy by enabling employees experience enhanced knowledge for executing jobs by training and developing them so that they have the appropriate skills, knowledge, abilities, and experience for current and future work.

Relatedness is about employees experiencing being loved and cared for. Employees want to experience being loved and cared for not just in words from the supervisors or co-workers but in deeds as well. Competence is an employee feeling of being effective in execution of work. Employees who are competent and are loved and cared for may look forward to being at work and willingly look forward to work and deliver desired results. However, employees who may lack empowerment in their roles (autonomy) as well as lack needed relatedness and competence may develop turnover intentions. Therefore, the following hypothesis is proposed:

Hypothesis 1 (H1): Basic needs satisfaction will negatively influence turnover intentions

2.1.3 Basic Needs Satisfaction and Work Engagement

According to van den Heuvel et al. (2020) work engagement is a positive fulfilling state of mind in which employees work with vigour, dedication, and absorption to achieve desired organizational and employee outcomes. Vigour is exemplified and reflected by high levels of energy, mental resilience, willingness to invest more effort in work, and persistence in working despite adversity or challenges encountered. A dedicated employee will be strongly involved in the work being done, and the employee experiences a sense of significance, enthusiasm,

inspiration, pride, and challenge. A dedicated employee finds meaning in the work being done, the work is exciting, and the employee judges that the work they are involved in is promoting a positive self-image of themselves, and the employee assesses that the challenges that come with the work are a source and process through which personal growth of their capabilities comes from. Through absorption, an employee has high levels of concentration and they are happy to focus on their work, and will not be distracted in their work. Work engaged employees have positive experiences with work. The work engaged employees necessarily apply themselves cognitively, physically, and emotionally, and work engaged employees actively allocate their personal resources (self-efficacy, optimism, hope, and resilience) to tasks in association to a work role (Gupta and Shaheen, 2017; Zhang and Bartol, 2010). Deci and Ryan (2000) regard psychological basic needs (autonomy, relatedness, and competence) as innate core nutrients required for growth, integrity and well-being. Realization of human potential in terms of performance and well-being at work is tied to satisfaction of psychological basic needs. Veth et al. (2019) proffer the view that satisfaction of employees' needs is critical for sustainable organization competitiveness. Reijseger, Peeters, Taris, and Schaufeli (2017) support this view and provided empirical evidence to show that engaged workers are better performers than non-engaged workers. Arising from this, the following hypothesis is proposed:

Hypothesis 2 (H2): Basic needs satisfaction will positively influence work engagement

2.1.4 Work Engagement and Turnover Intentions

Based on the Job demands-resources theory (JD-R), work engagement has been found to be related with high performance, both in-role and extra role performance, high productivity, good customer relations, lower absenteeism rates and lower turnover intentions and lower actual turnover (Christian, Garza, and Slaughter, 2011; Reijseger, Peeters, Taris, and Schaufeli, 2017; Wright and Bonett, 2007, Darr and Johns, 2008; Balducci, Schaufeli, and Fraccaroli, 2011). Christian and Ellis (2014) assert that turnover intentions have to be arrested otherwise they may lead to deviant behaviour and actual turnover. Heskett (2017) posits the view that engaged employees were more likely to stay rather than quit their jobs compared with their non-engaged counterparts. Bhatnagar (2012) provided empirical study in the Indian context and found that work engagement and turnover intentions were negatively related. In earlier study, Hallberg and Schaufeli (2006) found that work engagement and turnover intentions were significantly and negatively related. The less engaged employees tend to be alienated with their work, and therefore have higher turnover intentions. Positive emotion theory also helps to explain the tendency of employees getting alienated with their jobs. Fredrickson (2001) asserts that personal resources of employees who receive feedback are likely to increase and employees who tend to be appreciated at place of work develop further positive emotions that induce employees to apply themselves and try new things. However, when employees' experiences are not being improved or employees' expectations regarding the jobs they are doing are not attended to for a consistently long time, employees may consider quitting their jobs. Veth et al. (2019) advise for mutual benefits for

organizations and employees to be promoted through careful attention to employees' expectations as they execute their jobs and what the organization needs from its employees to achieve organizational goals. Arising from the above, the following hypothesis is proposed:

Hypothesis 3(H3): Work engagement will negatively influence turnover intentions

2.1.5 Basic Needs Satisfaction, Work Engagement, and Turnover Intentions

The Job demands-resources model (JD-R) provides the link among job resources, job demands, personal resources and work engagement and its outcomes. Schaufeli and Taris (2014) regard the JD-R model as just a descriptive model that offers no clear explanation for the mechanism that enables resources to promote work engagement. Robijn et al. (2020) assert that the underlying mechanism of how resources impact work engagement is not properly understood from just looking at the jobs demands-resources model. Robijn et al. (2020) draws on the work of Deci and Ryan (2000) on psychological needs and proposes basic needs satisfaction as a possible underlying mechanism through which resources promote work engagement. Deci and Ryan (2000) assert that all humans require at least three core innate psychological needs represented by autonomy, relatedness, and competence for them to have optimal functioning and flourish in what they are engaged in. It is in promoting and actual experiencing of these basic needs that the inner drive in humans to perform is enabled.

