

The Effect of Knowledge Sharing on Innovative Behavior in the Moroccan Pharmaceutical Industry

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Abstract: In the dynamic landscape of contemporary global industries, the imperative to foster innovation has been recognized as an indispensable key to corporate growth. Nowhere is this more pronounced than in the pharmaceutical sector, where the pursuit of groundbreaking advancements in research and development is deemed indispensable. Understanding the factors that influence innovative behavior (IB) among employees is of utmost importance, and this paper seeks to study the influence of knowledge sharing (KS) within the pharmaceutical sector in Morocco, specifically focusing on two essential dimensions: knowledge donating (KD) and knowledge collecting (KC). The study aims to collect and analyze data from a diverse sample of 100 engineers in the Moroccan pharmaceutical industry. We used quantitative methodology by employing correlation and multiple regression methodologies, the research endeavors to unravel the intricate association linking knowledge sharing and pharmaceutical engineers' Innovative behavior. Preliminary findings reveal a positive influence of the dimensions of knowledge sharing on workers' innovative behavior. This suggests that a climate of knowledge exchange and actively seeking knowledge plays a crucial role in driving innovation within the pharmaceutical workplace. Notably, the study places a nuanced emphasis on the efficacy of knowledge donating, underscoring its pivotal role in fostering a dynamic and innovative environment. These findings contribute valuable insights to the broader discourse on organizational innovation. By highlighting the positive correlation between KS and IB, the investigation provides actionable information for practitioners in the pharmaceutical firms. Grasping the effect of KD and KC can empower firms to sustain a culture that encourages collaboration, continuous learning, and ultimately, groundbreaking innovations. As industries continue to evolve, this exploration serves as a timely contribution to the ongoing dialogue on organizational innovation, offering practical implications for both industry professionals and scholars alike.

Keywords: Knowledge Sharing, Moroccan Context, Pharmaceutical Industry, Quantitative Study, Innovative Behavior.

1. Introduction

The pharmaceutical sector in Morocco is experiencing rapid and dynamic growth, representing a strategic field focused on the research, development, and distribution of sophisticated medical products Berrado, A. (2018). At the heart of this transformation process, knowledge sharing has become a crucial aspect, playing a vital role in shaping the innovative behavior (IB) of workers in this evolving environment Chatterjee, D. (2020). This investigation aims to examine in detail the underlying mechanisms, obstacles, and advantages that define the dynamic connection between knowledge sharing (KS) and the development of innovation in the Moroccan pharmaceutical sector.

The current environment necessitates an extensive analysis of the factors that boost innovation, not only to maintain a competitive position in the global marketplace but also to satisfy the rising requirements of the healthcare sector (Liu, 2021). Innovation in the pharmaceutical sector is a major factor in developing more efficacious, secure, and accessible medicines, thereby boosting public health globally. It encourages individualized approaches to therapy, tailored to the specific circumstances of each patient. Additionally, it plays a vital role in improving healthcare accessibility by offering more affordable medicines and innovative retail techniques (van Muijlwijk-Koezen, 2020).

Innovation supports regulatory alignment and strengthens drug quality and safety (PAHI, 2020). The sharing of knowledge among staff makes a tremendous difference in the performance of pharmaceutical firms (Christofi, 2021). By supporting innovation and R&D, it accelerates the drug development cycle. Knowledge sharing further encourages ongoing training, allowing staff to maintain up-to-date awareness of new developments in the field (Sajjad, 2021). In summary, knowledge sharing is a vital foundation for the development of competitiveness and sustainable growth of pharmaceutical corporations.

Thus, the aim of our examination is to explore the association between knowledge sharing (KS) processes and innovative behavior (IB) in pharmaceutical corporations. Consequently, the purpose of this investigation is to examine how knowledge donating (KD) and knowledge collecting (KC) impact innovative behavior in the pharmaceutical industry in Morocco. To address this issue and achieve our objectives, we have chosen to conduct a quantitative study using a questionnaire. In this section, we will provide a literature synthesis of the

main constructs and the theoretical framework used to evaluate the effect of KD and KC on IB. The outcome of this section will be the research model.

