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Does the Theory of Planned Behavior Predict Healthcare Waste Management Practices?

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Understanding the factors influencing healthcare waste practices behaviour can lead to better and more effective management practices programs in any country in the world. The main aim of this study was to examine factors associated with healthcare waste practices behaviours in light of the theory of planned behaviour within the Libyan hospital context. Previous studies have shown that a number of organisational characteristics such as structure, culture, size and operational location of an organisation will influence healthcare waste management practices. Underpinned by planned behavioural theory, using a reliable instrument, a pilot study survey was conducted to identify the statistical relationships between organisational structure and healthcare waste management practice of Libyan public hospitals. The correlation test analysis illustrated that centralisation and formalisation were found to have significantly strong relationships with healthcare waste collection and disposal. On the other hand, these two dimensions (centralisation and formalisation) were found to have no relationship with medical waste separation.

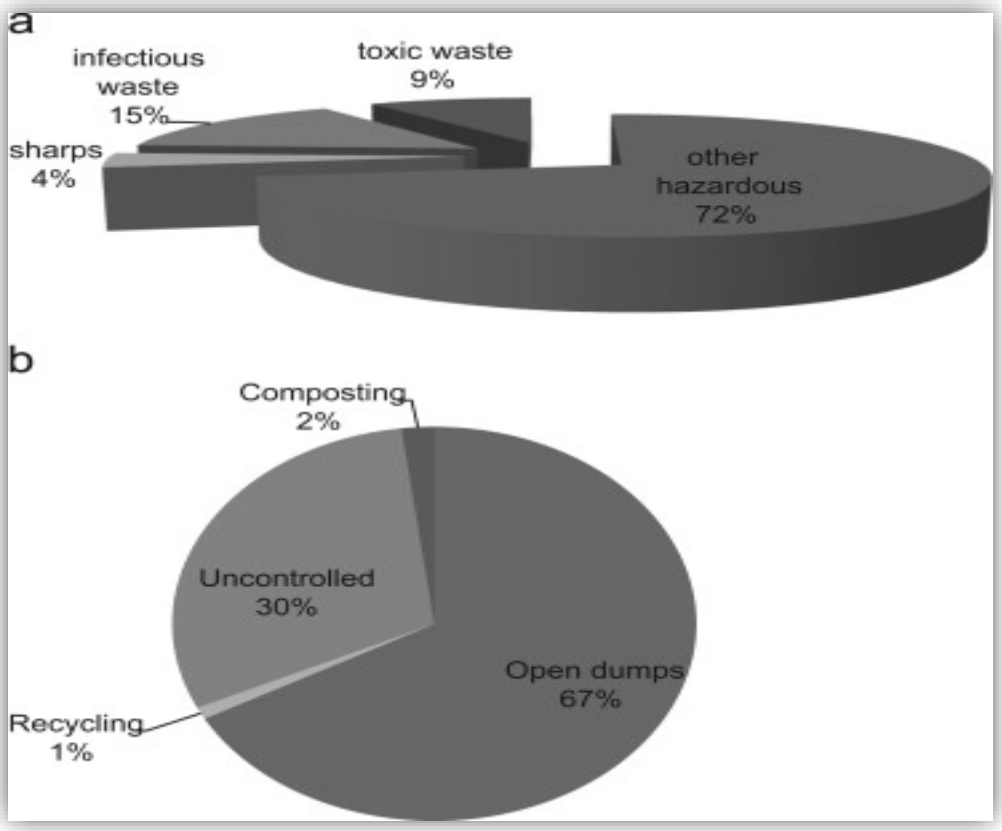
Key words: *Healthcare waste management practices, Waste behaviour, Organisational structure and Theory of planned behaviour.*

Introduction

According to RUNYORA (2016), waste management consists of collection, storage, treatment, transporting, recovery and waste disposal. Norris and Coats (2017) also described the term as an integrated rational system method for the accomplishment and protection of sustainable environmental quality development. Economic benefit will be achieved in terms of the project cost with the implementation of an appropriate construction waste management plan (Cordero-Coma & Esping-Andersen, 2018). In this study, construction waste is referred to as the waste

or debris created or generated as a result of construction or demolition works. According to Law (2017), about 1.3 billion tons of wastes are currently generated by cities around the world and this value is anticipated to increase by 2025 to about 2.2 billion tons. The increase is anticipated to be the greatest in lower income countries. Related to this is the annual global waste management cost that is expected to increase from $ 205 billion to about $ 376 billion in 2025, (Law, 2017). One of the processes in the management of waste is to deposit the waste into landfills after the initial treatment of the earth's surface to reduce the contamination with groundwater for the protection of the environment; in fact, the increase of the concern in the demand for reducing natural resources in making sustainable construction organisations appears to be among the factors responsible for the emergence of landfill. Altogether, these factors encourage various municipalities and governments to encourage the integrated waste management system, i.e. (reduce, reuse, recycling, and disposal) of the Construction & Demolition waste (Cordero-Coma & Esping-Andersen, 2018). This resonates with the fact that the European countries such as Belgium and Denmark had made a significant lead in recycling more than 80 percent of their C&D waste by the late 1990s. While landfilling is a component of handling construction waste, effective management of such waste could reduce a significant amount of waste deposited in landfills. For instance, public filling facilities and landfills will run out soon in Hong Kong, according to their government's estimation, while in the mid-2010s, three landfills were expected to have been full. In the meantime, waste reduction measures of construction need to be implemented on sites (EPD, 2012). In the Canadian provinces such as Nova Scotia, effort has also been made, where currently more than 80% of the wastes from construction activities are being diverted from the storage to the landfill by the Halifax Regional Municipality. Construction wastes are usually debris from buildings for instance, concrete, steel, earth, rubble, timber and diverse materials from site clearance; most often they are also organic materials or a mixture of immobile materials. Every construction activity across the globe generates large amount of waste, for instance, the United States (US) Environmental Protection Agency (2002) reported that roughly 136 million tons of Construction 5 Demolition wastes were generated in 1996 in the US and the bulk of the wastes produced was approximately 44% to 48% respectively. It is evident from Figure 2 that in Libya, almost 97 percent of waste is uncontrolled and in open dumps and 30 percent of the waste is of dangerous categories.

