LEADERSHIP AND MOTIVATION IN THE GREEK PHARMACEUTICAL INDUSTRY

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Abstract. *In today's rapidly changing environment, leadership style and employee motivation are considered as crucial factors for organizations to operate effectively and achieve their missions and objectives. The pharmaceutical industry makes a major contribution worldwide, and in Greece particularly, not only to public health and welfare but also to the economy and employment. The annual turnover of pharmaceutical production in Greece was estimated over one billion euros for the years 2018–2019 (Tsakanikas et al., 2020), and more than 23,300 employees were employed in the sector in 2020, demonstrating a significant increase (9.8%) compared to the previous year (SFEE-IOBE, 2020). In this study, leadership and motivation in the Greek pharmaceutical industry is studied via an empirical analysis. The primary data, collected via questionnaires answered by pharmaceutical industry employees located in Greece, aimed at identifying the impact that leaders, communication, and motives have on employees' performance in the context of the altered and volatile environment the COVID-19 pandemic – which unavoidably changed people's attitude, needs, and ways of communication – has shaped. A general framework was indeed identified (democratic and transformational leadership); however, characteristics of other distinct leadership styles were also observed. Managers' opinions about themselves regarding their contribution to employees' effectiveness were positive but did not achieve the highest grade. Subordinates were positive in this regard, albeit with more tending to agree than strongly agree. Similar findings were extracted regarding motivation. Communication was affected by the new environment that the COVID-19 pandemic has shaped. Face-to-face communication was considered more effective than distance communication; however, employees had positive feelings when they worked remotely and felt more flexible. Finally, according to the above, the overall outcome was positive, yet still indicates that there is room for improvement or for adaptation to the new situation.*

Keywords: *leadership, motivation, communication, pharmaceutical industry.*

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1. Introduction

There is no one particular leadership style or method that leads to the maximization of employees' performance. Different leadership styles and different leaders' skills have a different impact on (different) employees' performance. Motives and incentives shall be provided to employees to develop and maximize their performance so that they can consequently effectively serve their organizations' targets. However, what motivates one employee may not motivate another, and vice versa. Communication, the "lifeblood of an organization" (Mihiotis, 2005), is highly connected to leadership and effective performance. As pharmaceutical companies are divided into sectors (quality assurance and control, manufacturing, supply chain, technical operations etc.), clear and effective communication between teams and departments can maximize teams' cross-functional performance. The current study was conducted during the COVID-19 pandemic which, over the last two years, has rapidly changed economies, the working environment, people's attitudes, needs, and perceptions, as well as ways of communication. Thus, the new environment that is formed is expected to lead to more or different conclusions regarding leadership and communication, motivation, engagement, and people's commitment and satisfaction.

The pharmaceutical industry is crucial for public health. This was again underlined recently by the contribution of the sector in the worldwide effort to deal with the COVID-19 pandemic. According to the WHO (2021), as of 6:21pm CET, 26 November 2021, 259,502,031 confirmed cases of COVID-19 had been reported to the organization, including 5,183,003 deaths. As of 24 November 2021, 7,702,859,718 vaccine doses had been administered. Vaccines in general are critical for the prevention and control of infectious disease outbreaks, but they are not the only necessary tool. Consider also what the impact of shortages in drugs that cure, prevent, or control diseases such as asthma, diabetes, Hepatitis, and HIV would be, or consider the contribution of the research and development departments of the big pharmaceutical companies that are focusing on the development of drugs curing cancer. The pharmaceutical industry makes a major contribution worldwide not only to public health and welfare but also to the economy. In 2017, the global pharmaceutical market was valued at 1,135 billion U.S. dollars (Mikulic, 2021).

According to recent research from the Foundation for Economic & Industrial Research (Tsakanikas et al., 2020), pharmaceutical production in Greece was estimated at over one billion euros in recent years. According to SFEE-IOBE (2020), the Gross Value Added (GVA) of the domestic pharmaceutical sector was estimated at €1.2 billion in 2019, amounting to a share of 6.6% of the total manufacturing sector. The number of employees in the industry is consequently high and continuously increasing, having reaching 23,300 (SFEE-IOBE, 2020). The extremely complicated process of leadership and motivation becomes even more challenging if we consider the complicated organizational structure of the industry. A pharmaceutical company in Greece, and worldwide of course, consists of several different departments which need to effectively collaborate and communicate, such as human resources, warehouses, supply chain/planning, production/manufacturing, packaging, quality control, research and development, technical operations, regulatory affairs, pharmacovigilance, etc.

