

Reverse Logistics challenges in Manufacturing pharmaceutical companies: A study in the City of Tshwane South Africa

Background: The concept of reverse logistics, which is not entirely new, is becoming an interesting topic for a lot of emerging researchers. There is limited knowledge regarding the challenges that manufacturing pharmaceutical companies face when it comes to reverse logistics in the City of Tshwane in South Africa hence this study is undertaken. Reverse logistics has been related to the recovery of products; but it differs in most ways in terms of: the time; the way; and the structure of a product flow and therefor causing challenges for most companies.

Purpose: The main purpose of this study is to scrutinise the reverse logistics challenges in the manufacturing pharmaceutical companies and aims at finding better ways of dealing with those challenges.

Preliminary literature review: Manufacturing pharmaceutical companies cannot forecast goods returning back through the supply chain since goods were traditionally designed to move forward towards the consumer or the customer, therefore neglecting reverse logistics. Many manufacturing pharmaceutical companies want to possibly avoid the process of reverse logistics as it means they will incur costs such as transport costs since goods are moving backwards in the supply chain. The truth is reverse logistics cannot be avoided as people make mistakes with orders and there are market changes.

Method: A quantitative approach was utilised for this study. A questionnaire was used in conjunction with SurveyMonkey and a link of the questionnaire was distributed to relevant respondents in the manufacturing pharmaceutical companies. The Stata V13 statistical software was used for analysing the data.

Results: The main question of this study was to determine the challenges regarding reverse logistics in the manufacturing pharmaceutical companies and the respondents did indicate a number of challenges (lack of equipment, unqualified personnel, technology, amongst others) being faced where reverse logistics is concerned.

Conclusion: Reverse logistics is a very important process in many companies because at some stage goods/products go through the returns process. Manufacturing pharmaceutical companies also experience reverse logistics challenges as seen from the results, and the industry should take it into consideration by learning more about it, finding qualified personnel and use advanced technology. The context and the results from this study will assist businesses (not only limited to South Africa and the manufacturing pharmaceutical companies) to identify and comprehend the reverse logistics challenges that are being faced and how they can be alleviated.

Recommendations: The researcher recommends that management and all other employees learn more about reverse logistics. There should be reverse logistics development programs, such as learning more about machinery and advanced technology and this must accommodate everyone involved in reverse logistics; as this would be of benefit to the companies in the end; and it would create a competitive advantage. Motivating employees to be innovative as this will assist the firms to grow and have a leading edge in reverse logistics processes. Systems, processes and innovative machinery of reverse logistics could be implemented to deal with the different challenges that are being faced. For manufacturing pharmaceutical companies to grow and have a reduction of product returns; all the employees should have inputs and work together.

Keywords:

Reverse Logistics

Manufacturing pharmaceutical companies

Challenges

South Africa

City of Tshwane

Introduction

This paper presents the findings of reverse logistics challenges that are being faced in the manufacturing pharmaceutical companies in the City of Tshwane Metropolitan Municipality; hereinafter referred to as the City of Tshwane in South Africa. According to Akdoğan and Coşkun, (2012) the concept of reverse logistics has been related to the recovery of products; but it differs in most ways in terms of: the way; structure of a product flow and time. Sushmita, Arun and Rupesh, (2013) mention that reverse logistics refers to the returning of goods from the point of consumption to the point of origin, which means from point B back to point A; and this is the reverse movement of goods within the supply chain. Different authors, such as Rogers and Tibben-Lembke (2001) and Kumar (2012), believe that the process of reverse logistics starts at the point of consumption. This concept of reverse logistics is becoming more prevalent day by day and numerous companies and organisations have started to pay attention (Rajagopal, Sundram & Naidu, 2015). Reports show that only a limited percentage of major supply chain companies understand the importance of reverse logistics (Badenhorst & Nel, 2012).

More researchers are doing research, writing journal articles and theoretical papers regarding this topic reverse logistics because they are now noticing its importance. Researchers such as (Teunter, Inderfurth, Minner & Kleber (2003); Narayana, Elias & Pati (2012); Ali & Abdelsalam (2017); Mogaka (2015) have all done previous research on RL but their studies and research are not studies primarily in South Africa. For manufacturing pharmaceutical companies and businesses all over the world to have a successful reverse logistics system, they have to integrate business-proposal development, international trade compliance, contract administration, project management and product management into daily operations across the enterprise (Hart, 2008).