Figure 1. Health Care Waste in Libya



Source: Hamad et al., (2014)

In the recent past, there have been several research studies that focused on Healthcare Waste Management Practices (HCWMP) across countries such as The United Kingdom (UK), the USA, Greece, Turkey, Mongolia, Iran, Brazil, Egypt (Thakur & Anbanandam, 2016), Mauritius (Mustafa Ali, Chaudhry, & Wang, 2017) and Jordan, all reflecting the importance of proper management of healthcare waste. A number of past and recent studies have highlighted the importance of factors that influence the management of healthcare waste, such as the provision of education and training to staff and compliance with proper waste management practices, types of hospitals and clinics, reimbursement payment by National Health Insurance, total number of beds, bed occupancy, number of infectious disease beds and outpatients per day, appropriate legislation and effective control, (Harir, Kasim, & Ishiyaku, 2015). Universally, the waste management sector is faced with several challenges such as complexity and the volume amount of waste. This issue results in many environmental hazards such as infectious diseases, environmental degradation, water and soil pollution, greenhouse gas emissions and the undesirable effect on the nature of human life quality as well as other living things. These issues can obviously be noted and more visible in less developed countries of the world, where waste is still handled randomly in the chain of waste management process

programs. According to previous research, overcoming these issues and problems means recycling programs for waste generated must be suggested to for example, overcome any accumulated waste at landfilled sides (Cordero-Coma & Esping-Andersen, 2018). Recycling refers to a process in which certain tools and materials are used and later on gathered, rebuilt and reused. Despite the fact that about 85% of waste produced by healthcare facilities is general waste that can then be recycled, research illustrates that harmful and hazardous waste are often dumped together with the general waste (Bernardes & Günther, 2014).

In recent years, the number of healthcare facilities in Libya has drastically increased to serve the community, especially in large cities such as Tripoli, Sabha and Benghazi. However, most of the cities, if not all, have serious problems with medical waste management and the current exited system needs to be developed and improved. Medical waste management studies in Libya are few. For example, a study conducted across ten hospitals in the city of Benghazi, Libya, in the period between 2004-2005 explored the implications of how to deal with hazardous medical waste at all stages and estimated the size of the damage resulting from the residues.

Theoretical Framework and Hypothesis Development

Organisational structure is defined by Nasidi (2016) as the means in which an organisation is categorised with the end goal of accomplishing the expected result. Nasidi (2016) further suggested that organisational structure has the aim of representing the totality of connections and relations among its components at the organisational levels to a quite defined extent. As a result, there are also issues of approach, preparation and motivation, and to a great extent not as much of an issue of structure. The strategy, for instance, empowerment and flexibility, further differentiates one management approach from another. Once more, this is more or less an issue of structures. Therefore, the common idiom distributed between members is provided as a result of the formalisation, and it also enables an organisation to conduct proficient communication. In addition, formalisation can be said to be a signal to the extent in which the rules and obligations of the members of the organisations are determined and also the extent to which they are written as rules, instructions and procedure (Tomczak, Lanzo, & Aguinis, 2018). In relation to assigning power of decision-making in an organisation, there is the degree of the participation of the members of the organisation in making decisions (Eid & Abdelkader, 2017). Agarwal and Gupta (2018) characterised "centralisation as the point to which marketing and planning related activities and decisions are concentrated in a few positions". Also, in Durmaz and Eren (2018) they described "centralisation in their study as the locus of "decision-making authority and control within an entity of construction waste management organisations (Cordero-Coma & Esping-Andersen, 2018). Centralisation is referred to as the degree to which the power of decision making is focused on the apex of the organisation's managerial level and a centralised structure is to be practiced in an organisation once the decision-making task is concentrated in the hands of fewer organisations" (Agarwal & Gupta, 2018). In this study, the

construction waste management organisation's centralised structure confines the manager's authority, regarding decision-making, where the chief executive officers (CEO) or the directors have the decision power and control (Cordero-Coma & Esping-Andersen, 2018). Therefore, centralisation keeps the managers and members of the staff flexible and makes them take the initiative when performing their duties (Agarwal & Gupta, 2018).

Theory and literature related to the above mentioned objective are discussed here. Also, hypotheses on the relationships between healthcare waste management practice and organisational structure are presented. This (TPB) is designated to predict and explain human behaviour in specific contexts. In other words, it refers to the prediction of an individual's intention towards a behaviour at a specifically timed engagement and place. It postulates forward understanding that individual behaviour is driven by behavioural intentions, where behavioural intentions are considered the fundamental function of planned behavioural theory constructs. These constructs include attitudes toward behaviour, subjective norms and perceived behavioural control (Rahayu & Day, 2015). The key concepts and dimensions are discussed below.

In testing the possible relationship between organisational structure and healthcare waste management practices behaviour, a step further has been taken into consideration by referring to a theory-based study known as planned behavioural theory to understand the mechanisms responsible for healthcare waste management practices behaviour. There are a different number of behavioural theories applied to understand the factors influencing waste management practices, including the model of reasoned action (Shaw, Shiu, & Clarke, 2015), the theory of the Norm Activation model, and the Ajzen' model of the theory of planned behaviour (Rahayu & Day, 2015). In this study, the researchers opt to use the theory of planned behaviour for several reasons. One is that its theoretical framework paves the way to examine those factors that can play essential roles in behavioural change. For example, to achieve a given task behaviour, it is all dependable on the readiness of the person and his/her intention. The TPB considers intention as immediately following behaviour. Furthermore, to the best of our knowledge, ours is the first study to investigate the relationship between organisational structure and healthcare waste management practices behaviour. The main aim of this study was to examine factors associated with healthcare waste management behaviours in the context of the expanded TPB among public hospitals in Libya.