The aim of this study is to identify – through the evaluation of primary data – the impact

that leaders, motives, and incentives have on employees' performance. In this, it is significant-ly important at present to take into account the fact that the altered environment unavoidably changes peoples' attitudes, needs, and ways of communication. The significant importance of both leadership and management in the Greek pharmaceutical industry, as well as the altered environment that is formed, make this study and its conclusions even more significant and valuable.

A literature review, presented in the second section, reveals a huge number of theories, surveys, and questionnaires regarding both leadership and motivation. There is a significant difference, though, between these previous studies and the current undertaking: the environment, as the current study was conducted during the COVID-19 pandemic, which has irrevocably shaped new attitudes, feelings, and working environments (i.e. remote working), all of which underline the significance of this work. The methodology of the current study is described in the third section, and in the subsequent sections the statistical analysis and the results are presented. In the last section, the results and the conclusions are presented.

2. Literature review

"Leadership is one of the most observed and least understood phenomena on earth" (Stogdill, 1974). Because of the high complexity of leadership, several theories have developed over time. In truth, the high complexity of identification and understanding is key for acknowledging and developing new theories. According to Uhl-Bien, Marion, and McKelvey (2007), "much of leadership thinking has failed to recognize that leadership is not merely the influential act of an individual or individuals but rather is embedded in a complex interplay of numerous interacting forces."

The first researchers referred to the "great man": a hero, a born leader, and exclusively male. Such theories are now considered obsolete. The early "trait and skill theory" (Stogdill, 1948) tried to provide the tools to identify "born" leaders. Later, Stogdill (1974) again, Bass (1981), and other researchers tried to improve these tools, succeeding in connecting some traits to leaders (Bass, 1990; Kirkpatrick & Locke, 1991; Kouzes & Posner, 1990), but still providing minimal value as the majority of these traits cannot be learned. In contradiction to early trait theories, leadership is not only about strengths and skills but is also highly connected to behavior. Behavioral theory indicates that leadership can be taught and further developed, and behavioral theories were mainly studied by two universities: Ohio State University (Fleishman, 1953; Halpin & Winer, 1955) and Michigan University (Katz et al., 1951). The conclusions of these two universities were similar and, although criticized, they provide tools (questionnaires) and descriptions of leadership behavior. Similar conclusions were extracted by Blake and Mouton (1964) who, based on the Ohio and Michigan studies, issued a managerial grid focusing again on two dimensions: people and production. Finally, Bowers and Seashore (1966) summarized the Michigan research, also taking into consideration the Ohio research, concluding with the delimitation of four leadership dimensions: support, interaction facilitation, goal emphasis, and work facilitation.

Rensis Likert (1961, 1967) made a significant contribution to leadership and motivation theories by developing "Likert System Management," a continuum from authoritative to participative that demarcates four leadership classifications: the exploitive authoritative; the benevolent authoritative; the consultive; and the participative team. Similar findings and conclusions were reached by House (1971), who, in his Path-Goal theory, identified that a leader can be

defined as supportive, participative, achievement-oriented, or directive, according to their behavior. Some years later, Bolman and Deal (1984, 1991) suggested that a leader should consider the organization's challenges and their team's attitude and then decide which of the four frames (structural, human resource, political, or symbolic) fits, considering the situational model (first issued by Hersey, Blanchard & Natemeyer, 1979) which is highly connected to follower maturity level. Therefore, a leader can be directive or supportive, participative or achievement-oriented, depending on the situation and considering follower maturity levels (Daft, 2015).

The most recent theories focus on influence and the relational process. Influence is considered crucial to effective leadership (Yukl, 1999). Effective influence can lead to commitment and engagement, whereas ineffective influence can lead to resistance among followers. Relational theories resulted in "servant" (Greanleaf, 1973), transactional (Burns, 1978), and transformational (Bass, 1985) leadership theories, and the idea that a leader that influences subordinates shall be a charismatic leader that articulates a vision. A significant outcome of Burns' study (1978) was the development of the "MLQ" questionnaire (Yukl, 2013), which helped researchers to measure the transformational impact a leader has or to describe this leader.

