

A Behavioral Approach for Health-Care Waste Management Practices in Uganda: A Theoretical Review Perspective

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Abstract

Health-care waste management practices have remained behaviour tasks yet Uganda has not taken lot seriously. Aware of the context, this paper used a systematic theoretical review while seeking possible approach to apply. It shows that healthcare waste management practices are behavior problem or question and this shaped the main objective seeking for a solution to Uganda. A variety of papers have been accessed from the database and 140 articles were later used with the help of inclusion and exclusion criterion. The finding indicates proper healthcare waste management can be obtained by applying different theoretical approaches as they complement one another, but with emphasis to planned behaviour theory and the theory of self – regulation. Additionally, theories can be used in policy making processes.

Key words: Theoretical review, Behavioral approach, Healthcare waste, Management practices.

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INTRODUCTION

The medical and other generated waste have been approximated at 2.2 billion tones in the world by 2025 (He & Yu, 2021). The generation of waste occurs during the unavoidable activities for the existence of man. In facilities, medical waste are generated to enable patients' access to the health rights (Afesi-dei et al., 2023). The medical waste are divided into three; the general, infectious and hazardous wastes (Gueriri et al., 2024). The general wastes include material waste which do not contain blood, chemical wastes, body fluid, packing boxes, fabrics and the wastes generated through sweeping. The infectious wastes include sharps, stained blood materials of clothes and bandages, as well as body tissues. The hazardous wastes are vaccines, x-ray photograph films, expired drugs, heavy metals, solvents, and radioactive. In all the facilities, 85% of the total waste generated falls under general category while hazardous and others forms of wastes 15% (Song et al., 2021).

Since 1990s, Uganda has witnessed an increasing number of private and public facilities together with increased population seeking health services. The then Ministry of Health (MoH) and health personnel focused more to the patients and disease prevention which made medical waste one of the sources of clinical diseases especially to the health personnel. Whereas the international community especially the World Health Organization remained cautious about the impact of waste to human life and environment, there is dearth in knowledge about what behaviour that shaped the Ugandan perspective. In comparison to the international standards, the health facilities were failing in one of their behavioral functions. Thus, the rational of this paper.

From 2010 to 2016, Uganda witnessed an increase in health facilities from 4,450 to 5,117 in Kampala district alone (Katusiime, 2018). There was also an increase in generation of healthcare waste to approximately 95 kilograms (Kg) in one day in a hospital. At level IV, III, and II, the generation has been 42Kgs, 25Kgs, and 20Kgs respectively (Wafula et al., 2019). Several studies have been carried out from the healthcare waste management but the studies are limited and most of them do not go extra – miles to harness behavior aspect of healthcare personnel / workers that focuses entirely on disease with less or no practical management practices to waste. Yet improper management practices especially hazardous waste expose health personnel such as doctors, nurses and other groups of patients, visitors as well as laundry and handlers to risk of contracting clinical diseases (Karenzi et al., 2019). It also endangers environment and general habitat of scavengers (Al-khatib et al., 2020).

These risks range from radiation burns, poisoning and deadly explosives (Moskowitz, n.d.). Hazardous waste like mercury and expired drugs such as cytotoxic, cytostatic and antibiotics make the body susceptible to cancer, mutations, respiratory and skin infections (Ghasemi et al., 2016). Injuries from contaminated sharps like needles, broken glass or any medical cylinder are dangerous to personnel and improper separation exposes environment, biotic and abiotic organisms in soil to risks of death and extinction. Internationally, 16 x 10⁹ (16 billion) injections are annually administered by healthcare personnel (Demir, 2021). Most of them are poorly collected while others are disposed into the environment where they become risk vectors for acute infections, especially Human Immunodeficiency Virus (HIV), tetanus and hepatitis B and C (Scheibe et al., 2019). The inappropriate management and disposal have dire consequences to underground drinking water sources and surface water (Janik-karpinska et al., 2023). In jurisdiction of healthcare facilities, soils and atmospheric air become sources of bacterial and fungal infections to nearby communities. The rise of dioxins and furans gases from incinerated and open burning of healthcare waste have negative effect on carcinogen and endocrine system (Ghasemi et al., 2016). This affects immune and fertility organs for and other living organs on earth.

Research has shown that within three healthcare facilities, one does apply improper means which is dire within developing nations like Uganda (Ezeudu et al., 2022). Towards this gap, such nations and their health facilities have intensified policy measures especially towards proper management. Unfortunately, it only remains document rather than behavior or practice in healthcare facilities. As already observed, studies in Uganda do not go extra-miles to apprehend the behavioral aspect, while the policy is most limited on paper. A behavioral approach for waste management practices is therefore the best to enable health facilities to contain waste and to lead the nation towards achieving Sustainable Development Goal 6 and Vision 2040.

LITERATURE REVIEW

A behavioral perspective is a result of socio-cognitive and psychological discourses, which are explained theoretically and transited into practices (Sales et al., 2022). This behavior is examined using a wider lens in order to underpin persistence practices to harness healthcare waste which is mentioned that one in three facilities improperly manages waste. Under behavioralism, it is the environment and its consequences that shape a behavior i.e., towards either improper or proper practices towards the wastes. In order to attain desired results, emphasis is put on operant conditioning to be emphasized by healthcare facilities (Fanning, 2019). The aspect through which a voluntary behavior is modified with removal or rewarding a behavior-based on outcomes. In fact, the frequency of a behavior can increase through reinforcing or punishment. In healthcare facilities, emphasis has been extended to medical or clinical generation, separation, storage, transportation and disposal (Zhang et al., 2022). Actions or behaviors such as burning, incineration, dumping and burying have been examined with dire results on the environment and humans (Kwikiriza et al., 2019). However, there is limited documented evidence on either reward or punishment as emphasized under operant perspective can reduce or increase the practice (Muse et al., 2023). Some of effective theories used focus on existing norms, beliefs, perception, attitude and behaviors which all seems observable (Kwikiriza et al., 2019). The rewarding process or punishment to such behaviors however has less or no mention in facilities despite various legislated norms to govern the practices.

While using behavioral theories to underpin the actions within any environment, behaviorists deposit that such theories explain integrated and interdisciplinary concepts (Tian & Liu, 2022). Using such lens, it is clear that there are fabulous advantages for the concepts being

underpinned in original and action-oriented environments. There are also different theories of environmental psychology such as mid-range theories which provide answers to a variety of intriguing socio-economic, political and environmental challenges (Hall et al., 2012). Despite being used, less evidence is documented in Uganda. This demands a lot from similar theories if medical waste practices are meant to be well understood. There are three main stages adopted in medical research to develop and evaluate some complex situation and intervention (Karki & Rajesh, 2023). First, is called the stage of theory in which researchers and policy implementers collect evidence to a problem, formulate tools or theories, draw conceptual framework as they wait for resources for implementation. Second, is modelling stage, where hypothesis is formulated and tested. Importantly, it does not matter which approach used as long as scientific results are obtained. Third, is experimental stage, composed of trials, experiments to obtain results. Under the social science, most studies are conducted on the stage of theory which is in line with the framework obtained. This applies to this work which relates the behavior of health personnel in management. The theoretical aspect is applied to recoil literature after identified problem from the context of Uganda (Wafula et al., 2019). A glance of intervention was sought basing on theoretical discussions. These theories were considered since they apply to the context, topical concepts, implications, open areas for further questioning and research. Specifically, value, belief, attitude and behavior of an individual agree to socio-cognitive and psychological theories reviewed hereunder.

