MOTIVATION FOR CHOOSING THE MEDICAL IMAGING TECHNICIAN PROFESSION

https://doi.org/10.47743/jopafl-2024-31-40

MARKOVICH Sarit H. Malul
Alexandru Ioan Cuza University of Iasi
Iasi, Romania
saritm4@gmail.com

ANDREI Andreia Gabriela
Alexandru Ioan Cuza University of Iasi
Iasi, Romania
andrei.andreia@gmail.com

Abstract: The paper presents the context and findings of a study focused on motivational factors affecting the choice of the medical imaging technician profession. This profession is important around the globe, and more and more required on the labour market. Still, the supply of imaging technicians is low in many countries, so the waiting time for the tests is unreasonably long. This delays the diagnosis and treatment of illnesses on time and, undoubtedly, harms the public's basic right for healthcare services. This study assumes that there are motivational factors that affect people's decision to choose, and therefore learn the medical imaging technician profession. Aiming to understand what are those factors that affect this process of choice, the study focused on the case of Israel. A questionnaire-based survey was administered to 70 medical imaging technicians working in the Israeli healthcare system with the view to examine what has motivated them to choose this profession. The paper presents the empirical results indicating that both intrinsic and extrinsic motivation are high and have an impact on the process of choice. The findings offer valuable insights that might help improving the supply of imaging technician profession, and the retention of employees in the healthcare system.
Keywords: profession choice, intrinsic motivation, extrinsic motivation, medical imaging technician profession, supply and demand in the healthcare system.

Introduction

This paper explores the motivational factors affecting the decision to learn the medical imaging technician profession that is one of the important professions in the field of medicine. Medical imaging technicians perform tests and radiograms in order to diagnose and treat illnesses. In spite of their importance, the supply of these technicians is low (Smith, 2007; Vanckaviciene, 2014). The low supply causes problems in the way the profession is conducted, for example, the Israeli Ministry of Health. Although the Ministry has added five imaging machines, in fact there is no possibility to operate them due to the shortage of workers in this profession. Thus, the wide public is facing long waiting time to undergo the test (Haaretz Daily Newspaper, 2022). The Literature Review illustrates that choosing a profession is a complex process and people must choose between alternatives (Gati, 2016). People have to decide which profession they wish to choose for life. Hence, it is important to examine what are the motivational factors that affect the choice of the medical imaging technician profession. Studies indicate that there are intrinsic motivational factors, namely choice based on people's wish and the fact that the choice and

practice of this profession lead to satisfaction and pleasure. There are also extrinsic motivational factors that stimulate the choice, e.g., financial reward and prestige (Deci et al, 2017; Michlol Jewish Encyclopedia, 2022). Once we understand which motivation can drive people to learn the profession, this will facilitate improvement of the supply. Therein resides the motivation and importance of conducting this study. The research aimed to examine the motivational factors that affected the choice of the medical imaging technician profession, as well as explore the extent of impact of each motivation type on the choice of the medical imaging technician profession.

Literature Review

Choosing a profession

The literature indicates that there are two main mechanisms in the process of decision-making and both of them are acting on the deciding individuals. The first mechanism functions rationally, namely it works on the logic that determines what is good and worthy. The simplification of this complex process is taking the decision and fragmenting it into small components. This allows the potential candidates to choose an ability of coping with that complex decision (Indeed Editorial Team, 2021). The second mechanism is the emotional mechanism of the decision-makers. This mechanism functions according to the existing emotion that motivates potential candidates to make one decision or another. This is a highly powerful mechanism that can sometimes be damaging, leading to misguided decisions during the process of choice that is so important (Lerner et al, 2015). The rational mechanism originates from the economic approach while the emotional mechanism originates in the psychological approach (Oplatka, 2015).

Consolidation of professional identity

The decision-making process is developed throughout the individuals' process of self-identity consolidation. During the period of adolescence, there is a stage that is connected to the issue of deciding which profession to learn. This transpires when individuals are actually asking: Who am I?. This question encompasses other questions, such as: Where am I headed? What is my self-esteem? What are my goals (Erikson, 1968). This is the stage whereby individuals realize they need to make a decision and a choice that are associated with a long-term commitment. The choice of career should match the individuals' ideology and wishes out of the alternatives that exist on the labor market. The understanding of who am I, what do I want, and how do I see myself on the one hand, and how does the environment perceive me and my essence on the other hand and sees me and my essence (Marcia, 1966). When making the decision regarding the profession for life, people should understand that therein exists also a professional identity. This also constitutes their self-esteem towards the profession that comes from the essence of and identification with the profession (Bamber and Iyer, 2002). Be its definition, the profession is a common area with theoretical and practical knowledge that is acquired by learning and formal qualification (Dingwell and Lewis, 1983). Professional identity maintains interrelations between the way professionals perceive themselves and the way the environment perceives them (Kuzminsky, 2008). In fact, work provides the sub-culture of the individuals, shaping part of their self-identity and comprising part of their personality (Hugues, 1958).