A successful leader should influence subordinates; as a consequence, leadership is highly affected by and dependent on followership. An interesting categorization of followership was produced by Daft (2010), indicating five followership styles: the alienated; the conformist; the pragmatic; the passive; and the effective follower. As we are talking about influence and the interaction between the leader and the follower, effective communication is a mandatory requirement. The communication process is also a very complicated process, including not only content – the spoken or written words, or the symbols a message includes – but also context and paralanguage, including body language, hand gestures, etc. There are too many barriers to effective communication: environment; bias; smothering; emotions; non-verbal communication; culture; etc. There could perhaps be even more, considering the altered environment shaped by the COVID-19 pandemic, which has affected communication channels, non-verbal communication, and also emotional states. Therefore, an effective leader needs to possess special skills such as active listening, emotional intelligence (further analyzed to include self- and social-awareness, self-management, and relationship management according to Coleman and Boyatzis, 2017), and empathy.

An effective leader shall influence subordinates and have strong communication skills, but there is one more crucial factor: motivation. In leadership, several motivational theories have been developed by many researchers, starting with Frederick W. Taylor (1856–1915), who, according to Daft (2010), developed, among others, the "science of bricklaying" (Taylor, 1911): the breaking down of work cycles and production processes into simple elements ("Walk-rest, walk-rest," Taylor, 1911) in order to eliminate losses and standardize the process. Some years later, Mayo (1933), in his experiment at the Western Electric Company's Hawthorne plant in Chicago, caused a shift in supervisory style and human relations, believing that this science was the most crucial factor for increased performance and productivity (Daft, 2010).

As human beings are at the center of this discussion, human needs shall be considered as well. Abraham Maslow, a practicing psychologist, continued on the same path as Mayo. After observing that his patients' problems were mostly derived from their inability to satisfy their needs, he worked from a human resources perspective and proposed his widely known hierarchical relationship of needs, categorizing needs by level of importance and concluding with "Maslow's

pyramid." In the same direction, another psychologist, Frederick Herzberg (1923–2000), studied the aspects that cause satisfaction or dissatisfaction in employees' working environments, concluding, according to Daft (2010), with two factors: hygiene and motivators. Based on Maslow's study, McGregor (1961) categorized employees into two categories according to his Theory X and Theory Y.

Finally, McClelland (1985) identified three different areas of motivational needs: motivation by the need for power; by the need for affiliation; and by the need of achievement. These different areas of motivational needs explain why there is not one unique motivational "tool" for employees, as what motivates one employee may demotivate another, and vice versa. In the motivation area, intrinsic and extrinsic rewards are tools that are now widely used to motivate employees via their personal need for accomplishment or for those motivated by leadership awards, respectively. Empowerment, engagement, and job satisfaction, areas on which human resource management focuses, are considered as crucial factors for the development of employees and consequently for their effective contribution to the accomplishment of organizations' targets.

Leadership has developed throughout time: from the "great man" theory, to the relational and influence theories, and then to the theory of the transformational and visionary leader – a leader who, through their behavior, encourages openness in sharing information required for decision making, at the same time accepting the opinions and ideas of their followers, or a leader that influences their followers and articulates a vision. As identified, leadership is not static but dynamic. As a consequence, leadership is still developing, or, more correctly, adapting; adapting to the situation, the environment, and considering several factors. Thus, new theories are developed. According to some theories, the development of transformational leadership shaped, or resulted in, authentic leadership (Michie & Gooty, 2005). Luthans and Avolio (2003) defined authentic leadership as "a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development." Self-awareness refers to the individual's understanding of their own strengths and weaknesses, and is the key factor for self-development. In the same field, models of leadership cognition have recently been developed. Lord and Hall (2005) issued a leadership development model focusing on the cognitive abilities of the leader: skills-task; emotional; social; meta-monitoring; and value orientation. Mumford et al. (2007) focused on the interactions that occur between employees.

Multinational companies and remote working are relatively new phenomena. This newly shaped environment also brings new concepts, such as virtual or e-leadership, into a diverse environment where the leader must communicate, supervise, and lead people from different departments and countries using communication platforms (Avolio et al., 2001; Weisband, 2008) while experiencing a high risk of ineffective communication due to the loss of face-to-face contact. According to Balthazard et al. (2008), group members in face-to-face teams are more cohesive in general, more accepting of a group's decisions, and exhibit a greater amount of synergy and interaction than virtual teams. This kind of leadership demands higher effort – or a different approach – and new practices to: establish (and maintain) trust through remote communication channels; ensure that diversity is understood and appreciated; effectively manage virtual work-life cycles; monitor team progress using technology; enhance visibility of virtual members within

the team and outside the organization; and let individual team members benefit from the team (Malhotra et al., 2007).