Arising from the above, the proposition is made that basic needs satisfaction will promote work engagement and that there will be a positive relation among them, and that basic needs satisfaction will be negatively related with turnover intentions, and that work engagement will mediate the relation between basic needs satisfaction and turnover intentions.

Hypothesis 4 (H4): Work engagement will mediate the relation between Basic needs satisfaction and turnover intentions.

2.2 The Research model

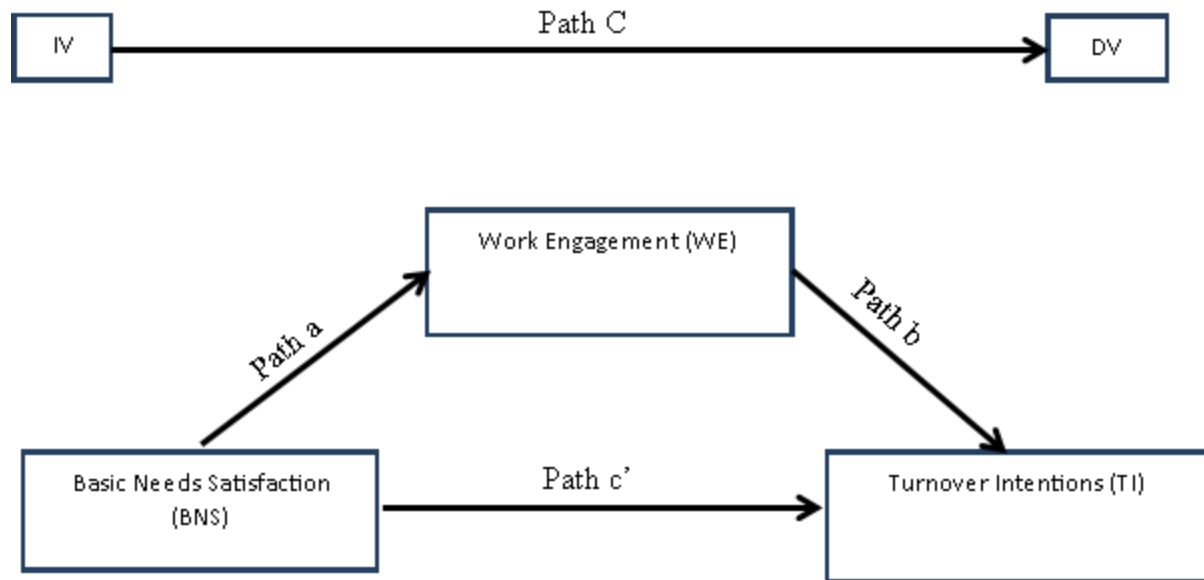


Figure 1: Research model for impact of basic needs satisfaction on work engagement and turnover intentions.

Source: Author (2023).

2.2.1 Path definitions

The following path definitions are based on Baron and Kenny (1986) conditions for establishing existence of a mediating variable:

- (a) Path (a) represents the relation between basic needs satisfaction (BNS) and Work engagement (WE). The regression coefficient for the impact of basic needs satisfaction on work engagement will be represented by (a).
- (b) Path (b) represents the relation between work engagement and turnover intentions. The regression coefficient for the impact of work engagement on turnover intentions will be represented by (b).
- (c) Path (c') represents the direct relation between basic needs satisfaction and turnover intentions. The regression coefficient for the direct impact of basic needs satisfaction on turnover intentions will be represented by (c').
- (d) Path (C) represents the total effect for the relation between basic needs satisfaction and turnover intentions. The regression coefficient for the impact of the total effect of basic needs satisfaction on turnover intentions will be represented by (C).
- (e) $C = ab + c'$; $c' = C - ab$

3.0 Method

3.1 Procedure and participants

One hundred employees at the mine took part in the research. Stratified random sampling was conducted to select the 100 employees in the research. Human Resources Department officials provided a list of 300 employees who were eligible for the study. The list provided comprised senior and junior staff employees, hence the need to stratify the employees to enable adequate representation of senior and junior staff employees according to their population. A well-structured questionnaire was prepared and distributed by hand to 100 hundred employees within the mine. The research was conducted from July 2022 to December 2022.

3.2 Research instruments

3.2.1 Work-related Basic needs satisfaction scale

For basic needs satisfaction, an 18 -item Scale that was developed and validated by Van den Broeck et al. (2010) and is based on the works of (Deci et al., 2001; Ilardi et al., 1993; Kasser et al., 1992) was used.

Participants were required to respond to the questions regarding their feelings on basic needs satisfaction in the last one year based on the scale provided.