2. Conceptual Framework: Innovative Behavior and Knowledge Sharing

2.1 Innovative Work Behavior

Organizational innovation results from individual innovativeness (Kalisz, D. E. 2021). Hence, there is considerable interest in IWB as a key to organizational efficiency (Janssen, 2000). Van Gyes (2012) describes innovative behavior (IB) as «The planned implementation, adoption, and application of new thoughts, procedures, policies, and products by individuals in their work role, group, or organization». Innovation is indeed a dynamic and complex social process (Avellar, 2013), comprising an interactional framework driven by a collection of interconnected human interactions (Purwanto, 2022). The human dimension occupies a central position in this process, as it is at the heart of generating, promoting, and implementing creative thoughts (Ali, 2019). The understanding of the role of IWB is reinforced by De Jong and Hartog (2010), who emphasize that individuals extend beyond the formal routine duties of a group or company to explore actual innovations, suggest alternative approaches to meeting targets, engage with existing methods of operation, and secure the necessary resources to implement their creative ideas. Innovative work behavior entails a model of high-level thinking, the identification of current and future challenges, the pursuit of opportunities, and the evaluation of performance gaps, as well as the exploration of contemporary approaches to addressing these gaps and challenges (Afsar, 2016).

Innovative behavior (IB) is a richer concept than creativity; it encompasses various stages with significant theoretical and practical implications (Ali, 2019). The innovation process consists of a specific set of steps (Ali, 2019): (1) Discovery of new ideas leading to opportunities for innovation or identification of weaknesses; (2) Idea generation involves exploring alternative approaches to solving problems and improving the current situation; (3) Idea promotion is defined as actively disseminating new ideas, building alliances to garner support and acceptance from stakeholders; (4) Implementation involves turning the idea into reality, experimenting with the innovation, adapting it, and integrating it into work practices. Employees who embrace innovative work behavior can readily and effectively identify new work circumstances and generate novel approaches to enhancing services and products (Priksat, V. 2023). The prevalence of effective knowledge sharing serves as one of the drivers of IWB in companies (Priksat, V. 2023). Therefore, it is crucial to investigate the type of knowledge sharing that stimulates IWB.

2.2 Knowledge Sharing Behaviors

The construct of knowledge sharing is largely debated in the management studies literature. It constitutes one of the important elements of KM, leading up to knowledge utilization. Knowledge sharing is a behavior whereby people reciprocally exchange their knowledge (Islam, T., & Asad, M. (2024). In the corporate context, knowledge sharing among workers fosters the creation of valuable tacit knowledge, contributes to the generation of new knowledge, enhances organizational knowledge, and provides advantages for the business. It is crucial to differentiate between behaviors and attitudes regarding knowledge sharing. Behaviors can be conceived as tangible actions that stem from attitudes. As observed by de Smékalová, L. (2023), KS behavior is influenced by an employee's attitude, namely their desire to exchange knowledge. Understanding the drivers, processes, and barriers related to knowledge sharing is crucial for developing appropriate approaches to foster a knowledge-sharing mindset and optimize the asset value of an enterprise's intellectual wealth. Knowledge sharing is an indispensable activity in corporations aimed at promoting the circulation and reciprocal transfer of know-how, competencies, and qualifications among employees (Anugrah, 2017). This practice supports innovation, organizational learning, and successful decision-making (Vanhaverbeke, 2019). Knowledge sharing involves two distinct active processes: knowledge collecting and knowledge donating. KC entails soliciting intellectual capital from others to discover what they know, while knowledge donating (also referred to as diffusion or contribution) involves sharing one's personal intellectual capital with colleagues (Nguyen, M. 2023).

The first process, knowledge donating, encompasses effectively sharing information, qualifications, or know-how with other workers. This can be achieved through various means such as teaching, training, mentoring, participating in conferences, and more. Knowledge donating is rooted in the principle of making a valuable contribution to the progress and advancement of others by offering what we have learned (Guo, 2021). On the other hand, knowledge collecting involves the process of investigating, gathering, and acquiring knowledge from

diverse sources. It entails collecting relevant and valuable knowledge and then applying it to solve problems, generate new insights, and foster innovation. Knowledge collecting methods can include documentary research, data analysis, observation, and investigation (Fatimah, 2024). Both processes enrich knowledge and promote advancement across various spheres of life, regardless of the professional or academic context (Wibowo, 2020).