3. Methodology

After the theoretical study of leadership and motivation, a questionnaire was developed considering the literature and targeting pharmaceutical industries located in Greece. The questionnaire included demographics and the areas under study. Specifically, nine questions referred to demographics, twenty to leadership style-oriented questions (equally distributed between democratic, authoritative, transformational, and laissez-faire leadership), and one to the definition of the impact of leadership on subordinates' performance. For the transformational-oriented questions specifically, sample items were based on MLQ (5X) (Bass & Riggio, 2006, p. 29), while for the other three styles, questions were created considering the style characteristics described in the literature. Twelve questions were relevant to motives and incentives covering Maslow's basic needs (or hygiene needs according to Herzberg, 1959) and the impact on employees (intrinsic and extrinsic motivation, development, empowerment, and job satisfaction), and one to the definition of the impact of the provided motives on subordinates' performance. Finally, ten questions were relevant to communication and its frequency, the environment, emotions, communication channels, and verbal communication, as these factors are considered crucial for the effectiveness of communication on the one hand, but are considered to be under risk because of the COVID-19 pandemic. Regarding demographics, the participants answered specific questions regarding their birthplace and hometown, gender, age, level of education, years of experience, activity sector and type, as well as the extent to which they were working remotely. For all other questions, apart from two relevant to communication frequency, multiple choice questions were developed using a (Likert) scale from 1–5 (where 1 is *strongly disagree*, 2 – *disagree*, 3 – *neutral*, 4 – *agree*, 5 – *strongly agree*) as is used successfully in many similar surveys.

The questionnaire was active 13–25 December 2021, and the data were collected and stored on the Google Forms platform. For the distribution of the questionnaires, social network platforms (Facebook messenger, Viber, LinkedIn, Instagram) were used. The only criterion for the selection of the population that participated in the questionnaire was employees working in pharmaceutical industries located in Greece, with no other discrimination. The scope was to collect as many participants as possible. Therefore, the sample is considered random, collecting data from social media from employees working in several different departments in pharmaceutical companies of all sizes. The total population, according to previous year data (SFEE-IOBE, 2021), was 23,300. The sample under evaluation was 259 employees. Thus, the portion of the population in the sample was over 1%.

Data collected from 259 employees from more than 10 pharmaceutical industries located in Greece were evaluated. The software used was Microsoft Excel for Mac, version 16.16.27, as well as IBM SPSS Statistics v. 27. The statistical methods used were descriptive statistics, hypothesis testing, and ANOVA, after verifying homogeneity of variance and assuming randomness and normality, as the sample was large enough (Berenson et al., 2020, p. 291). The results were confirmed with non-parametric tests (Wilcoxon, Kruskal–Wallis and Mann–Whitney for the post hoc tests) after Kolmogorov-Smirnov normality evaluation. Chi-square analysis was also performed for the independency test of variables.

4. Results

The descriptive statistics of the demographic questions are depicted below and tabulated in Table 1. The sample of 259 respondents consisted of 134 females, 123 males, and two participants who did not declare their gender, and the majority (54.4%) belonged to the 30–39 age group. It is widely known that the education level in the Greek pharmaceutical industry is high: more than half of respondents possessed a master's degree (55.6%), while 9.7% possessed a PhD. Almost four out of five (78%) of the respondents were born in the Attica region, and almost all respondents (96.5%) lived in the Attica region, as most of the pharmaceutical companies are located there. The high complexity and the multiple-department structure of the pharmaceutical industry is also depicted in the survey results, as the responders worked in many different departments. The sample was almost equally distributed between managers and subordinates. Finally, most of the respondents (64.5%) never worked from home, and the rest (35.5%) had worked from home to some extent since the COVID-19 pandemic shaped a new working environment.

Table 1. *Demographics*

Demographic	Variable	Frequency	Percentage
Place of birth	A European country	3	1.2
	A non-European country	4	1.5
	Attica, Greece	202	78.0
	Other area in Greece	50	19.3
Place of residence	A European country	5	1.9
	A non-European country	1	0.4
	Attica, Greece	250	96.5
	Other area in Greece	3	1.2
Gender	Female	134	51.7
	Male	123	47.5
	Neither female nor male	2	0.8
Age	18–29 years old	29	11.2
	30–39 years old	141	54.4
	40–49 years old	79	30.5
	50–59 years old	10	3.9