There are a number of drug recalls, in 2015 there was a medical recall for Corenza cold and flu syrup 100ml; this was due to a customer complaint of an un-dissolved crystal-like sediment (Adcock Ingram LTD, 2015). The Adcock Ingram LTD had to investigate and had identified the un-dissolved ingredient as paracetamol- which is an active ingredient in the product (Adcock

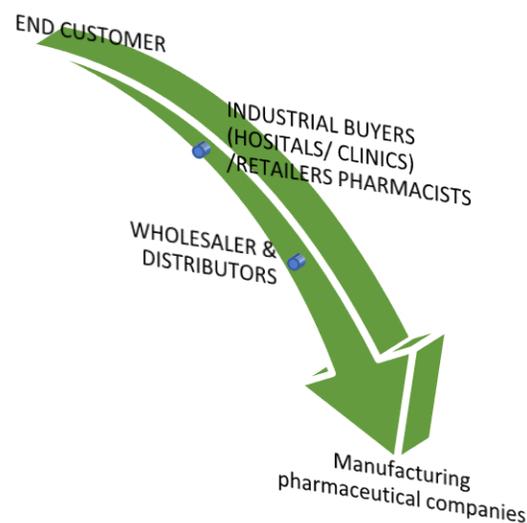
Ingram LTD, 2015). Johnson & Johnson recalled Benylin original and Benylin with codein – due to it being delivered in the wrong country, because of a set-up error and this happened recently in the year 2015(Johnson & Johnson, 2015). The enclosed package leaflets of Johnson & Johnson Benylin original and Benylin with codein were in Portuguese and not in English as these products were supposed to be delivered in Mozambique. Since the information on the leaflet was not in English, it did not meet the South African customers' requirements; as they did not understand the information (Johnson & Johnson, 2015). Drug recalls happen all over the world and manufacturing pharmaceutical companies need to make sure that the personnel are highly trained to deal with such, as it consumes a lot of money and time from the company. As a customer; when ordering medicine; I would love for the pharmacies to make sure that they deliver the right product at the right time and at the right place, to ensure a good relationship between the customer and the pharmacy.

There are more examples of recalls i.e. outbreak of listeria in South Africa in 2018 (Fin24, 2018), the Samsung Galaxy Note7 in the year 2017 (Samsung, 2017). The reverse logistics of these goods cost a lot of money, since it was food that was involved, and the only possible solution was to destroy the goods.

There are growing concerns regarding the environment and social challenges caused by reverse logistics therefor causing it to become a critical factor in many organisations (González-Torre, Álvarez, Sarkis & Adenso-Díaz, 2010). Kabir (2013) states that there are environmental concerns when dealing with reverse logistics in the manufacturing pharmaceutical companies; and if the manufacturing pharmaceutical companies reverse logistics processes are not well-managed then it means they would have to face environmental issues. The impact of reverse logistics can be seen from both the economic perspective and environmental perspective. This concept of reverse logistics has not been researched much in South Africa; and it has unfortunately been misjudged especially in this industry (manufacturing pharmaceutical companies) (Badenhorst & Nel, 2012). This is why this study is focused on the challenges of reverse logistics in the manufacturing pharmaceutical company, such as; equipment, implementation of new technology; collection, gatekeeping just to mention a few.

There is limited knowledge concerning the reverse logistics challenges that are being faced by the manufacturing pharmaceutical companies in the City of Tshwane. Narayana, Elias and Pati (2014:381) define the manufacturing pharmaceutical company as “a commercial business licensed to research, develop, market and distribute drugs, most commonly in the context of health care”. It is important for one to realise that when drugs/medication are being returned (reverse logistics) they cannot be disposed of or refurbished but they can only be destroyed. The return of drugs does not only start from the consumers, but it can also start at the point of retailers and distributors.

Kabir, (2013) mentions that normally in the manufacturing pharmaceutical companies when there is a return from a distributor or from a retailer, they have to make sure they work in agreement with the return policies; so that they can receive a refund. Therefore, reverse logistics can begin at the point of distributors and retailers (who are not consumers of the products). In the same way, ‘point-of-origin’ is also vague – it is not essentially the correct way to describe reverse logistics, it should rather be the ‘point of recovery’; since flows may go back to other points (Zuluaga, 2005). Different authors have different illustrations of the process of reverse logistics in different industries. Figure 1 will illustrate the process of reverse logistics in the manufacturing pharmaceutical companies as illustrated by Makaleng (2017).