The personal behavioural theories

Health Belief Model (HBM)

This is one of theories that focuses on actions and behavior consequences of individuals rather than groups in a social context (Anuar et al., 2020). Within context of Healthcare Waste Practices, the theory influences individual's practice towards needed direction and this has compelled different healthcare units, offices and wards to have different bins so as to enable healthcare personal access to generation behavior. Advanced in 1950s, the HBM assumes that a belief in threat of health, together with recommended action / norm led to the adoption of a needed behavior. This is the justification to the overriding narrative that health personnel are threatened by the healthcare wastes and outcomes. Thus, adherence to such collection would save the personnel from contracting clinical diseases at the end. The bins have been marked differently and presented in varied colors for particular collections. Despite this approach, the extent to collection behaviors needs articulate investigation.

Ideally, whereas there is evidence of HBM's influence in literature, there is pause in explaining how it is linked to cognitive and pleasurable constant actions (Cislaghi & Heise, 2019). Otherwise, clinical diseases and infections would have been stopped if such threat and interventions are adhered by all. This makes the theory fall-shot to explore relationship between social norms and some habitual factors or behavioral practices, yet fundamental in reducing waste generation (Sood & Ramaiya, 2022). In this context, the learning theory can be analyzed.

The Learning Theory

This article used the theory to scan how individual health personnel absorb, internalize, retain knowledge and produce it rather than basing on the norms or beliefs. The most known authors to the learning theories are Skinner in 1954; Lev Vygotsky and Bandura (Annan et al., 2020). The main assumption is that a behavior is learnt and well influenced by rewards and punishment. In the modern Uganda, rewards include lottery tickets, prizes, money, incentives, and coupons. The most known punishments include penalties and fines which can be

witnessed in different ways by organizations and government agencies. These however seems to have never been applied in health-facilities.

It assumes that persons behave pro-environment once they are exposed to a stimuli environment that facilitate a needed behavior (Kay & Kibble, 2016). This means that as long as norms and environment in Uganda are framed towards proper management practices, the healthcare personnel have no option. As already noted, bins have been placed in healthcare facilities as stimuli towards generation. However, there is still the general lack to make generation and separation routine to reduce the common threat as presented by HBM.

Behaviorists agree that external factors are most important in influencing behaviors and thus, extrinsic motivators (Abedini et al., 2023). Extrinsic motivators influence a behavior for a short time as compared to intrinsic motivators. Extrinsic motivators are not sustainable approach to maintain a behavior or achieving objectives and goals. In long – term, rewards become obsolete; individual healthcare personnel need to stick on intrinsic motivators in order to avoid being demoralized once incentives or rewards are terminated, which once again lead to unwanted behavior (Songkram et al., 2023). Individual persons and healthcare personnel in Uganda are similar to other persons across the world. Not all the healthcare personnel should be attracted by rewarding programs set by either the government or health facilities, rather this should come within individual persons intrinsically to collect, generate and transport waste to the final destination. The intrinsic motivators should be the most attractive narrative with individual belief, morals, positive attitudes, inner good intentions to environment and others human beings (Linder et al., 2021). Thus, the need to assess other theories so that different healthcare personnel are accommodated.

The Motivation Theory

The motivation theory is built on what drives an individual towards achieving certain goals and objectives (Urhahne & Wijnia, 2023) (Gupta, 2021). As modified by Frey and Jegen in 2001, the motivation theory relates pro-social behavior with external rewards or extrinsic motivation. Nonetheless, behavioralists believe that individuals who are intrinsically motivated are more pro-social and pro-environment than extrinsically motivated persons (Woźniak, 2018). Studies have been applied on motivation as independent variable (Hue et al., 2020). In such cases, it is individual intrinsic motivation that leads to reduction of wastes rather than extrinsic motivators. These studies cut across 10 European nations, Australia, Canada, China and Korea. Studies from these nations have been centered on policy and management practices like recycling. This opens various questions about health facilities and personnel in Uganda as well. In fact, how can the health facility managers and government instill the intrinsic motivators among the healthcare personnel to wards waste management practices.

Uganda is a developing nation where recycling has not taken deep roots due to low technological advancement but there are other practices that can be done to reduce waste. Thus, assessing the intrinsic motivation in line with management practices that are affordable to all health facilities serves the noble role. Studies reveal that environment is the key towards management and disposal (Shegow & Funwie, 2020). Even, an environment can act as an important intrinsic motivator as opposed to extrinsic. Studies have revealed that high subsidies, tax punishments, incomplete garbage fee systems are external and highly discourage intrinsic narrative towards waste management (Ahlheim, 2019). The monetary elements also fall short of management practices.

Norm Activation Theory

Developed by Schwartz in 1977, norms are developed to enable individuals know their moral obligations, identify their guilt and pride so that they can easily control themselves. Normally, such norms are also stimulant in different circumstances. When individuals or groups

become convinced that negative attributes have hazardous contribution on environment and following one's intrinsic realization, it becomes easier to adhere to the needed practice. Secondly, in order to bar an actions or activities from causing a crisis within the environment or ecology, norms must be put in place to guide the people. The theory is always applicable in a situation where people are convinced that quality of life or welfare, health and the general livelihoods of the society are highly threatened by an incident or occurrence (Le & Nguyen, 2022). This has compelled the health facilities to have written regulations and chats for individuals in management of the waste.

There is a profound impact on behavior especially reusing recycled waste and materials with the application of Norm Activation Theory (Fang et al., 2019). In order to achieve positive results, the contextual knowledge and awareness of norms need to be increased on the targeted population. This enhances direct and indirect participation in waste due to increased awareness of personal and social norms altogether. In study conducted from Indonesia, it was found that personal norms have a positive correlation with practices like recycling once there is awareness (Setiawan et al., 2021). It was also realized that social norms can transform an individual once emphasis is well stressed. While the social norms are instrumental in fostering behavior structurally, it is belief that is responsible for pro-environmental behavior

The outstanding narrative by Norm Activation Theory has attracted criticisms from various backgrounds. Research has revealed that the theory is not a predictor of people's behavior and there is a limited number of personnel who could declare their norms separate from their behavior (Benyamin et al., 2018). Besides, the functions under which attributes like guilt and pride have been framed leaves various questions towards behavior against healthcare waste practices and management. For example, a healthcare personal separating waste or blood sustained instruments has no pride or guilt rather do work to make environment clean for patients and general outlook (Schneider et al., 2017). There are also healthcare personnel who involve in separation of healthcare wastes as a routine rather than personal norm or regulation. In rural clinics, some healthcare personnel engage in waste separation but lack knowledge and competence. This in long or short run deter separation of waste during collection. From such examples, personal norms become external, motivated and situational rather than a personal initiative.

Theory of Self – Determination

The main focus of self-determination theory is intrinsic and extrinsic motivation as emphasized by Ryan and Deci in 2000 (Guay, 2022). The two motivators are examined to illustrate how they influence cognitive into biological, social, and cultural engagement or actions vividly observed with the health outcomes. Literature reveals that autonomy, competence and intrinsic motivator have significant influence on individual learning behavior (Salikhova et al., 2020). Theory of Self – Determination assumes that intrinsic motivation predicts human behavior. This means that there are other predictors of human behavior as based on various circumstances.