Education level	PhD	25	9.7
	Master's	144	55.6
	University degree	37	14.3
	Technological institute degree	27	10.4
	Technical education degree	13	5.0
	Secondary education	11	4.2
	Primary education	1	0.4
	Other	1	0.4
Work experience	0–2 years	21	8.1
	3–5 years	58	22.4
	6–10 years	75	29.0
	More than 10 years	97	37.5
	More than 20 years	8	3.1
Department	Business development	6	2.3
	Human resources	6	2.3
	Packaging	13	5.0
	Production	46	17.8
	Quality assurance	47	18.1
	Quality control	46	17.8
	Regulatory affairs	22	8.5
	R&D	29	11.2
	Supply chain	11	4.2
	Warehouse	1	0.4
	Other	32	12.4
Role	Managerial (supervising ≥ 2 employees)	81	31.3
	Managerial (supervising ≤ 1 employee	43	16.6
	Non-managerial (being supervised)	135	52.1

Remote working frequency	Never	167	64.5
	1–2 days per week	55	21.2
	3–4 days per week	24	9.3
	Always	13	5.0

The summarized results regarding preferred leadership style are depicted in Table 2.

Table 2. *Preferred leadership style – summary*

Role	Democratic	Autocratic	Transforma-tional	Laissez-faire
Managerial (supervising ≥ 2 subordinates)	3.9	2.63	3.94	2.49
Managerial (supervising ≤ 1 subordinate)	3.83	2.62	3.87	2.7
Non-managerial roles	3.81	2.73	3.51	2.89

It can be concluded that the preferred leadership styles are democratic and transformational; however, characteristics coming from other distinct leadership styles were also observed, confirming the initial observation from the literature study that leadership is dynamic and shaped according to the environment. The perception of the participants regarding the impact of leadership on effectiveness and productivity is depicted in Table 3.

Table 3. *The impact of leadership on productivity and effectiveness*

The attitude of my manager/I as a manager contribute(s) to the increased productivity and effectiveness of subordinates			
	Managerial (super-vising ≥ 2 subordi-nates)	Managerial (super-vising ≤ 1 subordi-nate)	Non-mana-gerial roles
Mean	4.02	3.86	3.55
SD	0.74	0.83	1.03
Grand mean	3.97		3.55
Grand SD	0.77		1.03

Managers' opinions about themselves regarding their contribution to employees' effectiveness was positive, but not at the highest grade. Subordinates were also positive, but more tended to agree than strongly agree.

Maslow (1954) is widely known for his "Pyramid of needs". The base of the pyramid consists of physiological and safety needs (hygiene needs, according to Herzberg) – according to

Maslow, the first things, the basics, should be covered in order for new needs to be generated. As expected, the majority of the participants, 7 out of 10, believed that their job was safe.

Table 4. *Maslow's needs*

Role	Job safety	Social & esteem	Self-actualiza-tion (creativity)
Managerial (supervising ≥ 2 subordinates)	3.78	4.01	3.73
Managerial (supervising ≤ 1 subordinate)	3.56	3.91	3.73
Non-managerial roles	3.90	4.01	3.35

According to Maslow, after physiological and safety needs, the base of the pyramid, are covered, social and esteem needs shall be covered. Over 80% of respondents felt respected by their colleagues. As observed previously, basic needs (physiological and safety) are covered to a high degree, as are social and esteem needs. Moving up the Maslow pyramid, self-actualization needs seem to be covered for six out of ten employees, with a high percentage of neutrality and employees not attaining self-actualization, something that is depicted in the results of non-managerial roles (see Table 4).

The rest of the results regarding motivational tools are depicted in Table 5. More specifically, intrinsic motivation, challenging tasks that provide a sense of accomplishment, were provided to seven out of ten employees. The high portion of neutral answers indicates that there is room for improvement. This can be considered as an indicator of the need for more frequent and effective communication, feedback, and target-setting in order for managers first to understand what motivates each individual and then to provide more challenging (but attainable) targets to each subordinate, helping and supporting them in reaching a sense of accomplishment according to their specific internal needs.

Extrinsic motivation seemed to be a controversial issue among our sample, as the answers varied and indicated neutrality. The responses relating to motivation and growth gained by training and development (high-level needs/motivators according to Herzberg, 1959) show that half of the employees believed that they did not receive adequate training that helped them develop, and that there were not many opportunities for development and growth. This is a strange result, as the activities of the pharmaceutical industry are performed according to Working Instructions (WIs) and Standard Operating Procedures (SOPs), with a training system (read and understood, webinars, seminars, workshops) in place for employees' assigned curricula. In general, development is a factor that participants seemed to be skeptical about, and thus leadership should consider the re-evaluation of the training system.

