

# Improving Firm's Innovation Performance through Transformation Leadership and Knowledge Sharing: the Moderating Role of absorptive Capacity. Case Study in Jordan

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**Abstract:** The goal of this research is to determine the impact of transformative leadership (TL) on innovation performance in terms of process and product innovation. It improves perceptions of paths to enhance certain characteristics of innovation performance by assessing the mediating function of knowledge sharing (KS) and the moderating effect of absorptive ability. Based on data obtained from 243 participants in Jordanian pharmaceutical enterprises, this study performs a questionnaire survey and uses Structural Equation Modeling (SEM) to evaluate hypotheses in the suggested research model. The research shows that TL is the primary driving factor behind the KS process and innovative results. The research addresses a large gap in the literature by focusing on how KS mediates the impact of TL on certain characteristics of innovative performance. The research greatly helps to developing the deeper understanding of the particular circumstances to increase the link between KS and innovative performance by examining the moderator of absorptive capacity.

**Keywords:** Transformational leadership; Knowledge sharing; Absorptive capacity; Product innovation; Process innovation; Innovation performance.

**Paper type:** Research paper

## 1 Introduction

The corporate world of today is fast-paced and ever-changing, highly complex, dense competition, more globalization, changes in information technology and systems, multiple customer desires and increased needs (Abualoush et al., 2018; Liao and Li, 2018). It leads to companies facing different challenges and many difficulties in the environment in which they operate (Obeidat et al., 2019). Organizations realize their need to make substantial and continuous adjustments in their implementation and administrative systems. In addition, organizations urged to reevaluate their internal environments in order to increase their position and competitive advantage through superior performance (Obeidat et al., 2017). One of the most recent subjects to get more attention from scholars, scientists, and business practitioners is innovation (Lei et al., 2019). Innovation has become a key and imperative for achieving organizational integrity, and brings the organization's competitiveness into a dynamic, fast-changing world

marked by growing globalization and competition (Cabrilo and Dahms, 2018; Natalicchio et al., 2018; Lei et al., 2021). Organizations must realize that innovation is the key to success (Lei et al., 2018) and it is the most important factor in making products capable of global competition, and trying to switch from imitation to innovative, and that the organization Innovators have higher profitability, better market value than others, and higher survival than their competitors (Al Thani and Obeidat, 2020).

In the literature, a number of factors have been identified that drive innovation, such as leadership styles (Cabrilo and Dahms, 2018), knowledge resources (Aljanabi, 2017), external knowledge and IT capability (Abualoush et al., 2022), thereby supporting firms' ability to deliver key organizational outcomes. (Usman Shehzad et al., 2022). In this regard, Nusair, (2012), Leadership is one of the most essential aspects and a potent source of impact on innovation performance, and they play a critical role in workplace organizational innovation, which is a vital tool

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for survival and addressing the complex dynamic nature of a competitive environment. (Cheung and Chi-Sum, 2011).

Types of leadership are multiple and different, but transformational leadership (TL) is the one that attracts the most attention possible (Hu et al., 2013), as TL is one of the most effective types and methods of leadership in the organization (Le et al., 2018; Phong and Son, 2020). In contrast, regarding knowledge sources, Usman Shehzad et al., (2022), discuss how external and internal processes, knowledge, and even information may be linked to help a company attain a competitive advantage by merging internal and external knowledge, as well as producing and combining new ideas. Assembling a complex mix of internal and external information to support a competitive advantage and company's innovative capabilities. As a reinforcing mechanism, the mix of internal and external sources of information configures the innovation capability that supports a certain innovation approach, whether it be process or product innovation. Building up complex combinations of external and internal information improves a company's capacity to innovate and gain a competitive advantage. knowledge sources and TL are important elements for innovation, however.

Understanding of the direct link between innovation performance and TL is still limited and incomplete. There are still empirical and theoretical gaps in the link between transformational leadership and innovation success that need to be investigated further (Afsar et al., 2019; Al Dari et al., 2018 ; Andreeva et al., 2017). As a result, the goal of this study is to look at the disparities in TL's effects on each facet of innovation performance in detail (process and product innovation), but also to get a better knowledge of the pathways that may be used to improve certain elements of innovative performance by evaluating the mediating function of KS and the moderating mechanism of Absorptive ability. The study topic is unique, exciting for many reasons.

with all these empirical evidence on the importance of these strategic organizational factors, TL, KS and absorptive capacity, these topics are rarely examined together, yet they foster and increase invention. The majority of research has concentrated on the link and interplay between innovation and leadership. (Nusair et al., 2012), and knowledge sharing (Masa'deh et al., 2016), absorptive capacity and Innovation (Dahiyat and Al-Zu'bi, 2012), but could not explore factors affecting innovation in a more holistic way. KS can have an important influence as a mediator between TL on innovation performance. The external acquired knowledge of the organization in the form of absorptive capacity can also play an important role as a mediator between KS and innovation performance. To fill up these research gaps, this study highlights the relevance of TL's function in innovation performance in terms of product and process innovation, as well as the controversy over KS's position as a mediator between innovation performance and TL, and explains the role of

absorptive capacity as an average between KS and innovation.

KS is concerned with transferring experiences and knowledge between workers and the organization (Wu, 2016), in addition to that, knowledge sharing is not the transfer of information between workers, but it does provide employees with assistance in assimilating information and mutual experiences to develop their work at the individual and group level (Saffar and Obeidat, 2020). KS is the key to creating an innovative organization (Choi et al., 2016). Wang et al. (2017) indicated that KS helps improve employee ability to produce new ideas and present innovative ideas, said that the success of knowledge sharing is dependent on individuals' desire to share knowledge. However, employees are frequently hesitant to share their fundamental knowledge for fear of losing ownership of knowledge, to overcome and solve these problems. Leadership is crucial; leaders can foster collaboration and openness. Employees are more likely to share more information, expertise, and essential resources, which is a crucial and necessary foundation for enhancing a company's ability to innovate. Accordingly, more research into the mediating function of information exchange between transformational leadership and specific components of innovation performance is critical in improving Jordanian companies' awareness of and ability to enliven innovation performance.

To fully understand under what condition the knowledge sharing –innovation performance link is more effective; this research examines the role of a moderator (Usmanova et al., 2020). Few scholars investigated the absorptive ability as a regulator of the relationship between information sharing and innovation performance (Liu et al., 2017), absorptive capacity has received increased attention from scientists and practitioners over long periods (Li et al., 2018) as it is considered a vital tool for the organization's ability to learn new things through experimenting with different methods and to make optimal use of it (Shrouf et al., 2018). The value and maintenance of competitive advantage through external knowledge management, so Organizations may improve their innovation performance by increasing their absorptive capacity, allowing them to compete more successfully (Liu et al., 2017). Thus, there is a necessity for more research on other boundary conditions impacting the knowledge sharing and innovation performance relationship.

