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**INVESTIGATING THE EFFECT OF PSYCHOLOGICAL NEEDS
SATISFACTION ON ORGANIZATIONAL CITIZENSHIP
BEHAVIOUR WITH EMPHASIS ON THE MEDIATING ROLE OF
WORK ENGAGEMENT IN THE MILAN GAS COMPANY**

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I hereby declare that I have compiled the thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading.

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ABSTRACT

Today, organizations expect their employees to have voluntary behaviours that increase employees' performance. These behaviours are called organizational citizenship behaviour (OCB). OCB is linked to key organizational characteristics such as job satisfaction and organizational performance. Therefore, it is critical for any organization. Numerous factors are influential in the formation of such behaviours. This study examines the effect of psychological needs satisfaction on OCB with emphasis on the mediating role of work engagement in Milan Gas Company. Psychological needs satisfaction included the desire for autonomy, competence, and relatedness.

The author used a descriptive survey case study strategy with a questionnaire method as a research tool to collect quantitative data. Cronbach's alpha measurement of the questionnaires showed that the questionnaire designed for this study is suitable. The samples of respondents in this research were the employees of Milan Gas Company in Iran. 68 completed questionnaires were received.

The results show that with 99% and 95% confidence levels, psychological needs satisfaction has significant effects on the variables of OCB and work engagement, respectively. In addition, work engagement has a significant effect on OCB. Furthermore, the indirect effect of work engagement in relationship between the psychological needs satisfaction and OCB is statistically significant. The results of this research are in line with the previous research in this field. Therefore, it can be concluded that satisfying the psychological needs of employees and considering the mediating role of work engagement, can improve the OCB of employees of companies such as Milan Gas Company.

Keywords: Psychological needs satisfaction, organizational citizenship behaviour (OCB), work engagement, mediation role.

INTRODUCTION

Today's organizations need committed and motivated employees to achieve success and competitiveness. Employees who, in addition to performing their duties, dedicate themselves to the organization and spare no effort to achieve its goals, this is referred to as organizational citizenship behaviour (OCB) (Tufan & Wendt, 2020). Accepting and taking on more responsibilities, following the company's norms and procedures, keeping and growing a positive attitude, and patience and tolerance of unhappiness and difficulties in the organization are all examples of good OCB (Mamman, *et al.* 2012). OCB is linked to key organizational characteristics such as job satisfaction, system maintenance and organizational performance. Therefore, it is critical for any organization (Zhao & Zhou, 2021). Since the most vital issue in any organization is organization performance, it is necessary to identify and meet the needs of employees (Hu *et al.* 2012). Numerous factors are influential in the formation of such behaviours and the growth of such forces. One of these factors is psychological needs satisfaction (Hu *et al.* 2012).

The self-determination theory is one of the most comprehensive and practical theories in the discussion of motivation (Chiniara & Bentein, 2016). The main focus of this theory is on intrinsic motivation and addressing the three basic needs of autonomy, competence and relatedness in humans (Chiniara & Bentein, 2016). Individuals have an innate need to satisfy their psychological requirements for autonomy, competence, and relatedness (Milyavskaya *et al.* 2013). In the workplace, people whose needs are well met show altruistic and benevolent behaviours, while people who do not satisfy their needs engage in destructive behaviours (Hu *et al.* 2012). Individuals' voluntary desire to collaborate is required for organizations to enhance their effectiveness. The distinction between voluntary and forced collaboration is crucial (Sidin *et al.* 2020). Therefore, it is necessary to examine the factors affecting them.

Job-oriented employees form a spiritual relationship with their job and invest certain resources in their current job, which is one of the most important factors in people's work lives (Niswaty *et al.* 2021). In addition, various studies in different organizations show that (Ozturk *et al.* 2021) for employees to be more efficient and willing to continue working, they must also have work engagement and also have a high sense of commitment to their duties. Work engagement is a combination of feelings and perceptions including satisfaction, commitment, sense of pride, loyalty, willingness to sacrifice, and fulfil responsibilities beyond the usual duties and responsibilities to the organization, this attachment

is continuous and predictable (Chen & Fellenz, 2020). Social factors of the job can also affect work engagement. Employees working in groups reported higher work engagement than employees working alone (Lee & Ok, 2016; Karatepe & Ngeche, 2012). Decision-making participation is related to work engagement to the extent that employees support organizational goals. The feeling of success and advancement in the job also increases the level of work engagement (Yu *et al.* 2020).

Iran is still under the control of the oil economy. Due to the limited natural oil resources, the need to get rid of the oil economy and join the industrial economy is very important. Employee performance in many Iranian companies is much lower than international standards. Therefore, companies' managers are interested in improving the current situation. The home appliance industry in Iran has not had much success over the past decades. So that in addition to foreign markets, it has not been able to have a place for itself in domestic markets (Khatami Firoozabadi *et al.* 2016).

The results of studies in Iran show that home appliance consumers were 70% inclined to foreign home appliances, 30% to Iranian home appliances (Appliance, 2021). In the city of Amol, Milan Gas Company was founded in 2003 to satisfy a portion of the country's home appliance industry's demands. Their distribution has begun in Iran and neighbouring nations such as Afghanistan, Iraq, Pakistan, Armenia, Uzbekistan, Tajikistan, and Azerbaijan. The products of this company include water heaters, liquefied Gas cylinders, hoods, and stoves (Milangasco, 2021).

OCB is defined as the voluntary behaviour of employees and is typically not rewarded but can improve the performance of industrial companies such as Milan Gas. If in Milan Gas Company, some employees contribute to the health and effectiveness of their organization by performing tasks beyond their role, this means that such employees make an extraordinary contribution that is neither necessary nor expected of them. The existence of OCB in an industrial company such as Milan Gas can increase organizational effectiveness through mechanisms such as increasing the productivity of management and employees, effective use of results, or increasing organizational flexibility. Due to the lack of enough research and attention in this field in the Iranian home appliance industry, the author decided to address this issue.

The aim of this thesis is twofold, first to examine the effect of psychological needs satisfaction on OCB and work engagement. Second to examine the mediating role of work engagement in the relationship between psychological needs satisfaction and OCB in the Milan Gas Company.

To achieve the aim of this thesis, the author designed a central research question followed by four sub-questions.

The central research question: How does the psychological need satisfaction impact the organisational citizenship behaviour and work engagement?

1. How does psychological needs satisfaction affect organizational citizenship behaviour?
2. How does psychological needs satisfaction affect work engagement?
3. How does work engagement affect organizational citizenship behaviour?
4. Does work engagement have a mediating role in the relationship between psychological needs satisfaction and organizational citizenship behaviour?

The author used literature analysis and a survey case study strategy designed by a questionnaire for data collection in this thesis. The samples of respondents in this research were the employees of the Milan Gas Company in Mazandaran province, Iran. The author used SPSS 26 software to analyse the data and the Sobel test to measure the mediating variable. This thesis is organized into four chapters. In the first chapter, a review of the literature (theoretical foundations and empirical background) is presented, which includes the following topics: OCB, psychological needs satisfaction, and work engagement and their theories and models. The second chapter introduces the research methodology and theoretical issues used in the research, which include the following topics: Research method, statistical population, sample size and sampling method, data collection method and tools, questionnaire, reliability of assessment tools of the questionnaires, and introduction of the data analysis method. The third chapter includes the analysis of experimental research findings. And finally, the fourth chapter includes the conclusion, practical recommendations, limitations of the research, and suggestions for the managers of home appliances companies and future research.

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1. LITERATURE REVIEW

In this chapter, the author provides a review of the literature (theoretical foundations and empirical background), which includes the following topics: OCB, psychological needs satisfaction, needs, self-determination theory, work engagement, and previous researches.

1.1. The concept of organizational citizenship behaviour

Organ, in the 1980s, was the first to present the theory of organizational citizenship behavior (OCB) to the research world (Organ, 1988). The primary intent of the OCB study was to determine the duties and behaviors that workers had in the organization. They were successful in increasing organizational efficiency, although that these behaviors were only partially quantified or even ignored in work performance evaluations (El Shaer, 2019). OCB is defined as “A collection of voluntary behaviors that are not part of one's formal obligations but are carried out by him and successfully improve the organization's tasks and plans” (Kim et al. 2020). As an example, an employee may not be required to work overtime or remain work late, however, he remains in the organization longer than his formal working hours to help others and improve current issues and streamline the organization's process (Kim *et al.* 2020).

Organ also argued that OCB is a personal and voluntary activity that is not directly influenced by the organization's formal incentive schemes. Nevertheless, it boosts the organization's performance and efficiency (Mi *et al.* 2019).

The following are some of the most important features of OCB. It is a type of conduct that goes beyond what is formally described to the organization's personnel. It is a voluntary behavior motivated by personal motives. Behavior that is not clearly recognized or valued by the organization's formal structure. That conduct is essential to the organization's performance and the sustainability of its procedures (Chen, & King, 2018).

There are three categories of research on OCB (Wörtler *et al.* 2020). Some studies have attempted to predict the variables that lead to OCB. Job satisfaction, organizational commitment, organizational identity, organizational justice, trust, leadership styles, and the leader-follower connection have all been cited as elements that influence OCB. On the other hand, the effects of OCB have been the subject of some studies. Organizational performance, organizational success, organizational

effectiveness, employee happiness, employee loyalty, and social capital have all been considered as criteria in this respect. In addition, a set of studies has concentrated only on the topic of OCB. They have attempted to re-define it, discover its dimensions, or use component analysis to build standard scales to quantify this concept (Wörtler et al. 2020).

1.1.2. Types of citizenship behaviour in organizations

There are three types of citizenship behaviors in organizations (Taylor, 2013). The first one is organizational obedience. This concept refers to activities that have been regarded as necessary and desirable and have been accepted within organizations. Following organizational norms and rules, performing duties, and meeting commitments are all examples of organizational obedience (Taylor, 2013). The second one is organizational loyalty. This type of loyalty is distinct from loyalty to oneself, other people. It reflects the extent to which personnel are willing to make sacrifices in the organization's best interests, as well as to support and defend it (Taylor, 2013). The third one is organizational participation. When employees participate in activities of the organizations, such as attending meetings, discussing ideas with others, and staying informed about the company's current challenges, the concept emerges (Taylor, 2013).

The rights granted to persons by the organization have a direct impact on these behaviors. Employment justice, appraisal and resolving employee grievances are examples of organizational citizenship rights in this context. As a result, employees who recognize that they have organizational citizenship rights are more inclined to demonstrate citizenship behaviors (obedience behavior) (Bogler & Somech, 2019).

This is also true in the other legal dimension, namely the impact of the organization's social rights on employee's behaviors, consisting of fair treatment of employees, such as increased salary and benefits, as well as social settings. When employees recognize that they have organizational social rights, they will be committed to the organization and demonstrate citizenship behaviors (loyalty behavior) (Chen & Chiu, 2009). Finally, when employees realize that their political rights are honored in the workplace and that they have the opportunity to participate in and influence policy decisions, they continue to demonstrate citizenship behavior (participation behavior) (Chen & Chiu, 2009).