Seven out of ten employees were informed about their company's performance and were encouraged to make decisions. The majority of the employees participating the survey were empowered by being part of the company (informed) and by participating in decision making. Regarding the job satisfaction of Greek pharmaceutical industry personnel, only half of the partic-

ipants clearly stated (agreed or strongly agreed) that their daily routine was interesting and that they did not feel burnt out. This indicates that there is again room for improvement regarding job satisfaction, as moderate or low levels in the long run could affect employees' effectiveness and productivity.

Table 5. *Motivation*

Role	In-trin-sic	Ex-trin-sic	De-velop-ment	Empow-erment	Job satis-faction
Managerial (supervising ≥ 2 subordinates)	3.94	2.96	3.35	3.98	3.36
Managerial (supervising ≤ 1 subordinate)	3.88	3.42	3.54	3.90	3.59
Non-manageri-al roles	3.57	2.96	3.29	3.72	3.20

Finally, the perception of the participants regarding the impact of the provided motives and incentives on effectiveness and productivity is depicted in Table 6.

Table 6. *The impact of leadership on productivity and effectiveness*

The provided motives and incentives contribute to the increased productivity and effectiveness of subordinates			
	Managerial (super-vising ≥ 2 subordi-nates)	Managerial (super-vising ≤ 1 subordi-nate)	Non-mana-gerial roles
Mean	3.54	3.44	3.23
SD	0.91	1.01	0.96
Grand mean	3.51		3.23
Grand SD	0.94		0.96

Participants occupying managerial roles tended to agree that the provided motives and incentives contributed to increased productivity and effectiveness. The overall image tended towards neutrality, as also observed above. Managers supervising more than two subordinates tended to marginally agree that the provided motives and incentives contributed to increased productivity and effectiveness, while the other managerial roles supervising one or no subordinates tended towards neutrality. Participants occupying non-managerial roles, subordinates, were more skeptical, and were even closer to neutrality towards the statement indicating that the provided motives and incentives contributed to increased productivity and effectiveness.

After descriptive statistics analysis provided a general figure for our sample, inferential sta-

tistics (refer to Appendix, Tables A1–A4) provided a general view for the population of the Greek pharmaceutical industry. Employees agreed that managers contributed with their attitude and actions to increased productivity and effectiveness. However, subordinates were more neutral than employees occupying managerial roles. The same picture was observed in the motivation field and regarding the relevant question regarding the contribution of the provided motives and incentives to subordinates' productivity and effectiveness.

The preferred leadership style was democratic and transformational. However, subordinates were again more neutral than managers. Both managers and subordinates were neutral regarding managers' adoption of autocratic leadership characteristics. Employees occupying managerial roles did not agree that they adopted laissez-faire characteristics, with subordinates being neutral.

The perception of employees regarding extrinsic motivation was independent from employee role. Burn out levels and job satisfaction were factors that were independent from age. Job satisfaction was independent from gender and age, but did, however, depend on years of experience. Time was a factor that could be considered relevant to development. Training and growth opportunities in general were dependent on the years of experience that an employee has, but were independent from age.

Employees in general tended to agree that their company provided what was necessary to effectively work remotely (high speed internet, laptop, office supplies). Empathy was affected by remote working, as remote working employees and those always working on site differed. The working routine was different for those working from home and those working on site. Remote working personnel, although communicating less effectively compared to face-to-face communication, believed that they remained in touch with their colleagues on site, and they had positive feelings while working from home. They also considered their working routine more interesting than that of personnel always working on site.

5. Conclusions

There is no one specific leadership style or method that leads to the maximization of people's performance. Different leadership styles and different leaders' skills have a different impact on (different) employees' performance. Leadership is not static but dynamic: it must change; it must be flexible, adaptive, and shaped each time according to the environment, the situation, the company's culture, and the maturity level of both the leader and the subordinate. That is the reason why the literature has encompassed several different leadership styles throughout time without concluding on one, unique, effective leadership style. However, as Reichard and Avolio (2005) stated, regardless of the leadership style applied, leadership interventions have a positive impact on productivity and effectiveness, even in cases where these interventions endure less than a day.