Source: Adapted from: Makaleng, (2017)

Figure 1: Reverse logistics process in manufacturing pharmaceutical companies

Figure 1 above, demonstrates how the reverse logistics process in the manufacturing pharmaceutical companies works. Drugs that would usually be returned by the customers (end/retailers) due to defects or recalls, will then go to the wholesalers and/ distributors, finally the drugs will be returned to the manufacturers (this is the main focus of this study).

Research problem

Studies of reverse logistics in manufacturing pharmaceutical companies are very limited in South Africa and this study intends to close that gap. This study aims to find better ways for undertaking reverse logistics challenges because the manufacturing pharmaceutical companies returns are worth a lot of money. Installing of new advanced equipment, gatekeeping, implementing new technology, waste elimination, value recover and storing; are some of the processes that can be implemented within the pharmaceutical industry and this can therefor assist managers in improving their organisational performance and, therefore, reducing their financial losses.

The research problem of this study is examining reverse logistics challenges in the manufacturing pharmaceutical companies in the City of Tshwane

Sub-problems

There is a negative outlook already concerning reverse logistics in the Manufacturing pharmaceutical company; and there are some problems that can be identified therewith; such as the loss of money (Badenhorst & Nel, 2012). Further problems are identified below.

- Uncertainties related to product returns

It is problematic, because of its involvement with irregular material flows (Hart, 2008).

- Inadequate information system

An absence of information systems and inadequate investments in information technology remain the most essential obstructions in the prosperous management, as well as the carrying out of reverse logistics (Jayaraman, Ross & Agarwal, 2008).

- Shortages of information technology (IT) infrastructure

Many organisations are faced with an incompetent and unmanageable returns-management process; because they focus their supply chain-related IT investments on forward logistics (Jayaraman, Ross & Agarwal, 2008).

- Negative perceptions about product returns from customers

Whenever there is a product return by the customer, it unavoidably conveys an unattractive connotation about the product or the organisation in their mind. This can have a negative impact in the relationship between the end- user and the organisation (Dampier, 2006).

Research objectives

The main objective of this study is to scrutinise the reverse logistics challenges in the manufacturing pharmaceutical company and aim at finding better ways of dealing with them. This study will therefore examine reverse logistics challenges in the manufacturing pharmaceutical companies; and to provide ways that can be used for refining the performance of manufacturing pharmaceutical companies. Additionally, there is a need to inform the other manufacturing pharmaceutical companies that are not necessarily managing with the reverse flow of goods – on how to benefit from reverse logistics programs. The researcher intends to bridge the gap of reverse logistics in the manufacturing pharmaceutical companies in the City of Tshwane region. The researcher will contribute knowledge on this topic. This will assist other upcoming researchers who will be in this field with conducting further research on this topic, in another industry, city/country.

Literature review

This section; reverse logistics and reverse logistics in the manufacturing pharmaceutical companies will be discussed.

Reverse Logistics

Many companies' concentrate more on their forward logistics; subsequently reverse logistics attracted little attention (Shaik, 2015). "logistics is that part of supply chain management that plans, implements and controls the efficient, effective forward and reverse flows and the storage of goods, services and related information between the point of origin and the point of consumption, in order to meet customers' requirements" (Council of Supply Chain Management Professionals, 2012). There are a number of activities for reverse logistics (such as gate-keeping, remanufacturing, waste disposal and repair services; amongst others) in the supply chain (Rajagopal, Sundram & Naidu, 2015).

South African companies sometimes fail to see the how significant reverse logistics is; as it is mostly seen in a negative perspective and many companies focus on forward logistics (Badenhorst & Nel, 2012). reverse logistics has gained a lot of attention in the last decade (Rajagopal, Sundram & Naidu, 2015). According to Kabir (2013), reverse logistics has received a lot of focus in both practice and research. There is as an increasing number of articles in the trade press, therefor increasing the attention being given to reverse logistics; (such as those of Jedd, 1999; Melbin, 1995; Ross, 1998, cited in Rogers & Tibben-Lembke, 2001:129; and Austhof, Helferich & Otis, 1997; Rogers, 1998; Stock, 1998b, cited in Rogers & Tibben-Lembke, 2001).

Reverse logistics has been receiving a lot of attention in practice in the operations field and management-research field for the rising pressures of enervation of resources and lack of waste-disposal capability (Changcheng, 2011). Waste materials control has established a focus of attention because of increased environmental awareness (Changcheng, 2011).