This study aims to answer the following research problems in order to solve the theoretical gaps mentioned above:

RQ1. How different are the influences of TL and KS on product and process innovation?

RQ2. Does KS mediate TL's influence on product and process innovation?

RQ3. Does the absorptive capacity moderate the influence of KS on product and process innovation?

This study uses structural equations modeling (SEM) to analyze the association between latent

components based on data obtained from 243 participants in Jordanian pharmaceutical companies in order to address the aforementioned research objectives. The goal of this study is to present theoretical approaches on leadership and knowledge management, as well as practical consequences for improving organizations' innovative capacities.

## 2 Background and hypotheses development

### 2.1 Transformational leadership and innovation

TL is seen as leadership that exceeds offering incentives against desired performance, to developing and encouraging workers intellectually and creatively and transforming their own interests to be an essential part of the organization's vision (Sahu et al., 2018). The TL have capable to urge his followers to do more than expected (Balwant et al., 2019). According to Bass (1998, p.11): [ . . . ] the term "transformational leadership" refers to a leader's ability to inspire followers to think beyond their immediate self-interests [ . . . ] raises the maturity and ideals of the followers, as well as their worries for others' accomplishment, self-actualization, and well-being, as well as the organization's and society.

TL stand out because they are developing and intellectually encouraging and inspiring their people to look beyond their particular interests in order to create a personal vision for their company (Bass, 1985). They have the capacity to exhibit followers' talents, inspire, motivate, and urge them to open up to others, resulting in improved innovative performance (Al Dari et al., 2018; Sattayaraksa and Boon-itt, 2018).

According to Bass (1985), TL may be categorized into four categories, more specifically, that TL appear in four aspects of behavior, which is the idealized influence referred the leader's ability to gain confidence, admiration and respect for followers so that workers perceive the leader as their highest ideals. They follow and obey their desire to implement its decisions and demands (Akhavan Tabassi et al., 2014); individualized consideration, is one of the main features that gives leaders an opportunity to pay attention to individual followers, taking into account their strengths and weaknesses and being aware of the principle of inspirational motivation; inspirational motivation refers to the capacity of transformative leaders to use symbols to focus their efforts that generate in the followers or employees a love of challenge, and that these behaviors work and encourage the team spirit in the work and commitment to organizational goals, and motivational processes include continuous communication processes and cases of tolerance in cases of failure and this is an instrument of learning (Xie, 2020); intellectual stimulation is the leader's ability to motivate followers to make them accept the challenge, solve their problems in new ways, and teach them how to face the challenges and difficulties that need to be solved creatively and logical solutions (Afsar et al., 2014). TL is a characteristic of leadership that the

leader offers an innovative vision to subordinates and uses a powerful communication channel to present their own ideas, and he represents a role model for motivating subordinates to achieve the best levels of performance.

According to Arar and Abu Nasra (2019), TL is a key and important tool to facilitate innovation, as it works to encourage employees to show innovation at the highest levels, the impact of TL on followers is incentives, empowerment and the ideal impact, motivation and ethics, so that all of them influence creativity in a good and direct way (Nusair et al., 2012). TL are crucial in providing an environment conducive to the growth of interactions, relationships and social networks within and outside the organization and employees have the opportunity to experiment with new ideas and gain new expertise (Sayyadi, 2019; Sattayaraksa and Boon-itt, 2018, Nusair et al., 2012). In addition, all employees encourage commitment to innovation, and requirements for work paths are provided.

Therefore, the actions and behaviors of the TL are important in achieving and implementing the innovation strategy, because they create an environment in which workers feel comfortable, confident, admired, and respected towards leaders, and they have the motivation to exceed leaders' expectations. Therefore, the TL possesses the ability to excite followers and motivate them to improve and develop innovation (Prasad and Junni, (2016). These aspects or behaviors of TL make him able to support innovation through his ability to motivate members of the organization to creativity and innovation, it is through the ideal effect that the TL will have the ability to push and motivates people to embrace change and organizational innovation, as well as ensuring that transformational leaders have employee support in achieving organizational innovation (Le and lei, 2019; Prasad and Junni, 2016), Personal attention to TL and their support for the needs and requirements of their followers can strengthen their clout among their fans engagement in artistic endeavors. These leaders stimulate followers' intellectual thinking by continually suggesting and challenging their ideas and thinking, which eventually motivates followers to join in the creative process. These leaders have the capacity to connect organizational vision to individual objectives, as well as inspire and motivate their followers (Dwivedi et al., 2020).

Transformational leaders that employ inspiring motivation (IM) set lofty goals, provide a compelling vision for innovation, and state that the vision is attainable (Afsar et al., 2014) argued that TL create inspiration to follow them to show creative ideas and improve their ability to solve problems and increasing their ability in analysis, they always help employees in the pursuit of very difficult and challenging goals by changing the orientation or inclination of employees to the innovative perspective.

We suggest the following hypothesis as a result of this:

*H1. There is a positive effect of TL on product and process innovation.*

## 2.2 Knowledge sharing and innovation

In today's businesses, knowledge is one of the most precious assets (Alavi and Leidner, 2001). It is the blood that passes through the veins of the organization and the most important aspects for a company's survival in a fast-paced, competitive environment (Sita Nirmala et al., 2012; Obeidat et al., 2017), as managers begin to concentrate on comprehending how knowledge management processes relate to value creation and performance improvement (Hussinki et al., 2017), and that the importance of knowledge as a component of organizational assets is growing, since it has a favorable influence on acquiring a competitive edge and enhancing innovation, which leads to improved performance for the firm (Obeidat et al., 2017; Le and lei, 2017).