Table 1: Basic needs satisfaction 5-point Likert Type scale

1	2	3	4	5
Strongly Disagree (SDA)	Disagree (DA)	Not Sure (NS)	Agree (A)	Strongly Agree (SA)

The following are some of the questions:

- ‘At work I feel part of a group’.
- ‘I have a feeling that I can even accomplish the most difficult tasks at work’
- ‘If I could choose, I would do things at work differently’

3.2.2 Work engagement scale

The scale used for work engagement is the one provided by Schaufeli et al. (2002). It is the long version of the Utrecht Work Engagement Scale–17 [UWES-17] for measuring work engagement. The individual employee is the unit analysis for the UWES-17. The variables for work engagement are vigour, dedication, and absorption (VI = Vigour scale; DE = Dedication scale; AB = Absorption scale). According to Bakker et al. (2008), the work engagement scale (UWES-17) has been validated and used in many countries. The scale has been translated in various languages across many countries. In the countries where the scale has been used, the Cronbach’s alpha for 17-scale UWES ranged between 0.85 and 0.92. These values of Cronbach’s

alpha value obtained satisfied the minimum 0.70 value needed for internal consistence of the scale (Henson, 2001).

Table 2: Work Engagement 5-point Likert Type scale

1	2	3	4	5
Strongly Disagree (SDA)	Disagree (DA)	Agree A Little (AAL)	Agree (A)	Strongly Agree (SA)

The following are some of the questions:

- ‘At my work, I feel bursting with energy’ (vigour).
- ‘To me, my job is challenging’ (Dedication).
- ‘I get carried away when I am working’ (Absorption).

3.2.3 Turnover intentions

The Turnover Intention Scale-6 (TIS-6) developed by Roodt (2004) and validated by Bothma and Roodt (2013) was used to measure turnover intentions. The TIS-6 is a short version of the 15-item turnover intention scale. The TIS-6 validated scale provides support for validity of the scale in measuring turnover intentions. The following is the guidance for interpretation of the scale scores: lower scores indicated higher likelihood of staying and the higher scores indicated higher likelihood of leaving the job. The Cronbach’s alpha calculated by Bothma and Roodt (2013) for the TIS-6 was .80, therefore since this is greater than .70, the scale was reliable in predicting whether one would quit or stay. The possible scores under TIS-6 range from 6 to 30. The mean score is 18. A person with a score of 6 has the least intentions of quitting and the person with a score of 30 has the highest intentions of quitting. The corresponding average scores are 1 and 5 respectively.

Table 3: Turnover Intentions 5-point Likert Type Scale

1	2	3	4	5
Strongly Disagree (SDA)	Disagree (DA)	Agree A Little (AAL)	Agree (A)	Strongly Agree (SA)

The following are some of the questions:

- ‘How often have you considered leaving your job’?

- ‘How often are you frustrated when not given the opportunity at work to achieve your personal work-related goals’?
- How often do you dream about getting another job that will better suit your personal needs?

3.2.4 Reliability of research instruments

Based on calculations done using SPSS software, the Cronbach’s alpha coefficients were 0.793, 0.872, and 0.702 respectively for basic needs satisfaction, work engagement, and turnover intentions scales. A value of .70 is widely quoted as minimum acceptable value for reliability of a scale. However, researchers do not agree on single cut-off value for reliability of a scale. Based on George and Mallery (2003) the following provides guidance for interpretation of Cronbach’s alpha values calculated (p.23):

- (1) $\geq .9$: Excellent.
- (2) $\geq .8$: Good.
- (3) $\geq .7$: Acceptable
- (4) $\geq .6$: Questionable.
- (5) $\geq .5$: Poor
- (6) $\leq .5$: Unacceptable

The calculated values for Cronbach’s alpha for the study variables were all between .70 and .90. Based on George and Mallery (2003), the scales for the research instruments used and responses provided through research are reliable.

3.2.5 Durbin-Watson Test for Autocorrelation

Number	Independent Variables	Dependent Variable	Durbin-Watson Statistic
1	Basic Needs Satisfaction (BNS)	Turnover Intentions (TI)	1.632
2	Work Engagement (WE)	Turnover Intentions (TI)	1.540
3	Basic Needs (BNS) Satisfaction and Work Engagement (WE)	Turnover Intentions (TI)	1.604

3.2.6 Demographics statistic of participants

Table 4: Research demographics

		Total	Percentage
Gender	Male	93	93%
	Female	07	7%
Age	20 - 29	12	12%
	30 - 39	37	37%
	40 - 49	28	28%
	50 - 59	19	19%
	60 - 69	04	04%
Education	Secondary	04	04%
	Technician/Craft	65	65%
	Diploma	22	22%
	Degree	07	07%
	Masters Degree	02	02%
Years of Service	1 – 5	22	22%
	6 – 10	31	31%
	11 – 15	18	18%
	>15	29	29%
Marital Status	Single	23	23%
	Married	77	77%

The demographics of the research participants are presented in table 4 above. Of the 100 participants, 93 were male and 7 were female, representing 93% and 7% respectively. The age distribution was as follows: 20-29 (12%), 30-39 (37%), 40-49 (28%), 50-59 (19%), and 60-69 (4%). In terms of educational attainment 4% had senior secondary school certificate, 65% had technician or craft certificates, 22% had diplomas, 7% had degrees, and 2% had masters’ degrees. Regarding years of service, 22% had served in the range 1-5, 31% had worked for 6-10 years, 18% had worked for 11-15 years, and 29% had worked for than 15 years. Of the 100 participants, 23% were single and 77% were married.