The purpose of reverse logistics is to increase the satisfaction of customers, set up competitive advantage and achieve sustainable development at the enterprise level, community level, and to reduce costs (Changcheng, 2011). Reverse logistics decreases the burden faced by the environment from industrial operations through extending the life of materials and products (González-Torre et al., 2010). There are a lot of countries such as China currently that are making more efforts in expanding their reverse logistics using diverse systems (Stănciulescu, 2011).

There are very stringent procedures on waste disposal and this requires an efficient system that will provide for the proper disposal of post-consumer goods by taking into consideration the human and environmental features (Shaik, 2015). It is important that companies start to efficiently achieve their reverse-supply chains, thus emerging into a thriving closed loop organisation because of penetrating opposition and demanding protocols regarding our environment, it is rather perplexing to bear affluent corporate processes just by managing the forward-supply chain well (Arun et al, 2011). There are some companies that have already silently transformed their return policies by setting up restocking fees, a return time limit (such as 30 days) and requiring receipts, which is a cost-versus-benefit analysis that supports a suitable balance (Olorunniwo & Li, 2011).

Reverse logistics in the manufacturing pharmaceutical companies

According to Turrisi, Bruccoleri and Cannella (2013) it is essential for manufacturing pharmaceutical companies to have the correct channels for reverse logistics; as from time to time, reverse logistics might occur in the manufacturing place and not from the customer point. Rogers, Melamed and Lembke (2012) mention that the notion of reverse logistics in the manufacturing pharmaceutical companies has not really been studied in literatures in South Africa although the recognition of reverse logistics has recently become a matter of significance. According to Elmas and Erdoğan (2011) Medicine can be returned because of defects with the products or the packaging. Medicine can also be returned due to the delivery of wrong medication being delivered, expiration of medicine or customer not requiring the medication anymore.

Reverse logistics encompasses handling returned goods due to seasonal inventory, obsolete equipment, recalls, restock, damage, salvage, recycling programs, excess inventory, hazardous material programs and asset recovery (Rajagopal, Sundram & Naidu, 2015). “Drug recalls are common for countries with well-defined regulatory guidelines that often involve totally defective products that pose health risks to patients” (Venkatesh, Bigoniya & Kumar ,2017, 8). Olorunniwo and Li (2011) continue by stating that product returns sometimes happen because of a number of reasons, for instance: products being shipped to the wrong destination (e.g. Benylin in 2015), wrong products being ordered, products being damaged, customers changing their mind and product defects.

One of the imperative activities in reverse logistics is transportation; which is the actual movement of goods, machines and resources from one point to another point within the reverse logistics network; and this is termed as the transportation process (Shaik, 2015). More activities mentioned by Pienaar and Vogt (2016) in return management include; customer service and help-desk enquiries, gate-keeping, the management of hazardous-material programs, measuring vendor performance in terms of product failures, the management of return policies and procedures, accounting and reconciliation practices related to returned products and service logistics. The handling of product returns has led the reverse logistics activities to be effective and efficient, whereby the efficiency of reverse logistics is accomplished by reducing inventory investments, reducing the waste, optimising the collection networks and recapturing recovered value (Shaik, 2015). One technique in which organisations try to maintain and expand effectiveness and market share is by the growth in efficiency of reverse logistics (Agrawal & Choudhary, 2014).