3. Theoretical Framework and Hypothesis Development:

Many investigations on knowledge management have reinforced the notion that knowledge sharing results in better business outcome, including innovation (Du Plessis, 2007). Innovation is defined as "a process by which economic or social utility is derived from knowledge through the generation, dissemination, and conversion of knowledge to create novel or materially advanced products or services that benefit the community" (Kahn, 2018).

Today's corporations are striving to maintain their dominant market positions by enhancing their competent and creative workforce. Numerous investigations have underscored the importance of human capital and skilled human resources in addressing corporate sustainability and innovation issues (Rasli, 2014). Several investigations have highlighted the critical effect of KM in enhancing corporate effectiveness (Kim, 2012). As knowledge represents the greatest corporate asset, it enables the acquisition of new business outputs, including innovation (Shaan, 2020). Knowledge sharing not only fosters problem-solving potential but also enhances workplace productivity (Mehrbani, 2021). Knowledge serves as the foundational element of the innovation cycle. Despite the limited investigations on knowledge sharing and innovative behavior, earlier studies have been constrained in exploring the drivers that encourage workers to embrace innovative behavior (Hussain, 2020).

According to Tran (2021), a corporation that encourages its staff to share their knowledge is expected to generate novel thoughts and foster new opportunities for the enterprise, thereby facilitating better innovation initiatives. Many researchers have observed that knowledge sharing has a positive impact on IWB; it enables staff to transfer their know-how to other team members and provides others with the opportunity to acquire valuable knowledge.

Sajjad (2021) examined the role of knowledge sharing (KS) on innovation and identified a favorable effect on innovation. Additionally, the research community has emphasized the necessity for more detailed studies on innovation and expertise (Rasli, 2014). This investigation analyses the significant aspects of knowledge sharing in conjunction with innovative behavior (IB), which have traditionally received less attention in the academic world. Innovation is the outcome of knowledge exchange among workers. Knowledge sharing generates valuable insights that subsequently facilitate and anticipate organizational innovation (Cuellar, 2020). Therefore, it can be hypothesized that the sharing and gathering of knowledge have a positive effect on the IB of workers within the company. Consequently, our research proposes the hypothesis that knowledge is crucial for innovation, and therefore, knowledge sharing exerts a beneficial influence on the development of IB among staff within the company.

Building on the preceding discussions and the analysis of earlier papers, the following hypotheses are proposed.

H1: knowledge donating influences pharmaceutical engineers' IB positively and significantly.

H2: Knowledge collecting influences pharmaceutical engineers' IB positively and significantly.

4. Field of Investigation

The pharmaceutical industry in Morocco is a rapidly evolving and expanding sector, making significant contributions to public healthcare and the economy. The industry is experiencing robust growth, fueled by increasing domestic demand for medications and high levels of exports. Morocco boasts a strong legal framework for the pharmaceutical business, with internationally recognized standards for quality and safety. While the country manufactures a portion of its drugs domestically, it also relies on imports to meet local needs. The government actively promotes domestic manufacturing through various measures and programs aimed at strengthening the country's pharmaceutical sector.

The Moroccan pharmaceutical industry is dedicated to investing in the research and development (R&D) of new products, although this investment is still relatively limited compared to other regions worldwide. However, there is a growing interest in producing generic drugs. The Moroccan government is committed to ensuring affordable access to medication for all Moroccans by implementing public health programs aimed at enhancing the availability and quality of essential medications. Despite its rapid growth, the Moroccan pharmaceutical industry

faces several challenges, including competition from international rivals and the proliferation of counterfeit medications. Nonetheless, there are numerous opportunities for expansion, particularly through increased exports to other African countries and by fostering innovation and R&D activities.

5. Sampling Technique, Sampler Size and Questionnaire

The selected respondents were primarily sourced from LinkedIn, utilizing a convenience sampling approach. This method was chosen as accessing workers directly was not a straightforward option for the investigators. Data content analysis yielded the following results: 50 respondents were women, compared to 170 men. The participants' ages ranged between 26 and 45.