Knowledge sharing, according to Cohen and Leventhal (1990), is a vital aspect in an organization's capacity to adjust swiftly to change, innovate, and achieve competitive success. The capacity of members of an organization to communicate and incorporate current information, knowledge, and ideas, according to Han and Chen (2018), is critical to the establishment of organizational knowledge. Andreeva and Kianto (2011) discovered that information must be made communal - that is, it must be shared among the people of the organization - in order to positively contribute to the performance of innovation. Al-Sa'di et al. (2017) pointed out that KS or facilitating the exchange of information, skills, knowledge, and experiences among workers, will lead to creating new models of knowledge. In addition, KS reduces the time and effort, which employee needs to collect information and knowledge, leads to utilizing the organizational resources to support innovation. It is anticipated that, based on these hypotheses:

*H2. There is a positive effect of knowledge sharing on product and process innovation.*

## 2.3 The absorptive capacity and innovation performance

Knowledge is viewed as one of the organization's strategic resources in the knowledge-based approach. Therefore, the competitive advantage depends on the absorptive, integrational, and upgradeable ability of organizations. The absorptive capacity, according to Cohen and Levinthal (1990), is "the ability to identify, understand, and apply informational values on the commercial purposes" in the organization. The absorptive value is classified into two categories: realized absorptive capacity, and potential absorptive capacity. The potential absorptive capacity, according to Zahra and George (2002) is represented in acquiring knowledge and the abilities to absorb it (acquisition and assimilation). The capacity of a firm to recognize and attract important information from outside the organization, or the attitude that is employed to acquire external information, is referred to as acquisition. Assimilation is the process that is used by the company to

interpret and understand the acquired knowledge from outside, which helps in the effective sharing of the intellectual resources at the right time (Andersén, 2015). It is expressed in the transformation and exploitation as realized absorptive ability of the organization's ability to develop the processes or enhance the procedures, which facilitate the collecting process among the current knowledge of the organization and the acquired knowledge from outside. Knowledge Exploitation means "to refine, extend, and leverage existing competencies" in the form of existing knowledge stock (Zahra and George, 2002).

The absorptive capacity of an organization is a fundamental indicator of its ability to acquire, absorb, convert, and use new external information (Ahimbisibwe et al., 2016), also, using knowledge from outside the organization is crucial to achieving innovation. Moreover, the absorptive capacity reduces the ability for firms to reorganize their resources bases and adapt dynamically to the constant, changing circumstances of the market in order to achieve better performance. The absorptive capacity is linked to education, skill acquisition, and knowledge transmission (Ramachandran, 2018). These processes improve the company's capacity to tap into external information sources, adapt to environmental changes, increase innovation, and respond to client wants. Furthermore, the process of innovation usually depends on external information sources (Cohen and Levinthal, 1990). The absorptive capacity does not enable firms to exploit new knowledge, but it enables them to accurately anticipate the nature of future technological development. As a result, present investments in absorptive capacity will reap future innovative advantages. In general, recent empirical studies have backed up the assumption that absorptive capacity is important, specifically, is linked with the innovational ability and performance (Ramachandran, 2018). Thereby, the organizations which have a lower absorptive capacity are bound to absorb and market new knowledge, which prevents them from achieving the desired innovation. With regard to knowledge acquisition in particular, the board range of external knowledge is connected with the performance of positive innovation (Ahimbisibwe et al., 2016).

This helps the firms in developing new collections of beneficial knowledge in order to be creative, which widens the collection of the available solutions to solve the challenges of innovation, which are endemic in the firm. In addition, companies that are looking forward to innovation on a wide range may earn more knowledge and technological abilities (Ali et al., 2018; Aljanabi, 2017). Innovation depends heavily on the effective use of acquired knowledge. When it is shared, integrated, and used by the organizational education, the knowledge, which is acquired externally, can be transformed into new products, technologies, and services to address the requirements of customers and to enhance the performance of businesses in terms of innovation. The strong connection in the network, the exchanged trust, and the solidarity between



organizations and companies could be positive for the organizational education, sharing knowledge, and promoting the innovational activities and the abilities (Muraliraj, 2020). As a result, the following hypothesis is proposed:

*H3. There is a positive effect of absorptive capacity on product and process innovation.*

## *2.4 Transformational leadership, knowledge sharing, and innovation performance*

In the rapidly changing business world, innovation becomes the mainstay for each company (Alrowwad et al., 2020). The world's economic growth nature has been changed because of the rapid innovation, which becomes possible due to the rapid, advanced technology, the short lifecycle for products, and the increase of advanced products (Obeidat et al., 2018). To gain and sustain a competitive edge, organizations must guarantee that their business plans are creative. However, because of shifting consumer wants, intense competitive pressure, and quick technical advances, innovation becomes more complicated (du Plessis, 2007). TL play an important role in creating an environment to develop the interactions, the social networks and relationships inside and outside the organization, and the ability for employees to experiment with knowledge and even fresh ideas (Sayyadi, 2019). One of the highest-ranking leadership patterns, TL, is well-known. Leaders who have the ability to inspire workers to reach the highest level of achievements and results, motivate the employers to fulfill targets beyond the expectations, convince the staff to pass self-interest to the public facilities of the organization, work as a major power for the firm, encourage the development of new skills among employees and the continuous search for new job opportunities for the company to develop the firm (Sattayaraksa and Boon-itt, 2018).

Balwant et al. (2019) indicate that TL greatly impacts the knowledge capital of the organization and the major results. As a result, examining the impacts of TL on certain forms of KS has a significant impact on researchers and practitioners in terms of identifying specific circumstances for enhancing KS behaviors among company employees. The KS process contributes significantly to the firm's knowledge capital. However, it does not occur at random; current research shows that this process occurs only in certain circumstances or at a given time, which has impacts and supports the leadership. These impacts are extremely important in determining the amount and intensity of the staff's willingness to share their expertise (Cabrilo and Dahms, 2018).

Furthermore, the presence of TL is critical in growing and improving human capital, as well as winning followers' respect and trust, in order to foster a favorable environment conducive to knowledge exchange. Also, the TL always affects the behaviors of the staff towards sharing the knowledge after they had felt justice and trust in their leadership. TL is widely regarded as one of the most

effective leadership methods for promoting knowledge sharing (Al Dari et al., 2018).

Employees proactively exchange and acquire knowledge with their colleagues for innovation, according to Le and Lei (2019). Also, under the transformational leadership of their leaders, people are becoming more inventive and willing to share their expertise and experience. According to Cheung and Chi-Sum (2011), "TL creates a supportive working climate and provides adequate resources to facilitate KS activities among employees". Lei et al. (2021) have recently published the data on the mediating effect of KS between TL and particular features of company competence of frugal innovation. Therefore, the following hypothesis is formulated:

*H4. KS mediates the effects of TL on innovation process (or on product and process innovation).*

## *2.5 Knowledge sharing, absorptive capacity, and innovation performance.*

KS is seen as a valuable contribution to innovation. One of the most important advantages of KS is innovation through helping or pushing businesses to share their ideas and making the market more understandable. In an organization that shares tacit information and transforms it into explicit knowledge, knowledge exchange and innovation are encouraged. In addition, KS has the ability for developing knowledge inside the individual organization (Han and Chen, 2018). KS is seen as a social exchange that increases the total amount of knowledge produces innovations, and improve innovational performance (Ritala et al., 2018). Moreover, KS inside the facility positively affects the abilities of innovation, and the ability of organizational innovation can affect positively on the performance of the organizational innovation (Lei et al., 2019). Han and Chen (2018) mentioned that KS impacts positively on the performance of innovation, and the organizations must attach great importance to knowledge-sharing. Many researchers also indicate that the organization that facilitates KS practices inside the team or inside the entire institution which tends to generate new ideas to introduce new work opportunities, thereby, enhancing innovation and improving the performance of innovation (Lei et al., 2019; Obeidat et al., 2017). Furthermore, firms that possess strong KS abilities are able to build a good reputation in the commercial business.