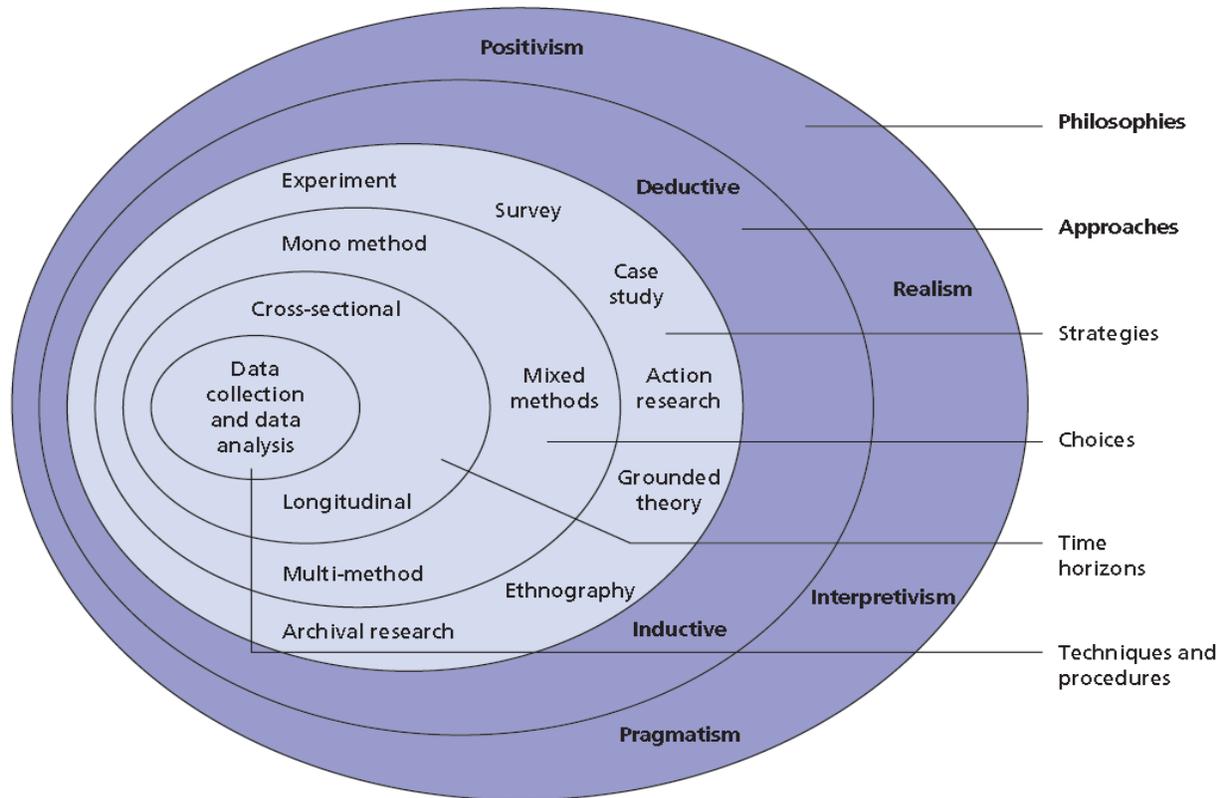
It is evident that reverse logistics has a number of fundamental barriers and problems that need to be addressed; and Manufacturing pharmaceutical companies need to ask themselves if they are aware of the reverse logistics activities and procedures in their organisations; and if they are able to manage these activities and procedures well (Badenhorst & Nel, 2012). Agrawal and Choudhary (2014:20) mention some of the important strategies that can assist companies in improving their reverse logistics, such as:

- a) Customer satisfaction, the voice of the customer is the most significant aspect of reverse logistics management;
- b) The technology development to handle reverse logistics should be flexible enough to handle expected future expansion and exceptions involved in reverse logistics;
- c) Eco-compatibility and environmental performance continue to be a focus issue for many companies;
- d) Strategic alliances are often used to rationalise business operations and recover the overall competitive position of a company; and
- e) Knowledge management is a multidisciplinary approach to achieve organisational objectives by making best use of knowledge”.

The next section discusses the research methodology for this study.

Research methodology

The research question/s should be the one that directs the researcher in choosing the correct research methodology (Leedy & Omrod, 2013). There are three (3) dissimilar research designs that a researcher might use when conducting research (Creswel, 2014). A researcher has the option of using quantitative, qualitative or even a mixed method (Leedy & Omrod, 2013). Saunders, Lewis and Thornhill, (2012:128) explain research methodology using the research onion. The research onion summarises the research methodology a researcher might take, which is depicted in figure 2 below (Saunders, Lewis and Thornhill, 2012).



Source: Saunders, Lewis and Thornhill, 2012; 128

Figure 2: The research onion

A researcher can decide to use these three (3) approaches: deduction, abduction and induction; the researcher used the deduction approach; as the “data collection is used to evaluate [the] propositions or hypotheses relating to an existing theory” (Saunders, Lewis & Thornhill, 2012:144). The quantitative approach is used for this study. “A quantitative study tends to have a particular, pre-specified focus” (Leedy & Ormrod, 2013:184), whereby human beings are the topic of the study; and the focus is typically on a certain aspect of behaviour. Furthermore, the behaviour is quantified in some way.

Burns and Bush (2010) define quantitative research as research that involves the use of structured questions, in which the response options have been set; and a large number of respondents are involved. As the term quantitative proposes; data is collected and analysed in numeric form, and

this has a tendency to highlight a fairly large-scale and descriptive dataset; and it is often, falsely in our view, presented or professed as being about the gathering of facts (Changcheng, 2011). The focus for this study is employees in the Manufacturing pharmaceutical companies that deal with the logistics, manufacturing, operations and returns (amongst others).