Although there are important traits among individuals, they are not sufficient enough towards waste management and practices. Healthcare workers across the world and Uganda in particular treat patients with many diseases caused by healthcare or any other sold wastes. This external factor influences some healthcare personnel to emphasis waste collection, separation, storing and transportation for proper disposal (Kostromina et al., 2022). However, there are other personnel who have been witnessing and treating such diseases but finds it hard to separate wastes. Owing to sch examples, we conclude that there are external factors that influence management practices rather than self-determinism. While self-determination theory explains the inner

forces towards such waste management practices, it is not universally enough to all persons in healthcare fraternity especially Uganda where some of the facilities have been constructed for commercial purposes in care - disguise.

Theory of Self – efficacy

Commonly known as confidence theory, self – efficacy is a cognitive conviction of individual's innate ability or competence in accomplishing tasks and having favorable outcomes (Bandura, 2019). This comes with mastered skills to cope up with set or given situation. Bandura and Schunk who are the brain behind the theory in 1981 stated that people weigh sources of information into their ability and determine their ability towards success of behavior (Ye & Asmi, 2022). The theory tasks individuals to measure their capability to regulate their approach as they protect environment where they live. Literature has incorporated the theory of self-efficacy into various aspects of waste such as reduction, waste prevention, composting, participation, and recycling (Mustafa et al., 2019). The ability of individual person to involve in the above practices have taken the main toll as authors emphasize that it is self-efficacy driving persons to properly adhere the narrative there embedded. Other scholars believe that humane which is a result of self-efficacy is a driving force among individuals to participate in management practices (Bleacher et al., 2020). It is within the learning process that self-efficacy is born rather than humane aspects of life.

Despite being one of the modern cognitive theories, self-efficacy has been criticized in literature (Abbasi et al., 2020). Mainly, the concept is not clear how it leads to outcomes. Supporters of this critical assert that outcomes are received due to set goals and objectives rather than mere ability or competence of an individual. Besides, outcomes vary across tasks in given period and situations. Literature has also revealed that persons with high-self efficacy tend to be over-confident which override their performance to failure (Mustafa et al., 2019). Some can be stretched to set high and many goals unable to be achieved in set period of time. In complex situations like healthcare waste management, vivid problematic outcomes and profound health facilities have pause in separating wastes despite professional health personnel. In Uganda, majority of whom know the effect of wastes to environment especially soil, yet they prefer dumping and burying practices as best options to dispose wastes (Capone, 2022).

Theory of Self – regulation

This is a cognitive theory for controlling behavior of individual persons by considering self-evaluation, motivation, revision and modification. The theory of self – regulation assume that human beings have inner expressions that are combined with self – observation, evaluation and judgment (Ran et al., 2023). It also assumes that individual persons who endeavor to avoid dull or routine tasks create attractive and positive tasks in their lives and others' lives (Wijaya, 2022). In line with modern waste management practices, although unattractive, most health personnel have continuously involved in such activities in order to make the environment better (Thea et al., 2020). This has been energized by cognitive narrative that failure to adhere to requirements is dangerous to environment and human lives in particular. Other studies have been conducted with main aim focusing on the need to find and organize themselves to engage in such activities despite embedded challenges. This is because such challenges to healthcare personnel are minor as compared to effects on the environment.

Nonetheless, self-regulation theory has its own shortfalls especially due to concepts involved in its application. Some of applicable concepts in Uganda to waste management practices include functions, decisions making process, competent monitoring and cognitive approaches that are quite different and based on different interpretations.

Theories of the psychological / cognitive behavior

Theory of Reasoned Action – TRA

This theory was developed by Ajzen in 1985 with a view that intention predicts attitude, subjective norm and performance as well (Hale et al., 2003). When these are evaluated positively under health facilities, health personnel have more positive intention to perform certain practices in their reach. The theory compels people to believe that any by personnel is cognitively planned. Studies conducted to determine the relationship between some variables such as attitude or subjective norm with waste practices found the model the best narrative behind behavioral practices among practitioners. Studies recommend a more vivid approach based on TRA model if results in waste management (Bernova et al., 2020).

In other studies, it has been revealed that a positive attitude significantly influence intention to separate wastes not only in healthcare but also to municipal or household waste (Myresten, 2015). Nonetheless, literature has identified some pause while measuring intention – behavior and actual intention-behaviors (Concari, 2023). Some of the meta-analysis studies predict the outcomes at less percentage of 19-38%, which is less enough to support both variables (Nguyen et al., 2019). There are some waste management practices like separation, reuse and composting which are done not at the will or cognitive initiative of individuals, rather by planned and licensed by government, skills, resources available and well as convenience. This applies to Uganda despite having limits in its technology advancements. In such aspect, intention acts as a mediating factor or not any parameter to influence behaviors. Thus, the lack of wider scope analysis of these behavioral outcomes remained a major issue in seeking more knowledge whether TRA model is sufficient enough to simulate behavioral relations in contexts of Uganda.

The Theory of planned behavior - TPB

This was advanced by Ajzen (1991) makes TRA more complete since it adds the narrative of perceived behavioral control to items like knowledge, resources and awareness (Srivastava, 2023) (Nickell et al., 2023). In its application, both cognitive (intrinsic) and external (extrinsic) factors combine to make the process complete. It agrees with TRA that the main variable is behavioral intention that leads to action intention behavior and outcome. This has been supported by various literature that adds the nature of individual behavioral intention to direct action of behavioral and controls. When this is translated into healthcare waste management practices, the onus remains on type or nature of individual to use external and internal nexus towards waste (Azmiara et al., 2021).

Studies indicate that attitude, social norms and perceived behavior control have a strong relationship with intention (He & Yu, 2021). In yet other studies, it has been found that awareness or knowledge about effect of wastes on human being and environment influence intention to involve in various practices (Jacob et al., 2022). In studies about relationship between recycling practice, attitude and social norms, a significant relationship has been identified (Abdelsalam, 2019). In studying the significance between environmental awareness and attitude, it is indicated that the two are linked in healthcare wastes. All these studies are essential in enabling the situation to be assessed on Uganda.

The Value Belief Norm – VBN Theory

The overriding assumption by Stern (2000) states that values are rooted and deeply developed in individual's life in early stages of growth and development (Chen & Chen, 2022). Such values are tripartite: egoistic (concerns own welfare); altruistic (concerns welfare of others); and biospheric (concerns non-human aspects but adjacent environment). These values lead to ecological beliefs, which is essential towards

awareness effects from three aspects. Consequently, people are aware of potential threats and negative effect to environment which they value by behaving well (Canlas & Karpudewan, 2022). It also has it that through actions taken, such persons feel accredited of moral responsibility and behavior. Therefore, the theory embraces individual attachment to the environment.

Literature reveals that during behavioral formation, beliefs mediate between attitude and values (Kara & Ada, 2021). Under healthcare waste management, preferring reuse of certain equipment in medical approaches do it as a compromise to environmental values since they feel that reuse has less impact on environment. They agree with assertion that unnecessary disposal of medical wastes have effect on the environment. They also believe that value have significant contribution to moral norms. The personnel with such value are friendly to the environment, believe on benefits and outcomes to humanity.

Studies justify the view that a basis of relationship between values and behavior (Xing & Jin, 2023). Such studies have been carried out from the practices like waste separation, and reduction behaviors in other field of generation rather than the medical waste. In another study, personal value mediate general values and environmental values as persons engage in wastes (Mamun et al., 2022). It is personal norm that awaken guilt toward diversion from normal. Thus, the healthcare personnel in Uganda whose behavioral practices have been repeated in terms of collection, separation, and reduction, have perceived them as habits and this well explains why there has been lapses in adhering rightful procedures.