Organisational Structure

There are several dimensions discussed in the literature. The most important aspects of organisational structure consist of centralisation, formalisation, integration and complexity (Murad Ali, Al-Maimani, & Park, 2018). Centralisation refers to the degree to which the right to make decisions and evaluate activities is concentrated, and formalisation refers to the degree

to which decisions and working relationships are directed by formal rules and standard policies and procedures in an organisation (Falkner, Hulman, & Kushner, 2018).

The purpose of using centralisation is to ensure standardisation, clear documentation, responsibility regarding best practice, minimising the interested parties who are facing lack of information or skills; it enables them to utilise the skills of central and specialised experts, and to have a closer control of organisational operations (Agarwal & Gupta, 2018). Additionally, when the organisation allows individuals to act autonomously, then it can achieve better business opportunities with regard to services or even new products (Arpaci, 2017). However, centralised organisations may reduce creative solutions, discourage inter-departmental communication as well as the frequent circulation and knowledge sharing due to the existence of the long time needed. From the perspective of waste management practices, bodies in charge practice centralisation structures in which only the authoritative personnel have power in terms of decision making and full empowerment lies in the hand of top managers. So as a result, the benefit of centralisation is to prevent staff members or even managers from being flexible and taking the initiative in the course of performing their duties (Agarwal & Gupta, 2018).

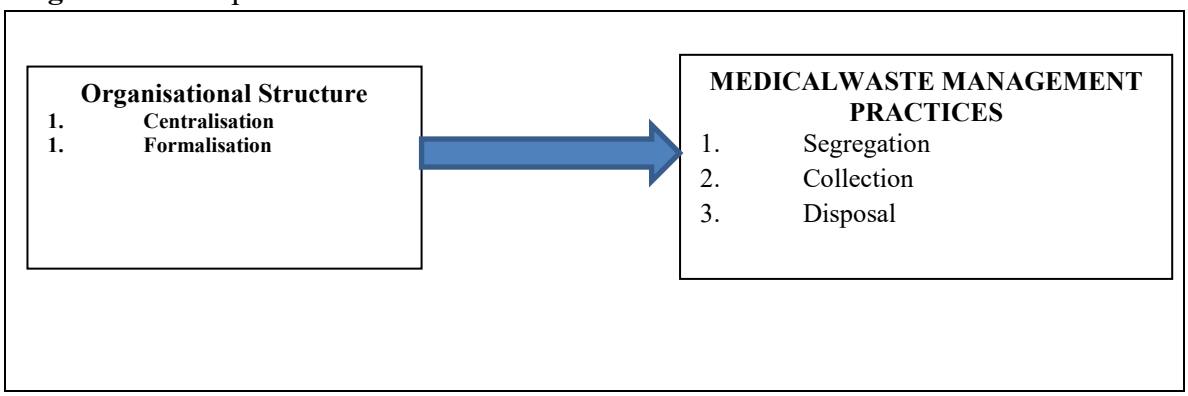
Formalisation refers to the extent to which standard policies, formal rules, and procedures manage decisions and working relationships (Falkner et al., 2018). This definition could be negatively criticised where it suffers from a restriction when strict formal rules dominate an organisation. On the other hand, formalisation can well improve cooperation and collaboration among the organisational staff all together (Müller-Stewens & Möller, 2017). Moreover, formalisation could shape interactional structure and scope and provide helpful insights for organisational management improvement. Formalisation measures the extent to which an organisation uses rules and procedures to prescribe behaviour.

The adopted definition of formalisation in this paper is that formalisation refers to the degree to which decisions and working relationships are directed by formal rules and standard policies and procedures in the management of waste healthcare facilities (Falkner et al., 2018). From the point of healthcare waste view, healthcare waste management with proper structure and clear rules and procedures will firstly permit the management to ease the circulation of handling the waste properly, where they are produced in deferent healthcare units and departments, and secondly reduce ambiguity (Müller-Stewens & Möller, 2017). Lastly, with formal procedures, employees tend to deal more effectively with contingencies, because they include the best practices learned from experience and incorporated into the organisational memory (Basheer, Hameed, Rashid, & Nadim). So in this context, formalisation control and regulation of best practices in order to stabilise and disseminate consistent programs will enable employees to follow these regularly and increase the quality of performance.

Healthcare Waste Management Practices

Healthcare waste is defined as any dangerous substances or objects of waste that pose a hazard to both the environment and human beings and which resulted from various medical activities which are intended or mandatory to be disposed of according to the provisions of the local regulation and policy for medical waste. The WHO has stated that choosing technology for treatment of medical waste disposal must firstly take into consideration financial effectiveness and ease of implementation as well as environmental concerns (Zahra, Waseem, Fiaz, & Farhan). Scholars also advocate that minimal hazard assessments for waste management facilities, environmental and human health impacts, should ideally be considered for any proposed method of disposing of medical waste. Recently, attention has increased over multi-disposal techniques on the deactivation micro-organisms in medical waste. Consequently, the suggested method for treating waste must have the ability to reduce or inactivate completely any infectious micro-organisms so that the waste no longer carries any harmful diseases for those exposed to it. In the same direction, there are a number of methods and technologies being used to treat the micro-organisms generated from medical waste so that the waste poses no hazard of infectious diseases to the safety of the public and the environment (Basheer, Siam, Awn, & Hassan, 2019). The conceptual framework for organisational structure and healthcare waste management practices is presented below.