The results of this study are considered positive and promising regarding leadership in the Greek pharmaceutical industry. A general framework is clearly identified (democratic and transformational leadership); however, characteristics of other distinct leadership styles were also observed. Participants occupying managerial roles tended to agree that leaders contribute to the increase of subordinates' effectiveness and productivity, while subordinates were also positive, but they believed less strongly than managers that leadership contributes to increased effective-

ness and productivity, tending towards neutrality. According to the above, the conclusions of the literature review were entirely confirmed by this study, which also indicates that there is room for improvement and a need for managers to study leadership more, listen more actively to subordinates' needs, and provide more effective incentives that target each individual.

The risks of the development of negative feelings such as, anxiety, anger, or isolation due to the environment that the COVID-19 pandemic has shaped were not confirmed, as employees working remotely had positive experiences. The perception of employees was that remote communication was not as effective as face-to-face communication, and empathy was negatively affected by remote working. No significant differences in stress and burnout between employees working from home and those on site were identified – in truth, employees working from home found their working routine more interesting than employees working on site. Finally, remote working employees felt that they remained in touch with their colleagues (mostly with peers and much less with the managers). A contributing factor regarding the latter could be the supplies provided by the pharmaceutical companies, such as high-speed internet, laptops, or office supplies, maintaining high levels of communication effectiveness.

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APPENDIX

Table A1. *Hypothesis testing summary*

Null hypothesis	Result	Sig.
H_0: Managers do not contribute with their attitude and actions to increased subordinates' productivity and effectiveness.	H_0 rejected for managers	<0.001
	H_0 confirmed for subordinates	0.203
H_0: Managers neither adopt nor reject, or do not adopt, democratic leadership characteristics.	H_0 rejected for managers	<0.001
	H_0 confirmed for subordinates	0.049
H_0: Managers tend not to adopt, or do not adopt, autocratic leadership characteristics.	H_0 rejected for managers	0.006
	H_0 rejected for subordinates	<0.001
H_0: Managers neither adopt nor reject, or do not adopt, transformational leadership characteristics.	H_0 rejected for managers	<0.001
	H_0 confirmed for subordinates	0.431
H_0: Managers tend not to adopt or do not adopt laissez-faire leadership characteristics.	H_0 confirmed for managers	0.502
	H_0 rejected for subordinates	<0.001
H_0: The population is either neutral or disagrees that the provided motives and incentives increase subordinates' productivity and effectiveness.	H_0 rejected for managers	0.417
	H_0 rejected for subordinates	0.019
H_0: The population either tends towards neutral or agrees that the provided motives and incentives increase subordinates' productivity and effectiveness.	H_0 confirmed for managers	0.465
	H_0 rejected for subordinates	0.171
H_0: Employees tend to agree or agree that the company provides what is needed to work effectively remotely (high-speed internet, laptop, office supplies)	H_0 confirmed for employees, managerial & non-managerial roles	0.615
H_0: Subordinates' (μ_1) and managers' (μ_2) means in the statement "Managers contribute with their attitude and actions to increased effectiveness and productivity" do not differ significantly.	H_0 rejected	<0.001
H_0: Male and female genders' means in the statement "I do not feel burned out" do not differ significantly.	H_0 confirmed for males vs females	0.468
H_0: Male and female genders' means in the statement "My daily routine at work is interesting" do not differ significantly.	H_0 confirmed for males vs females	0.393
H_0: On-site employees' mean and working-from-home (WFH) employees' mean in the statement "I do not feel burned out" do not differ significantly.	H_0 confirmed for on-site vs WFH employees	0.581
H_0: On-site employees' mean and WFH employees' mean in the statement "My daily routine at work is interesting" do not differ significantly.	H_0 rejected for on-site vs WFH employees	0.063

H_0: On-site employees' mean and WFH employees' mean in the statement "Empathy is not impacted by remote working" do not differ significantly.	H_0 confirmed for on-site vs WFH employees	0.568
H_0: Empathy is impacted by remote working.	H_0 confirmed for WFH employee	0.092
H_0: The population tends towards neutrality or disagrees on the statement "I feel that I remain in touch with my manager and peers (colleagues) when WFH."	H_0 confirmed for WFH employees	0.017
H_0: Remote-working personnel is either neutral or disagrees on the statement "I have positive feelings when WFH."	H_0 rejected for WFH employees	0.005
H_0: Remote-working personnel tends to disagree or disagree on the statement "I communicate more effectively remotely (via Skype, Teams, email, phone) rather than beig on-site."	H_0 confirmed for WFH employees	0.202