4.0 Results

4.1 Correlation Results

Table 4: Mean of variables, standard deviations and correlation between variables

		Age	Gender	MS	edu	BNS	WE	TI
Age	Pearson Correlation	1	-.005	.484**	-.087	.292**	.241*	-.354**
	Sig. (2-tailed)		.963	.000	.388	.003	.016	.000
	N	100	100	100	100	100	100	100
Gender	Pearson Correlation	-.005	1	-.132	.121	-.091	.150	-.198*
	Sig. (2-tailed)	.963		.190	.231	.368	.137	.048
	N	100	100	100	100	100	100	100
MS	Pearson Correlation	.484**	-.132	1	-.117	.198*	.133	-.015
	Sig. (2-tailed)	.000	.190		.247	.049	.188	.884
	N	100	100	100	100	100	100	100
edu	Pearson Correlation	-.087	.121	-.117	1	-.067	-.075	.185
	Sig. (2-tailed)	.388	.231	.247		.508	.459	.065

	N	100	100	100	100	100	100	100
BNS	Pearson Correlation	.292**	-.091	.198*	-.067	1	.544**	-.459**
	Sig. (2-tailed)	.003	.368	.049	.508		.000	.000
	N	100	100	100	100	100	100	100
WE	Pearson Correlation	.241*	.150	.133	-.075	.544**	1	-.519**
	Sig. (2-tailed)	.016	.137	.188	.459	.000		.000
	N	100	100	100	100	100	100	100
TI	Pearson Correlation	-.354**	-.198*	-.015	.185	-.459**	-.519**	1
	Sig. (2-tailed)	.000	.048	.884	.065	.000	.000	
	N	100	100	100	100	100	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Pearson's R correlation analysis was conducted to ascertain the relation among variables. The results for the correlation analysis are presented in table 4. Age was highly significantly correlated with marital status (MS) (R: .484**, $p < .01$), basic needs satisfaction (BNS) (R: .292**, $p < .01$), and turnover intentions (TI) (R: -.354**, $p < .01$), and age was correlated with work engagement (WE) (R: .241*) and relation was only significant at $p < .05$. There was no significant correlation of gender with other variables apart from turnover intentions (R: -.198*, $p < .05$), the relation was significant, not at $p < .01$ but at $p < .05$. Marital status was significantly correlated with age (R: .484**, $p < .01$) and basic needs satisfaction (R: .198*, $p < .05$). Education status was not significantly correlated with any of the variables.

Basic needs satisfaction (BNS) was significantly correlated with age (R: .292**, $p < .01$), marital status (MS) (R: .198*, $p < .05$), work engagement (WE) (R: .544**, $p < .01$), and turnover intentions (T) (R: -.459**, $p < .01$).

Work engagement (WE) was highly significantly correlated with basic needs satisfaction (R: .544**, $p < .01$), turnover intentions (R: -.519, $p < .01$), and significantly correlated with age (R: .241*, $p < .05$). Turnover intentions (TI) were highly significantly correlated with age (R: -.354**, $p < .01$), basic needs satisfaction (R: -.459**, $p < .01$), work engagement (R: -.519**, $p < .01$), and significantly correlated with gender (R: -.198, $p < .05$).

4.2 Impact of Age group on study variables

Table 5: Impact of age group on study variables

Age Range (years)	BNS	WE	TI
27-29	3.78	3.3	3.49
30-39	3.80	3.57	3.33
40-49	4.04	3.72	3.09
50-59	4.08	3.67	2.90
60-69	4.24	4.29	2.21

A calculation of aggregate the means for the variables according to age group revealed the above results. Impact of age group was positively related to basic needs satisfaction (BNS) and work engagement (WE) and negatively related to turnover intentions.

4.3 Regression Results

Table 6: Prediction of Basic Needs Satisfaction and Work Engagement variables on Turnover Intentions.

Dependent Variable	Turnover Intentions		
Independent Variable	Basic Needs Satisfaction		
Adjusted R²: .203	F test: 26.178	Significance: .000	
Variable in Equation	Beta	t	p
Basic Needs Satisfaction	-.459	-5.116	.000

Dependent Variable	Turnover Intentions		
Independent Variable	Work Engagement		

Adjusted R²: .262	F test: 36.138	Significance: .000	
Variable in Equation	Beta	t	p
Work Engagement	-.519	-6.011	.000
Dependent Variable	Work Engagement		
Independent Variable	Basic Needs Satisfaction		
Adjusted R²: .288	F test: 41.104	Significance: .000	
Variable in Equation	Beta	t	p
Basic Needs Satisfaction	.544	6.411	.000
Dependent Variable	Turnover Intentions		
Independent Variables	Basic Needs Satisfaction, Work Engagement		
Adjusted R²: .300	F test: 22.187	Significance: .000	
Variable in Equation	Beta	t	p
Work Engagement	-.382	-3.817	.000

Simple and multiple linear regressions were performed to examine the relation between Basic Needs Satisfaction, Work Engagement, and Turnover Intentions. The results of the regression analysis are presented in Table 6. Simple regression analysis was conducted between Basic Needs Satisfaction and Turnover Intentions ($R^2: .203$, $F: 26.178$, $\beta_{basicneedssatisfaction}: -.459$, $p < .01$). The relationship was significant as indicated in Table 6. Hypothesis H1: Basic needs satisfaction will negatively influence turnover intentions was supported, and was therefore accepted.