1.1.3. Dimensions of citizenship behaviour

Various researchers have identified seven types of organizational citizenship activities (Choi, 2007). These organizational citizenship activities include helping behaviors, sportsmanship, individual innovation, civil virtue, organizational commitment, self-satisfaction, and individual growth.

Loyalty, conscientiousness, participation (Social, supportive, functional, and civic), attention and respect, sacrifice, and tolerance (Spirit of generosity) are indicators of OCB (Choi, 2007).

Assisting others with employee work, supporting the company, volunteering for supplementary jobs, and accepting responsibility are all examples of citizenship performance. To explain the citizenship performance, researchers propose a model with the following four aspects (Pradhan *et al.* 2016). The first one is that perseverance combined with extraordinary passion and effort is essential to complete successful activities at work. The second one is that participate in volunteer works and activities that are not part of the job description. The third one is that collaboration and support from others. The fourth one is that following the norms and procedures of the organization (Pradhan *et al.* 2016).

Organ in 1988 offered perhaps one of the most authoritative definitions of the dimensions of OCB, which is used in various studies. Civic virtues, altruism, conscientiousness, sportsmanship, and courtesy are these dimensions (Organ, 1988).

Civic virtues, conscientiousness, and altruism are all thought to be beneficial, active, and desirable characteristics. Civic virtues are a way of behaving that demonstrates an interest in being a member of the social life of an organization (Kizilos *et al.* 2013). Participating in extra activities when they are not required, supporting the development and changes provided by the organization's managers, the desire to read books, magazines, and increasing public information and the importance of posting banners and announcements made in the organization to inform others are all examples of civic virtues. A competent organizational citizen, according to Graham, should not only be aware of current concerns in the organization but also remark on them and participate actively in their resolution (Kizilos *et al.* 2013). In the workplace, conscientiousness is defined as behavior that goes above and beyond the organization's expectations (Working after working hours to benefit the company is one example). According to Organ, people with progressive citizenship behaviors keep working even when they are sick or disabled (Saxena & Saxena, 2015). Altruism refers to helpful and useful activities among colleagues, such as fostering closeness, understanding, and compassion, that directly or indirectly assist employees with job issues (Ariani, 2013). Components such as sportsmanship and civility imply preventing damage to the organization. The willingness to be patient in the face of

inescapable harassment and workplace abuse without complaining is what sportsmanship entails. While courtesy is about thinking about how one's actions affect others (Hermawati & Mas, 2017). It is possible that not all aspects of citizenship conduct will develop at the same time (Ong *et al.* 2018). For example, employees with a conscience component may not always be self-sacrificing and altruistic. Or some of these dimensions, such as altruism and conscientiousness are tactics to put pressure on managers. That is, by trying to do these things, employees try to influence the decision-making process of the organization's managers to promote or reward them. In this case, the employees of the organization change from being "good soldiers" to "good actors" for the organization (Ong *et al.* 2018).

Strengthening citizenship behavior, like any other behavior that comes from individuals, needs to be encouraged and promoted (Alessandri *et al.* 2021). One of the things that can be effective in this regard is organizational policies and actions. Organizational managers should strive to develop citizenship behaviors in the organization by formulating appropriate policies and strategies (Alessandri *et al.* 2021). In this regard, some of these relevant strategies to develop and encourage citizenship behavior have been described by the author.

1.1.4. Selection and employment

According to some studies, persons who exhibit excellent citizenship in their personal lives are equally as likely to be good corporate citizens. Organizations should construct their hiring procedures in such a way that persons who exhibit progressive citizenship behavior get hired (Lim & Loosemore, 2017). Among the staff selection tools that may be used to identify good organizational citizens, interviews are better than any other tools. In interviews, more emphasis should be on collaborative and group behaviors in order to increase the likelihood of selecting employees who are more prone to citizen behavior. Of course, in the process of selecting and employing individuals, organizations need to keep in mind that citizenship behaviors should not replace traditional job functions. According to this the characteristics traditionally required to perform a job should not be overlooked for being a good citizen (Lim & Loosemore, 2017).

Some organizations may not be able to identify good citizens and people with potential citizenship behaviors on their own, and they may not be able to employ these people as needed. But they can create useful and constructive citizenship behaviors by implementing training plans for the organization's current employees. Using training programs facilitates interpersonal assistance among

employees. Of course, training and job rotation programs can also be used to develop staff skills (Tufan & Wendt, 2020). Another method of implementing training programs is to create programs that are directly tied to citizenship behavior development. According to studies, (Tefera & Hunsaker, 2020) training supervisors based on organizational justice concepts are linked to improved subordinate citizenship behaviors. To put it another way, employees with supervisors who have done justice training courses are more likely to show citizenship behaviors than other employees (Tefera & Hunsaker, 2020).

Organizations can greatly facilitate the development of citizenship behavior by establishing regular and rational systems for rewarding employees. Previous researches show that (Mohammad *et al.* 2016) people are more likely to participate in jobs that are likely to be rewarding. Therefore, paying attention to effective and contingent reward systems by the organization will be very effective in shaping good citizens. Accordingly, most organizations, to encourage citizenship behavior, give annual rewards to employees who are somewhat willing to engage in extra-role behaviors, not individuals who have only positive personal characteristics (Mohammad *et al.* 2016). Although this issue is very important, organizations have potentially reduced rewards for employees directly involved in citizenship behaviors and have increased rewards for formal commitments (Ong *et al.* 2018). Some researchers attribute this to the fact that excessive attention to extra-role behaviors of employees, to be rewarded, causes negligence and failure to perform official organizational duties and the employees of the organization do things beyond their role instead of performing their duties. While the goal of developing citizenship behaviors is to encourage collaboration in addition to official organizational responsibilities (Ong *et al.* 2018). Organizations should direct their reward systems at the group and organizational levels, rather than at the individual level, to encourage citizenship behaviors (Kizilos, *et al.* 2013).

1.1.5. Factors affecting organizational citizenship behaviours

Four elements of employee personal characteristics, Job specification, organizational characteristics, and leadership characteristics have been noted in studies on the factors affecting OCB (Mi *et al.* 2019). Oregon and his team focused their initial research in this field on staff attitudes, attitudes, and leadership support (Anand *et al.* 2018). Podsakoff and his colleagues' following leadership research have widened the scope of leadership behaviors to include diverse forms of interactive and transformative leadership behaviors (Anand *et al.* 2018).

The preliminary research on individual characteristics focuses on two main axes (Chen & Chiu , 2009). First, researchers believe that employee happiness, organizational commitment, feelings of fairness, and perceptions of leadership support are all factors impacting morale. Second, the researchers' findings suggest a substantial link between these characteristics and OCB, implying that these variables are important in OCB (Chen & Chiu , 2009).

Concerning job factors, researchers have focused more on replacing leadership theory. The findings show that there is a consistent link between work engagement and citizenship behaviors (Mi *et al.* 2019). Furthermore, all three forms of job descriptions, including replacements for leadership theory literature (job feedback, job duplication, inner job satisfaction), are strongly linked to various aspects of OCB (Altruism, courtesy, conscientiousness, sportsmanship and social etiquette). There is a strong link between job feedback and inner job satisfaction with OCB, on the other hand, OCB has a negative link with job duplication (Mi *et al.* 2019).

Wortler *et al* (2020) examined the role of moderating individual differences in need intensity in the relationship between satisfaction with basic psychological needs and OCB. They examined two statistical samples in the United States (353) and the Netherlands (298). The results of their research showed that satisfaction with psychological needs has a significant positive relationship with OCB. They concluded that individual differences in need severity play a minor moderating role in the relationship between satisfaction with basic psychological needs and OCB.

Bogler and Somech (2019) described the results of their research entitled “Psychological capital, team resources, and OCB “. The goal of the study was to see how team resources, such as learning values and team leader optimism, influenced the link between team psychological capital and OCB, which was quantified as a team outcome. A quantitative questionnaire was completed by 82 management teams with 395 individuals from educational organizations. The interaction effects of both moderating factors, which serve as positive resources for the team by strengthening the influence of team psychological capital on the desire of the team to engage in OCB, were verified by hierarchical regression analyses. Team psychological capital was shown to be a positive team resource that creates an environment that encourages high levels of organizational citizenship activity. When both team learning and the team leader's optimism are strong, this link is enhanced (Bogler & Somech, 2019).

1.1.6. The relationship between psychological needs satisfaction and organizational citizenship behaviour

Committed, motivated, and conscientious workers are now one of the most significant sources of competitive advantage in companies. And performance and behaviors beyond what is officially stated in the job description are expected. It is especially important in new work systems that are associated with reduced supervision and oversight and increased employee autonomy. Work systems based on employee involvement in decision-making and work processes may produce behaviors similar to OCB (Choi, 2007). Employees' beliefs, knowledge, and expectations influence their choice of goals or set of behaviors. Turning to empowerment will increase work motivation, and will guide people in their work roles. Employees who feel a sense of control in their work show a higher level of performance (Pradhan *et al.* 2016). Similarly, employees who directly participate in decision-making find their work meaningful, and those who feel more influential often make better decisions about their work. Which leads to higher levels of performance (Bogler & Somech, 2019). In this regard, the author believes that one of the variables that have great potential to affect OCB is the psychological needs of employees. Therefore, he decided to examine the relationship between these two variables.

1.2. The concept of psychological needs

Whenever an activity activates our psychological needs, we become interested in it. When an activity meets our psychological needs, we feel satisfied. So we are aware of our feelings of interest and satisfaction, but we are busy in our environment because it activates and satisfies our psychological needs (Elsbach, & Pieper, 2019).

1.2.1. Definitions of need

Need is any state within the individual that is necessary for life, growth and health. If needs are addressed and met, health is maintained and improved. If needs are ignored, damages will be done that impairs physical or mental health and self-harm can occur, it can also damage a person's relationship with the social world (Chiniara & Bentein, 2016).

There are three types of needs (Milyavskaya *et al.* 2013). The First one is physiological needs such as thirst, hunger, and sexual desire that depend on how the function of the biological system. Psychological needs such as autonomy, competence, and relatedness are the second ones that depend on human nature and healthy growth. And the third one is social needs such as achievement, intimacy,

and power that have been learned or internalized from our history of emotion and socialization (Milyavskaya *et al.* 2013).

It is easy to distinguish physiological needs from psychological needs, but it is not easy to distinguish psychological needs from social needs. Physiological needs include biological systems, such as the neural circuits, hormones, and organs. If physiological needs are not met for a long time, they create a deadly state of emergency and create motivational states that dominate consciousness. When these needs are met, their mastery decreases consciously and is forgotten, at least for a while (Kubiak, 2020). The study of human needs was first begun by McDougall in 1908, continued by Freud, Murray, and Hall, and eventually popularized by Maslow in the field of psychology. Over the past century, different perspectives on the basic needs of human beings have evolved (Milyavskaya *et al.* 2013). In this regard, different theories of psychology have discussed human needs. These needs have been considered at different levels, which that realization has a special place and importance in intrapersonal and interpersonal fields and has been the main focus of theories based on psychological need. Some researchers consider human needs to be inherent (Burgueño *et al.* 2020), while others consider needs to be acquired. There is also disagreement about the nature of these needs. While some researchers consider needs to be psychological in nature, others believe that needs are physiological in nature. Some, like Maslow, attribute a mixed nature to needs (Burgueño *et al.* 2020).