This kind of reputation aids businesses in forming more prospective commercial alliances and fostering innovation. The importance of focusing on the function of knowledge and spreading it across organizational lines cannot be overstated (Ritala et al., 2018). External relationships have been determined to have the biggest influence on creativity, according to our findings (Ritala et al., 2018). If the firm does not have the potentials for KS, it may only be able to reach the entire range of desired innovation outcomes since the firm may lose the potential

to exchange external information, and its own expertise may go underutilized (Santoro et al., 2017).

Moreover, KS helps companies develop better innovative performance and build competitive strength within the industry. Therefore, companies develop competitive advantages by exploiting and exploring knowledge within and outside the boundaries of the company (Campanella et al., 2017; Santoro et al., 2017). On the one hand, internal departments and staff are being put under pressure to create new goods and discover new

ways to suit consumer demands (Vrontis et al., 2019). Internal departments and personnel, on the other hand, struggle to locate information offered externally by customers, not only through consumer interaction strategies, but also through other market-based sources like suppliers and distributors, as well as scientific partners like universities (Dahiyat et al., 2012). Therefore, the hypothesis is developed as follows:

H5. Absorptive capacity positively moderates the effects of KS on innovation performance (or on product and

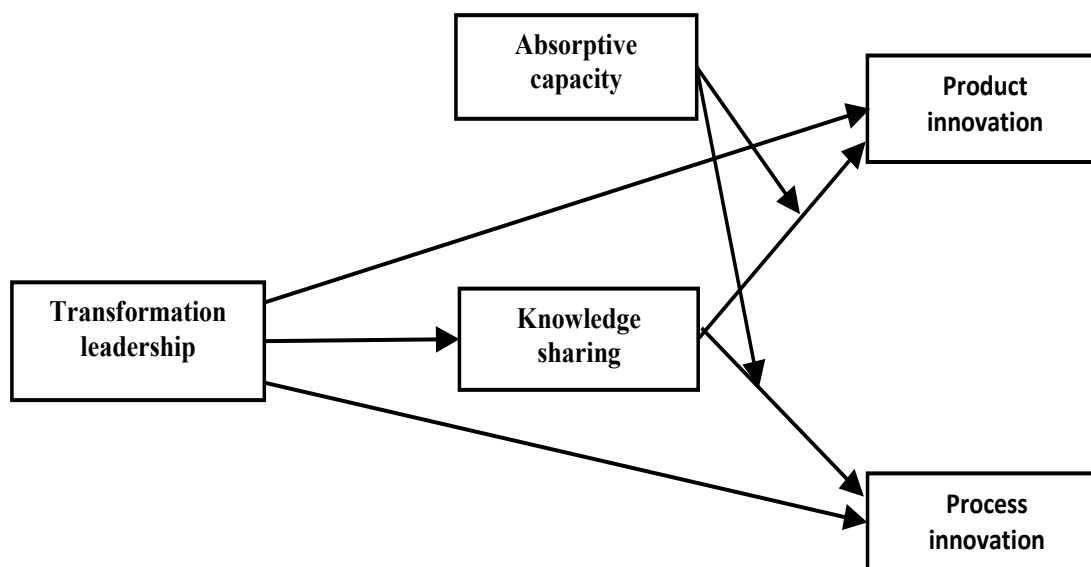


Fig. 1: Research model.

### 3 Research Methodologies

#### 3.1 Sample and data Collection

The data collecting tool employed in this study was survey questionnaire. Seven academics were invited to assess the instrument before the survey was conducted (questionnaire). They were lecturers from Jordanian universities' departments of business administration and management information systems, while the others were lecturers in leadership, knowledge resources, and innovation. As a result of the review, language usage, content, and vagueness of questions were identified as problems. After the review, several enhancements were implemented. These changes were in accordance with the recommendations made by these lecturers. As part of a pilot study, ten managers of the pharmaceutical industries in Jordan, especially human resource managers, were provided with eight sets of revised questionnaires. Based on feedback from the pilot study, several more modifications were made to the questionnaire, especially the items. Participants in the study included all Jordanian

pharmaceutical companies, of which there are 18 companies, registered under the Jordanian Association of Pharmaceutical Industries. For this reason, it is easy to collect data from those companies as the Jordanian Association of Pharmaceutical Industries Sector is considered an authority to that can be referred in relation to those companies, but there are 7 companies that agreed to conduct the study and distribute the questionnaires to them. The inspection and analysis unit that the study targeted consisted of directors of departments at various administrative levels in those companies, and the reason for choosing managers of administrations, especially the higher management, is that they are responsible for translating the general policy that he sets, which companies define them into strategic plans and carry out transformational leadership practices where they have the ability to demonstrate the capabilities of the followers and motivate them to open up to others, thus facilitating innovation in a better way. A simple random sample was chosen from the study population, where the number of questionnaires distributed was 316 questionnaires over the study sample. A total of 257 questionnaires were retrieved from them, and 14 questionnaires were excluded because of their lack of

validity due to the incompleteness of the respondents. Consequently, the number of questionnaires suitable for analysis became 243, at a rate of (.813%).

In order to obtain reliable and valid results, we determined the sample size of this study based on the guidelines for using SEM in AMOS 21. Kline (2010) recommends a sample size of 200 or more when modeling a complicated path. Although we eliminated incomplete surveys, the number of employees that met the guidelines of Kline (2010), Krejcie and Morgan (1970), and Pallant (2005). The sex distribution of 187 respondents explains 77% of the respondents were males and the remaining 23% were females. 15.2% of the respondents are postgraduate students, based on their level of education. See Table 1 for demographic information about the respondents.