Social behavioral theories

Rational choice theory

The is premised on the fact that choices made by persons tend to maximize utility, and it is energized by reinforcement for continued occurrence (Beaudry-cyr, 2020). Advanced by Roth and Weber in 1976, the rational choice theory assumes that this utility can be observed basing on choices made. Thus, what people do or how they behave is maximization of utility which is a subject to certain constraints or opportunities. Literature has revealed that every action taken by an individual has meaning and social action are always taken through thinking. Thus, rational choices are conceptually perceived through three approaches (Kim, 2023). First, the long-standing tradition which is premised on individuals' judgement towards doing a task. For example, choice to either separate waste or not, which can even attract public judgement other than self. Second is the emotional state with various features like love, hate, sympathy and compassion. Thus, it is compassion of others and the self that influence an individual involvement in healthcare practices like separation and collection. It can also be called hatred of healthcare waste and their effect that would influence such acts. Any action of healthcare personnel has the ability to influence other persons in the due course. Third, is individual values and acting rationally that influence healthcare management. The third approach is more horizontal since it seeks to bring an individual aspect into the social narratives – norms and socialization.

Despite the importance of theory towards behavior, it has been criticized for failure to accommodate social structure, yet most wastes are collected, stored, transported, recycled and disposed by institution such structures (Alsharif & Peters, 2020). For example, healthcare waste practices are factually done institutionally. Nexus of this form lead cases of bias, social imaginations as well as unanswered questions. This calls for further debates. The fact that healthcare waste is generated at institutional and not individual level, which highly affect approaches to preserve environment, social setting and ecology; I find rational choice theory lacking in illustrating practical behavior of healthcare wastes. One assumption of the theory is that every action is rational. However,

I found this individualistic and not embracing institutional features. Besides, most healthcare waste management at healthcare facilities are carried by individual although transported institutionally. Besides, effect from healthcare wastes is social, economic, environmental and institutional rather than individual. Lastly, the theory fall-short in explaining social norms governing healthcare waste management at institutional or national level.

Social cognitive theory

It attracts psychology, sociology and political researchers as it illustrates behaviors of individual persons. Developed in 1977 by Albert Bandura, the theory presents observation and cognitive factors as main predictors of behavior (Govindaraju, 2021). Under healthcare waste management, literature shows continuous social learning in real life experience through observing actions of others. In literature, expectations at personal level, self-concepts towards wastes, and social sanctions are presented significant factors towards proper disposal of wastes at all levels (Thoijampa, 2019).

The theory maintains learning and decision making are based on normal thinking (Manjarres-posada & Onofre-rodri, 2020). In doing so, it has no preservation of emotions that contravene the narrative to normal thinking. What is clear is the fact that learning process or thinking can lead the healthcare personnel into different processes such as collection of wastes by separation, waste storing, transportation and disposal. This however does not stop the health personnel into emotional behavior such as littering in other places or throwing papers or containers into drinking water. A good example can also be found in the healthcare kitchen. The chef can clean food remains and dump them into the bin provided. This however cannot stop him / her from pouring remaining food into saucepan or created water trenches near the kitchen. A medical doctor may be aware of the bin provided in the dressing room, but this cannot bar him/her from leaving used papers on a patient littered in the room for the nurses to clean. One the way back home, similar health personnel throw water containers or any other rubbish to roadside during the day or night. These and more examples apply that the social cognitive theory can be applied at one place and falsified in another situation by the same person, especially with waste management practices. In such circumstances and examples, the answer is planned behavior and self-regulatory theories. This transfer of knowledge also reveals the fact that observational learning and learning theories fall short to some of particular behaviors. In fact, what is learnt in theory must be backed by planned narrative and self-regulations.

Social Practice Theory

Holland and Lave in 2009 developed the social practice theory which has remained common in sociology and anthropology studies (Klitkou et al., 2022). The theory assumes that practices such collection, separation, transportation, storing, recycling and disposing wastes are routine behaviors that can result into other different mental and physical activities (Sharma et al., 2021). It is a theory that brings a practice as a unit of analysis in research rather than characterizations of individuals or structure of the society. In this aspect, practices such as collection and separation of waste are perceived as healthcare personnel's behavior other than cognition, psychological or motivation. The theory further shows that these practices fall within the ambits of individual choices rather than rational or technological practice that attract employee's participation. In fact, these practices fall under the social narrative that is sustainable to be achieved.

Across the literature, social practice theory has been applied in many behavior actions such as climate change which has stood as a threat across the globe, energy and green-gas conservations (Frost et al., 2020). This has allowed individual psychologists to seek for the possible

needs for practice and a road to participation.

The healthcare waste management is a demand of people coming from boredom. What is clear is the fact that in all theories developed, there is a need to remain united up the end (Adu et al., 2020). Besides, these practices become habitual to various healthcare personnel due to constant and daily experience. By separating used cotton that has been stained with blood, the healthcare personnel bring confidence to patients towards healing, feeling safely protected and healing process. The success of practices therefore depends on the theoretical narrative that a healthcare institution can apply in the due course. It also dependent on healthcare personnel who seek to apply possible narrative in line to the exiting conditions or technology. Thus, the need for a review the theoretical theories in order to encapsulate a narrative for Uganda.

METHODOLOGY

A Systematic Literature Review (SLR) that used PSALSAR method was applied with the view that it is explicit, transferable and reproducible while carrying out SLR. Additionally, it enables assessing both qualitative and quantitative contents of literature so as to have well informed knowledge gaps that can be bridged. The fact that SLR is intended to analyze past researched information in order to answer the underlying question, it was easy to summarize some of the vivid questions of this research framed in form of objectives as they stem from the theories (Sauer & Seuring, 2023). Thus, SLR was applied to synthesize already researched theoretical information in which gaps have been identified towards possible decision approach to be applied in the field of waste management. In fact, this form of synthesizing is advantageous in informing decision makers since it considers various already researched studies than only one survey. The review came from journals and articles (papers) of the past. Stated and selected questions were subjected to methodological narrative of inquiry using SLR under overriding objective as: To conduct a current research overview on behavioral approach towards medical / healthcare waste management practices. This enabled defining four broad questions as indicated in Table 1.

Table 1: Illustration of research questions

Recent used theories	Questions
Commonly applied theories	What are most recent theories applied while predicting medical / healthcare waste management practice among health personnel? Under this question, behavioral theories underpinning practices in all fields were applied to investigate the question. Most of these theories are cognitively generated
Commonly applied theories	What theories that are commonly applied in medical / healthcare waste management practices in literature. The underlying question was to examine commonly used theories in literature.
Variables	What are variables, most influencing healthcare waste management practices that prior research have identified? Variables were appreciated towards formation of hypothesis to be examined in research investigation.

Search strategy to key words

A desk review and literature search were used to establish determinants of healthcare waste management practices. A simple search focusing on words, healthcare waste management practices and stated theories were applied. I identified 13 electronic databases with healthcare waste management practices, especially publication papers and reviewed journals. The search applied included published articles between January 1, 2010 and December 31, 2013. These were accessed from the following sources: Association Consumer Research, Clocks, American Psychological Association – APA, EBSCO Host, Emerald Insight, Elsevier, Google Scholar, JSTOR, Open Access Research Database, SAGE, SpringerLink, Taylor and Francis, University Research, Wiley Online. That database that would not allow access were rejected. There were some databases that would give abstract or one page of

introduction of research about certain articles. Such articles were also excluded from use. In fact, the search strategy emphasized the Boolean operators (AND, OR, NOT) hoping to obtained the systematical and well refined search results.