1.2.3. Self-determination theory

One of the approaches that have examined the basic psychological needs is Self-determination theory and is the basis of voluntary actions and behaviors. Self-determination is realized when a person feels that he can choose his behaviors and determine his actions and goals (Molix & Nichols, 2013). According to this theory, individuals have an innate desire for growth and integration. The desire to explore the environment, the curiosity, and the pursuit of intrinsic, challenging and satisfying activities are manifestations of this desire (Molix & Nichols, 2013).

In line with this theory, the main criterion of a fundamental need is to directly affect well-being and psychological development. For this reason, from the point of view of this approach, the desire to have achievements and self-esteem are not considered needs because they do not directly affect psychological well-being. The meeting of the three fundamental psychological needs of autonomy,

relatedness, and competence, according to the concept of basic psychological needs, is required for self-motivation and optimum personal and psychological growth (Messmann *et al.* 2021).

Autonomy or self-discipline refers to a person's need for a sense of choice and self-initiation in performing tasks and actions (Iqbal *et al.* 2020). It is an internal behavior that refers to the will and authority of the individual. This need involves the ability to choose when it comes to initiating, sustaining, and arranging activities. When people believe they are in control of their actions, they are shown to be autonomous. That is, they feel confident in their choices and can perform well. The desire for autonomy in the regulation of personal actions and the fact that a person feels that his behavioral messages are autonomous is called the need for autonomy (Van den Broeck *et al.* 2016). Autonomy is the need to experience and choose to initiate and adjust behavior. An autonomous agent desires to have the right to choose for himself, rather than being determined by the events of his environment (Arshadi, 2010).

Relatedness refers to the need to feel confident when having a relationship with others and the need to accept the person as a person worthy of love and respect by others. This need is the desire to connect with others, to like and support others. Relatedness is an important motivational structure because people who meet their need of relatedness become more stress-resistant and have fewer mental health issues (Van den Broeck *et al.* 2016).

Competence means feeling effective in activities that are aimed at self-integration. It refers to a person's need to be effective in pursuing their goals and interacting with the environment. This need reflects an innate desire to act on individual capacities and to explore and master environmental challenges. In this regard, neurological studies have recently considered intrinsic evolving mastery and exploratory behaviors as a kind of evolutionary tendencies that seem to agree with self-determination theory about the inherent nature of these needs (Lee *et al.* 2020).

Self-determination theory is based on the basic psychological needs that are considered as the energy needed to help actively engage with the environment, develop skills and grow healthily. These needs are innate in all human beings and are essential for the self-regulation and well-being of individuals (Elsbach & Pieper, 2019). Supporting basic psychological needs can directly predict many motivational, behavioral. In addition, and emotional consequences and motivational variables can be considered as mediating needs and life satisfaction (Williams *et al.* 2014). In conformity with research findings (Hu *et al.* 2019), the satisfaction of basic psychological needs leads to high life satisfaction and well-being of individuals, basic psychological needs may be directly related to life satisfaction.

In another study (Hu *et al.* 2019), a direct relationship was found between basic psychological needs and life satisfaction.

Mossman *et al.* (2021) examined the mediating role of satisfaction with basic psychological needs in the relationship between transformational leadership and innovative behaviors in the workplace. They used a time-lag approach in a quantitative study with 130 instructors in Dutch secondary schools to address this issue. The results of their research showed that transformational leadership in the school environment is effective in meeting the needs of autonomy and competence of teachers, and on the other hand, addressing the need for the competence of teachers can help improve their innovative behaviors in the workplace (Messmann *et al.* 2021).

Kubiak (2020) conducted a study on improving the meaning of work by satisfying psychological needs using strategic human resource management. He concluded that meaningful work has a mediating role between human resource performance and performance. And analyzed that performance management policies can be improved by meaningful work. And found that performance management policies can be improved by meaningful work. In addition, attention to the issue of positive psychology should be on the agenda and priority of performance management policies (Kubiak, 2020).

Wang *et al.* (2018) examined the mediating role of psychological needs satisfaction in the relationship between supervision and managerial guidance and participation in activities within the organization by newcomers. They selected 438 newcomers to work in eastern China. Their findings demonstrate that management monitoring and direction can help newcomers become more involved in intra-organizational activities. In this regard, the mediating role of satisfying psychological needs is very important (Wang *et al.* 2018).

Chiang and Hsieh (2012) investigated the mediating effects of organizational citizenship activity on perceived organizational support and psychological empowerment on work performance. They looked at how hotel employees felt about organizational support, work motivation, corporate citizenship, and work performance. Perceived organizational support and psychological empowerment both had a favorable impact on OCB, according to the findings. Job performance was not influenced by perceived organizational support. Job performance was improved through psychological empowerment and OCB (Chiang & Hsieh, 2012).

In recent decades, with the introduction of psychological issues into the industry, much attention has been paid to the fact that employees have expectations from their work other than the financial aspect,

but some of their expectations have a psychological aspect and if the best payment system is implemented in the organization, but the psychological requests of employees are not taken into account, it can affect the programmatic effects of satisfaction resulting from increased payments (Wörtler *et al.* 2020). Therefore, mere attention to financial needs as one of the determinants of work engagement alone could not solve the problems related to work engagement and therefore, apart from financial needs, managers should also pay special attention to the psychological needs of employees. So that by neglecting these needs, they cause dissatisfaction and lack of motivation of employees, which will lead to reduced performance and efficiency (Pradhan *et al.* 2016).

Therefore, managers are looking for theories and models to solve these problems. Hence, the concept of engagement and recognizing the factors that cause human engagement to work is one of the most complex parts of management today and requires extensive scientific and research work.

1.3. Work engagement

Work engagement is a kind of emotional and psychological connection with the job in which the person knows the job and its components, he identifies with it, aligns with the goals and values of the organization and does not spare any effort to achieve them, and he is not thinking of leaving the organization and moving to another organization (Niswaty *et al.* 2021). Having employees with high work engagement may benefit the organization because when people are immersed in their work, their motivation increases, which in turn may have a positive effect on their job performance (Niswaty *et al.* 2021). Work engagement is defined by enthusiasm, devotion, and job attractiveness as a pleasant and job-related state of mind. Employees with work engagement are very energetic and have enough enthusiasm to do their job. This positive state of mind is seen as a counterpoint to exhaustion, they are not only happier but spend more time at work (Jung & Yoon, 2016).

Work engagement can be increased through three methods of delegation, teamwork and training (Niswaty *et al.* 2021). Delegation is the act of allowing employees to make decisions about their own work without the need for others to intervene. In this case, they will feel more responsible. By receiving accepted training, a person will be able to better understand his organizational role and identify his job expectations. In an organizational group, employees learn how to create and manage a team and through teamwork, they achieve a high level of performance and respond to client needs with more flexibility (Niswaty *et al.* 2021).

A person engaged to work is described as someone whose job is a necessary part of defining himself (Ogbuanya & Chukwuedo, 2017). Likewise, many theorists have assumed that (Ogbuanya & Chukwuedo, 2017) these people make a major effort to achieve organizational goals and are less likely to leave their jobs. People who become attached to their job find in their work the potential to satisfy their high-level psychological needs. For example, for growth, development, meaningfulness recognition and safety. It enhances people's performance by motivating them to put in more effort and use their creativity to solve problems and work smarter (Ogbuanya & Chukwuedo, 2017).

1.3.2. Factors affecting work engagement

Job-based theories of work engagement prove that it is a consequence of compatibility between work, personality, job, and organizational characteristics (Chen & Fellenz, 2020). Work engagement is an aspect of work motivation, and several variables such as general motivational services, career opportunities, role clarity, daily work, and team culture are important for work motivation. Work engagement is closely related to job motivation and satisfaction. Work engagement is usually more important than job satisfaction. It depends on personal characteristics and the nature of job responsibilities (Chen & Fellenz, 2020).

Work engagement stems in part from personality, personal characteristics, organizational environment, and job design. The most important personality traits in work engagement are age, need for growth, and belief in traditional work ethic. With the focus on internal control and the need for advancement, older workers are often more dependent on their jobs because of more responsibility and challenge and more opportunities to meet growth needs. Older workers also tend to be more diligent about the value of hard work. Younger workers are typically less motivated at the grassroots level and their jobs are less challenging (Zhang *et al.* 2017). When people in their work find the potential to satisfy basic psychological needs, they become attached to their job, for example, for growth, advancement, meaningfulness, recognition, and safety (Teng *et al.* 2021). Employees become engaged in their job when their job is the central interest of their lives, they actively participate in it, they perceive their performance as valuable and self-respecting, they perceive their performance in harmony with their self-image. Because growth needs are important in work engagement, job characteristics that provide satisfaction for growth needs are highly correlated with work engagement. These characteristics include motivation, diversity, job identity, feedback and participation, and

among these job dimensions, job identity and participation are more effective on work engagement (Teng *et al.* 2021).

Employees working in groups reported higher work engagement than employees working alone (Lee & Ok, 2016). Participation in decision-making is related to work engagement to the extent that employees support organizational goals. A sense of success and advancement in the job also increases a person's level of work engagement. Other situational factors such as job design, psychological and organizational climate and management style also have important effects on employee work engagement. The job design factor seems to have a stronger effect on the job attachment of people who are more inclined to satisfy high-level psychological needs (Lee & Ok, 2016).

Braganza *et al.* (2021) expressed the results of their research entitled “Productive Employment and Decent Work: The impact of AI adoption on psychological contracts, job Engagement and employee trust”. Their conclusions are based on a review of 232 survey responses in which they looked at the impact of artificial intelligence adoption on workers' psychological contracts, engagement, and trust. Psychological contracts have a significant and strong effect on work engagement and trust, according to the researchers (Braganza *et al.* 2021).

Ozturk *et al.* (2021) presented the results of their research entitled “The effect of servant leadership on hotel employees’ behavioral consequences: Work engagement versus job satisfaction”. They observed that servant leadership had a high impact on job satisfaction than on work engagement. Work engagement is a mediator between servant leadership and work satisfaction, as hypothesized (Ozturk *et al.* 2021).

Zhang *et al.* (2017) described the results of their research entitled “Identity judgements, work engagement and OCB: The mediating effects based on group engagement model”. Their findings reveal that organizational identification is positively linked to both pride and respect. Work engagement and OCB are also linked to organizational identification (Zhang *et al.* 2017).

In general, work engagement affects both the individual and the organization (Wang *et al.* 2020). From an organizational point of view, work engagement is considered as a key to open employee motivation and increase production, and from a personal point of view, it is the key to motivation for performance and personal growth and satisfaction in the workplace (Wang *et al.* 2020).

In this season, the author examined the research variables (OCB, psychological needs satisfaction, and work engagement), factors affecting these variables, the relationships between these variables, and the previous studies in this field. As reviewed, several studies examined the relationship between

these variables and their impact on OCB. However, work engagement has not been examined as a mediator in the link between psychological needs and OCB. To fill this gap, the author decided to examine the direct effect of psychological needs satisfaction and work engagement on OCB and the indirect effect of work engagement in the relationship between psychological needs satisfaction and OCB. The author believes that examining these variables as effective factors in the OCB of employees of companies can help improve these behaviors and ultimately improve the performance of companies such as Milan Gas (Mi *et al.* 2019).