### 3.2 Variable measurement

A survey questionnaire served as the primary data gathering tool for this study, as shown above. The questionnaire has two sections: the first section includes questions regarding respondents' demographic information, such as their gender, education level, position, and years of experience, and the second includes items measuring the following variables: transformational leadership and innovation (process and product); and knowledge sharing and absorptive capacity. For the study to be valid and reliable, items from earlier studies were used to measure the variables. In order to measure all constructs, multiple items were used, and all items were measured using a 5-point Likert scale (1-strongly disagree, 5-strongly agree). *Transformational leadership*. The seven items measuring *transformational leadership* were adapted from previous studies (e.g. Alrowwad et al., 2020; Jia et al.,

2018). Example items are "Our leader encourages us to make efforts towards fulfilling the company vision"

*Knowledge sharing*. We used 8 items adapted from the study of (Chiu et al., 2018; Jamshed and Majeed, 2019) to measure the actions of KS among employees. Example items are "I am usually willing to share my knowledge and experience with others", and "I share my job experience with my coworkers".

*Absorptive capacity*. It is represented by two dimensions namely potential, and realized absorptive capacity, was measured using 10 items. The 5 items measuring *potential absorptive capacity* were adapted from (Wu et al 2019; Chaudhary, 2019), example items are "As part of our business network, we interact frequently with companies to gain new knowledge" while the 5 items measuring *realized absorptive capacity* were adapted from (Wu et al., 2019, Chaudhary, 2019). Example items are "We quickly recognize the usefulness of new external knowledge to existing knowledge" and "We record and store newly acquired knowledge for future reference".

*Innovation performance*. The construct of innovation performance is represented by two dimensions namely process innovation, and product innovation, was measured using 10 items.. The 5 items measuring process innovation were adapted from (Abdul Basit and Medase, 2019). Example items are "The firm introduced new or significantly improved operational processes in the last three years", while the 5 items measuring product innovation were adapted from (Liao et al., 2018; Sattayaraksa and Boon-itt, 2018 ). Example items are "We can introduce a high number of new products into production each year" and "We have capability to design an extensive variety of new products".

**Table 1:** Description of the respondents' demographic profiles.

| Category         |                       | Frequency | Percentage% |
|------------------|-----------------------|-----------|-------------|
| Gender           | Male                  | 187       | 77,0        |
|                  | Female                | 56        | 23,0        |
|                  | Total                 | 243       | 100         |
| Education level  | Bachelor              | 206       | 84.8        |
|                  | Master                | 30        | 12.3        |
|                  | Ph.d                  | 7         | 2.90        |
|                  | Total                 | 243       | 100         |
| Management level | Top management        | 70        | 28.8        |
|                  | Middle management     | 167       | 68.7        |
|                  | Low management        | 6         | 2.50        |
|                  | Total                 | 243       | 100         |
| Experience       | Less than 5 years     | 58        | 23.9        |
|                  | 5- less than 10 years | 104       | 42.8        |
|                  | 10-less than 15 years | 52        | 9.40        |
|                  | 15 years and above    | 29        | 11.9        |
|                  | Total                 | 243       | 100         |

### 3.3 Descriptive Analysis

In order to understand the responses and then the attitude of the respondents based on the questions, we calculated the standard deviation and the mean. As opposed to the mean, which indicates the central tendency of the data, the standard deviation offers information on how widely dispersed the data are (Pallant, 2005; Sekaran and Bougie, 2013). The Likert scale levels of each item were calculated using the formula: (highest point on the Likert scale - lowest point on the Likert scale) / 5 = 0.80, where 1-1.80 represents "very low", 1.81-2.60 represents "low", 2.61-3.40 represents "moderate", 3.41-4.20 represents "high", and 4.21-5 represents "very high". The items were then ordered on the basis of their means. The results are shown in Table 2.

Confirmatory factor analysis (CFA) was conducted to confirm the instrument items' properties. Indeed, the measurement model recognizes the relationship between

### 3.4 Measurement Model

latent variables and observed variables; thereby providing validation and reliability for the observed variables responses to the latent variables (Bagozzi and Yi, 1988; Hair et al., 2006). As shown in Table 3, this study assessed its first specified model with different types of goodness of fit indices. The chi-square analysis showed that the model had a chi-square ( $\chi^2$ ) value of 1289.091, which implies good fit to the data ( $p < 0.05$ ). As other fit indices, we used the  $\chi^2/df$  ( $1289.091/675 = 1.909$ ; threshold below 3 is serious or below 5 is appropriate), Incremental Fit Index (IFI) of 0.91, Tucker-Lewis Index (TLI) of 0.87, CFI of 0.92, GFI of 0.856, the (AGFI) of 0.864, the (NFI) of 0.914, the (RMSEA) of 0.063, and (SRMR) of 0.054. Fit indices suggest that the measurement model did an adequate job fitting the sample data (Newkirk and Lederer, 2006; Hair et al., 2010; and Kline, 2010).

**Table 2:** The mean and standard deviation of the variables of the study.

| Transformational Leader (TL)        | Mean | SD    |
|-------------------------------------|------|-------|
| TL1                                 | 3.65 | 1.01  |
| TL2                                 | 3.14 | 1.321 |
| TL3                                 | 2.87 | 1.123 |
| TL4                                 | 3.30 | 1.022 |
| TL5                                 | 4.12 | 1.025 |
| TL6                                 | 3.81 | 0.943 |
| TL7                                 | 3.44 | 1.142 |
| Knowledge sharing (KS)              | Mean | SD    |
| KS1                                 | 2.53 | 0.975 |
| KS2                                 | 3.47 | 1.274 |
| KS3                                 | 3.67 | 1.336 |
| KS4                                 | 3.64 | 0.835 |
| KS5                                 | 3.76 | 0.886 |
| KS6                                 | 3.78 | 0.975 |
| KS7                                 | 3.63 | 0.819 |
| KS8                                 | 3.72 | 1.041 |
| Realized absorptive capacity (RAC)  | Mean | SD    |
| RAC1                                | 3.02 | 0.943 |
| RAC2                                | 3.35 | 0.919 |
| RAC3                                | 3.47 | 1.008 |
| RAC4                                | 3.61 | 0.824 |
| RAC5                                | 3.76 | 0.812 |
| Potential absorptive capacity (PAC) | Mean | SD    |
| PAC1                                | 3.78 | 0.745 |
| PAC2                                | 3.74 | 0.616 |
| PAC3                                | 3.87 | 0.803 |



|                    |      |       |
|--------------------|------|-------|
| PAC4               | 3.35 | 0.778 |
| PAC5               | 4.14 | 0.712 |
| Process innovation | Mean | SD    |
| PCI1               | 3.33 | 0.517 |
| PCI2               | 3.39 | 0.923 |
| PCI3               | 3.43 | 0.824 |
| PCI4               | 3.55 | 1.054 |
| PCI 5              | 3.79 | 0.778 |
| Product innovation | Mean | SD    |
| PDI1               | 4.03 | 0.413 |
| PDI2               | 3.83 | 0.687 |
| PDI3               | 3.75 | 0.846 |
| PDI4               | 3.84 | 0.782 |
| PDI5               | 3.93 | 0.827 |