A survey instrument was used for this research; and SurveyMonkey was used for this. SurveyMonkey is an online survey that can be sent to a large amount of people, comprising individuals located far away; and it is less time-consuming and less expensive. A SurveyMonkey allows the researcher to present different types of items, such as multiple-choice items and rating scales; and it also offers patterns that make the questionnaire design easy (Leedy & Ormrod, 2013). The next section will explain how sampling and population selection occurred in this research study.

Population and sampling

Probability and non-probability sampling are the two major categories of sampling mentioned by Leedy and Ormrod (2013). In probability sampling, there is a probability and a chance for each case that is being selected from the population to be equal for all the cases (Saunders, Lewis and Thornhill, 2012). According to Leedy and Ormrod (2013:214), “in non-probability sampling, the researcher has no way of predicting or guaranteeing that each element of the population will be represented in the sample”. According to Leedy and Ormrod (2013) there are two (2) forms of non-probability sampling; convenience sampling (makes no discovery of classifying a representative division of a population and is also known as accidental sampling) and quota sampling (which is different from convenience sampling).

Since this study is focused on the viewpoints and opinions of the employees involved, the researcher used non-probability sampling. The researcher utilised purposeful sampling. According to Saunders, Lewis and Thornhill (2012), purposive sampling is sometimes known as judgemental

sampling; as the researchers uses their own discretion in selecting the respondents, to better enable them to answer the research questions and to meet the objectives set.

This study mainly targeted the 100 Manufacturing pharmaceutical companies that are based in the City of Tshwane (The South African Pharmacy Council, 2015). The sample size was 50 Manufacturing pharmaceutical companies. This sample included respondents that manage the operations (5), manufacturing (5), buying (5), logistics (5), and sales personnel/managers (5) that deal with reverse logistics in the manufacturing pharmaceutical company.

Data collection

SurveyMonkey was used to collect data. SurveyMonkey is less expensive and less time consuming. A link from survey monkey can be sent to respondents that are situated far away and nearby. The questionnaire took approximately 20 minutes of the respondent's time to complete. A questionnaire was developed through using other previous questions from another literature (Shaik, 2015) in this field (this was to ensure validity of the questions), based on the literature review. The questionnaire was posted online via SurveyMonkey and the link to the questionnaire was emailed to five (5) personnel members (manufacturing or production personnel, logistics or operations managers, factory managers, procurement managers or personnel and sales personnel) in each organisation. A total of 250 respondents who received the email (127 responded) a response rate of 51% was received.

Validity and reliability

In conducting research, a researcher must make sure that they produce quality in ensuring validity and reliability. According to Leedy and Ormrod (2013:89), "the validity of a measurement instrument is the extent to which the instrument measures what it is supposed to measure". Comparing the results acquired with those of another instrument/study known to measure the same/similar study – is how one can know whether the data collected are valid. Reliability is a vital issue that the researchers should take into consideration, when conducting the main study – even if they use questionnaires, which are pre-existing, whereby quite a few researchers usually

use a validated questionnaire or survey but avoiding the issue of reliability checking; which is one of the usual mistakes (Hazzi & Maldaon, 2011). When it is said that a person is reliable; it is concluded that he/she is predictable, trustworthy, steady, constant and authentic, whereby the word ‘reliable’ is utilised very frequently in our lives; hence, the notion that the reliability relative to a research instrument has a similar meaning: if a research tool is reliable and consistent, foreseeable and precise, it is said to be reliable (Kumar, 2012).

To ensure validity the respondents for this research study were personnel that work in the manufacturing pharmaceutical companies and deal with reverse logistics challenges (manufacturing or production personnel, logistics or operations managers, factory managers and sales personnel), with the attached link to the questionnaire. This was to make sure that the researcher measures what is needed. To test the reliability of the questions Cronbach’s alpha test was conducted. Cronbach’s alpha measures the internal reliability; and it consists of values between 0 and 1. When alpha is 0.70, or higher; it is considered acceptable in most social science research situations, this proposes that there is internal consistency within your items (Saunders, Lewis & Thornhill, 2012). This test is normally used to test the reliability and the consistency of the instrument to a set of questions that are combined as a scale to measure a particular concept (Saunders, Lewis & Thornhill, 2012). The individual alpha tells you how the total alpha would improve if that item was to be removed from the questionnaire.