2. METHODOLOGY

In this chapter, the author has reviewed the methodology of the present study. For this purpose, the author described the type of research, statistical population, sampling method, data collection technique, reliability of the questionnaire, and data analysis technique.

2.1. Research method

Research is activities that a researcher use to find out the reality and research method means a set of activities that are done to achieve the aim of the research (Taylor *et al.* 2006). Research is a process through which one can search for the "unknown" and gain the necessary knowledge about it. In this process, how to collect and convert them into findings is called methodology. Researchers use various methods in their research. The goal is to determine which method can be used to obtain more accurate, easier, and faster answers to research questions (Taylor *et al.* 2006). In terms of purpose, research methods can be divided into historical, descriptive and experimental methods. Also, in terms of nature, research is divided into two general categories of the fundamental research and applied research (Gunawan et al. 2019).

The philosophy of the current research is positivism. According to positivism, only "factual" information received by observation, including measurement, is considered reliable. In positivist research, the researcher's activities are restricted to data gathering and objective interpretation (Ryan, 2018). The method of doing this thesis is deductive because the author has used the existing theory to do this thesis (Wilson, 2010). The type of research is based on the practical type. Practical research is research that uses theories, and techniques developed in basic research, to solve real problems. This research is causal-comparative research because it examines the effect of the independent variable on the dependent variable. The main purpose of this study is to investigate the effect of psychological needs satisfaction on OCB with emphasis on the mediating role of work engagement in the Milan Gas Company in Mazandaran province, Iran. In this research, psychological needs satisfaction is an independent variable, OCB is a dependent variable and work engagement is a mediator variable. From the point of view of how it is done, the present study is a descriptive study that seeks to gather real and accurate information to achieve the objectives of the research. This research is done in a survey case study strategy in which researchers give questionnaires to the target community to get information about the extent and characteristics of that community. In general, this descriptive-

analytical research is a causal type of survey case study strategy and quantitative and is a branch of field studies and is cross-sectional research in terms of time.

2.2. Sampling and sampling size

In general, two sets of factors influence the definition and determination of population, The first set arises from the requirements of the problem because answering any given problem requires choosing the right population for it. The second set arises from scientific limitations because the scope of research is affected by the facilities available to the researcher (Singh & Masuku, 2014). The statistical population of this research is the employees of Milan Gas Company in Mazandaran Province, Iran. Cochran's formula is one of the methods for estimating the sample size, which can estimate the sample size with 95% and 99% confidence based on the total statistical population (Lachin, 2011). In this study, the Cochran formula was used to estimate the sample size. Considering that the statistical population of this research are 82 persons, using the above-mentioned formula, the author calculated the samples as 68 subjects.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left(\frac{z^2 pq}{d^2} - 1 \right)}$$

$$67.72 = \frac{\frac{1.96^2 \times 0.05 \times 0.05}{0.05^2}}{1 + \frac{1}{82} \left(\frac{1.96^2 \times 0.05 \times 0.05}{0.05^2} - 1 \right)}$$

n: Statistical sample size

N: Volume of statistical population

d: Considered error (assumed to be 0.05)

z: The value of the normal variable with confidence level $\alpha-1$. In the two-domain test, the z value is 1.96 for the 95% confidence level and 2.58 for the 99% confidence level.

p: Ratio of the desired trait

q = (1-p): The ratio of not having the desired trait. Usually, p and q are considered 0.5.

The traditional method (paper method) is the most common method of distributing questionnaires in Iran used in this thesis. The author distributed 68 questionnaires in the form of the random sampling method among the employees of Milan Gas Amol Company in Mazandaran province of Iran in September 2021 and received the completed questionnaires two weeks later.

In order to achieve more accurate results and a better understanding of the questionnaire by respondents, the author was present at the Milan Gaz Company and distributed the questionnaire and answered the questions about it.

2.3. Data collection

One of the main parts of any research work is data collection. The researcher should collect the necessary data from the statistical community through methods and tools, and by analyzing, processing and analyzing them, should answer the research questions (Gunawan *et al.* 2019). The researcher needs various tools to collect data, the type of which depends on various factors such as the type and methods of research. Each of the data collection tools has advantages and disadvantages. The researcher should consider their impact on the purpose of the research by observing the necessary points (Taylor *et al.* 2006).

Data can be extracted from the population of a statistical sample by three general methods. The first one is the library method. It is used in all scientific research. In some researches, this method is used as part of a research process. And in some other, the method of research is the library method and relies on library research findings from the beginning to the end (Walsh & Downe, 2005). The author employed the library method and tools to prepare and compile theoretical parts.

The second one is the field research methods. These are data collection methods that are described as qualitative. Field methods refer to the techniques that researchers use to go out into the external environment, including individual and organizational culture, to collect data by interacting directly with them (Nardi, 2018). Questionnaires, interviews, observations, and hall tests are some of the instruments that can be used in field research. In this study, a questionnaire was used to collect information about the research variables, which was provided to the employees of the company by field method and by referring to Milan Gas Company in Mazandaran Province of Iran. After completing the questionnaire, the information obtained was analyzed by SPSS software.

The third one is the questionnaire method. It is a common research tool and a straightforward method of gathering research data. A questionnaire is a collection of goal-oriented questions about a subject, with various scales used to assess the respondent's point of view (Nardi, 2018).

In this research, the author has used a questionnaire. The questions include the following two parts:

- 1) The author has designed five questions in this part to collect demographic and general information about the respondents' characteristics, such as age, gender, marital status, education, and work experience.

2) The author used specialized research questions (questions related to the variables of this research). The author used standard questions with minor modifications in the questionnaire. The questionnaire had a total of 30 specialized questions in which respondents were asked to express their opinion on a scale of strongly agree to strongly disagree with the responses, which were organized in the form of a Likert scale (Albaum, 1997).

Table 2.1. Specialized questions

Name of the questionnaire	Number of questions	Sources
Psychological needs satisfaction	12	(Jung & Yoon, 2016)
Satisfaction of the need for autonomy	4	
Satisfaction of the need for competence	4	
Satisfaction of the need for relatedness	4	
Work engagement	8	(Chou <i>et al.</i> 2013)
Organizational citizenship behaviour	10	(Le <i>et al.</i> 2020)
Total	30	

Source: Author's research

Before the final assurance about the measurement tools and their use in the main stage of data collection, a researcher must find the necessary assurance about the reliability of the tool use. Reliability is the principle of measurement to evaluate scientific research and are features that are essential for the usefulness and effectiveness of data collection methods. Reliability means that if we give the measuring instrument several times in a short period to a single group of people, the results will be close to each other (Tavakol & Dennick, 2011). Researchers use a measure called a "reliability coefficient" to measure reliability, which usually varies between zero and one. Zero reliability indicates uncertainty and a reliability coefficient indicates complete reliability. Researchers use different methods such as Perform a Retest, Parallel Method, Composition method, Kuder and Richardson method and Cronbach's alpha method to calculate the reliability of measuring instruments (Tavakol & Dennick, 2011).

To evaluate the reliability of each questionnaire, the author calculated Cronbach's alpha for the questionnaires using SPSS software. 35 samples have been used to calculate Cronbach's alpha in this study.

Table 2.2: Cronbach's alpha calculated for the questionnaire

Name of the questionnaire	Number of questions	Cronbach's alpha	Reliability
Psychological needs satisfaction	12	0.872	Confirmed
Work engagement	8	0.873	Confirmed
Organizational citizenship behaviour	10	0.884	Confirmed

Source: Author's research

The measurement of Cronbach's alpha above 0.7 confirms the questionnaires in this thesis have sufficient reliability (see Table 2.2). As can be seen, Cronbach's alpha values for all 3 questionnaires are above 0.7 and acceptable. Therefore, from the result, a high level of reliability has been observed for the used questionnaires in this thesis.

2.4. Methods of analysis

The researchers in the area of business and management studies often employ statistical tests and techniques provided by SPSS software. Besides, numerical statistics and quantitative techniques are typically used to analyse the research data collected through a questionnaire in quantitative research. Similarly, in this research, the author has used SPSS 26 software for data analysis.

2.4.1. Normality test

Important basic conditions for analysing multivariate data are the presuppositions of normality, linearity, and uniform data distribution. Before performing univariate and multivariate statistical analyses, the assumptions of normality, linearity, uniformity of dispersion, and absence of multiple alignments between variables must apply to them (Razali & Wah, 2011). The concept of normal distribution applies to parametric data (Razali & Wah, 2011). One of the most well-known tests for examining the normality and abnormality of research data is the Kolmogorov-Smirnov test. After examining the normality or skewness and kurtosis of the data distribution, the author used the Shapiro-Wilk test and the Kolmogorov-Smirnov test to ensure the normality of the data. When checking the normality of the data, we test the null hypothesis that the data distribution is normal at the 5% error level (Hanusz & Tarasińska, 2015). There is no reason to reject the null hypothesis that the data is normal if the higher test statistic equals 0.05. To put it another way, the data will distribute normally.

The following statistical assumptions are used to test normality (Hanusz & Tarasińska, 2015):

H0: The distribution of data related to each of the variables is normal.

H1: The distribution of data related to each of the variables is not normal.

By executing the normality test command in SPSS software, the output appears in a table called Tests of Normality, which gives two values of significance level for each of the variables separately. These values are crucial in determining the normality of the data. If the significance level in the Kolmogorov-Smirnov test in this table with sig. displayed greater than 0.05 the data can be assumed to be normal with high confidence. Otherwise, it cannot be said that the data distribution is normal (Hanusz & Tarasińska, 2015).

2.4.2. Correlation test and regression model

Correlation research is one of the types of research methods in which a researcher tries to identify or understand the type of relationship between several variables. Simply put, correlation research seeks to map the type of relationship between research variables. This method has been mentioned as a subset of descriptive research. In correlation studies, a researcher measures two or more variables and then determines whether there is a correlation between them. Researchers typically use correlation to test the relationship between two or more variables including the bivariate correlation, analysis of Regression, and covariance analysis (Osborne & Waters, 2002). The correlation coefficient fluctuates between +1 and -1, when the community has a complete and direct correlation, the value of their correlation coefficient is +1, and if it has a complete inverse correlation, their correlation coefficient is -1 and if they have no correlation, their correlation coefficient will be zero (Osborne & Waters, 2002). Therefore, many researchers use this technique to test the type and significance of the relationship between the research variables.

The regression model is the next method. Regression analysis is used when the researcher is interested in testing if the independent variable of the research can predict the dependent variables. Therefore, it can be employed to predict change in a dependent variable by changes in a few independent variables (Heo *et al.* 2008). The degree of correlation between the two variables determines the amount of regression occurrence. Regression to the mean occurs when the correlation between the two variables is not complete. The accuracy of the prediction depends on the strength of the correlation. The higher the correlation between the variables, the more accurate the prediction (Counsell & Cribbie, 2015). In

most bivariate correlational studies, the distance scale is used with the default of normal distribution and the Pearson correlation coefficient is calculated (Busalim & Ghabban, 2021).