**Table 3:** Measurement model fit indices.

| Model       | $\chi^2$ | Df  | P     | $\chi^2/df$ | IFI  | TLI  | CFI  | GFI  | AGFI | RMS EA |
|-------------|----------|-----|-------|-------------|------|------|------|------|------|--------|
| Final model | 1286.091 | 656 | 0.000 | 1.908       | 0.92 | 0.84 | 0.92 | 0.86 | 0.92 | 0.061  |

In table 4 are presented the factor loadings, Cronbach's alpha, the composite reliability, and the (AVE) for all variables. Indicators of the factor loadings all exceeded 0.50, thus demonstrating convergence (Bagozzi and Yi, 1988; Creswell, 2009). The measurement proved to be convergent at the item level, since all of the factor loadings increased to above 0.50, while all of the coefficients of determination exceeded 0.60, providing strong evidence of the latent variables' internal consistency.

Moreover, since (AVE) exceeded 0.50 in each case (Bagozzi and Yi, 1988; Hair et al., 2006), there was evidence of convergent validity.

Also, as noticed from Table 5, all of the intercorrelations between pairs of constructs were less than the square root of the AVE estimates of the two constructs, providing discriminant validity (Hair et al., 2006). Consequently, the measurement results indicating that this study had adequate levels of convergent and discriminant validity.

**Table 4:** The factor loadings, Cronbach alpha, composite reliability, and AVE.

| Constructs and Indicators    | Factor Loadings | Cronbach Alpha | CR*  | AVE** |
|------------------------------|-----------------|----------------|------|-------|
| Transformational Leader (TL) |                 | 0.886          | 0.92 | 0.47  |
| TL1                          | 0.854           |                |      |       |
| TL2                          | 0.835           |                |      |       |
| TL3                          | 0.813           |                |      |       |
| TL4                          | 0.855           |                |      |       |
| TL5                          | 0.876           |                |      |       |
| TL6                          | 0.852           |                |      |       |
| TL7                          | 0.802           |                |      |       |
| Knowledge sharing            |                 | 0.876          | 0.94 | 0.79  |
| KS1                          | 0.856           |                |      |       |
| KS2                          | 0.912           |                |      |       |
| KS3                          | 0.874           |                |      |       |
| KS4                          | 0.865           |                |      |       |
| KS5                          | 0.876           |                |      |       |
| KS6                          | 0.821           |                |      |       |

|                                      |              |              |             |             |
|--------------------------------------|--------------|--------------|-------------|-------------|
| <i>S7</i>                            | <i>0.864</i> |              |             |             |
| <i>Potential absorptive capacity</i> |              | <i>0.793</i> | <i>0.91</i> | <i>0.82</i> |
| <i>PAC1</i>                          | <i>0.843</i> |              |             |             |
| <i>PAC2</i>                          | <i>0.895</i> |              |             |             |
| <i>PAC3</i>                          | <i>0.813</i> |              |             |             |
| <i>PAC4</i>                          | <i>0.912</i> |              |             |             |
| <i>PAC5</i>                          | <i>0.823</i> |              |             |             |
| <i>Realized absorptive capacity</i>  |              | <i>0.768</i> | <i>0.89</i> | <i>0.82</i> |
| <i>RAC1</i>                          | <i>0.831</i> |              |             |             |
| <i>RAC2</i>                          | <i>0.810</i> |              |             |             |
| <i>RAC3</i>                          | <i>0.748</i> |              |             |             |
| <i>RAC4</i>                          | <i>0.901</i> |              |             |             |
| <i>RAC5</i>                          | <i>0.872</i> |              |             |             |
| <i>Product innovation</i>            |              | <i>0.814</i> | <i>0.88</i> | <i>0.84</i> |
| <i>PDI1</i>                          | <i>0.891</i> |              |             |             |
| <i>PDI2</i>                          | <i>0.840</i> |              |             |             |
| <i>PDI3</i>                          | <i>0.855</i> |              |             |             |
| <i>PDI4</i>                          | <i>0.840</i> |              |             |             |
| <i>PDI5</i>                          | <i>0.898</i> |              |             |             |
| <i>Process innovation</i>            |              | <i>0.832</i> | <i>0.91</i> | <i>0.82</i> |
| <i>PCI1</i>                          | <i>0.768</i> |              |             |             |
| <i>PCI2</i>                          | <i>0.736</i> |              |             |             |
| <i>PCI3</i>                          | <i>0.855</i> |              |             |             |
| <i>PCI4</i>                          | <i>0.898</i> |              |             |             |
| <i>PCI5</i>                          | <i>0.905</i> |              |             |             |

**Table 5:** AVE and square of correlations between constructs.

| Constructs | TL          | KS          | PAC         | RAC         | PDI         | PCI         |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| TL         | <b>0.78</b> |             |             |             |             |             |
| KS         | 0.54        | <b>0.76</b> |             |             |             |             |
| PAC        | 0.56        | 0.52        | <b>0.77</b> |             |             |             |
| RAC        | 0.55        | 0.51        | 0.43        | <b>0.79</b> |             |             |
| PDI        | 0.53        | 0.46        | 0.46        | 0.53        | <b>0.78</b> |             |
| PCI        | 0.54        | 0.52        | 0.44        | 0.43        | 0.54        | <b>0.81</b> |

**Notes:** Diagonal elements (in bold) are the square root of the AVE.

## 4 Hypothesis testing results

The process described by Baron and Kenny (1986) was applied to test the research hypothesis. “Four separate regression analysis is required for this approach to identify the existence of a mediation impact. The independent variable must predict the dependent variable in the first regression model. The independent variable must predict the mediator in the second regression model. The mediator should predict the dependent variable in the third regression model. And finally, both the independent variable and the mediator must be entered simultaneously to predict the dependent variable in the fourth regression model. Full mediation effect exists if the effect of the independent variable on the dependent variable while maintaining the

mediator lowers to zero”. In the first regression model, transformational leadership (the independent variable) was significantly related to innovation (the dependent variable) as shown in Table 6 ( $\beta = 0.511$ ;  $p < 0.001$ ).