Figure 1. Conceptual Framework



In this paper, the adopted definition of healthcare waste management practice refers to any dangerous substances or objects of waste that pose hazards to both the environment and human beings and which resulted from various medical activities which are intended or mandatory to be disposed of according to the provisions of the local regulations and policies for medical waste. Consistent with past organisational waste management research, the current study proposes that organisational structure will influence healthcare waste management practices. We therefore, develop the following hypotheses.

Previous studies have illustrated that centralisation may reduce the creative solutions and impede interdepartmental communication as well as the frequent circulation and sharing of

ideas (Agarwal & Gupta, 2018; Hameed, Basheer, & Anwar, 2018), because of the existence of time-consuming formal communication channels. This may clearly be noted when a healthcare facility has accumulated expired medications. On the other hand, emphasis is placed on the significance of empowerment by decentralised organisations. This is known to facilitate the assimilation of new attitudes and behaviours, and, as a result, it gives support to an atmosphere where workers are not hindered from participating in the building process more spontaneously.

However, formalisation refers to the extent to which standard policies, formal rules, and procedures manage decisions and working relationships (Falkner et al., 2018). So, formalised organisations can improve the level of cooperation and teamwork among the organisational staff as a whole (Müller-Stewens & Möller, 2017) and could shape the structure and scope of the interactions while providing helpful insights for improving the management of an organisation.
This current study seeks to identify the relationship between centralisation, formalisation (Murad Ali et al., 2018) and current healthcare waste management practices behaviour in Libyan public hospitals. The term centralisation in this study refers to the concentration of power or decision-making authority in an organisation. Formalisation refers to the degree to which standard policies, formal rules, and procedures manage decisions and working relationships.

H1: There is a significant relationship between organisational structure and waste management in public Libyan hospitals.
H1a: There is a significant relationship between centralisation and segregation in public Libyan hospitals.
H1b: There is a significant relationship between formalisation and segregation in public Libyan hospitals.

H2: There is a significant relationship between organisational structure and collection in public Libyan hospitals.
H2a: There is a significant relationship between centralisation and collection in public Libyan hospitals.
H2b: There is a significant relationship between formalisation and collection in public Libyan hospitals.

H3: There is a significant relationship between organisational structure and disposal in public Libyan hospitals.
H2a: There is a significant relationship between centralisation and disposal in public Libyan hospitals.
H2b: There is a significant relationship between formalisation and disposal in public Libyan hospitals.

Methodology

A key concern in this research was the response rate of survey. The response rate determines the validity of the questionnaires gathered for further analysis (Hair, Hult, Ringle, & Thiele, 2017). According to Victor (2018), response rate is the respondents' percentage which participated in the survey conducted across the sample size. About 239 questionnaires were given to the respondents and the collected number of questionnaires was 137. The response rate of the survey was 57.32%, which is more than sufficient for further research analysis. It has been suggested by Dikko (2016) that 30% response rate is sufficient and acceptable for survey research.

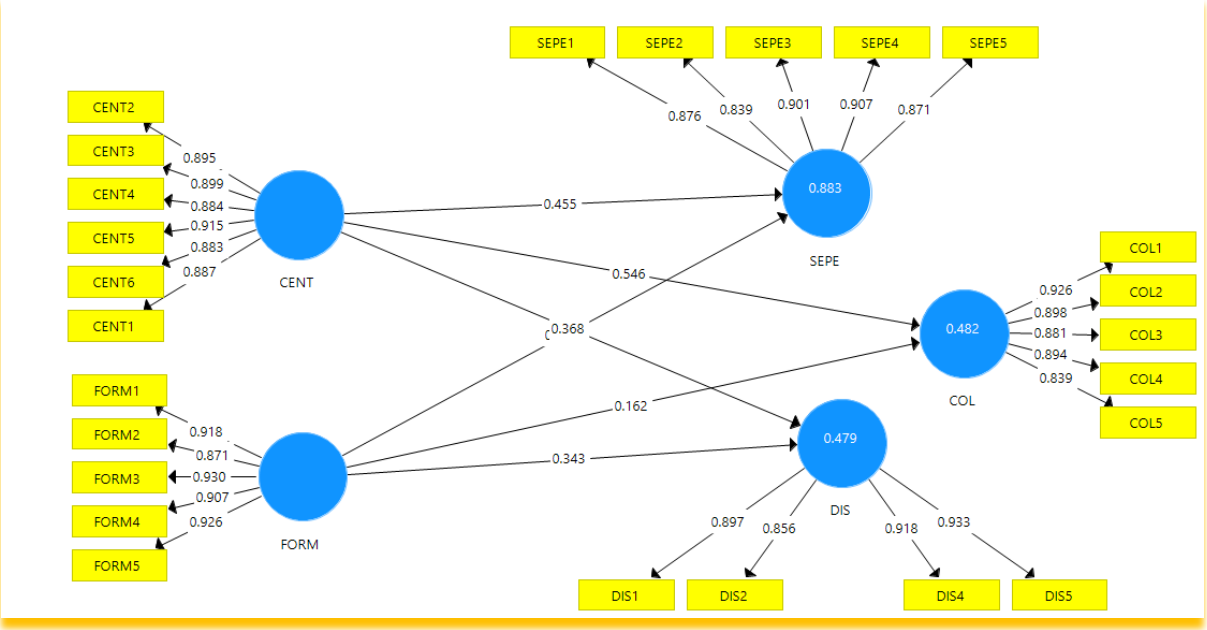
SPSS version 22.0 and Smart PLS 2.0 M3 have been used in this research for data analysis. SPSS has the capability of performing several tasks in this research including data entry, coding of data, cleaning of preliminary data, t-test, descriptive statistics and checking biases of non-response (Basheer, Hafeez, Hassan, & Haroon, 2018). Moreover, the internal consistency has been determined through Cronbach's alpha value. The data has been checked for outliers along with determination of multivariate conditions. The multivariate conditions include linearity, homoscedasticity, normality, and multi-collinearity of data, along with common method variance. Moreover, Ringle, Wende, and Becker (2015) developed Smart PLS 2.0 M3 software, which determines the structure and measurement model in CFA analysis. Specially, hypotheses have been tested through structural models. Researchers are enabled to determine the relations among the variables in SEM (structural equation modelling) simultaneously (Jaafar, Noor, & Rasoolimanesh, 2015). In this research, the method of PLS-SEM has been optioned as per the needs of the study.