The predictability of Basic Needs Satisfaction to positively influence Work Engagement was examined by performing simple regression analysis, ($R^2: .288$, $F: 41.104$, $\beta_{basicneedssatisfaction}: .544$, $p < .01$). The relationship was significant as indicated in Table 6. Hypothesis H2: Basic needs satisfaction will positively influence work engagement was supported, and was therefore accepted.

The predictability of Work Engagement to negatively influence Turnover Intentions was examined by performing simple regression analysis, ($R^2: .262$, $F: 36.138$, $\beta_{workengagement}: -.519$, $p < .01$). The relationship was significant as indicated in Table 6. Hypothesis H3: Work Engagement will negatively influence Turnover Intentions was supported, and was therefore accepted.

Multiple linear regression analysis was performed to examine the impact of Basic Needs Satisfaction and Work Engagement as independent variables on Turnover Intentions ($R^2: .300$, $F: 22.187$, $\beta_{workengagement}: -.382$, $p < .01$; $\beta_{basicneedsatisfaction}: -.251$, $p > .01$). The actual p-value for Basic Needs Satisfaction result when Work Engagement was controlled (used as a mediating variable) was .014, therefore despite Basic Needs Satisfaction still contributing to variance in Turnover Intentions when Basic Needs Satisfaction and Work Engagement were used as independent variables at the same time to predict Turnover Intentions, the result was insignificant at the reference p-value of $p < .01$.

According to Baron and Kenny (1986) conditions for a variable to qualify as a mediating variable, the direct impact of Basic Needs Satisfaction on Turnover Intentions must be insignificant when a mediating variable (in our case, Work Engagement) is controlled as independent or predictor variable. The direct relationship between Basic Needs Satisfaction and Turnover Intentions became insignificant when Work Engagement was controlled, therefore the Hypothesis H4: Work Engagement will mediate the relation between Basic Needs Satisfaction and Turnover Intentions was supported, and hypothesis was therefore accepted.

Table 7: Sobel test calculations

Input:		Test statistic:	Std. Error:	p-value:
a	0.628	Sobel test: -4.37647566	0.09972865	0.00001206
b	-0.695	Aroian test: -4.34831677	0.10037447	0.00001372
s_a	0.098	Goodman test: -4.40518879	0.09907861	0.00001057
s_b	0.116	Reset all	Calculate	

Input:		Test statistic:	p-value:
t_a	6.411	Sobel test: 4.3850135	0.0000116
t_b	-6.011	Aroian test: 4.35689803	0.00001319
		Goodman test: 4.41368038	0.00001016
	Reset all	Calculate	

A Sobel test was conducted to confirm the mediating role of Work Engagement (WE) on Basic Needs Satisfaction (BNS) and Turnover Intentions (TI). The first table is generated through multiple linear regression of the effect of Basic Needs Satisfaction (Independent variable) and Work Engagement (Mediating variable) on the dependent variable Turnover Intentions. Multiple regression was used to generate the unstandardized regression coefficients (a and b) and the standard errors (s_a and s_b). The Sobel test calculation provided a level of significance much lower

than .01. Therefore, since the level of significance was lower than .01, it was concluded that Work Engagement was a mediating variable, and result obtained was significant at $p < .01$. The second table utilizes “Z Scores” to ascertain whether computed Z score falls outside critical values.

$$Z = \frac{a * b}{\sqrt{(b^2 * S_a^2 + a^2 * S_b^2)}}$$

Equation 1: Formula for Z value for Sobel Test

According to Sobel (1982), the calculated Z score will be significant if it lies outside ± 1.96 for the provided two-tailed (alpha- α) p-value of .05 and outside ± 2.58 for the provided two-tailed (alpha- α) p-value of .01.

Since the Sobel test statistic (4.3850135) is outside the ± 2.58 range for a two- tailed alpha (α) of .01 ($p < .01$), and the p-value of the statistic is 0.0000116 (less than .01), mediation of Work Engagement on Basic Needs Satisfaction and Turnover Intentions is confirmed.

Table 8: Bootstrapping results

Bootstrap for Coefficients

Model	B	Bootstrap ^a				
		Bias	Std. Error	Sig. (2-tailed)	BCa 99% Confidence Interval	
					Lower	Upper
1 (Constant)	6.544	-.045	.510	.000	4.968	7.525
WE	-.512	.005	.124	.000	-.856	-.166
BNS	-.388	.006	.158	.016	-.815	.089

a. Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

Table 8 provides bootstrapping results to confirm Work Engagement as a mediating variable between Basic Needs Satisfaction and Turnover Intentions.