Pharmaceutical engineers were contacted via direct email and invited to participate in a self-administered study. Initially, 500 surveys were distributed, but only 230 were returned fully completed and deemed suitable for analysis.

To quantify the underlying sub-dimensions of knowledge sharing, our research adopted the scale utilized by Lin (2007). For assessing innovative behavior, we utilized the 9-item scale developed by Janssen (2000), which comprises three components: generation, championing, and implementation of innovative ideas. Pharmaceutical engineers were asked to provide their responses using a Likert scale with four points: 1= strongly disagree, 2= disagree, 3= agree, and 4= strongly agree.

6. Results and Analyses

6.1 Overview of Descriptive Statistics

Table 1 shows that the variables "Knowledge Donating", "Knowledge Collecting" and "Innovative Behavior" are measured on a scale of 1 to 4. The mean of "Knowledge Donating" is 3.78 with a standard deviation of 0.713, showing a particularly high degree of knowledge sharing. For "Knowledge Collecting", the mean is 3.69 with a standard deviation of 0.828, also showing a high degree of knowledge collecting. As for "Innovative Behavior", the average is 3.67 with a standard deviation of 0.551, also demonstrating a strong degree of "Innovative Behavior".

Table 1: Descriptive statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
KD	1	5	3.78	.713
KC	1	5	3.69	.828
IB	1	5	3.67	.551

6.2 Exploratory Factor Analysis

To investigate the convergent and discriminant validity of the measurement scales for "Knowledge Donating," "Knowledge Collecting," and "Innovative Work Behavior," we conducted a factorial analysis using principal component analysis (PCA) (Table 2). To determine the appropriateness of our data for PCA (Hair et al., 2014), we performed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity (Hair et al., 2014). The results of the KMO test and Bartlett's test indicate that the data meet the fundamental requirements for factor analysis and exhibit sufficient correlations.

The KMO coefficient is 0.83, and Bartlett's test is significant ($p < 0.001$). We then applied principal component analysis (PCA) with Varimax rotation to group all variables into principal components. The number of factors extracted was determined using the Kaiser criterion, which retains only principal components with eigenvalues greater than 1. Factors with eigenvalues less than 1 were considered non-significant and excluded. The factor analysis yielded a three-factor solution with a satisfactory total cumulative variance percentage of 77.11%.

Principal component analysis also revealed that items intended to measure the same construct loaded strongly on the same principal component, with a minimum loading of 0.61, indicating shared common variance and thus demonstrating convergent validity. Additionally, items measuring different constructs primarily loaded on distinct components, indicating good discriminant validity.

Table 2: Component matrix

Items	F1	F2	F3
Kd1	0.67		
Kd2	0.87		
Kd3	0.61		
Kc1		0.63	
Kc2		0.90	
Kc3		0.71	
lwb1			0.63
lwb2			0.73
lwb3			0.81
lwb4			0.97
lwb5			0.75
lwb6			0.69
lwb7			0.79
lwb8			0.68
lwb9			0.71

F1 : Knowledge donating (Kd) ; F2: Knowledge Collecting (Kc); F3: Innovative Work Behavior (lwb)

6.3 Reliability Assessment through Cronbach's Alpha:

Before beginning the correlation analyzes and testing our hypotheses, we will study the reliability of the measurement scales studied with the help of Cronbach's Alpha. The findings of the reliability analyze of the constructs demonstrate that "Knowledge donating" with three items obtained a Cronbach's alpha coefficient of .781, denoting excellent reliability. Similarly, the "Knowledge Collecting" variable showed an alpha coefficient of .832 with four items, suggesting satisfactory reliability. The "Knowledge Sharing" variable combining the two previous variables presented satisfactory reliability with an alpha of around .804. Finally, the variable "Innovative Behavior" presented the highest alpha coefficient, at .898, with nine items. These results support the reliability of the variables studied in this research.