The peer-reviewed papers were also considered since their accuracy has been approved by a group of researchers but the government reports and conference papers were not considered in the search or criteria for source selection. Most of the government reports and conferences papers could fall short of varied theoretical needs such as individual behavior. While the limit of publications used in this study was between 2010 – 2023, the main focus was between 2020 – 2023. The nearby and current publications were perceived essential towards responding an ongoing behavior problem or practices as well answering set questions. Additionally, new literature was mostly preferred starting with 2010 and strong emphasis focused on publications from 2020. Thus, the older literature (before 2010) was excluded.

The search was carried out with sensitive filters agreed in research arena. In fact, there were various theories reviewed towards the behavioral concern of this study, some were long and with ability to explain complex situations at hand. However, only relevant articles with clear titles and abstracts were included in the study. In order to reach at the maximum needs, search for theories and content were complemented focusing on healthcare waste management practices. The search strategy consisted the following: list of theories with a best narrative on behavior. Secondly, the relevance of the theory in the context of behavioral change; then, thematic discipline of healthcare waste management practices. The study identified six (6) main theories that would apply but only two (2) were filtered best. They include cognitive and social behavior theories only.

The study applied various measures to retrieve information from the database. This was done with view that database have different strings and openings. Thus, using a single measure would not enable reach at the desired information. Multiple searches were therefore applied with a combination of different but related words alongside search measures especially java and python Boolean (AND, OR, NOT). Some of the search measures and combination of items as well as wording are presented in Table 2.

Table 2: Search measures and web

Concept	Key word & measure	Web
Healthcare waste management practices	Medical waste management & practices / behavior – Concept, theories, healthcare waste system, healthcare personnel	Java
Behavioral / practice theories – cognitive, social, & psychological	Healthcare waste management & practices / behavior – Concept, theories, healthcare waste system, healthcare personnel	python
Waste management practices in application	Collection, separation, parking, storing, transportation, reduction, disposal – theories, concepts, healthcare system[s].	Java

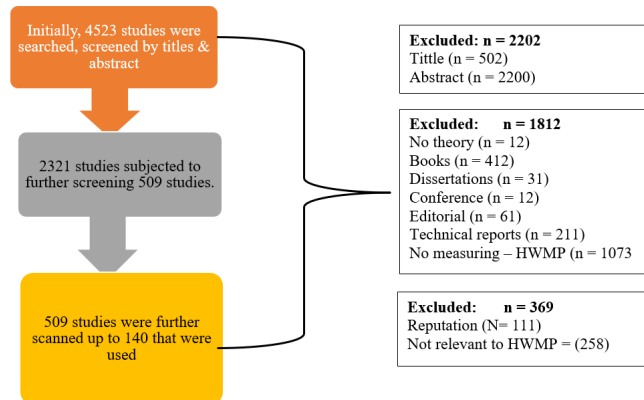
Apart from the tabulated measures, the study also used web search in which various key words and theoretical interventions were written. The use of search engine would be essential towards reach needed results. Some of the institutional web-based used include selected universities for search health and government social research units.

Literature selection and quality assessment

The study applied search approach to select theories. In the first instance, 4523 articles were retrieved. Screening of relevant articles by title and abstract led 2321 inclusive. Exclusion by conference papers, workshop papers, books, editorial reviews, dissertations, and book reviews was also made, leading to 509 as relevant studies. The 509 further reduced on exclusion basis of reputation / similarity in content, relevant theories to healthcare waste or medical / biomedical

management practices. This led to only 260 studies of inclusion to be used. The process of reduction is well articulated in Figure 1 in which each box of exclusion corresponds with opposite box.

Figure 1: The reduction process of studies



Excluded articles at any stage were first assessed to maintain quality of information. The assessment would start with the topic or title, abstract and the flow of academic information written. Inclusive articles were therefore grouped into four types in order to fasten analysis and discussions. First, descriptive articles had original explanations and written by authors, emphasizing the mainstay of the theory and its application. The intervention articles were the second. The main focus was application of the theory in line with nexus of healthcare waste management practices, especially collection and separation as the main behaviors. Some of the articles could seek to evaluate the extent to which a theory was tested in different studies. This would increase confidence in the use of the theory. The fourth was reviews which was considered due to systematic and clear methodology, especially the peer reviews.

One of challenges of systematic literature review research is selection and maintaining quality of papers used. While there has been no internationally recognized procedure or standard measure for selecting high quality in SLR, most of researchers agree on narrative of context – based as one of the standards. Other issues considered include research design applied, theory or model application and its relevance to the area of concern, peer reviewed journals, definition of key terms within the papers, innovativeness and nature of academic writing. It is worth noting that this paper is evidence – based in nature whose quality stems from use and application of theories within context of healthcare waste management practices / behaviors. As an SLR design, it uses theories to capture and explain the existing situation in health facilities so as to provide a systemic approach that would make environment better. The search methods applied in this paper and scrutiny of multiple studies is yet another quality justification. The paper was also written with main emphasis to philosophical narrative as presented by the paper and a scientific synthesis. These among others were central to justify a highly standard measure in line with healthcare waste.

Additionally, quality assessment was also reached by being transparent in all steps in order to make trusted results. This was obtained by asking several questions on inclusion and exclusion criteria. First, whether the application of inclusion and exclusion criteria was appropriate. Secondly, whether the literature search applied covered relevant studies on behavioral perspective selected from different locations (Ref. Table 3.3). Quality was also reached by assessing the extent to which selected publications had enough knowledge or content to answer the underlying question on behavior. Under this approach, three knowledgeable reviewers (one academic researcher & two educated medical waste management officers) were used to assess the quality / validity of selected articles. The two educated medical waste management officers were also essential in assessing current waste management practices in the healthcare facilities in Uganda.

Inclusion criteria for theories and articles

A theory would be adopted as long as it fulfilled the following: has an author with clear definitional assumptions that well explain waste management practices. Secondly, a theory would be included as long as it explains certain behavior and its outcomes. Under planned behavior theory and the cognitive theories, a threat or a positive outcome would be constant as well as yardstick. Theories were also included once they refer to an individual or group behavior in a social setting or structure. It must have had a framework or narrative to illustrate functioning of the system. This is well observed in the health belief model that goes beyond to illustrate benefits and threat to the community of the people. Lastly, all included theories had potential to change social setting or behavior once implemented so that a new behavior can be observed. A good example can be seen from the values theory that has two shapes; pre and post exitance.

The inclusion of articles mainly followed healthcare waste practices and within facility's context. In this, one would assess the use and benefit of the applied theory to ameliorate or explain the phenomenon. Articles were included once the theory is not well evaluated basing on research questions or problem. A derivative outcome would be measured basing on the interventive theory at the end. An article would be considered once it was an empirical description, with well identified sampling procedure, tools used, data collection methods, presented results, discussions and recommendations as well. Article with explorative behavioral outcome and constructs as well would be included. Some of the articles were considered basing on philosophical and hypothetical test in the model theory. There were articles included basing on the link between independent and dependent variables conceptually. The conceptual framework were most determinants at this point of inclusion. Articles that would lead to formulation of the new theory within context of collection, separation, parking, storing, transporting, incineration and disposing of healthcare waste could be included.