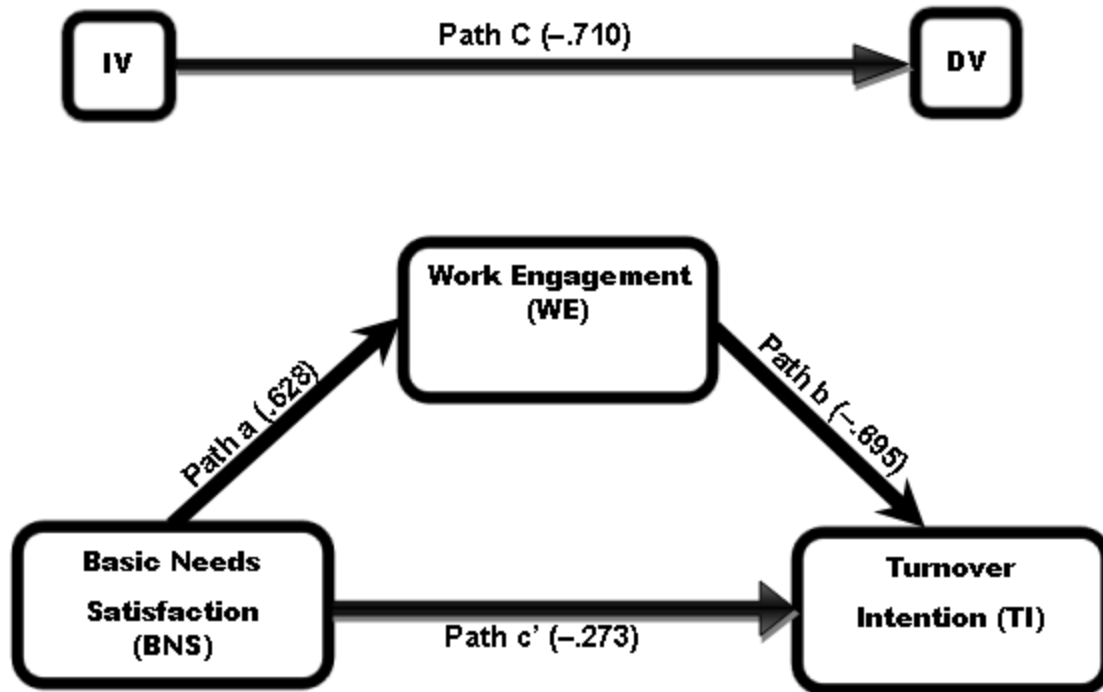


Figure 2: Research model with actual unstandardized regression coefficients for impact of basic needs satisfaction on work engagement and turnover intentions.

Source: Author (2023).

The direct impact of Basic Needs Satisfaction on Turnover Intentions was calculated from the formula: $C = c' + a*b$ (Baron and Kenny, 1986), where c' is the direct impact of Basic Needs Satisfaction on Turnover Intentions; a is the regression coefficient for the impact of Basic Needs Satisfaction on Work Engagement; b is the regression coefficient for the impact of Work Engagement on Turnover Intentions; a and b are essentially the indirect effect of Basic Needs Satisfaction on Turnover Intentions. When (a) or (b) is zero, the relation between Basic Needs Satisfaction and Turnover Intentions is direct and the total effect (C) is equal to the direct effect (c'). The indirect effect ($a*b$) was .43646. Therefore, the direct effect was -.273.

5.0 Discussions

The objective of this study was to examine the mediating role of work engagement between Basic Needs Satisfaction and Turnover Intentions. The sub-objectives were (a) to examine the impact of basic needs satisfaction on turnover intentions, (b) to examine the impact of basic needs satisfaction on work engagement, and (c) to examine the impact of work engagement on turnover intentions.

The study has shown that based on the Baron and Kenny (1986) treatise for confirmation of a variable as being a mediator, Sobel test for mediation, and bootstrapping conducted, Work Engagement was confirmed as mediating variable between Basic Needs Satisfaction and Turnover

Intentions. There was a negative relation between Basic Needs Satisfaction and Turnover Intentions. The correlation between Basic Needs Satisfaction and Turnover Intentions was $-.459$, and was significant at $p < .01$. There was a positive relation between Basic Needs Satisfaction and Work Engagement. The correlation between Basic Needs Satisfaction and Work Engagement was $.544$, and was significant at $p < .01$. There was a negative relation between Work Engagement and Turnover Intentions. The correlation between Work Engagement and Turnover Intentions was $-.519$, was significant at $p < .01$. When multiple linear regression analysis was conducted by using Turnover Intentions as dependent variable and Basic Needs Satisfaction and Work Engagement as independent variables (but controlling for Work Engagement), the regression result was significant but Basic Needs Satisfaction was insignificant at $p < .01$. Therefore, based on Baron and Kenny (1986), Work Engagement was the mediator and it performed the role of generative mechanism through which Basic Needs Satisfaction impacted Turnover Intentions.