The research model in this study is based on a large number of variables. The study involves various indicator variables and paths, which can be referred to as a complex model (Jaafar et al., 2015). The complexity of the model requires the adoption of PLS-SEM. The PLS-SEM method is regarded as appropriate for interpreting complex data and hypothesised relations (Jaafar et al., 2015; Wamba et al., 2017). Specifically, complex models can be handled with PLS without any issues of estimation (Hair et al., 2017; Jaafar et al., 2015). The research also utilised the scale adopted from Eid and Abdelkader (2017) to measure centralisation and formalisation. Centralisation was measured with six items and formalisation was measured with eight items.The research uses a five-point scale to measure all variables and are thus: ordered 1= "strongly disagree," 2= "disagree, " 3= "neutral, " 4= "agree, " 5= " strongly agree.

Data Analysis

High theoretical parsimony and lower complexity of the model is required for the estimation of a complex model using PLS (Jaafar et al., 2015). Further, the issue of small sample size has been dealt with by using PLS, as it imposes less requirements for the sample size and related characteristics (Akter, Fosso Wamba, & Dewan, 2017). The issue of small sample size cannot be resolved with the use of AMOS or LISREL (SEM approaches based on covariance). High statistical power can be afforded by PLS to deal with the complex model in this research along with a small size of sample (Henseler, Ringle, & Sarstedt, 2015). It was claimed by Henseler et al. (2015) that GoF is not appropriate for the validation of model (Hair, Sarstedt, & Hopkins, 2014). It was found by researchers that GoF is not appropriate for validation of model, when the PLS path model is used with simulated data. In this case, GoF cannot distinguish the valid and invalid models (Hair et al., 2014). Therefore, a two-step method was adopted in this study and the findings of PLS-SEM path were reported (Henseler et al., 2015). In the first step, the measurement model is assessed. In the second step, the structural model is assessed. In the measurement model assessment, the reliability of individual item, reliability of internal consistency and discriminant validity is determined (Hair, Hult, Ringle, & Sarstedt, 2016; Hair et al., 2014; Henseler et al., 2015).

Figure 2. Measurement Model



The individual loadings and item contributions are recognised in composite reliability, the level with which the intended unobserved construct is represented by items and their correlation with other measures of the similar unobserved variable is referred to as convergent validity (Hair et al., 2016). The AVE value of every unobserved construct has been used to determine the convergent validity (Tzempelikos & Gounaris, 2017).

Table 1: Outer Loading

	CENT	COL	DIS	FORM	SEPE
CENT2	0.895				
CENT3	0.899				
CENT4	0.884				
CENT5	0.915				
CENT6	0.883				
COL1		0.926			
COL2		0.898			
COL3		0.881			
COL4		0.894			
COL5		0.839			
DIS1			0.897		
DIS2			0.856		
DIS4			0.918		
DIS5			0.933		
FORM1				0.918	
FORM2				0.871	
FORM3				0.930	
FORM4				0.907	
FORM5				0.926	
SEPE1					0.876
SEPE2					0.839
SEPE3					0.901
SEPE4					0.907
SEPE5					0.871
CENT1	0.887				

The reliability of every item is determined in individual reliability of item (Hair et al., 2014). The outer loading of every variable, which is intended to be measured, is examined in the individual reliability of item (Hair et al., 2014). In social science studies, the issue of weak outer loadings occurs (Davcik & Sharma, 2016). The weak loading values are eliminated for increasing the overall reliability and AVE value. The value of item loadings in range of 0.40 to 0.70 must be considered for exclusion (Hair et al., 2017). The level with which the similar concept is measured by all the items of a specific scale is referred to as internal consistency reliability. The most commonly used estimators for measuring the reliability of internal consistency include composite reliability efficiency and Cronbach's alpha coefficient. However, the internal reliability consistency is determined through composite reliability (Hair et al., 2016). Composite reliability estimate has been selected based on two reasons. It offers a

less biased reliability estimate. The coefficient of Cronbach's alpha assumes equal weights for all the indicators (Amaro & Duarte, 2016). The reliability scale can be over or underestimated by the Cronbach's alpha. Alternatively, the indicators with different loadings are considered in composite reliability.

Table 2: Reliability

	Cronbach's Alpha	rho_A	CR	(AVE)
CENT	**0.950**	**0.950**	**0.960**	**0.799**
COL	**0.933**	**0.934**	**0.949**	**0.789**
DIS	**0.923**	**0.929**	**0.945**	**0.812**
FORM	**0.948**	**0.950**	**0.960**	**0.829**
SEPE	**0.926**	**0.927**	**0.944**	**0.773**