Data analysis

The Stata V13 statistical software was used for data analysis for this research study. Stata V13 is similar to the statistical package for social sciences (SPSS) “a software package used for statistical analysis” to identify and examine the current state of reverse logistics (Levesque, 2007). Stata is also a statistical package used for analyzing data. Descriptive and inferential statistics are the two types of statistics that can be used (Keller & Warrack, 2004). According to Keller and Warrack (2004:3) “Inferential statistics is a body of methods used to draw conclusions or inferences about the characteristics of populations based on the sample data”. Pallant (2011:53) explains that “descriptive statistics describes the characteristics of the sample in the method section of the

report; it checks the variables; and it addresses [the] specific research questions”. This kind of examination is frequently utilised for quantitative studies (Keller & Warrack, 2004).

A one-way analysis of variance by ranks (Kruskal-Wallis) test was conducted and a Chi-square test to examine the relationship in the Manufacturing Pharmaceutical Companies (Manufacturing pharmaceutical companies). These procedures (statistical tests) were calculated for essential subgroups and possibly for the whole study population. The findings were used as recommendations to improve reverse logistics practices and performance in the manufacturing pharmaceutical industry.

Findings

This section will be discussing some of the results (a section) found from this study regarding the challenges that the manufacturing pharmaceutical companies in the City of Tshwane in South Africa face. The following section presents the results of the views of the employees regarding the role of equipment for the development and promotion of reverse logistics in the manufacturing pharmaceutical companies. This section provided for a five-point Likert scale: strongly agree, agree, neither agree nor disagree, disagree and strongly disagree and a Chi-square test.

- There’s enough equipment (computers and material handling equipment) for developing the company to deal with reverse logistics (V16)

Having equipment in any organisation is very important; as it enables the procedures to be undertaken in any working environment. Table 1 provides the results for V16.

TABLE 1: There's enough equipment, such as; computers and material handling equipment for developing the company to deal with reverse logistics (V16)

V16	FREQUENCY	PERCENTAGE (%)	CUMULATIVE %
Strongly agree	24	18.90%	18.90%
Agree	29	22.83%	41.73%
Neither agree nor disagree	32	25.20%	66.93%
Disagree	28	22.05%	88.98%
Strongly disagree	14	11.02%	100%
Total	127	100%	

The results show that 18.90% strongly agreed and 22.83% agreed with the statement. Only 25.20% neither agreed nor disagreed with having enough equipment. It further tabulates that 33.07% of the employees feel that the equipment available is not enough to develop the company – by disagreeing and strongly disagreeing with the statement.

- The company has enough qualified logisticians for sustainable reverse logistics development (v17)

The V17 indicated that 24.41% of the respondents strongly agreed; and 26.77% of the respondents agree. A total percentage of 51.18% of the respondents implies that the manufacturing pharmaceutical companies have qualified logisticians that can deal with reverse logistics. The results further indicated that 25.98% of the respondents disagreed or strongly disagreed with the statement that enough qualified logisticians are available in their manufacturing pharmaceutical company, in order to sustain the development of reverse logistics.

- Financial constraints affect the development of reverse logistics (V18)

The financial capability of a business is essential; as it is required to develop programmes in reverse logistics. This sub-section presents the results on whether the manufacturing pharmaceutical companies in the City of Tshwane financial constraints have affecting the development of reverse logistics. Figure 3 below indicates that 37.01% of the respondents strongly agreed and 55.12% agreed with the fact that there are financial constraints restricting them from fully developing their reverse logistics system. There are only 3.15% respondents that disagree with this statement; however, none of the respondents strongly disagreed. This is a concern; as in developing a reverse logistics system you need to have available resources (such as technology and human resources) in place (Shaik, 2015; Badenhorst & Nel, 2012).



Figure 3: Histogram of the company’s financial constraints affecting the development of reverse logistics (V18).

- The technology you are using is technologically advanced (V19)

Technology is advancing at a fast pace; and companies need to make sure that they are not left behind. The results indicated that 15.75% of the respondents strongly agreed and 29.92% of the respondents agreed that they are using technologically advanced equipment in their companies. Only 27.56% of the respondents were neutral; 16.54% of the respondents disagreed; and only 10.24% of the respondents strongly disagreed.