The study results at the mine regarding the contribution of Work Engagement to Turnover Intentions yielded similar results to studies by Li, Li and Wan (2019) and Xiong and Wen (2020) who conducted research on impact of work engagement on turnover intentions among Chinese community health nurses and retail bank workers respectively. Further, the study by Gupta and Shaheen (2017) on a sample of 228 employees obtained from diverse industries in India provided a Pearson correlation of $-.30$ and coefficient of determination was 9% for the relation between Work Engagement and Turnover Intentions. The Pearson correlation in Li et al. (2019) study was $-.38$ and coefficient of determination was 14.14% while in the Xiong and Wen study, the Pearson correlation was $-.37$ and the coefficient of determination was 13.69%. Based on Cohen, Cohen, West and Aiken (2003), the three studies provided coefficient of determination reflecting small (1% to 9%) to medium (9.1% to 25%) size effect. However, the Pearson correlation in the study at the mine was slightly higher at $-.519$, giving a coefficient of determination of 26.9%, representing a large effect (based on Cohen et al. (2003), 25.1% to 100% is a large effect). Employees at the mine gave as many as 60 reasons for turnover intentions. The top 20 reasons yielded 17 reasons associated with relatedness and 3 reasons associated with competence components of Basic Needs Satisfaction. Relatedness is associated with the employee's need to belong with others and the felt experience of being wanted and supported by superiors, co-workers, and generally most of the workers. These reasons were provided by the employees as reasons associated with reduced satisfaction of their basic needs. The top 20 reasons were: low salaries (79), bad supervisor-subordinate relation (47), lack of opportunities for growth (35), lack of reward system for competent people (34), lack of recognition (34), poor working environment (25), poor conditions of service (24), lack of motivation (21), lack of incentives (17), lack of resources to perform jobs (17), lack of differentiation of salaries between new and old employees (16), poor working relationship among employees (13), lack of challenging jobs (12), lack of security (11), poor communication / feedback (09), lack of promotion (09), seeking higher pay / greener pastures (08), qualifications not respected (05), lack of assessment based rewards (05), and frustrations

(05). The figures in brackets represent the number of times (frequency) the specific reason was given by employees.

The unstandardized regression coefficient for the total (C) impact of Basic Needs Satisfaction on Turnover Intentions was $-.710$. This means that a one unit increase in Basic Needs Satisfaction was associated with an average decrease of $.710$ in Turnover Intentions or a one unit decrease in Basic Needs Satisfaction was associated with an increase of $.710$ in Turnover Intentions, assuming all other factors that also be impacting on Turnover Intentions are held constant. The unstandardized regression coefficient for impact of Basic Needs Satisfaction on Work Engagement was $.628$. This means that a one unit increase in Basic Needs Satisfaction is associated with an average increase of $.628$ in Work Engagement, assuming all other factors that may be impacting on Work Engagement are held constant. The unstandardized regression coefficient for the impact of Work Engagement on Turnover Intentions was $-.695$. This means that a one unit increase in Work Engagement is associated with an average decrease of $.695$ in Turnover Intentions or a one unit decrease in Work Engagement is associated with an average increase of $.695$ in Turnover Intentions, assuming Basic Needs Satisfaction and all other factors that maybe impacting on Turnover Intentions are held constant. The direct impact of Basic Needs Satisfaction on Turnover Intentions was calculated from the formula: $C = c' + a*b$ (Baron and Kenny, 1986), where c' is the direct impact of Basic Needs Satisfaction on Turnover Intentions; a is the regression coefficient for the impact of Basic Needs Satisfaction on Work Engagement; b is the regression coefficient for the impact of Work Engagement on Turnover Intentions; a and b are essentially the indirect effect of Basic Needs Satisfaction on Turnover Intentions. When (a) or (b) is zero, the relation between Basic Needs Satisfaction and Turnover Intentions is direct and the total effect (C) is equal to the direct effect (c'). The indirect effect ($a*b$) was $.43646$. Therefore, the direct effect was $-.273$. This means that in the absence of Work Engagement, the direct impact of Basic Needs Satisfaction on Turnover Intentions was $-.273$ while in the presence of Work Engagement, the total impact of Basic Needs Satisfaction was $-.710$. Therefore, the impact of Basic Needs Satisfaction on Turnover Intentions is more in the presence of Work Engagement, and it is less in the absence of Work Engagement.