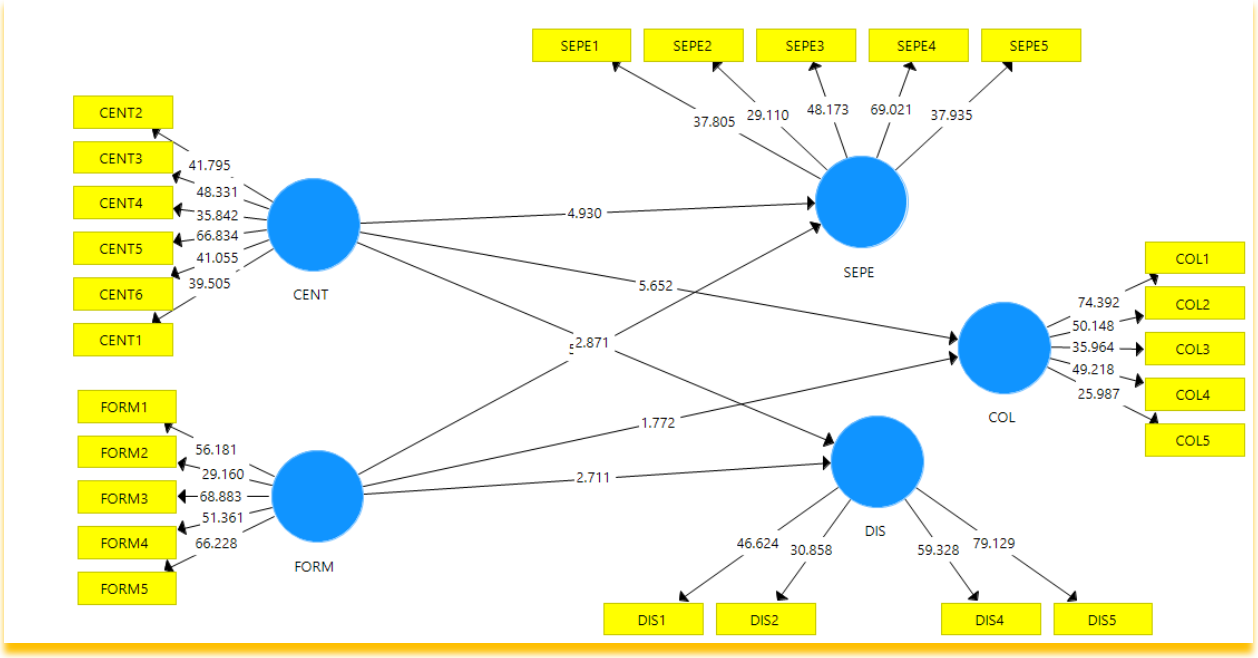
The level with which an unobserved construct is different from other unobserved constructs is regarded as discriminant validity (Hair et al., 2014). The AVE criterion of Tzempelikos and Gounaris (2017) has been used in this research to determine discriminant validity (Akter et al., 2017). Based on the criterion of Tzempelikos and Gounaris (2017), when the square root of AVE is greater than the correlation of other unobserved constructs, it refers to discriminant validity. It is depicted in Table 3 that the square root of AVE for all the variables is greater than the value of correlation between the unobserved constructs. This reflects the presence of discriminant validity (Tzempelikos & Gounaris, 2017).

Tale 3: Discriminant Validity

	CENT	COL	DIS	FORM	SEPE
CENT	0.894				
COL	0.691	0.888			
DIS	0.674	0.720	0.901		
FORM	0.892	0.749	0.672	0.881	
SEPE	0.811	0.795	0.725	0.817	0.879

This research has used the process of bootstrapping with a sample of 134 cases to determine the path coefficient significance (Hair et al., 2014; Henseler et al., 2015). It is crucial to use the bootstrapping process, as the data is not assumed to be normally distributed in PLS-SEM (Hair et al., 2014). The use of the bootstrapping method results in suitable estimates of standard error. Akter et al. (2017) has explained that the strength of the association between the endogenous and exogenous variables is reflected by the path coefficients.

Figure 3. Structural Model



Tale 4: Regression Results

	Beta	(M)	(STDEV)	(|O/STDEV|)	P Values
CENT -> COL	0.546	0.542	0.097	5.652	**0.000**
CENT -> DIS	0.368	0.359	0.128	2.871	**0.002**
CENT -> SEPE	0.455	0.451	0.092	4.930	**0.000**
FORM -> COL	0.162	0.168	0.091	1.772	**0.038**
FORM -> DIS	0.343	0.354	0.127	2.711	**0.003**
FORM -> SEPE	0.511	0.515	0.090	5.645	**0.000**

The global usage of TBP to predict healthcare waste behaviour has been recorded. Our findings had illustrated that there was a significant relationship between organisational structure and healthcare waste management practices behaviour. In addition to that, the two organisational structure dimensions (centralisation & formalisation) recorded strong and positive relationships with waste segregation, collection and disposal practices behaviour. Centralisation and segregation ($p<0.01$), collection ($p<0.01$) and disposal ($p<0.05$). Other significant relationships were also found between formalisation and segregation ($r=0.778$, $p<0.01$), collection ($p<0.01$) and disposal ($p<0.01$). This finding is consistent with previous research regarding medical waste practices such as collection, segregation and disposal. Generally, the current behavioural practice of healthcare waste management within the Libyan hospitals provides an indication of what has been mentioned earlier by WHO (2011), where there was an emphasis on some of the major and priority needs in the primary healthcare structure and hospitals in Libya. These include scaling up the hygiene standards and healthcare waste collection, disposal, training of selected staff, technical support for the disposal of large

amounts of expired drugs, the development of the medical waste segregation, treatment and disposal. Similarly, our study is comparable to previous research conducted on waste management recycling behaviour. All the aforementioned studies reported the global usage of TPB to predict waste management practical behaviours (collection, recycling, reuse and waste reduction) despite differences in culture and waste management infrastructure between advanced and less advanced countries of the world (Cordero-Coma & Esping-Andersen, 2018).