Exclusion criteria for theories and articles

Once a theory was reviewed and found that its application would not benefit or underpin concepts underlying healthcare waste management practices such as separation, collection, parking, storing and transportation; such theory would be excluded. Most of healthcare waste management practices are carried or initiated by an individual person as a justification of routine behavior. Therefore, theories that referred to groups or entities where personnel would engage practical efforts, were excluded. Other theories were rejected due to inclusiveness; yet the main focus was behavior or practice.

Although the main narrative of this article is healthcare waste management practices, articles that stopped on types of wastes such as hazardous waste, municipal / household wastes were rejected. This could be due to their failure to go extra-miles to capture practices or behavior as a narrative to this article. There were articles that focused on the environment in broad, rather than healthcare facility environment. Some of the environmental articles rejected addressed landslides, climate change or ecological conservation rather than focus on healthcare facility environment. This decision could be reached in a peer review rather than a single researcher (This means that there were some articles included basing on these parameters). There were articles rejected due to lack of theoretical narrative about healthcare wastes management practices. Some of the theories would not have some concept that would capture such narratives. These were completely rejected. Other theories would test some of the attitudes, behavior and outcomes towards other variables yet the concern of this paper is about healthcare management practice. Therefore, such papers were rejected. Duplicated studies were also excluded and this was done as a single researcher and peer review of three educated researchers. Exclusion would also include some of the group-based theories. This was due to the fact that healthcare waste management

is an individual practice, rather than groups. Aspects such as waste management by team behavior and institutional frameworks could be agreed inclusive in a peer review rather than a single researcher.

Data process

Three steps were followed in order to get data and these include; factual characterization within the selected study, theme classification and identical variables. Under characterization, two main issues were included as indicated in Table 3.3. The question of location as be country and type of the paper selected dominated the main realm in the first place. Thus, the country where the article was published and its type were instrumental. Under this, the composition of the selected article was included and activities involved in research processes. Ideally, these are primary sources that normally considered in data collection. Secondly was the theory used in the due course of research paper write-up and development. This aspect is also presented in Table 3.3.

Generalized characterization

The components in characterizing the studies enabled in answering research question 1 and 2. Briefly, the following as presented in Table 3

Table 3: Characterizing studies

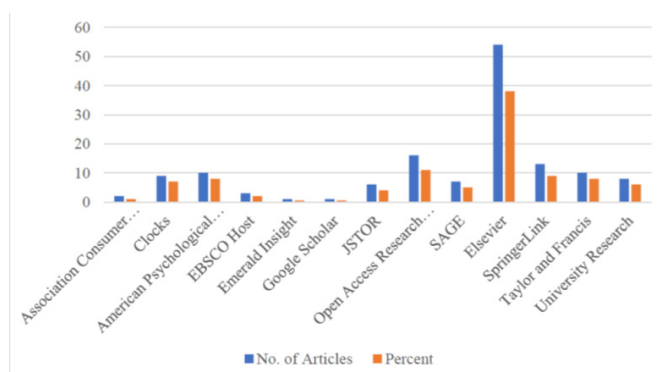
Nos	Character	Category
1	Country	Selective
2	Journal published	Selective
3	Type of the article	Descriptive Review Evaluative
4	Source of data	Primary Secondary
5	Theory used	Selective

The themes were classified on the nature of research and applied theory basing on the content analysis. This is well discussed under theory and frequency in Table 3. The similar table is used to identify variables under personal and social behavioral theories.

RESULTS AND DISCUSSION

The article publication was dominated by Elsevier (n = 54; 38%) as indicated in Figure 2. It was SAGE however that dominated free paper publication / Scopus index (n=23; 35%).

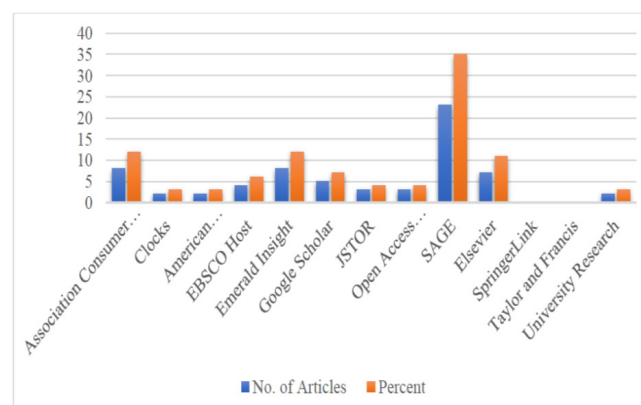
Figure 2: Sources of Articles used



There are two reasons for high number of the articles by Elsevier being using in this study. First, exclusion and inclusion criteria used which was based standardized yardsticks. Secondly, Elsevier seem to be current writers on the topic of research. This applies to the rest of the

numbers and percentages as presented. The high number of Elsevier has a high level of significance to results since the publishing house is among the best international publishers. This earns this article credit towards behavioral theoretical formulation. The study also assessed the number of free paper publications as presented in Figure 3.

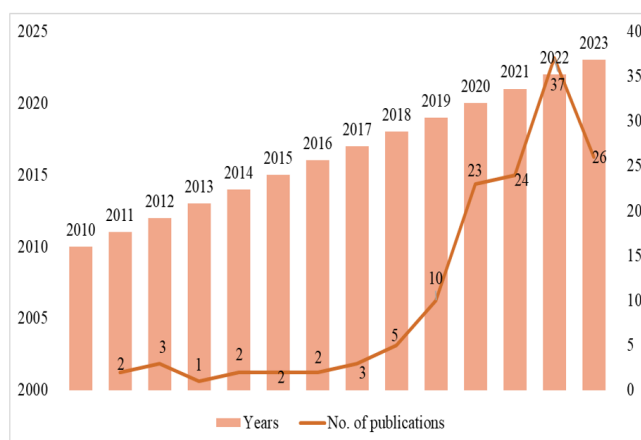
Figure 3: Free paper publication used



The SAGE publishers produced most free accessed papers to this review. This review was therefore dominated by papers from the Elsevier and SAGE. Internationally, the two publishing houses are recognized and this makes results credible.

On articles about healthcare waste management practices, a peak of research used materials and publications were between 2021 and 2023 as indicated in Figure 4.

Figure 4: Categorization of publication by years



The trend follows a line and bar-graph which indicates a growing trend of researchers in healthcare waste management practices in attempt seek and find a solution that would lead to proper management. In 2023, the publishers slopped to 26 from 37 in 2022. This was entirely due to exclusion and inclusion criteria. Additionally, the years between 2019 -2022 have been characterized by COVID-19. It might have attracted different writers on waste management practices while guiding the healthcare practitioners and the public from being infected through waste management – generation and collection. The publications were globally distributed without regional segregation.

Use of theories and frequency

Thirteen theories were reviewed in order to predict behavioral approach that would enable proper healthcare waste management. Three social theories were used since waste management is social activity and healthcare personnel get involved on a social aspect. Frequency use of the theories is presented in Table 4.