The adjusted coefficient of determination (R^2) for the regression analysis was 20.3% for the impact of Basic Needs Satisfaction on Turnover Intentions, and this impact was significant at $p < .01$. The adjusted coefficient of determination (R^2) for the regression analysis was 26.2% for the impact of Work Engagement on Turnover Intentions, and this impact was significant at $p < .01$. The adjusted coefficient of determination (R^2) for the regression analysis was 28.8% for the impact of Basic Needs Satisfaction on Work Engagement, and this impact was significant at $p < .01$. The adjusted coefficient of determination (R^2) for the regression analysis was 30.0% for the combined impact of Basic Needs Satisfaction and Work Engagement on Turnover Intentions, and this impact was significant at $p < .01$. The mediation analysis conducted showed that in the when Work Engagement was controlled, the impact of Basic Needs Satisfaction was reduced (from -

.710 unstandardized and -.459 standardized to -.388 unstandardized and -.251 standardized), and the impact of Basic Needs Satisfaction was not significant at $p < .01$ (actual p-value was .014). Contribution of Work Engagement was significant at $p < .01$ despite its respective regression coefficients decreasing. The mediation model yielded a direct impact of -.273 for the effect of Basic Needs Satisfaction on Turnover Intentions. Therefore, full mediation by Work Engagement was not achieved because the direct impact of Basic Needs Satisfaction on Turnover Intentions was non-zero in the presence of Work Engagement. The regression analysis for mediation yielded partial mediation by Work Engagement for the impact of Basic Needs Satisfaction on Turnover Intentions. Hayes (2013) provides the following formula for the proportion of the effect attributed to the mediator:

$$P_M = a*b/a*b + c' \text{ (Equation 2: ratio of indirect effect to total effect)}$$

Based on equation 2 above, the ratio of the indirect effect to total effect was 0.615. This ratio is very big. Therefore, indirect effect or the mediating effect of Work Engagement between Basic Needs Satisfaction and Turnover Intentions was big.

5.1 Theoretical implications

The study has provided further empirical support to the theorization that Turnover Intentions can be studied through the Basic Needs Satisfaction and Work Engagement constructs. Based on the Job Demands-Resources theory (JD-R) (Bakker and Demerouti, 2017), Work Engagement has been studied as antecedent variable for organizational outcomes like organizational performance and affective outcomes for individual employees like turnover, in-role and extra-role performance, and absenteeism. Work Engagement has also been studied as a dependent variable and moderating variable but it has rarely been studied as a mediating variable between Basic Needs Satisfaction and Turnover Intentions. This study is the first of its kind in our country to theorize turnover intentions based on the basic needs satisfaction of autonomy, relatedness, and competence, which form the central aspects of self-determination theory (SDT) espoused by Deci and Ryan (2000) and Work Engagement which is one of the core aspects of JD-R theory (Bakker and Demerouti, 2017). The study contributes to the body of knowledge by using Work Engagement as the generative mechanism through which Basic Needs Satisfaction could operate to impact Turnover Intentions. The study generated empirical results to support the use of Work Engagement as mediating variable between Basic Needs Satisfaction and Turnover Intentions.

5.2 Practical implications

The study results have practical implications on turnover intentions and retention strategies that may be employed. Of the 20 top reasons provided by employees as causes of turnover intentions, 17 of them have to do with relatedness aspect of basic needs satisfaction and 3 have to do with competence. Since the study established that basic needs satisfaction was negatively related to turnover intentions and that basic needs satisfaction was positively related to work

engagement, which in turn was negatively related to turnover intentions, managers must attend to issues leading to poor basic needs satisfaction. While autonomy is desirable, autonomy did not feature among the top 20 reasons for turnover intentions. Managers must attend to and rectify turnover intention arising from low compensation, bad supervisor-subordinate relationship, lack of training and development opportunities, and lack of reward and recognition of competent employees. Attending to some of these factors, especially the ones with high frequency may help employees to feel that they belong with the organization and with others and the experience of being wanted and supported by superiors, co-workers, and generally most of the workers may actually be felt. Failure to arrest turnover intentions will continue to contribute to loss of valuable employees, and this in turn will adversely impact productivity of operations of the organization. Insights into individual employee basic needs, work engagement, and turnover intentions may be obtained through annual or six-monthly surveys among various employees. These surveys can be used to guide managerial decisions regarding intervention measures for turnover intentions and retention of valuable employees.

5.3 **Limitations and recommendations for the future**

The study was a cross-sectional design; therefore, causality and generalization of results cannot be made. The author recommends that longitudinal data can be obtained through more study on research participants at the mine as well as other mines in Zambia so that causality of study variables can be confirmed. Insights into what individual employee basic needs, work engagement, and turnover intentions may be obtained through annual or six-monthly surveys among various employees. Future researchers should try to conduct similar research in other sectors of industry so that generalization of results is enabled.

5.4 **Conclusion**

The study established that basic needs satisfaction was negatively related with turnover intentions. Satisfying of basic needs captured under autonomy, relatedness, and competence would therefore help in reducing turnover intentions. The study also established that basic needs satisfaction was positively related with work engagement, and that work engagement was negatively related with turnover intentions. Therefore, satisfaction of basic needs would promote enhanced work engagement among employees, and this promotion of work engagement would help to reduce turnover intentions. Through mediation analysis based on Baron and Kenny (1986), and confirmation through Sobel tests (Sobel, 1982) and bootstrapping, work engagement was confirmed as a mediating variable between basic needs satisfaction and turnover intentions.

ORCID Id: <https://orcid.org/0000-0002-8980-0260>

Conflicting interests

The authors have no conflicting interests attached to this article.

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