6.4 Analysis of Correlations

The correlation matrix (Table 3) presents the relationships between the variables of "Knowledge donating", "Knowledge Collecting" and "Innovative Work Behavior". The correlation coefficients are significant at the 0.05 level. We observe a significant positive correlation between "Knowledge donating" and "Knowledge Collecting" ($r = .24$, $p < 0.05$) as well as between "Knowledge donating" and "Innovative Work Behavior" ($r = .40$, $p < 0.05$). In addition, a significant positive correlation is also observed between "Knowledge Collecting" and "Innovative Work Behavior" ($r = .44$, $p < 0.05$).

Table 3 : Matrice de corrélation de Pearson

Variables	Knowledge donating	Knowledge Collecting	Innovative Work Behavior
Knowledge donating	1	.24*	.40*
Knowledge Collecting		1	.44*
Innovative Work Behavior			1

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

6.5 Hypotheses Testing by Multiple Regression Analysis

The findings of the regression analysis are illustrated in Table below indicate a significant influence of the variables "Knowledge donating" and "Knowledge collecting" on "innovative behavior", with respective

standardized coefficients of 0.220 and 0.127. This means that each one-unit increase in "Knowledge donating" is associated with an augmentation of 0.220 in "innovative behavior", while each one-unit increase in "Knowledge collecting" is associated with an increase of 0.127 in "innovative behavior". These coefficients are statistically significant, with t-Student values of 2.708 and 2.910 accordingly, and p-values of 0.008 and 0.004, both below the significance level of 0.05.

Furthermore, the regression model appears to be overall significant, with a coefficient of determination R^2 of 0.71, which means that 71% of the variance in "Innovative Behavior" is explained by the variables included in the model. The Fisher test also shows a significant F statistic, with a value of 30.351 for a degree of freedom of 2 and 228, confirming the overall relevance of the model.

Regarding collinearity, the values of VIF (Variance Inflation Factor) are both less than 10, with values of 2.903 for "Knowledge donating" and 1.760 for "Knowledge collecting", which demonstrates the absence of major problems of multicollinearity between the predictors and reinforces the validity of our model.

Table 4: Results of multiple linear regression

	B	B	t	p	S.E	Collinearity Statistics	
Constant		.084	.617	.538	.135	Tolerance	VIF
KD	.220	.245	2.708	.008	.091	.344	2.903
KC	.127	.117	2.910	.004	.040	.568	1.760

$R^2 = .71$

Fisher (2,228) = 30.351

7. Discussion and Interpretation of Results

The purpose of our investigation is to study the effect of KS on the innovative behavior of pharmaceutical engineers in Morocco. The research findings corroborate the formulated hypotheses. Following a comprehensive review of existing academic literature, two hypotheses are proposed.

Hypothesis H1 posits that KD has a positive and significant impact on the IB of pharmaceutical engineers. The findings of this investigation strongly support this hypothesis, indicating that KD indeed exerts a significant and positive effect on the IB of pharmaceutical engineers. This outcome suggests that pharmaceutical engineers who engage in knowledge donating within the workplace demonstrate a greater sense of commitment to the company's success. This aligns with Roman Kmiecik's research (2020), which finds a strong correlation between the KD and innovative work behavior within a major Polish capital group.

Furthermore, the second hypothesis posits that KC exerts a significant and positive impact on the IB of pharmaceutical engineers. The findings presented in the table substantiate this claim, thus providing support for the second hypothesis. This suggests that employees who demonstrate a greater inclination towards acquiring new knowledge within the organization are also more likely to exhibit a heightened commitment to the company's success. This underscores the relevance of fostering an organizational culture that promotes continuous learning.

This corresponds with Guo's (2021) findings, which indicate a positive correlation between knowledge collecting and IWB in Chinese software companies. Knowledge collecting enables workers to increase their personal knowledge reserves, enrich the knowledge necessary for innovation, and improve their capabilities, which significantly impacts innovative work behavior (Smith, 2006).

The result of our study aligns with previous research conducted by Du Plessis, M. (2007), who identified that employee knowledge sharing (KS) enhances a company's innovativeness. However, the specific impact of knowledge donating (KD) and collecting (KC) on innovative behavior (IB) has not been thoroughly investigated until now. Additionally, Carneiro, A. (2000), in their research note, proposed that KS contributes positively to employees' innovative behavior, a notion supported by the findings of this current study. Similarly, Migdadi, M. M. (2020), among the latest researchers, have also identified the beneficial impact of KS on IB.