Table A2. *ANOVA summary (level of significance 5%)*

Null hypothesis	Result	Sig
H_0: $\mu_1 = \mu_2 = \mu_3$, where μ_1, μ_2, μ_3 are the variances of the means of age groups 18–29, 30–39, and 40–49, respectively, in the statement related to job satisfaction: "I do not feel burned out."	H_0 rejected	0.005
H_0: $\mu_1 = \mu_2 = \mu_3$, where μ_1, μ_2, μ_3 are the variances of the means of age groups 18–29, 30–39, and 40–49, respectively, in the statement related to job satisfaction: "My daily working routine is interesting."	H_0 rejected	0.041
H_0: $\mu_1 = \mu_2 = \mu_3$ H_0: not all μ_n are equal ($n = 1, 2, 3$), where μ_1, μ_2, μ_3 are the means of groups of 3–5, 6–10, and 11–20 years of work experience, respectively, in the statement related to job satisfaction: "My daily working routine is interesting."	H_0 rejected	0.033

Null hypothesis	Result	Sig
$H_0: \mu_1 = \mu_2 = \mu_3,$ H_0:not all μ_n are equal (n = 1, 2, 3), where μ_1, μ_2, μ_3 are means of age groups 18–29, 30–39, and 40–49, respectively, in the statement related to development: "I receive adequate training that helps me develop."	H_0 confirmed	0.209
$H_0: \mu_1 = \mu_2 = \mu_3,$ H_0:not all μ_n are equal (n = 1, 2, 3), where μ_1, μ_2, μ_3 are means of age groups 18–29, 30–39, and 40–49, respectively, in the statement related to development: "I feel there are opportunities for personal growth and development."	H_0 confirmed	0.627
$H_0: \mu_1 = \mu_2 = \mu_3,$ and the alternative hypothesis H_0:not all μ_n are equal (n = 1, 2, 3), where μ_1, μ_2, μ_3 are the means of groups of 3–5, 6–10, and 11–20 years of work experience, respectively, in the statement "I receive adequate training that helps me develop."	H_0 confirmed	0.577
$H_0: \mu_1 = \mu_2 = \mu_3,$ H_0:not all μ_n are equal (n = 1, 2, 3), where μ_1, μ_2, μ_3 are the means of groups of 3–5, 6–10, and 11–20 years of work experience, respectively, in the statement "I feel that there are growth and development opportunities."	H_0 confirmed	0.609
$H_0: \mu_1 = \mu_2 = \mu_3,$ H_0:not all μ_n are equal (n = 1, 2, 3), and the alternative hypothesis are equal (n= 1, 2, 3), where μ_1 – non-managerial roles (subordinates), μ_2 – managerial roles (supervising $\geq$ 2 subordinates), and μ_3 – managerial roles (supervising $\leq$ 1 subordinate), in the statement "Extra benefits are provided connected to my performance are different across the different roles."	H_0 confirmed	0.540

Table A3. *Chi-square summary*

Variables checked for independence	Result	Sig.
i. Burnout vs age	i. Independent	0.222
ii. Work routine interest vs age	ii. Independent	0.189
i. Burnout vs work experience	i. Dependent	<0.001
ii. Work routine interest vs work experience	ii. Dependent	<0.001
i. Development via training vs age	i. Independent	0.155
ii. Development & growth vs age	ii. Independent	0.599
i. Development via training vs work experience	i. Dependent	<0.001
ii. Development & growth vs work experience	ii. Dependent	<0.001
i. Extrinsic motivation vs role	i. Independent	0.429

Table A4. *Variables' independence check summary*

Null Hypothesis	Result	Critical value
$H_0: \pi_1 = \pi_2$ $H_1: \pi_1 \neq \pi_2$ π_1 = the proportion of managerial roles in the population that agree that managers contribute to subordinates' productivity and effectiveness. π_2 = the proportion of non-managerial roles in the population that agree that managers contribute to subordinates' productivity and effectiveness.	H_0 rejected	11.42 (>3.841)
$H_0: \pi_1 = \pi_2$ Against the alternative that the two populations are not the same: $H_1: \pi_1 \neq \pi_2$ π_1 = the proportion of managerial roles in the population that agree that the provided motives and incentives contribute to increased subordinates' productivity and effectiveness. π_2 = the proportion of non-managerial roles in the population that agree that the provided motives and incentives contribute to increased subordinates' productivity and effectiveness.	H_0 confirmed	2.27 (<3.841)