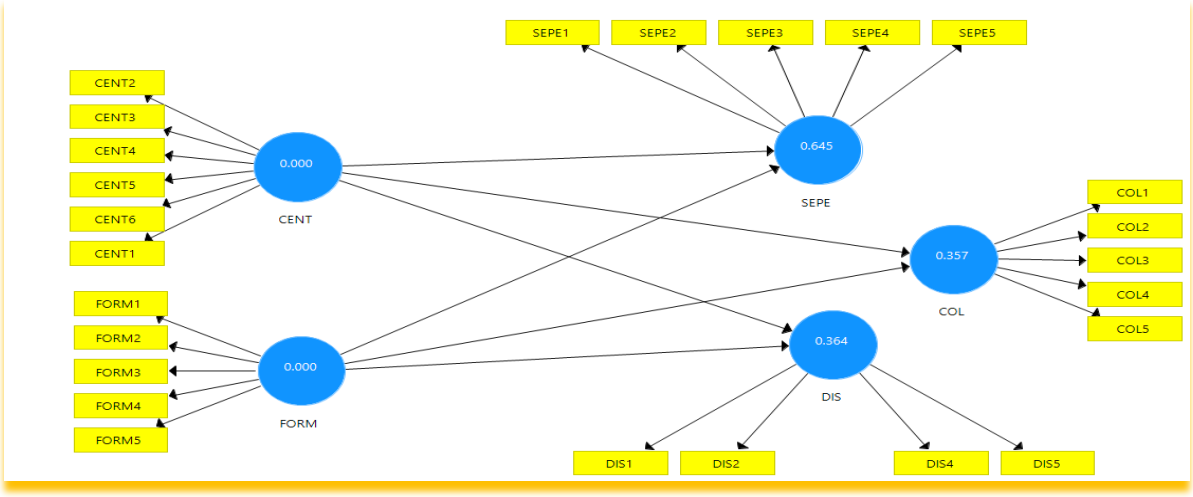
Together with training programs to all key personnel coming in contact with healthcare waste directly or non-directly through certain campaigns, this may improve individual moral obligations to take serious action to deal with healthcare waste efficiently. Such campaigns can emphasise the positivity of sound practice (attitude), the capability of each worker towards waste management practices (perceived behavioural control), and taking into consideration the fundamental strategies to develop the current practice (action planning).
In PLS-SEM, another way to determine the structural model is by using coefficient of determination (R2) (Hair et al., 2014; Henseler et al., 2015). The percentage change in the endogenous variable explained by the exogenous variable is represented by R2 (Hair et al., 2017). When the value of R2 is high, it shows that the model has higher predictive accuracy and vice versa (Hair et al., 2014). There is no minimum criterion of R2 but its value must be in range 0-1. Moreover, it was recommended by Akter et al. (2017) that value of R2 of 0.7, 0.31, and 0.21 are considered good, moderate, and poor.

Tale 5: R-Square

	R Square
COL	0.482
DIS	0.479
SEPE	0.883

The predictive relevance of the model is determined by using the value of Q2, which is the measure of cross-validated redundancy (Hair et al., 2014; Jaafar et al., 2015). When the value of Q2 is positive, it means the model has predictive relevance. When the value is zero, there is no predictive relevance (Henseler et al., 2015).

Figure 4. Measurement Model



The findings of cross-validated redundancy obtained through the process of blindfolding are presented in Table 6, showing the measure of cross-validation redundancy for all the independent unobserved variables, which is greater than zero. This shows the existence of predictive relevance in the model (Akter et al., 2017; Henseler et al., 2015).

Tale 5: Q-Square

	SSO	**SSE**	**Q^2 (=1-SSE/SSO)**
CENT	1,302.000	1,302.000	
COL	1,085.000	697.165	0.357
DIS	868.000	551.755	0.364
FORM	1,085.000	1,085.000	
SEPE	1,085.000	385.235	0.645

Conclusion

We found that, this study has been able to provide some theoretical implications by giving additional empirical evidence in the domain of planned behavioural theory. The theory basically assumes that attitude, subjective norms, perceived behavioural control, moral obligation, self-identity, intention, and action planning can predict healthcare waste management practices behaviour in public hospitals in Libya. However, the study demonstrates organisational structure is strongly linked and having significant impact on healthcare waste management practice. The results maybe have boosted new understanding to the present planned behavioural theory. The propensity towards waste management segregation, collection and disposing played a significant role in explaining their effect in waste management practices execution behaviours (Hafeez, Basheer, & Rafique, 2018; Hameed, Nawaz, Basheer, & Waseem, 2019). Our study highlighted some limitations. The research studied the influence of

organisational structure on HCWMP in one regional area of Libya and thus, our findings and results might have limited the generalisability to other urban cities and cultures.

REFERENCES

Agarwal, U. A., & Gupta, V. (2018). Relationships between job characteristics, work engagement, conscientiousness and managers' turnover intentions: A moderated-mediation analysis. *Personnel Review, 47*(2), 353-377.

Akter, S., Fosso Wamba, S., & Dewan, S. (2017). Why PLS-SEM is suitable for complex modelling? An empirical illustration in big data analytics quality. *Production Planning & Control, 28*(11-12), 1011-1021.

Ali, M., Al-Maimani, K. A., & Park, K. (2018). The effect of organizational structure on absorptive capacity in single and dual learning modes. *Journal of Innovation & Knowledge, 3*(3), 108-114.

Ali, M., Chaudhry, N., & Wang, W. (2017). Assessment of hospital waste management in a major city of Pakistan. *International Journal of Environment and Waste Management, 19*(2), 97-104.

Amaro, S., & Duarte, P. (2016). *Modelling formative second order constructs in PLS.* Paper presented at the European Conference on Research Methodology for Business and Management Studies.

Arpaci, I. (2017). Antecedents and consequences of cloud computing adoption in education to achieve knowledge management. *Computers in Human Behavior, 70*, 382-390.

Basheer, Hafeez, M. H., Hassan, S. G., & Haroon, U. (2018). Exploring the Role of TQM and Supply Chain Practices for Firm Supply Performance in the Presence of Organizational Learning Capabilities: A Case of Textile Firms in Pakistan. *Paradigms, 12*(2), 172-178.

Basheer, Hameed, W. U., Rashid, A., & Nadim, M. Factors effecting Employee Loyalty through Mediating role of Employee Engagement: Evidence from PROTON Automotive Industry, Malaysia.