H1 was therefore supported. In the second regression model, TLs was significantly correlated with KS, which supports H2 ( $\beta = 0.427$ ,  $p < 0.001$ ). , KS was significantly associated with innovation, supporting H3 ( $\beta = 0.459$ ;  $p < 0.001$ ). Also, KS and innovation were significantly related ( $\beta = 0.511$ ;  $p < 0.001$ ). It was found that absorptive capacity correlated significantly with innovation ( $\beta = 0.432$   $P < 0.001$ ).

**Table 6:** Hypothesis testing results.

| Variables           | Innovation | KS       | Product innovation | Process innovation |
|---------------------|------------|----------|--------------------|--------------------|
| Constant            | 2.434***   | 2.745*** | 2.856***           | 2.521***           |
| TL                  | 0.511***   | 0.432*** |                    | 0.335***           |
| KS                  |            |          | 0.427***           | 0.274***           |
| R                   | 0.522      | 0.465    | 0.462              | 0.536              |
| R2                  | 0.427      | 0.447    | .454               | .456               |
| Adjust R2           | 0.421      | 0.439    | 0.441              | 0.432              |
| f- value            | 67.652     | 71.245   | 66.765             | 65.541             |
| Variables           | Innovation | ACAP     | Product innovation | Process innovation |
| KS                  | 0.496***   | 0.447*** |                    | 0.345***           |
| Absorptive capacity |            |          | 0.437***           | 0.274***           |
| R                   | 0.551      | 0.430    | 0.462              | 0.536              |
| R2                  | 0.416      | 0.432    | .4390              | .456               |
| Adjust R2           | 0.401      | 0.426    | 0.423              | 0.444              |
| f- value            | 64.612     | 76.239   | 71.261             | 61.241             |

**Table 7:** provides summary of the tested hypotheses.

| Hypotheses | Path         | Effect                              | Result    |
|------------|--------------|-------------------------------------|-----------|
| H1         | TL- INN      | 0.511***                            | Supported |
| H2         | KS-INN       | 0.427***                            | Supported |
| H3         | ACAP- INN    | 0.437***                            | Supported |
| H4         | TL-KS-INN    | 0.188 ***( <i>indirect effect</i> ) | Supported |
| H5         | KS-ACAP- INN | 0.195 ***( <i>indirect effect</i> ) | Supported |

Notes: \*\*\* $p < 0.001$ 

As it appears in Table 6, the direct effect of TLs on innovation in the first regression model ( $\beta = 0.511$ ;  $p < 0.001$ ) was reduced in the fourth regression model, but still significant ( $\beta = 0.335$ ;  $p < 0.001$ ) implying that only partial mediation effect may exist. To calculate the indirect effect according to the (Sobel 1982) regression coefficient obtained from regressing the mediator to predict the dependent variable ( $\beta = 0.427$ ) should be multiplied by the regression coefficient obtained from regressing the TLs to predict TL the mediator ( $\beta = 0.432$ ). Thus, the indirect effect of TLs on innovation through knowledge sharing =  $0.432 * 0.427 = 0.188$ . Also, the indirect effect of knowledge sharing on innovation through absorptive capacity =  $0.447 * 0.437 = 0.195$ . In order to ensure that the indirect effect is significant, it is recommended

## 5 Discussions and Implications

The purpose of this paper is to discuss the impact of TLs on improving innovation capability, and the mediating influence of KS under the moderating role of absorptive capacity. Accordingly, a conceptual model based on TL, KS, absorptive capacity, and innovation literature, is developed. To achieve the study's goals, We developed and tested five hypotheses using regression analysis (SEM) on the sample, which consists of seven pharmaceutical companies in Jordan. The study indicates that TLs is positively correlated with innovation capability. Through TLs, employees can be motivated to be more innovative and introduce new ideas to develop the company's products and services. This is consistent with previous studies

showing that TLs has a positive impact on an organization. Given that TLs has an influence on the different aspects of performance such as innovation, creativity, high performance, and career satisfaction (Afsar et al., 2019). In addition, the study shows that there is a direct impact on KS and innovation, which supports (H2) theory. KS is seen as a valuable contribution to innovation, and this corresponds with the study (Li et al., 2019), so KS helps in teaching and gaining new information of knowledge. This is fundamental to generate innovative ideas. Al-Sa'di et al. (2017) ensures that KS helps the employees getting more comprehensive information and knowledge, choosing valuable knowledge and introducing it, facilitating innovation. A positive relationship between absorptive capacity and innovation was found in the third hypothesis (H3), which is in line with previous research. Salas-Vallina et al. (2020) see in the business, complex environment that knowledge is an important source and major key for the competitive advantage. To ensure growth and development, companies have to define, absorb, and apply the value of new external information, so their products or services become innovative. In addition, it corresponds with the study of (Ali et al., 2018), as he indicates that the absorptive capacity helps the integration of externally acquired knowledge and current knowledge inside the organization. Thereby, it enhances innovation. In other words, there must be the ability to collect external and internal knowledge.

Then we had studied the moderating effect of KS between TLs and innovation capability. The results of the study show that knowledge-sharing practices and basis help the staff introducing innovative products and services under transformational leadership, and this corresponds with Al Dari et al.'s (2018) study. Innovation initiatives are generated inside the organization by knowledge-sharing process, experience, and proficiency. Additionally, the ability of the firm to acquire, share, and apply knowledge determines how innovative it is, i.e. innovating the process of products. Although it does not happen randomly, this process only appears in specific circumstances or occasions in which it includes effects that are very crucial on the extent and intensity of the staff towards sharing the knowledge.

Finally, The study found that absorptive capacity partially mediates the relationship between KS and innovation. Absorptive capacity is seen as a key source of competitive advantage when it comes to innovation, and thereby the ability of the organization to exploit external knowledge is an effective element in innovative abilities. This corresponds with (Liu et al., 2017), which explores the mediating role of absorptive ability in the relationship between knowledge-sharing and the performance of innovation. Also, it showed knowledge acquisition is the ability of companies to define and share external knowledge, which helps commercial procedures. Acquiring Knowledge is a major part of knowledge-sharing between employees and an important guarantee for knowledge-

sharing practice, which can improve the performance of organizational innovation. Absorbing knowledge is the ability of organizations to analyze, process, and understand external information. Transforming knowledge is the ability of companies to recollect current knowledge inside the organization with the acquired knowledge to get new knowledge. In addition, the knowledge-sharing and knowledge transfer process enable companies to generate new ideas, define new opportunities, explain development prospects, and improve the performance of innovation. If the purpose is to promote the growth of the company, external knowledge must be applied by sharing the experiences, activities, and processes to promote innovative practice. Therefore, applying the knowledge is the key to a quantum leap for the accumulation of knowledge that enhances the development of innovation performance.