Furthermore, the findings of this study reveal insightful aspects: both KD and KC significantly influence

employees' IB. Specifically, employees demonstrate higher levels of IB when they engage in knowledge collecting rather than knowledge donating. To put it differently, employees exhibit greater IB when they have the opportunity to gather information rather than simply disseminating it. As noted by Newell, S. (2000), during knowledge exchange, employees not only share information but also coordinate, develop, and transform it into meaningful and useful forms. Moreover, when employees acquire knowledge from their colleagues, they enhance their capacity to innovate (Tarhini, A., 2016). The underlying rationale behind employees' willingness to donate and collect knowledge is quite apparent. In essence, sharing knowledge represents a powerful expression of an employee's personal character, enabling them to recognize their own intrinsic value.

Moreover, it allows them to satisfy their urge for self-expression (Tarhini, A., 2016). However, this study suggests that individuals exhibit greater IB when they are empowered to expand their knowledge. Our findings reinforce the positive and significant impact of both KD and KC on the IB of pharmaceutical engineers. These findings underscore the importance of promoting knowledge-sharing and knowledge-donating practices within organizations, not only to foster the professional development of employees but also to enhance their commitment to the overall well-being and performance of the enterprise.

8. Conclusion

The conclusion of this examination underscores the critical value of knowledge sharing (KS) in the Moroccan pharmaceutical industry, both from a managerial and theoretical perspective. By investing in policies, technologies, and management practices that facilitate knowledge sharing, companies can not only foster innovation and enhance performance but also bolster their competitive position in the global marketplace. The positive and significant results obtained for hypotheses H1 and H2 underscore the critical value of fostering an organizational culture that promotes KS among pharmaceutical engineers. Managers and senior executives should take proactive measures to cultivate this culture by implementing incentives, sharing platforms, and policies that incentivize and recognize knowledge donating and collecting. Additionally, pharmaceutical companies should invest in knowledge management systems and technological platforms that streamline and facilitate knowledge sharing and collection processes. These tools can not only enhance operational efficiency but also stimulate innovation by enabling employees to readily access pertinent knowledge and share it with their colleagues. Executives have to grasp the significance of knowledge sharing (KS) for innovation and should receive training to promote and facilitate this practice within their teams. Training and awareness programs can be instituted to acquaint employees with the advantages of knowledge sharing and to enhance their communication and collaboration abilities. Companies can promote the establishment of informal collaboration networks where employees can exchange ideas, collaborate on problem-solving, and share experiences. These networks cultivate an environment conducive to innovation by enabling individuals from various functional backgrounds and different levels of expertise to collaborate and learn from one another.

Although our findings offer some precious indications on the influence of knowledge sharing (KS) on IWB within the Moroccan pharmaceutical industry, several research avenues are emerging to further enrich our understanding of this pivotal domain. Conducting an in-depth analysis of the cultural and organizational factors that shape individuals' willingness to share knowledge would be beneficial. This could encompass examining cultural values, organizational norms, leadership styles, reward systems, and trust climates, and how these components interplay to shape knowledge sharing behaviors. Gaining a deeper understanding of the underlying mechanisms by which knowledge sharing (KS) influences innovative behaviors in the workplace would be invaluable. This may entail identifying intermediary variables that elucidate the connection between KS and innovation, as well as moderating variables that influence the strength of this relationship in various contexts. Comparing knowledge sharing (KS) and innovative behavior (IWB) between the Moroccan pharmaceutical industry and other industries or countries would illuminate local specificities as well as international best practices. Such comparisons could facilitate the identification of learning opportunities and areas requiring strategic interventions to enhance competitiveness.

By addressing these research questions and fostering interdisciplinary collaboration across the domains of knowledge management, innovation, organizational psychology, and sociology, we can further enhance our comprehension of the underlying mechanisms that facilitate knowledge sharing (KS) and innovative behavior (IWB) within pharmaceutical firms. This, in turn, will enable us to develop managerial practices and policies that foster progress and sustainability in this critical sector.

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