- Improvement of equipment in your company is needed where reverse logistics is concerned (V20)

Equipment plays an important role in the success of a company; and there needs to be an improvement in the equipment employed; as new systems keeps emerging. Table 2 below shows that 71.65% of the respondents who are employed by the manufacturing pharmaceutical companies (strongly agreed and agreed); the respondents feel that there is a huge need for the improvement of equipment in their company where reverse logistics is concerned. The results further indicated that none of the respondents strongly disagreed; and 24.41% of the respondents neither agreed nor disagreed. Only 3.94% of the respondents do not feel that there is a need for improvement of their manufacturing pharmaceutical company technology concerning reverse logistics that is employed; as they are the only few that disagreed.

TABLE 2: There is a need for the improvement of equipment in your company where reverse logistics is concerned (V20)

V20	FREQUENCY	PERCENTAGE (%)	CUMULATIVE %
Strongly agree	46	36.22%	36.22%
Agree	45	35.43%	71.65%
Neither agree nor disagree	31	24.41%	96.06%
Disagree	5	3.94%	100%
Strongly disagree	0	0	100%
Total	127	100%	

The results for the Cronbach's alpha indicated that there is internal consistency; as the total scale for the alpha is 0.7789, which is above 0.70; therefore, it is considered acceptable in most social science research situations, which suggests that there is also internal consistency among the items.

Recommendations

Forward and reverse logistics are playing a very important role in our lives and in our society since customers are involved, companies have to make sure that customer needs are satisfied at all times. The Manufacturing pharmaceutical companies all over the world are experiencing reverse logistics as previous research has shown. According to 92% of the respondents, financial constraints (V16) are affecting the development of good equipment to deal with the issues on reverse logistics. The employees employed by the manufacturing pharmaceutical companies agreed that the technological equipment being utilised could be improved. This can happen through utilizing new and advanced machinery, using advanced technology.

The researcher further recommends that more qualified personnel be hired in this field, implementation of advanced technology, eco-compatibility and the environment policies should be followed, and alliances created. More researchers to conduct further studies on how these challenges can be mitigated. There should be development programs for staff members to learn more about this concept and the systems that can be used in order to reduce the reverse logistics challenges. Technology is very important nowadays and staff need to be technologically advanced to deal with systems being used to deal with reverse logistics and working together as cross-functional teams to deal with customer queries, complaints and returns in a timely manner. The use of forecasting through technological advancement also plays a very significant role as this will assist the Manufacturing pharmaceutical companies with knowing the number of drugs required by customers and therefore reducing the number of obsolete drugs in the firms.

It is further recommended that more research be made regarding this topic in another city, country and even in another industry.

Conclusions

Reverse logistics has been in existence as long as forward logistics, but companies would normally concentrate on forward logistics as they viewed reverse logistics as a cost consuming process.

Reverse logistics is the movement of goods backwards from the customer to the supplier and this is the opposite of forward logistics which is the movement of goods from supplier to customer. There are several products/goods that have recently been reversed due to several factors (Enterprise products, Ford Kuga and medication) (Fin24, 2018; Benylin, 2015; Wheels24, 2017). There are different challenges that manufacturing pharmaceutical companies face when coming to reverse logistics. Challenges could vary from equipment, technology, transportation (costs) and disposing the products; amongst from others since this is medication. Since Manufacturing pharmaceutical companies deal with medicine and medicine cannot be refurbished or re-sold, they can only dispose it. The environmental policy's needs to be taken into consideration as medication can be harmful to the environment.

What triggered this research is mainly because this study is limited; especially in the Manufacturing pharmaceutical companies in the City of Tshwane (South Africa) and the researcher is based in the City of Tshwane where she would want to contribute in finding solutions towards the research problem.

The researcher used the quantitative approach to conduct the research with the guide of the research onion. Structured questions were used and sent to respondents using survey monkey (an instrument that allows the researcher to present different types of items to make the questionnaire design easy). The researcher had an option to choose between using probability and non-probability sampling. Non-probability sampling was used since the questions focused on the viewpoints and opinions of the employees involved. Validity and reliability were taken into consideration and ensured. The Stata V13 was used to analyse the data. Descriptive statistics and Cronbach's Alpha.

The findings from this research indicated the challenges being faced by the manufacturing pharmaceutical companies in the City of Tshwane. The Cronbach's Alpha was equals to 0.78 which is acceptable in research and suggests that there is internal consistency within the items. It is recommended by the researcher that further studies are conducted to refine this study and that the study be conducted in other countries and other industries.

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