Table 4: Theories and frequency

Theoretical category	Name	First author & time	Included article reviewed
Personal behavioral theory	Health Belief Model (HBM)	Rosenstock, 1966	8
	Learning theory	Skinner, 1954	1
	Motivation theory	Frey & Jegen, 2001	4
	Norm Activation Theory	Schwartz, 1977	8
	Self – Determination Theory	Daci & Ryan, 1980	4
	Self – efficacy theory	Badura, 1977	3
	Self – regulation theory	Kanfer & Koroly, 1970	21
	Theory of Reasoned Action	Ajzen Fishbein, 1975	12
	Theory of planned behavior	Ajzen, 1985	38
	Value Belief Norm Theory	Stern, 1999	1
Social Theories	Rational choice theory	Weber, 1958	1
	Social cognitive theory	Bandura, 1986	1
	Social Practice Theory	Bourdieu, 1977	1

Results in Table 4 indicate that out of 13 intervention theories, only three had a highly frequency to be used among the articles assessed. These are theory of planned behavior, self – regulation theory and theory of reasoned action. They have been used accurately towards providing guidance and underpinning concepts of behaviors. The frequency was due to inclusion and exclusion criteria adopted. Therefore, the frequency from 13 to 1 has been due to criterion applied rather than the researcher's imagination. What is important, these theories complement one another. They have been applied towards a certain behavior in health or any setting so as to attain positive results. Thus, their application in waste management in health sector in Uganda has significant effect. Some of the application in the health sector towards different behaviors, purpose and results are presented in Table 5 alongside assumed relevance in case applied in Uganda.

Table 5: Theory and summarized application towards behavior

Theory & sector	Purposes	Methodology in a review	Results and relevance	Reference
HBM & Health sector	Qualitatively explore doctors' perceptions of on – shift health protective behaviors and perceived effect on competence	Theoretical driven Expanded Health Belief Model – EHBM for an occupational context survey, in-depth interviews & Focused Group Discussions FGDs. The content analysis applied.	The belief of doctors was strongly influenced by perceived identity in the systematic context. Impaired self-efficacy affected their health needs on shift which harmed the self & their patients. The systemic culture affected doctor's psycho- social which influenced the contextual occupational health-protective behavioral action. This can be as well be applicable to waste management.	Hodgson et al. (2024).
HBM & Health sector	The effect of educational intervention based on the HBM on self-care behaviors among health workers in comprehensive urban health service centers.	Quasi-experimental study, application of random selection. Chi-square and Mann-Whitney U tests were used in analysis.	The 86% of the participants were female. Intervention by HBM improved the $\pm$ scores of the HBM constructs (except for perceived benefits) and dimensions of self-care behavior ($P < 0.05$ for all). The average $\pm$ scores of self-care behavior increased from ± 128.4 before the intervention to ± 148.37 after the intervention. Such average scores would be applicable in waste management process.	Kasmaei et al. (2024)
Learning theory & Health Institution	Aimed at assessing the impact of Nurse Educators' attitudes on performance and Ethical Growth Nursing Students	A descriptive cross-sectional mixed-methods design, incorporating both quantitative and qualitative approaches was used. It utilized stratified random sampling Factor analysis by ANOVA and the chi-square test were used and maintained at a significance level of $p \leq 0.05$	There was positive influence of educators' attitudes, commitment, and effective teaching methods. Educators' behaviour remained negative towards clinical preparation, student participation, and the perceived influence of on academic progress and motivation. Similarly, attitudes and behavioral sets can as well apply to waste management once the theory is adopted as the main stream source of knowledge.	Babawo et al. (2024)
Motivation theory & Healthcare institution	Examining whether pay-for- performance (PBP) may crowd out intrinsic motivation by analyzing the association between the proportions of the PBP component of the total salary and intrinsic motivation levels among primary healthcare workers	A cross- sectional survey using survey tools on motivation where primary outcome was intrinsic motivation, measured using the intrinsic motivation subscale of the 15- item work motivation scale. Quantitative methods were adopted mostly.	A complex relationship between the proportion of the PBP component of the total salary and intrinsic motivation levels among primary healthcare workers. A higher PBP proportions were associated with increased intrinsic motivation scores ($\beta=0.49$, $p<0.05$), particularly when incentives targeted groups rather than individuals ($\beta=1.04$, $p<0.05$) and when both the quantity and quality of care were included in performance measurement ($\beta=0.61$, $p<0.05$). The intrinsic motivation can as well apply in waste management approach.	Li et al. (2025)
Norm Activation Theory & Health environment	Examining the influencing factors to recycling behaviors with the reference to Normative Activation Model (NAM).	A research survey of 1068 participants was carried out. The hypotheses were analyzed using partial least square structural equation modeling (PLS-SEM).	Personal norms and awareness consequently positively impact recycling behaviors of waste from the environment. The two also effect on attitude, recycling intention. Its application is therefore real in current healthcare facilities in Uganda.	Eisharkawy et al. (2025)
Self – Determination Theory & Health sector	The extent to which physical activity alleviate depressive in nursing home.	Random sampling of 46 nursing home residents in control group ($n = 23$) or an intervention group ($n = 23$). Both groups were monitored for 24 weeks post-intervention. Self-designed questionnaire, cognitive function evaluated using the Mini-Mental State Examination, and weight and body fat measured using the Omron KARADA Scan Body Composition and Scale.	Both groups exhibited a trend of decline by more than five points. The intervention group demonstrated more favourable pre-to-post changes in depression scores compared to the control group. Such decline can be as well be witnessed in waste generation for the case of healthcare facilities in Uganda.	Liu et al. (2024)