2.4.3. Sobel test

In this study, the Sobel test is used to examine the mediating role of work engagement in the relationship between psychological needs and OCB. Of course, provided that the collected data is normal, otherwise the Sobel test cannot be used. As explained below, the formula of the Sobel test is based on the results of the regression test (path coefficient), so if the data is not normal, the regression test cannot be used, and if the output of the regression test is not, the test cannot be used. This test was proposed by Michael Sobel. The mediator variable is located between independent and dependent variables and affects the relationship between them (Gorondutse & Hilman, 2014). A mediator variable must correlate with both dependent and independent variables (Gorondutse & Hilman, 2014).

$$Z - Value = \frac{a \times b}{\sqrt{(b^2 \times s_a^2) + (a^2 \times s_b^2) + (s_a^2 \times s_b^2)}}$$

Source: (Preacher & Leonardelli, 2001)

a- The path coefficient between the independent variable and the mediator.

b- The path coefficient between the mediator and the dependent variable.

Sa- standard error of independent and mediator variable path.

Sb- Standard error of intermediate and dependent variable path.

3. ANALYSIS OF RESEARCH DATA AND FINDINGS

In this chapter, the author analyzes data obtained through the questionnaire. Data analysis is of particular importance for examining research questions in any type of research. Data analysis is one of the main and most important parts of the research. The statistical population of this research is the personnel of Milan Gas Company. According to the company's management, the company's staffs at the time of distribution of the questionnaires were 82 persons. Therefore, the statistical population of this study was considered to be 82 persons, the author used the Cochran formula, the sample size was 68 persons. The author distributed 68 questionnaires among the statistical population in a simple random manner and after collecting the questionnaires, he entered the scores of the questionnaire questions, which were scored based on the Likert scale, into SPSS26 software.

3.1. Descriptive statistics of the variables

Table 3.1 describes the descriptive analysis of each of the variables in this study, including psychological needs satisfaction, work engagement and OCB, in which, respectively: Number of questions per variable, sample size who answered the questionnaires, score range, maximum score, minimum score, the average score of the questionnaire are shown.

Table 3.1. Indicators of descriptive statistics of data

	N	Sample	Range	Minimum	Maximum	Mean		Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Psychological needs	12	68	39.00	18.00	57.00	38.8088	1.11799	-0.148	-0.557
Work engagement	8	68	32.00	8.00	40.00	29.0000	0.68086	-0.578	1.852
OCB	10	68	35.00	15.00	50.00	33.9412	0.94629	0.139	-0.336

Source: Author's research

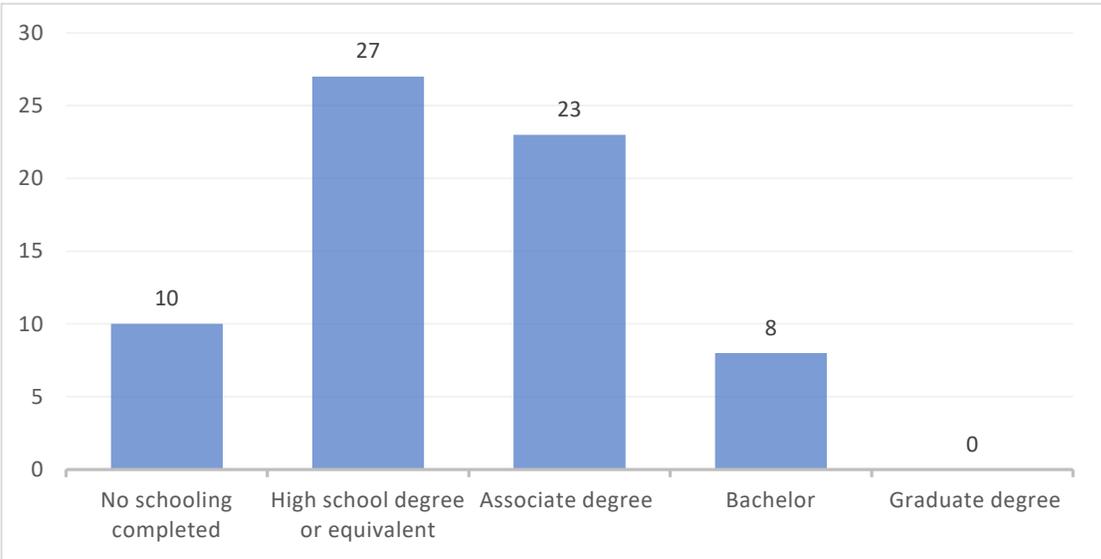
According to the Table 3.1, the answers are rated based on a five-point Likert scale continuum range from strongly disagreeing (1) to strongly agree (5). As can be seen, the average score of the questionnaires is in the medium and higher range, which indicates the relatively good status of the

variables studied in the target population. The amount of skewness and kurtosis obtained for the variables indicates the normality of the data.

3.2. Demographic statistics of respondents to questionnaires

As can be seen in the frequency distribution Figure 3.1 of the respondents based on their education level, the employees whose no schooling completed are 10 persons, high school degrees or equivalent are 27 persons, associate degrees are 23 persons, bachelors are 8 persons, and graduate degrees are 0, the frequency percentage no schooling completed is 14.8%, high school degree or equivalent is 39.7%, an associate degree is 33.8%, the bachelor is 11.7%.

Figure 3.1. Frequency distribution of respondents based on education



Source: Author’s research

According to the frequency distribution in Table 3.2 by gender, the respondents are 19 females and 49 males, with a frequency of 27.9% for females and 72.1% for males.

Table 3.2. Frequency distribution of respondents by gender

Gender	Frequency	Percentage frequency	Cumulative percentage
Females	19	27.9	27.9
Males	49	72.1	100
Total	68	100	

Source: Author's research

As shown in Table 3.3, there are 9 employees with work experience less than 1-year, 32 employees with 1 to 5 years, 19 employees with 5 to 10 years, 8 employees with more than 10 years. The frequency percentage under 1 year is 13.2%, 1 to 5 years is 47%, 6 to 10 years is 28% and more than 10 years is 11.8%.

Table 3.3. Frequency distribution of respondents based on the work experience

Work experience	1 year or less	1- 5 years	6-10 years	More than 10 years	Total
Frequency	9	32	19	8	68
Percentage frequency	13.2	47	28	11.8	100

Source: Author's research

According to the frequency distribution Table 3.4 based on age, employees who are 18 to 30 years old are 25 persons, 31 to 40 years old are 25 persons, 41 to 50 years old are 11 persons and 51 years old and older are 7 persons. And frequency percentage for persons who have 18 to 30 years old is 36.8%, 31 to 40 years old is 36.8%, 41 to 50 years old is 16.3%, and 51 years and older is 10.1%.

Table 3.4. Frequency distribution of respondents based on age

Age	18 to 30 years old	31 to 40 years old	41 to 50 years old	51 years old	Total
Frequency	25	25	11	7	68
Percentage frequency	36.8	36.8	16.3	10.1	100
Cumulative percentage	36.8	73.6	89.1	100	

Source: Author's research

According to the frequency distribution the Table 3.5 based on marital status, 35 respondents are single and 33 persons are married, a frequency percentage of single is 51% and married is 49%.

Table 3.5. Frequency distribution of respondents based on marital status

Marital status	Frequency	Percentage frequency	Cumulative percentage
Single	35	51	51
Married	33	49	100
Total	68	100	100

Source: Author's research

3.3. Normality of data

As the author examined in the methodology section, before performing parametric tests, the data need to be examined for normality. In this section, the author used the Kolmogorov-Smirnov test and Shapiro-Wilk to test the hypothesis of normality of the samples.

The test hypothesis of normality of the study samples are as follows:

H_0 : The samples have a normal distribution.

H_1 : The samples do not have a normal distribution.

If the probability value means the significance level is less than 5%, the null hypothesis, the assumption that the distribution of the sample under study is normal, is rejected at the 5% error level, otherwise, the null hypothesis is confirmed, which means that the distribution The sample is normal (Hanusz & Tarasińska, 2015).

Table 3.6. The result of the normality tests

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Psychological needs	0.076	68	0.200*	0.985	68	0.594
Work engagement	0.081	68	0.200*	0.965	68	0.054
Organizational citizenship behaviour	0.084	68	0.200*	0.981	68	0.376

Source: Author's research

According to the values of the significant level obtained in Table 3.6, which is all greater than 5%, the null hypothesis, the hypothesis of normal distribution of samples at the 5% error level, is

confirmed. And it allows the author to run the analysis for testing the research questions using parametric techniques.

3.4. Answer to the research questions

3.4.1. Answer to the first research question

How does psychological needs satisfaction affect organizational citizenship behaviour?

To answer the first research question, the author transformed this question into two hypotheses so that he can answer the research question by testing the hypotheses.

The Pearson correlation coefficient significance test was employed in the current thesis with the following hypotheses:

H_0 : Psychological needs satisfaction has no significant effect on organizational citizenship behavior.

H_1 : Psychological needs satisfaction has a significant effect on organizational citizenship behaviour.

$$\begin{cases} H_0: \rho = 0 \\ H_1: \rho \neq 0 \end{cases}$$

Running the Pearson correlation test allows the author to calculate the correlation coefficient between the psychological needs satisfaction and the OCB as variables of the model. If the correlation coefficient (ρ) is 0, the author can confirm the H_0 , otherwise ($\rho \neq 0$) the author can confirm the H_1 .

The results of the calculations are recorded in the following table.

Table 3.7. Pearson correlation coefficient between psychological needs satisfaction and OCB

Correlations		Psychological needs satisfaction
OCB	Pearson Correlation	0.361**
	Sig	0.003
	N	68

Source: Author's research

The correlation coefficient value is presented in Table 3.7. Since the observed correlation coefficient between the two variables of psychological needs satisfaction and OCB is equal to 0.361 and the level of significance is 0.003, it can be concluded that there is a strong and direct relationship between these variables. Besides, P-value < 0.01 confirms a very significant relationship at the level of 1% error. The author concludes that the alternative hypothesis (H_1) is confirmed.

The table below presents the correlation coefficient between each of the subscales of psychological needs satisfaction with OCB.

Table 3.8. The correlation coefficient between subscales of psychological needs satisfaction and OCB

Correlations		Autonomy	Competence	Relatedness
Organizational citizenship behavior	Pearson Correlation	0.243*	0.392**	0.308*
	Sig	0.046	0.001	0.011
	N	68	68	68

Source: Author's research

As shown in Table 3.8 the strongest relationship between subscales of psychological needs satisfaction and OCB is related to the relationship between competency satisfaction and OCB, followed by relatedness and autonomy are placed. As it was observed, the independent variable of psychological needs satisfaction has a direct linear relationship with the dependent variable of OCB (with increasing the independent variable, the value of the dependent variable increases).

Now, using linear regression, the author proposes a regression model for these variables.

Table 3.9. Table of estimated regression coefficients related to the first question

Model	R	R Square	ANOVA	Durbin-Watson
1	0.400 ^a	0.160	0.011	1.871

Source: Author's research

According to Table 3.9, the regression coefficient between psychological needs satisfaction and OCB is 0.400, so R Square is equal to 0.160, which indicates that the predictive power of the independent variable (subscales of psychological satisfaction) is equal to It is 16%. The value of the Durbin-Watson is equal to 1.871 which validates the regression test. The result of the Anova is equal to 0.011, which shows that the obtained regression model has a good fit and has a high ability to predict the future.