### 5.1 Theoretical Implications

This paper introduces many contributions in the hypotheses of transformational leadership, KS, absorptive capacity, and innovation.

First, the theoretical contribution of this study includes developing an integrated model for strategic, organizational factors and exploring effective modern tracks that enhance innovation abilities. Moreover, if we focus on the previous works of many studies, we will find that transformational leadership is a crucial factor in encouraging knowledge-sharing and innovation. Yet it has received just a little research attention (Li et al., 2018; Abualoush et al., 2018). To fill the research gaps, the study provided an integrated model to link transformational leadership with the presence of two important intermediate variables focused on the intangible assets of the organization, which shares knowledge and absorptive capacity. With innovation abilities, the empirical results verify the important effects of transformational leadership on knowledge-sharing and innovation abilities. The study indicates that leadership practice may provide organizations with not only a suitable climate to stimulate knowledge sharing among employees but a crucial determiner of innovation.

Second, this paper completes the previous empirical evidence by verifying that transformational leadership is a critical factor in encouraging KS among employees. The main reason behind this is that transformational leadership creates an atmosphere of positivity towards employees' trust and cooperation and helps improve interactions and increase commitment among employees to share knowledge. This study also demonstrates that transformational leadership is an important and crucial determinant of innovation practice and encouraging leaders to engage in transformational leadership practices to promote innovation. TL appears in times of change and distress. TL pattern appears when leaders increasingly care about their employees, create awareness of duties and tasks for teams or groups, and provide incentives for employees to uphold work over



personal interests. These things were accomplished in a number of ways: motivating intellectual employees, creating innovative and logical solutions to problems, and emphasizing that difficulties can turn into problems that can be solved.

Li et al. (2018) found that knowledge is an important resource for organizations of today. Along with human resources and capital, it became an important factor for production. Moreover, it is the main driver for economic growth, as well as a motivator for technological advancement and improved production. Innovation is created by knowledge, then transformed into processes and products to maintain competitive advantage. It was not the purpose of the study to fully understand the important relationship between KS and knowledge management, but only to investigate the important role of KS as an intermediary, between the TL, process, and product innovation, to fully understand the role of knowledge capital in the ability of organizations to innovate, companies are required to assess the mediating mechanisms between knowledge management, its processes, and various components that influence transformational leadership and innovation. Thus, the current study linked TL to process and product innovation while KS served as a mediating factor and absorption capacity served as a medium, interacting positively with two of the core aspects of innovation capacity (product innovation and process innovation). KS acts as an effective mediator between TL and two specific aspects of innovation ability. In addition, this study finds that absorption capacity has relatively little impact on external knowledge sharing, but it serves as an intermediary between KS and the performance of organizational innovation. Companies gain more external knowledge through their potential absorption capacity, and taking advantage of that absorption capacity means that external knowledge can be transformed and efficiently exploited while sharing or combining it with the existing organizational knowledge.

### 5.2 Managerial Implications

This study also has important implications for management. For organizations to promote knowledge-sharing, leadership development programs are essential. Training managers in transformational leadership can be of great benefit to organizations, increasing employee confidence and resulting in increased knowledge sharing between employees (Yen et al., 2019). Therefore, organizations have to pay more attention to the entire process of leadership training, including training preparation, training implementation, training evaluation, and feedback to provide the leaders of the organization with adequate skills to provide an appropriate environment that is collectively capable of sharing useful knowledge. Leadership technique in the organization is a vital and effective part of innovation, in which it supports each of the transformational leadership and innovation inside the organizations by defining short and long term strategic goals, internal and external incentives, and empowering

employees and taking care of them. In addition, organizations must have in mind that the efficiency and effectiveness of transformational leadership in the organization vary depending on the external environment, in which they work. Transformational leadership is successful in a dynamic work environment because it argues its human capital to be more flexible and to think differently. Organizations have to carry out the practices of transformational leadership in order to improve and encourage innovation for employees and followers. Therefore, transformational leadership is a tool to improve the creative skills of employees and thus develop effective solutions to their problems. The innovation of employees can be facilitated and encouraged by creating and improving the organizational environment, by saving time and providing adequate resources, incentives, and rewards for creativity and innovation. Companies have to dedicate themselves and care about innovation performance. Also, Companies have to organize or share formal and informal activities, which are narrow, repetitive, and prominent in the subject, create good interaction and cooperative relationships, promote the effective flow of knowledge inside the network, and achieve a high level of performance for collaborative innovation. The findings also reveal that in order to level up the innovation performance, companies have to raise building absorptive capacity to a high strategic level, establish an internal system for knowledge management, organize various formal and informal knowledge and exchanging of information activities e.g. sharing of information, the competition of information and so on. They may also create a good atmosphere for learning and collaboration inside companies, so that it could be the employee's ability to acquire, adapt, absorb, and apply knowledge and the innovative ability to develop a new product.

### 5.3 Limitation

Although this research paper provides an addendum and a scientific contribution, it adheres to some restrictions like other previous researches. Due to a large number of Jordanian drug companies in Jordan and based on the approval of a few of them to participate in the current study, we are not able to generalize the results of our research. Indeed, this study was conducted on a specific group of drug companies in Jordan. We were not able to cover the questionnaire and deliver it for all the available drug manufacturing companies in Jordan; thereby, the number of companies that didn't participate in the study and reply has been and remains noticeable. Thereby, there is an urgent need to conduct more research with a high response rate. Also, future studies, which deal with the effect of study variables on the performance of small and medium-sized enterprises (SMEs), could have beneficial results only on the drug sector in Jordan. More research is needed to examine and confirm the results of our research, and this can be conducted on food companies and other sectors such as banks, financial and investment companies. Furthermore, it will be beneficial to know if the results of our research

were approved in different contexts and regions. The approval of our research will help to generalize our results and explore other unstudied factors of mutual relationships between transformational leadership, knowledge-sharing, absorptive capacity, and innovation. This study has centered on the intermediary role for only one process of knowledge management processes, which is knowledge-sharing, even though it is a crucial factor in knowledge management processes, between transformational leadership, absorptive capacity, and innovation. But for a full understanding of knowledge management role, i.e. (knowledge assets within the organization) towards improving innovation for organizations, future studies must take other knowledge management processes, e.g. (generating and stocking knowledge), or the intermediary role of intellectual capital, as one of the knowledge assets within the company between transformational leadership and innovation (incremental or radical).

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