Basheer, Siam, M., Awn, A., & Hassan, S. (2019). Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: A case of textile firms in Pakistan. *Uncertain Supply Chain Management, 7*(2), 275-288.

Bernardes, C., & Günther, W. M. R. (2014). Generation of domestic solid waste in rural areas: case study of remote communities in the Brazilian Amazon. *Human ecology, 42*(4), 617-623.

Cordero-Coma, J., & Esping-Andersen, G. (2018). The Intergenerational Transmission of Gender Roles: Children's Contribution to Housework in Germany. *Journal of Marriage and Family, 80*(4), 1005-1019.

Davcik, N. S., & Sharma, P. (2016). Marketing resources, performance, and competitive advantage: A review and future research directions. *Journal of Business Research, 69*(12), 5547-5552.

Dikko, M. (2016). Establishing construct validity and reliability: Pilot testing of a qualitative interview for research in Takaful (Islamic insurance). *The Qualitative Report, 21*(3), 521-528.

Durmaz, A., & Eren, M. S. (2018). Export Performance: Is It Possible through Knowledge and Capabilities? Evidence from Turkish Manufacturing Firms. *Journal of Global Marketing, 31*(3), 180-196.

Eid, R., & Abdelkader, A. A. (2017). Customer Orientation Implementation Constructs in the Banking Sector: A Theoretical Construct Development and its Empirical Validation. *International Journal of Online Marketing (IJOM), 7*(2), 1-22.

Falkner, B., Hulman, S., & Kushner, H. (2018). 12 Insulin Resistance as a Determinant of Cardiovascular Reactivity. *Stress and Disease Processes: Perspectives in Behavioral Medicine*.

Hafeez, M. H., Basheer, M. F., & Rafique, M., Siddiqui, Sulaman Hafeez. (2018). Exploring the Links between TQM Practices, Business Innovativeness and Firm Performance: An Emerging Market Perspective. *Pakistan Journal of Social Sciences (PJSS), 38*(2).

Hair, Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage publications.

Hair, Hult, G. T. M., Ringle, C. M., & Thiele, K. O. (2017). Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science, 45*(5), 616-632.

Hair, Sarstedt, M., & Hopkins, L., Kuppelwieser, Volker. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review, 26*(2), 106-121.

Hamad, T. A., Agll, A. A., Hamad, Y. M., & Sheffield, J. W. (2014). Solid waste as renewable source of energy: current and future possibility in Libya. *Case studies in thermal Engineering*, *4*, 144-152.17.

Hameed, Basheer, M. F., Iqbal, Jawad, & Anwar, A., Ahmad, Hafiz Khalil. (2018). Determinants of Firm's open innovation performance and the role of R & D department: an empirical evidence from Malaysian SME's. *Journal of Global Entrepreneurship Research, 8*(1), 29.

Hameed, Nawaz, M., Basheer, M. F., & Waseem, M. (2019). The Effect of Amanah Ikhtiar Malaysia (AIM) on Microenterprise Success in Sabah State Malaysia. *Dialogue (1819-6462), 14*(2).

Harir, A. I., Kasim, R., & Ishiyaku, B. (2015). Exploring the resource recovery potentials of municipal solid waste: a review of solid wastes composting in developing countries. *International Journal of Scientific and Research Publications, 5*(4), 2250-3153.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115-135.

Jaafar, M., Noor, S. M., & Rasoolimanesh, S. M. (2015). Perception of young local residents toward sustainable conservation programmes: A case study of the Lenggong World Cultural Heritage Site. *Tourism Management, 48*, 154-163.

Law, K. L. (2017). Plastics in the marine environment. *Annual review of marine science, 9*, 205-229.

Müller-Stewens, B., & Möller, K. (2017). Performance in new product development: a comprehensive framework, current trends, and research directions. *Journal of Management Control, 28*(2), 157-201.

Nasidi, Y. (2016). *The effect of government policy on the relationship between organizational factors and construction waste management in Abuja, Nigeria.* Universiti Utara Malaysia.

Norris, E. J., & Coats, J. R. (2017). Current and future repellent technologies: the potential of spatial repellents and their place in mosquito-borne disease control. *International journal of environmental research and public health, 14*(2), 124.

Rahayu, R., & Day, J. (2015). Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia. *Procedia-Social and Behavioral Sciences, 195*, 142-150.

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). SmartPLS 3. Bönningstedt: SmartPLS. *Retrieved July, 15*, 2016.

RUNYORA, T. N. (2016). *WASTE MANAGEMENT PRACTICES IN THE FRUIT VALUE CHAIN DEVELOPMENT: THE CASE OF MANGO FRUIT IN LOWER EASTERN AND NAIROBI COUNTIES OF KENYA.* SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI.

Shaw, D., Shiu, E., & Clarke, I. (2015). Ethical consumption: The contribution of ethical obligation and self-identity to the theory of planned behaviour *Global Perspectives in Marketing for the 21st Century* (pp. 359-359): Springer.

Thakur, V., & Anbanandam, R. (2016). Healthcare waste management: an interpretive structural modeling approach. *International journal of health care quality assurance, 29*(5), 559-581.

Tomczak, D. L., Lanzo, L. A., & Aguinis, H. (2018). Evidence-based recommendations for employee performance monitoring. *Business horizons, 61*(2), 251-259.

Tzempelikos, N., & Gounaris, S. (2017). A conceptual and empirical examination of key account management orientation and its implications–the role of trust *The Customer is NOT Always Right? Marketing Orientationsin a Dynamic Business World* (pp. 673-681): Springer.

Victor, P. A. (2018). *Managing without growth: slower by design, not disaster*: Edward Elgar Publishing.

Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J.-f., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research, 70*, 356-365.

Zahra, M., Waseem, D., Fiaz, M., & Farhan, M. Information Technology Capability a Tool to Expedite Higher Organizational Performance.