Table 3.8. Table of estimated regression coefficients related to the first question

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	21.981	3.927		5.597	0.000
	Autonomy	-0.113	0.351	-0.051	-0.322	0.749
	Competence	0.772	0.359	0.354	2.150	0.035
	Relatedness	0.244	0.367	0.108	0.663	0.509

Source: Author's research

Therefore, the following is the regression model:

$$OCB = 21.981 + (-0.113 \text{Autonomy}) + 0.772 \text{Competence} + 0.244 \text{Relatedness}$$

Therefore, to answer the first question of the research, according to the results of the Pearson correlation test, it can be concluded that psychological needs satisfaction with 99% confidence has a significant positive effect on OCB. So that with increasing satisfaction of psychological needs, OCB increases. All three subscales of psychological needs satisfaction (autonomy, competence, and relatedness) have significant relationships with OCB and based on the regression model, these subscales can predict 16% of OCB changes.

3.4.2. Answer to the second research question

How does psychological needs satisfaction affect work engagement?

To answer the second research question, the author transformed this question into two hypotheses so that he can answer the research question by testing the hypotheses.

The Pearson correlation coefficient significance test was employed in the current thesis with the following hypotheses:

H_0 : Psychological needs satisfaction has no significant effect on work engagement.

H_1 : Psychological needs satisfaction has a significant effect on work engagement.

$$\begin{cases} H_0: \rho = 0 \\ H_1: \rho \neq 0 \end{cases}$$

Running the Pearson correlation test allows the author to calculate the correlation coefficient between the psychological needs satisfaction and the work engagement as variables of the model. If the

correlation coefficient (p) is 0, the author can confirm the H0, otherwise (p ≠ 0) the author can confirm the H1. The results of the calculations are recorded in the following table.

Table 3.9. The Pearson correlation coefficient between psychological needs satisfaction and work engagement

Correlations		Psychological needs satisfaction
Work engagement	Pearson Correlation	0.306*
	Sig	0.011
	N	68

Source: Author's research

The correlation coefficient value is presented in Table 3.9. Since the observed correlation coefficient between the two variables of psychological needs satisfaction and work engagement is equal to 0.306 and the level of significance is 0.011, it can be concluded that there is a strong and direct relationship between these variables. Besides, $0.01 < P\text{-value} < 0.05$ confirms a significant relationship at the level of 5% error. The author concludes that the alternative hypothesis (H1) is confirmed. The table below presents the correlation coefficient between each of the subscales of psychological needs satisfaction work engagement.

Table 3.10. The correlation coefficient between subscales of psychological needs satisfaction and work engagement

Correlations		Autonomy	Competence	Relatedness
Work engagement	Pearson Correlation	0.108	0.340**	0.353**
	Sig	0.380	0.005	0.003
	N	68	68	68

Source: Author's research

As shown in Table 3.10, the strongest relationship between the subscales of psychological need satisfaction and work engagement is related to the relationship between relatedness and work engagement, followed by competency satisfaction with a small difference in the next rank. Satisfaction of the need for autonomy is not significantly related to work engagement. As it was observed, the independent variable of psychological needs satisfaction has a direct linear relationship with the mediator variable of work engagement (with the increase of the independent variable, the value of the mediator variable increases). Now, using linear regression, the author proposes a regression model for these variables.

Table 3.11. Table of estimated regression coefficients related to the second question

Model	R	R Square	ANOVA	Durbin-Watson
1	0.381 ^a	0.145	0.006	1.877

Source: Author's research

According to Table 3.11, the regression coefficient between psychological needs satisfaction and work engagement is 0.381, so R Square is equal to 0.145, which indicates that the predictive power of the independent variable (subscales of psychological satisfaction) is equal to It is 14.5%. The value of the Durbin-Watson is equal to 1.877 which validates the regression test. The result of the Anova is equal to 0.006, which shows that the obtained regression model has a good fit and has a high ability to predict the future.

Table 3.12. Table of estimated regression coefficients related to the second question

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	19.999	2.793		7.160	0.000
	Competence	0.298	0.238	0.190	1.252	0.215
	Relatedness	0.371	0.247	0.228	1.501	0.138

Source: Author's research

Therefore, the following is the regression model:

$$\text{Work engagement} = 19.999 + 0.298 \text{ Competence} + 0.371 \text{ Relatedness}$$

Therefore, to answer the second question of the research, according to the results of the Pearson correlation test, it can be concluded that psychological needs satisfaction with 95% confidence has a significant positive effect on work engagement. So that with increasing satisfaction of psychological needs, work engagement increases. Two subscales of psychological needs satisfaction (competence and relatedness) with 99% confidence have significant effects on work engagement and based on the regression model, these subscales can predict 14% of work engagement changes. In addition, satisfying the need for autonomy has no significant relationship with work engagement.

3.4.3. Answer to the third research question

How does work engagement affect organizational citizenship behaviour?

To answer the third research question, the author transformed this question into two hypotheses so that he can answer the research question by testing the hypotheses.

The Pearson correlation coefficient significance test was employed in the current thesis with the following hypotheses:

H_0 : Work engagement has no significant effect on organizational citizenship behaviour.

H_1 : Work engagement has a significant effect on organizational citizenship behaviour.

$H_0: \rho = 0$

$H_1: \rho \neq 0$

Running the Pearson correlation test allows the author to calculate the correlation coefficient between the work engagement and the OCB as variables of the model. If the correlation coefficient (ρ) is 0, the author can confirm the H_0 , otherwise ($\rho \neq 0$) the author can confirm the H_1 .

The results of the calculations are recorded in the following table.

Table 3.13. Pearson correlation coefficient between work engagement and OCB

Correlations		Work engagement
OCB	Pearson Correlation	0.693**
	Sig	0.000
	N	68

Source: Author's research

The correlation coefficient value is presented in Table 3.13. Since the observed correlation coefficient between the two variables of work engagement and OCB is equal to 0.693, it can be concluded that there is a strong and direct relationship between these variables. Besides, P-value < 0.01 confirms a very significant relationship at the level of 1% error. The author concludes that the alternative hypothesis (H_1) is confirmed. Now, using linear regression, the author proposes a regression model for these variables.

Table 3.14. Table of estimated regression coefficients related to the third question

Model	R	R Square	ANOVA	Durbin-Watson
1	0.693 ^a	0.480	0.000	1.892

Source: Author's research

According to Table 3.14, the regression coefficient between work engagement and OCB is 0.693, so R Square is equal to 0.480, which indicates that the predictive power of the mediator variable (work engagement) is equal to 48%. The value of the Durbin-Watson is equal to 1.892 which validates the regression test. The result of the Anova is equal to 0.000, which shows that the obtained regression model has a good fit and has a high ability to predict the future.

Table 3.15. Table of estimated regression coefficients related to the third question

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	6.026	3.644		- 1.654	0.103
	Work engagement	0.963	0.123	0.693	7.800	0.000

Source: Author's research

Therefore, the following is the regression model:

$$OCB = 6.026 + 0.963 \text{ Work engagement}$$

Therefore, to answer the third question of the research, according to the results of the Pearson correlation test, it can be concluded that work engagement with 99% confidence has a significant positive effect on OCB. So that with increasing work engagement, OCB increases. Also, the regression model shows that changes in OCB can be predicted by changes in work engagement with 48% strength.

3.4.4. Answer to the fourth research question

Does work engagement have a mediating role in the relationship between psychological needs satisfaction and organizational citizenship behaviour?

To answer the fourth research question, the author transformed this question into two hypotheses so that he can answer the research question by testing the hypotheses.

H₀: Work engagement does not have a mediating role in the relationship between psychological needs satisfaction and organizational citizenship behaviour.

H₁: Work engagement has a mediating role in the relationship between psychological needs satisfaction and organizational citizenship behaviour.

Due to the normality of the distribution of samples, the author used the Sobel test to test the above hypothesis. Assumptions zero and one can be defined as follows:

$$H_0: \rho = 0$$

$$H_1: \rho \neq 0$$

In this thesis, the author used the Sobel test to examine the mediating role of work engagement in the relationship between psychological needs satisfaction and OCB. The Sobel test for inference about the indirect effect coefficient ab is based on the same inference theory used for direct effect. Indirect effect ab is a specific sample estimate of the indirect effect in the community that is exposed to sampling variance. By estimating the standard error ab and assuming the sampling distribution ab is normal, a p-value for ab can be obtained (Gorondutse & Hilman, 2014). In general, in the Sobel test, a normal estimation can be used to evaluate the significance of the relationship. By estimating the standard error of the indirect effect, the null hypothesis can be tested against the opposite hypothesis. The statistic Z is equal to the ratio ab to its standard error (Gorondutse & Hilman, 2014). The author obtained the Z -Value from the following equation.

$$Z - Value = \frac{a \times b}{\sqrt{(b^2 \times s_a^2) + (a^2 \times s_b^2) + (s_a^2 \times s_b^2)}}$$

Source: (Preacher & Leonardelli, 2001)

a- The path coefficient between the independent variable and the mediator.

b- The path coefficient between the mediator and the dependent variable.

Sa- standard error of independent and mediator variable path.

Sb- Standard error of intermediate and dependent variable path.

$$Z - Value = \frac{0.186 \times 0.963}{\sqrt{(0.963^2 \times 0.071^2) + (0.186^2 \times 0.123^2) + (0.071^2 \times 0.123^2)}} = 2.466$$

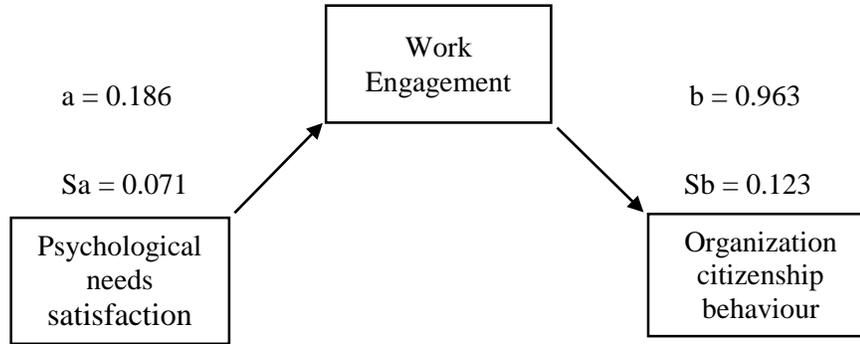


Figure 3.2. Model of the role of mediation of work engagement and values of Sobel test formula.

Source: Author's research

Considering the 5% error level, if $1.96 < Z\text{-Value} < 2.58$, the observed indirect effect is statistically significant at the 95% level and if $2.58 < Z\text{-Value}$ the observed indirect effect is statistically significant at the 99% level (Abu-Bader & Jones, 2021). The value of Sobel is equal to 2.466, which is $1.96 < 2.466 < 2.58$, so the indirect effect observed is statistically significant at the 95% level. So, the alternative hypothesis (H1) is confirmed. In other words, the mediating role of work engagement at the 95% confidence level is confirmed.