Theory & sector	Purposes	Methodology in a review	Results and relevance	Reference
Self – efficacy theory & Health sector	Determining the relationship between self-efficacy, emotional intelligence, and work engagement among nurses, and how these factors influence the quality of care and staff retention.	A quantitative analysis was conducted, using structured surveys in measuring levels of self-efficacy, emotional intelligence, and work engagement.	There is a positive relationship between self-efficacy and work engagement. Positive association between emotional intelligence and work engagement in this professional group was also validated. Additionally, nurses with higher emotional intelligence and self-efficacy tend to have a greater work engagement, positively affecting the quality of care and their retention. Once such theory is applied, it can as well be a justification for waste management.	Cabana-mamani & Ccalachua (2024)
Self – regulation theory & Health sector	Effectiveness of the self-management (SM) in controlling conditions and improving quality of life: Stakeholders' experiences and expectations of SM in enhancing program development.	The qualitative grounded theory approach to explore three stakeholder groups: 19 patients with hypertension, type 2 diabetes, and dyslipidemia, 11 primary healthcare providers, and five provincial health policymakers and managers. Semi-structured patient interviews and focus group discussions (FGDs) were applied. Corbin and Strauss principles with ATLAS ti -version 9.0 software were used for analysis.	Patient interviews and FGDs resulted in 12 and 13 subthemes, respectively, with five subthemes common to both sources. These subthemes were grouped into broader main themes, including "effective content design," "effective presentation and delivery," "characteristics and conditions of involved parties," and "educational needs," collectively reflect the central concept of "effective self-management." This theory as well as the concept are essential in formulating a theoretical framework for the case of Uganda.	Mpaata et al. (2024)
Theory of Reasoned Action & Health sector	To comprehend the dietary habits of individuals consuming wild mushrooms.	Application of the extended version for the theory of reasoned action in order to determine the benefit and food-related self-efficacy.	From a total of 793, subjective norm was calculated at ($\beta = 0.219$, $t = 5.314$), attitudes ($\beta = 0.426$, $t = 8.237$), self-efficacy ($\beta = 0.144$, $t = 5.905$), and perceived benefit ($\beta = 0.177$, $t = 4.586$) which were significantly influenced by participants' intentions. This would sound effectively working once the theory is applied in waste management.	Gong et al. (2022)
Theory of Reasoned Action & Health sector	Assessing the implementation of the theory of reason action model to explain the perception of professionalism and the implementation of patient safety in nurses.	A correlational quantitative analytic study under cross-sectional approach, upon the nurses.	The workload and motivation variables simultaneously affect the implementation of patient safety with the perception of professionalism as an intervening variable (probability level $0.285 > 0.05$). There was a negative and significant effect of workload on the implementation of patient safety (p -value $0.012 < 0.05$). There was also a negative and significant effect of workload on the perception of professional (p -value $0.000 < 0.05$). The motivation variable positively affects the implementation of patient safety (p -value $0.032 < 0.05$). Motivation variable positively affected the perception of professional (p -value $0.000 < 0.05$).	Nasta et al. (2021)
Theory of planned behavior & Health sector	Investigated the determinants of consumer food waste behaviour using the Theory of Planned Behaviour,	A quantitative approach was adopted in a survey of 300 Malaysian households. Descriptive statistics were used to analyze the survey data, with constructs of attitudes towards food waste, subjective norms, perceived behavioural control, and food related routines	Thus, the behavioural control, shopping routines, and the reuse of leftovers are significant predictors of food waste behaviour. Planning routines contribute indirectly to reducing food waste.	Ain et al. (2022)
Theory of planned behavior & Health sector	Assessed the determinants of source waste separation behavior (SWSB) while applying the TPB.	Descriptive study that was performed using 689 questionnaires on 10 randomly selected participants. Analysis was done using a structural equation model (SEM) was used	Subjective norm was found the best predictor of source waste separation (SWS) intention. The TPB had a prediction power of 68% and 74% for predicting waste separation from the source intention and behavior, respectively.	Alimardani et al. (2024)
Value Belief Norm Theory & Health sector	This study examined individual in making decision to buy recycled products.	VBN theory is explored in the context of recycled product was adopted, applying quantitative methods. The different influence was analyzed using partial least squares structural equation modelling.	Results indicate that the causal chain of relationships between values, beliefs, and personal norm has a positive influence purchase of recycled product intention. Perceived risk, on the other hand, has a significant negative direct effect on purchase intention but strengthens the relationship between personal norms and purchase intention.	Huang et al. (2023)
Rational choice theory & Health sector	Examined the rational drug use of individuals between the ages of 18-65 and to evaluate the effects of various socio-demographic factors (such as gender, educational status, chronic disease status, age) on rational drug use.	Face-to-face survey method and Google form were applied on 1,015 people. The data were analyzed with SPSS.	There was a significant problem between rational drug use and the recommendation to recommend prescriptions of the same quality as gender, education level, chronic disease status and amount of use.	Makales et al. (2025)
Social cognitive theory & Health sector	Examined the effect of educational interventions based on an integrated social cognition model (ISCM) on waste recycling.	Quasi-experimental study of 144 women in healthcare services. Selection was multistage random sampling method and the sample divided into intervention and control groups, consisting of 72 women. Demographic, awareness, and ISCM questionnaires used had a content validity ratio – CVR of 0.84 and content validity index - CVI; 0.83. The Cronbach's alpha coefficient was 0.85 and internal consistency measured at 0.84. Analysis was done through the descriptive statistics, Chi-square, independent t-test, paired t-test, and analysis of covariance (ANCOVA) using SPSS version 25.	The mean age of the participants was 38.9 ± 12.1 . The 2 groups showed a statistically significant difference in mean scores of awareness, attitude, subjective norms, perceived behavioral control, self-efficacy, behavioral intention, and action and coping planning after the intervention ($P < 0.001$). The mean $\pm$ SD of the behavior score increased from 17.25 ± 4.96 before the intervention to 25.78 ± 4.95 after the intervention ($P < 0.001$).	Moghaddam and I. M. Zeidi (2024)
Social Practice Theory & Health sector	Investigated the effect of waste management practices and institutional pressures on environmental sustainability performance.	Explanatory and quantitative research design to analyze data collected from 339 sample size. Data were processed using SPSS for descriptive statistical analysis and Smart-PLS 4 for structural equation modeling to examine relationships among variables	Institutional pressures positively influence waste management practices and environmental sustainability performance. Interestingly, institutional pressure negatively moderates the relationship between waste management practices and environmental sustainability performance	Quartey and E. Y. Nyamah (2025)

CONCLUSION AND RECOMMENDATIONS

Conclusion

This review shows that there are numerous forms of theories which have been applied in order to direct different variables of behaviors targeted. Importantly, the reviewed theories focused on variables like attitudes, perceptions, intentions and performance which are part of the behavior towards certain ideals to be achieved. These have been applied in healthcare institution or health sector as presented in Table 4.1. The behavioral approach for Uganda therefore indicates the need to prioritize the self – regulation theory and the theory of planned behavior towards waste management in the healthcare facilities. It is imperative to note that the two theories complement one another in the due process. Their application in the healthcare facilities cannot work in isolation of the other theories. In fact, in order to have a holistic theoretical perspective it is imperative to apply all the theories of behavior as one healthcare facility or personnel confront the intriguing circumstances. What is important however is the reduction or proper waste management as hypothesized by this article.

This review presents a multiplicity of theories and how they can be applied in behavioral change or management. Each theory is presented towards a positive and significant behavioral change or effect. Such study sets a precedent or act as a whistle blower to what can be used in waste management. The healthcare institutions and their managers can seek the theoretical discourse even without government intervention at the policy level. The healthcare facilities can seek possible systematic theoretical approach in all wards and upon the health personnel as one of the possible solutions to behavior on waste management.

Recommendations

From theoretical review, this study is essentially helpful to the government of Uganda, the healthcare personnel and policy makers in adopting an approach that would change behaviors for effective and proper management practices of waste.

The Government and Ministry of Health

This review is important for the government of Uganda that is currently facing the increasing number of populations in the urban setting and the patients in its healthcare facilities. The government finds that while there is increasing numbers indifferent sectors, there is a gap on having a policy on behaviors. It is within this circumstance, that a behavior policy for the medical waste management is essentially needed so as to have a safer and clean environment in the health sectors. Besides, the government will establish to seek possible means to have different approaches towards behaviors in different aspects not only for waste management but also to its programmes. It is behavioral change that makes different approaches and practices possible, learnt and programmes being implemented.

A review of different but related and complementing theories justifies a need for holistic models for individual and group working in social setting, as well as the government office to have knowledge of such theories. This can be attained once it becomes the government policy or approach to different groups of its employees as well as private firms. In facilitating this narrative by the government, it will be easier even for the families to adopt certain behaviors since waste is generated in different places of human lives.

Health personnel at the facilities

The healthcare waste is largely complexed since it involves different forms of knowledge right from generation to the end point or the disposal. In fact, all the healthcare waste processes need educated individuals with knowledge of handling, and sorting. This calls the health institutions to increase learning effort about the medical care waste and behavioral approaches if such conditions or waste management practices are o

be embraced in the hospitals or the healthcare facilities. It is within such teaching and learning that different theories will be taught against medical healthcare waste. For example, separating healthcare waste needs a planned behavioral theory, backed by self-regulation theory as main basis for other theories in a holistic approach. This will inform and enable the learner to integrate the theories in application.

Additionally, healthcare facilities should have various chats in different areas for behavioral change against waste. This can attract not only the health personnel but also the patients and their caretakers to observe the set agenda towards the waste. This will be reached after the incorporation of multiple theories in healthcare waste management which will easily lead to valid needed single measure based on planned behavior for a particular approach.

Policy makers

There is a need for the policy makers in Uganda to come up with planned behavior policy that can enable medical facilities, personnel and the patients to change the behavior against waste. The policy needs to be an integral product of various behavioral theories such as the theory of planned behavior which needs to be interlinked into self-regulation theory to be relevant individual persons.

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