Therefore, to answer the fourth question of the research, according to the results of the Sobel test, it can be concluded that work engagement with 95% confidence has a mediating role in the relationship between psychological needs satisfaction and OCB. So that with increasing work engagement, the effect of psychological needs satisfaction on OCB increases.

3.4.5. Multiple regression model

According to Table 4-16, the regression coefficient between the effective variables (psychological needs satisfaction and work engagement) with the dependent variable of OCB is equal to 0.710, so R Square is equal to 0.504, which indicates that the predictive power of the mediator variable and independent variable is equal to 50.4%.

Table 3.16. Regression test results

Model	R	R Square	ANOVA	Durbin-Watson
1	0.710 ^a	0.504	0.000	1.882

Source: Author's research

The calculated value of the Durbin-Watson is 1.882 allows the author to confirm the assumption of the regression and validate the results of the regression. The result of the Anova is equal to 0.000, which shows that the obtained regression model has a good fit and has a high ability to predict the future.

Table 3.17. Regression test results to determine model coefficients (effective components)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	2.649	4.049		0.654	0.515
	Psychological needs satisfaction	0.139	0.078	0.165	1.794	0.078
	Work engagement	0.893	0.127	0.642	7.002	0.000

Source: Author's research

Therefore, the following is the regression model:

$$OCB = 2.649 + 0.139\text{Psychological needs satisfaction} + 0.893\text{Work engagement}$$

According to the above multiple regression model, psychological need satisfaction (Independent variable) and work engagement (mediating variable) can predict changes in OCB (dependent variable) with 50% strength.

CONCLUSION

In this chapter, the author presented a general discussion and conclusion based on the findings of this research. In addition, he made suggestions based on the results of the thesis to improve the OCB of the employees in the Milan Gas Company. He also referred to the limitations of this research and finally stated the suggestions for future research.

By examining the descriptive statistics of the questions of the autonomy part of the questionnaire, it can be concluded that the managers of Milan Gas Company consider flexibility in changing working hours and applying decision-making power to improve employee performance. On the other hand, they do not have a positive opinion about doing personal work in the workplace. In this regard, they have limited their employees. With looking at the results of the competence section, it was found that there are relatively good situations in terms of feeling capable in the workplace, learning new and interesting skills and feeling effective in the workplace in this company. However, it has not been able to empower its employees to express their views and opinions on how their co-workers perform in the workplace. Moreover, the result of the relatedness satisfaction questionnaire showed that the managers of the company have succeeded in creating a friendly and warm work environment inside the company, but have not been able to provide such a space outside working hours.

In addition, with examining the OCB questionnaire, it was discovered that employees in terms of helping colleagues, avoiding wastage of time, the order in the workplace, performing tasks accurately without the supervision of managers, providing effective suggestions in eliminating shortcomings, allocating personal time for the company, accepting responsibilities, not paying attention negative news of the company and participation in decisions are relatively in good situations. However, the company's employees have weaknesses in sharing knowledge and skills with their colleagues.

The following items were discovered for the work engagement questionnaire part. The employees of this company in terms of mental feeling, ability to continue working, energetic spirit at work, feeling power at work, job dependence, cheerfulness at work, being fascinated by work and feeling happy and satisfied at work are in good conditions.

The correlation coefficient between the two variables of psychological needs satisfaction and OCB is 0.361 and the significance level is 0.003 .Therefore, there is a significant relationship between these

two variables at the 99% confidence level. Examining the correlation between subscales of psychological needs satisfaction with OCB, it was found that all three subscales of autonomy need satisfaction, competency needs satisfaction and relatedness need satisfaction have significant relationships with OCB. The results obtained by the author in this study show that improving the factors of satisfaction of employees' psychological needs are effective in promoting OCB. This result is consistent with the results obtained by Chiniara and Bentein (2016), Wang *et al.* (2018), and Wortler *et al.* (2020). It is important to note that psychological needs are part of the basic needs, that are met to an average in Milan Gas Company. So, the feeling of need at this level occupies part of the power and mind of employees. Therefore, it can be said that managers should create an environment based on the principle of meritocracy, promotion of teamwork, freedom of action against organizational problems and obstacles, permission for employees to comment and autonomy in decision making. Based on the findings of this study, it is suggested to the managers of the Milan Gas Company to increase the job motivation of their employees to create an environment in the organization that meets as much as possible the basic psychological needs related to employees' work.

The correlation coefficient between the two variables of psychological needs satisfaction and work engagement is 0.306 and the significance level is equal to 0.011. Therefore, there is a significant relationship between these two variables at the 95% confidence level. In examining the correlation between subscales of psychological needs satisfaction with work engagement, it was found that satisfaction of relatedness needs and satisfaction of competency needs have significant relationships with work engagement, but autonomy needs satisfaction has no significant relationship with work engagement. This was to be expected, as the desire for autonomy conflicts with the work engagement. These results are consistent with what was discovered by Braganza *et al.* (2021) and Mossman *et al.* (2021). Based on the findings of this study, it can be concluded that people with work engagement are deeply attracted to their work and are often fascinated by it, and often think about their job issues even when they are not working. These people are more satisfied with their job and are more committed to their job, profession and organization. People who become attached to their job find in their work the potential to satisfy their high psychological needs. One of the solutions to increase work engagement among employees is training. Therefore, the author suggests to the managers of Milan Gas Company to provide training programs for employees according to the culture and work environment.

The correlation coefficient between the two variables of work engagement and OCB is 0.693 and the significance level is 0.000. Therefore, there is a significant relationship between these two variables

at the 99% confidence level. This result indicates that employees who have a strong connection with their job or so-called stronger work engagement have higher job performance and commitment. The results of this study confirm and support the results of the studies of Yu *et al.* (2020) and Bogler and Somech (2019). Based on the research findings, it can be concluded that employees with work engagement prefer to show their citizenship behaviours through behaviours such as work overtime, effort and perseverance, aligning with organizational change, following the orders of supervisors, and protecting organizational property. Milan Gas executives are reminded that companies that are successful in promoting work engagement are companies that choose from a large number of job seekers those that better reflect the goals and values of the organization. In essence, companies that effectively promote job attachment and provide ongoing training. And they do not limit themselves to those basic employee training upon arrival and training to introduce the organization to employees. The results of the Sobel test showed that the mediating role of work engagement in the relationship between psychological needs and OCB was confirmed at the 95% confidence level. Ozturk *et al.* (2021) and Teo *et al.* (2020) examined the mediating role of work engagement in the relationship between other individual and organizational variables. Work engagement was found to mediate relationships between high-performance work systems, perceived organizational support, emotional commitment, and job satisfaction, and was consistent with the findings of the present study. The results of this study show that there is a significant correlation between psychological needs and OCB and work engagement in this regard has a positive mediating role. In other words, work engagement improves the effect of psychological needs on OCB. The existence of work engagement among the employees of Milan Gas Company cause improves the OCB in this company. The managers of Milan Gas Company are recommended to provide organizational information to employees to perform their duties, to enable employees to make appropriate and timely choices and appropriate behaviours.

Undoubtedly, there are limitations in any research work, and this research is no exception to this rule. Although any research is complete and comprehensive, the researcher faces problems and limitations in the process. These limitations make it impossible to generalize descriptive researches in the long run and all aspects. In the present study, the author faced the following limitations.

The first limitation was that, because of the COVID-19 problems, it was impossible to adequately monitor the completion of the questionnaires, which raised the chances of errors.

The next limitation of this thesis was the lack of access to the Internet and gadgets for all employees. The author had to distribute the questionnaire traditionally among the employees.

In addition to the limitations mentioned above, since the study is cross-sectional, the findings' validity could change with time. To address the limitations of the research, the author focused on the research problem and focused his research on a specific problem. Because answering questions could be boring for employees, the author avoided asking too many questions in the questionnaire. It caused the respondents to answer the questionnaires in a shorter time. To better answer the questions, the author wrote a brief definition of the research variables at the beginning of the questionnaire so that the respondents could answer the questions with full understanding and awareness. In addition, he was present at the Milan Gas Company and answered the questions about it.

The author suggests that the model used in this research be tested in other companies as well. Certainly, the validity and reliability of the model in new companies must be calculated and researched. Because most Iranian companies do not pay much attention to the effect of satisfying psychological needs on the OCB of their employees and have many shortcomings in this regard.

This study tried to examine the relationship between psychological needs satisfaction and OCB under the influence of work engagement mediation, so to complete research in this area, the author suggests that researchers study the following topics:

The impact of organizational commitment on OCB with emphasis on the mediating role of job satisfaction.

Examining the effect of psychological needs satisfaction on job performance with an emphasis on the mediating role of work engagement.

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APPENDICES

Appendix 1. The survey questionnaire

Dear Sir/ Madam

I am a student of International Business Administration (MBA) at Tallinn University of Technology. The questionnaire in front of you is designed to conduct my master's thesis. The purpose of this thesis is to investigate the effect of psychological needs satisfaction on organizational citizenship behaviour with emphasis on the mediating role of work engagement in the Milan Gas Company. Your honesty and accuracy in answering the questions will increase the accuracy of the results of this research. Your responses will be kept entirely private, and the information gathered will only be employed for testing purposes. Thank you for your attention and for taking the time to complete this questionnaire.

Sincerely yours, Babak Mohammadi

Age	18-30	31-40	41-50	51 or older	Prefer not to answer	
Education	No schooling completed	High school degree or equivalent	Associate degree	Bachelor degree	Graduate degree	Prefer not to answer
Work experience in the Milan Gas	1 year or less	1- 5 years	5-10 years	More than 10 years		
Gender	Male		Female		Prefer not to answer	
Marital Status	Single		Married		Prefer not to answer	

Row number	This part of the questionnaire consists of three blocks of questions, that are about the satisfaction of different types of employees needs in the Milan Gas Company.	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	Satisfying the need for autonomy					
1.1	It is possible to do personal work while working In the Company.					
1.2	In my job, there is flexibility to change working hours.					
1.3	The managers of the organization provide decision-making power to the employees in choosing the right way to do the job.					
1.4	This job allows employees to decide for themselves what they need to do.					
2	Satisfying the need for competence					
2.1	Most of the time in the workplace, I feel capable.					
2.2	My co-workers tell me I am good at what I do.					
2.3	Recently I have been able to learn new and interesting skills.					
2.4	On most days, I believe that what I do has a significant impact on my life.					
3	Satisfying the need for relatedness in humans					
3.1	I am emotionally close to colleagues with whom I have regular contact.					
3.2	I like to socialize with my colleagues.					
3.3	The staffs of Milan Gas always support me.					
3.4	My co-workers always treat me fairly friendly.					

Row number	In this part of the questionnaire, please answer the questions related to that go beyond performing the tasks defined as part of one's job in the Milan Gas Company.	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	I volunteer to help co-workers who have a lot of work or are absent.					
2	I avoid wasting time doing things.					
3	Discipline in the workplace is very important to me, and I try not to be late or absent.					
4	I do not complain about minor and trivial issues, and I work well without monitoring.					
5	I am always looking to help the organization eliminate shortcomings and deficiencies by providing suggestions.					
6	I dedicate part of my personal time to the work of the organization.					
7	I do not object to the duties and responsibilities assigned to me and I accept additional responsibilities.					
8	I share my knowledge and information with the employees of the organization.					
9	I do not pay attention to announcements, messages and posters that contain negative and false information about the organization.					
10	I attend meetings related to organizational issues and participate in decisions.					

Row number	In this part of the questionnaire, please answer the questions related to work engagement in the Milan Gas Company.	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	I feel good mentally when I work.					
2	I can continue this job for a long time.					
3	I have a lot of energy while I work, and I expend a lot of it on my work.					
4	When I work, I feel that my work gives me a lot of spiritual and mental strength.					
5	When I wake up in the morning, I spontaneously prepare to go to work.					
6	I am happy at work and have a good feeling.					
7	I am fascinated by my work and do not notice the passage of time.					
8	I feel happier when I do hard work.					

Thank you for taking the time to complete this survey.

Appendix 2. The survey questionnaire and results

Dear Sir/ Madam

I am a student of International Business Administration (MBA) at Tallinn University of Technology. The questionnaire in front of you is designed to conduct my master's thesis. The purpose of this thesis is to investigate the effect of psychological needs satisfaction on organizational citizenship behaviour with emphasis on the mediating role of work engagement in the Milan Gas Company. Your honesty and accuracy in answering the questions will increase the accuracy of the results of this research. Your responses will be kept entirely private, and the information gathered will only be employed for testing purposes. Thank you for your attention and for taking the time to complete this questionnaire.

Sincerely yours, Babak Mohammadi

Age	18-30	31-40	41-50	51 or older	Prefer not to answer	
	25 36.8%	25 36.8%	11 16.3%	7 10.1%		
Education	No schooling completed	High school degree or equivalent	Associate degree	Bachelor degree	Graduate degree	Prefer not to answer
	10 14.8%	27 39.7%	23 23.8%	8 11.7%		
Work experience in the Milan Gas	1 year or less	1- 5 years	5-10 years	More than 10 years		
	9 13.2%	32 47%	19 28%	8 11.8%		
Gender	Male	49 (72.1%)	Female	19 (27.9%)	Prefer not to answer	
Marital Status	Single	35 51%	Married	33 49%	Prefer not to answer	

Row number	This part of the questionnaire consists of three blocks of questions that are about the satisfaction of different types of employees needs in the Milan Gas Company.	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	Satisfying the need for autonomy					
1.1	It is possible to do personal work while working In the Company.	15 22.1%	17 25%	13 19.1%	16 23.5%	7 10.3%
1.2	In my job, there is flexibility to change working hours.	11 16.2%	8 11.8%	17 25%	23 33.8%	9 13.2%
1.3	The managers of the organization provide decision-making power to the employees in choosing the right way to do the job.	6 8.8%	9 13.2%	21 30.9%	22 32.4%	10 14.7%
1.4	This job allows employees to decide for themselves what they need to do.	9 13.2%	18 26.5%	22 32,4%	15 22.1%	4 5.9
2	Satisfying the need for competence					
2.1	Most of the time in the workplace, I feel capable.	7 10.3%	11 16.2%	18 26.5%	26 38.2%	6 8.8%
2.2	My co-workers tell me I am good at what I do.	11 16.2%	18 26.5%	14 20.6%	18 26.5%	7 10.3%
2.3	Recently I have been able to learn new and interesting skills.	9 13.2%	13 19.1%	17 25%	16 23.5%	13 19.1
2.4	On most days, I believe that what I do has a significant impact on my life.	2 2.9%	10 14.7%	14 20.6%	27 39.7	15 22.1
3	Satisfying the need for relatedness in humans					
3.1	I am emotionally close to colleagues with whom I have regular contact.		10 14.7%	10 14.7%	30 44.1%	18 25.5%
3.2	I like to socialize with my colleagues.	13 19.1%	9 13.2%	24 35.3%	11 16.2%	11 16.2%
3.3	The staffs of Milan Gas always support me.	4 5.9%	6 8.8%	16 23.6%	28 41.2%	14 20.6%
3.4	My co-workers always treat me fairly friendly.	9 13.2%	5 7.4%	14 20.6%	23 33.8%	17 25%

Row number	In this part of the questionnaire, please answer the questions related to that go beyond performing the tasks defined as part of one's job in the Milan Gas Company.	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	I volunteer to help co-workers who have a lot of work or are absent.	3 4.4%	6 8.8%	25 36.8%	22 32.4%	12 17.6%
2	I avoid wasting time doing things.	3 4.4%	7 10.3%	16 23.5%	25 36.8%	17 25%
3	Discipline in the workplace is very important to me, and I try not to be late or absent.	8 11.8%	17 25%	16 23.5%	18 26.5%	9 13.2%
4	I do not complain about minor and trivial issues, and I work well without monitoring.	3 4.4%	10 14.7%	15 22.1%	28 41.2%	12 17.6%
5	I am always looking to help the organization eliminate shortcomings and deficiencies by providing suggestions.	11 16.2%	12 17.6%	18 26.5%	19 27.9%	8 11.8%
6	I dedicate part of my personal time to the work of the organization.	6 8.8%	10 14.7%	18 26.5%	19 27.9%	15 22.1%
7	I do not object to the duties and responsibilities assigned to me and I accept additional responsibilities.	4 5.9%	11 16.2%	6 8.8%	33 48.5%	14 20.6%
8	I share my knowledge and information with the employees of the organization.	10 14.7%	16 23.5%	22 32.4%	9 13.2%	11 16.2%
9	I do not pay attention to announcements, messages and posters that contain negative and false information about the organization.	2 2.9%	7 10.3%	18 26.5%	27 39.7%	14 20.6%
10	I attend meetings related to organizational issues and participate in decisions.	1 1.5%	10 14.7%	20 29.4%	22 32.4%	15 22.1%

Row number	In this part of the questionnaire, please answer the questions related to work engagement in the Milan Gas Company.	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	I feel good mentally when I work.	3 4.4%	4 5.9%	13 19.1%	24 35.3%	24 35.3%
2	I can continue this job for a long time.	4 5.9%	7 10.3%	15 22.1%	29 42.6%	13 19.1%
3	I have a lot of energy while I work, and I expend a lot of it on my work.	1 1.5%	7 10.3%	25 36.8%	24 35.3%	11 16.2%
4	When I work, I feel that my work gives me a lot of spiritual and mental strength.	4 5.9%	11 16.2%	12 17.6%	30 44.1%	11 16.2%
5	When I wake up in the morning, I spontaneously prepare to go to work.	8 11.8%	2 2.9%	19 27.9%	25 36.8%	14 20.6%
6	I am happy at work and have a good feeling.	3 4.4%	8 11.8%	16 23.5%	28 41.2%	13 19.1%
7	I am fascinated by my work and do not notice the passage of time.	2 2.9%	7 10.3%	15 22.1%	31 45.6%	13 19.1%
8	I feel happier when I do hard work.	3 4.4%	5 7.4%	17 25%	28 41.2%	15 22.1%

Thank you for taking the time to complete this survey.

Appendix 3. Descriptive analysis of the questionnaire

Descriptive analysis of the autonomy questionnaire

	N	Range	Minimum	Maximum	Mean		Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Autonomy1	68	4.00	1.00	5.00	2.7500	0.16008	0.158	-1.179
Autonomy2	68	4.00	1.00	5.00	3.1618	0.15483	-0.401	-0.873
Autonomy3	68	4.00	1.00	5.00	3.3088	0.13938	-0.395	-0.484
Autonomy4	68	4.00	1.00	5.00	2.8088	0.13458	0.054	-0.702

Source: Author's research

Descriptive analysis of the competency questionnaire

	N	Range	Minimum	Maximum	Mean		Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Competence1	68	4.00	1.00	5.00	3.1912	0.13780	-0.452	-0.605
Competence2	68	4.00	1.00	5.00	2.8824	0.15329	0.045	-1.107
Competence3	68	4.00	1.00	5.00	3.1618	0.15903	-0.145	-1.061
Competence4	68	4.00	1.00	5.00	3.6324	0.13068	-0.538	-0.449

Source: Author's research

Descriptive analysis of the relatedness questionnaire

	N	Range	Minimum	Maximum	Mean		Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Relatedness1	68	3.00	2.00	5.00	3.8235	0.12025	-0.580	-0.612
Relatedness2	68	4.00	1.00	5.00	2.9706	0.15952	-0.025	-0.943
Relatedness3	68	4.00	1.00	5.00	3.6176	0.13256	-0.734	0.096
Relatedness4	68	4.00	1.00	5.00	3.5000	0.15888	-0.677	-0.561

Source: Author's research

Descriptive analysis of organizational citizenship behaviour questionnaire

	N	Range	Minimum	Maximum	Mean		Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
OCB1	68	4.00	1.00	5.00	3.5000	0.12484	-0.381	-0.068
OCB2	68	4.00	1.00	5.00	3.6765	0.13324	-0.640	-0.170
OCB3	68	4.00	1.00	5.00	3.0441	0.15026	-0.037	-1.016
OCB4	68	4.00	1.00	5.00	3.5294	0.13163	-0.547	-0.362
OCB5	68	4.00	1.00	5.00	3.0147	0.15324	-0.166	-0.987
OCB6	68	4.00	1.00	5.00	3.3971	0.14983	-0.368	-0.770
OCB7	68	4.00	1.00	5.00	3.6176	0.14060	-0.798	-0.286
OCB8	68	4.00	1.00	5.00	2.9265	0.15441	0.186	-0.874
OCB9	68	4.00	1.00	5.00	3.6471	0.12354	-0.544	-0.105
OCB10	68	4.00	1.00	5.00	3.5882	0.12612	-0.242	-0.752

Source: Author's research

Descriptive analysis of work engagement questionnaire

	N	Range	Minimum	Maximum	Mean		Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Work engagement1	68	4.00	1.00	5.00	3.9118	0.13207	-0.963	0.478
Work engagement2	68	4.00	1.00	5.00	3.5882	0.13290	-0.723	0.010
Work engagement3	68	4.00	1.00	5.00	3.5441	0.11367	-0.188	-0.299
Work engagement4	68	4.00	1.00	5.00	3.4853	0.13658	-0.608	-0.432
Work engagement5	68	4.00	1.00	5.00	3.5147	0.14590	-0.777	-0.013
Work engagement6	68	4.00	1.00	5.00	3.5882	0.12956	-0.615	-0.133
Work engagement7	68	4.00	1.00	5.00	3.6765	0.12116	-0.690	0.158
Work engagement8	68	4.00	1.00	5.00	3.6912	0.12616	-0.735	0.295

Source: Author's research

Appendix 4. Tables of regression coefficients

Table of estimated regression coefficients between psychological needs satisfaction and work engagement

Model	R	R Square	ANOVA	Durbin-Watson
1	0.306 ^a	0.093	0.011	1.872

Source: Author's research

Table of estimated regression coefficients between psychological needs satisfaction and work engagement

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	21.776	2.846	-	1.654	0.000
	Psychological needs satisfaction	0.186	0.071	0.306	7.800	0.011

Source: Author's research

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