The factors that define professional identity

One of the factors that define the professional identity of people and society is the prestige of the profession. A profession is considered more prestigious when the wide public understands that the knowledge of this profession is only in the hands of the professional and they have the necessary competence for finding a solution to the problem they are facing. Professionals with the required suitable qualification, and only they, can assess and judge the performance (Marks et al, 2002). The more prestigious the profession, the more satisfied people are. This sense of satisfaction increases the consolidation of people's professional identity (Moor, 1970). Another factor in the consolidation of professional identity is the professional image. When individuals feel at ease to advertise that they engage in this profession (Kremer and Hofman, 1982), and the wide public perceives the professional image as high, that implies that the public formally acknowledges the profession, its authority, certificates, and so on. All these are highly important in the consolidation of the professional identity (Wackerhausen, 2009). Furthermore, the conditions of induction into the profession result in the consolidation of professional identity. When the induction conditions are strict, the profession requires more specializations, and there are continued study pathways, individuals develop a unique feeling that stimulates the consolidation of professional identity (McKeon and Simons, 1981). The public's concept that it is important to consolidate a professional identity for a profession, can also affect potential students in the decision-making process. Individuals usually do not make the decision alone. They consult their immediate family, friends, and information from various sources about the diversified professions that interest them and are offered on the labor market. Research findings indicate that children frequently choose the profession of one of their parents due to the acquaintance and conversation about it in the family, evoking a wish to choose the profession (Calcalist Newspaper Supplement, 2017). Hence, the consolidation of an important professional identity among the population can affect one's choice. This paper engages in the choice of the medical imaging technician profession. Research findings indicate that the prestige and professional image of this profession are low (Mavrodinova et al, 2022) and its professional identity is not consolidated (Twobig, 2006).

Professional image of medical imaging technicians

From a historical point of view, the work of medical imaging technicians has been considered as only having to push a button of the machines. This impression has apparently been formed as a result of qualification and licensing problems that this profession experiences in some of the world countries. People are accustomed to thinking that every person can press a button after several weeks of training (Collins and Nolen, 2002). Yet, this is entirely wrong! Many studies have found that when medical imaging technicians are involved in the reporting, and that they have the knowledge, education, and ability to report, this entails an important rationalization of time and money (Mavrodinova et al, 2022; Rouger, 2018). In Israel, only in 2023, has the Israeli Parliament Health Committee ratified the law regulating the engagement in healthcare professions. (State of Israel, 2022b). The law defined the profession from the aspect of qualification and training of students who had learned in Israel and those who had learned in other countries (State of Israel, 2022a).

Supply of medical imaging technician

This profession is one of the healthcare professions that are important to the entire population. Without the medical imaging technicians, people will not have the right for healthcare that is the basic need of life to which every country is committed. The medical imaging technicians perform imaging tests for the purpose of diagnosis and treatment in different and varied areas. For example: MRI, ultrasound, catheterizations, nuclear medicine, CT, and more. This field has increasingly grown in the last years due to technological developments. The growing demand for performing the tests and the aging of the population are the reasons why the world needs more competent people who practice this profession (Shaarey Mada and Mishpat Academic Center, no date; Smith, 2007; Vanckaviciene, 2014). However, in reality, the situation is different. There are insufficient medical imaging technicians on the labor market, i.e., the supply is low and the demand is high (Smith, 2007; Vanckaviciene, 2014). In many countries around the globe, the time of waiting for an imaging test is unreasonably long and it is not in line with the actual need for performing a high-quality diagnostic test on time. In most cases, doctors cannot know how to diagnose and treat the patients without the test. Due to the particularly long waiting time for an MRI test, people are referred to an alternative test, the CT, that involves exposure to unnecessary ionizing radiation that, in itself, is dangerous to the patients. In some countries around the world, an international standard for performing the test has been defined, while in other countries there is no definition of this kind of standard. Nevertheless, even in countries that do have a standard, it specifies a long time of up to 40 days. Moreover, even when there are machines that can be used for performing the test, they are not fully operational since the number of medical imaging technicians is insufficient. Thus, it is unnecessary to purchase additional machines when no one can operate them (Biloglav et al, 2020). A long waiting time prevents giving the diagnosis and treatment on time, entailing a low level of the wide public's satisfaction with the healthcare system. Moreover, it directly affects the mental health that results from the frustration of a long wait for the test (Biloglav et al, 2020).

In Israel, too, the waiting time for an MRI test is especially long (Boldor et al, 2021). Compared to the other OECD member-states, the number of MRI machines in Israel is low and the number of tests performed on these machines is high. This reflects the existing load and distress of appointments (Blanc, 2021). The Israeli Ministry of Health does not have an exact number of medical imaging technicians on the labor market. This is due to the fact that in 2005 it stopped issuing status acknowledging certificates to this profession. Although there is no numerical data, the shortage is felt, particularly because of the long waiting time for the test (Haareta Daily Newspaper, 2022; State Comptroller, 2015).

Motivational factors for choosing a profession

The question is raised as to the factors that motivate individuals to choose the medical imaging technician profession. Understanding these motives can help in the improvement of the existing low supply of this profession. The Self-Determination Theory is seeking those natural factors embodied in people and encouraging them to work and prosper at their place of work. An effective organization is an organization that encourages workers to perform on a high quality and makes them prosper. The theory divides these factors in two: autonomous motivational factors, i.e., intrinsic motivation, and controlled motivational factors, namely extrinsic motivation. Intrinsic motivation implies that individuals engage

in a certain action, such as professional practice, out of wish, interest, pleasure, and enthusiasm, without an external reward but out of love. For example: wish to help others, the profession compliance with one's area of interest. Extrinsic motivation implies that individuals engage in an action that is motivated from an external source, such as financial or emotional reward, social appreciation, prestige and so on (Deci et al, 2017; Michlol Jewish Encyclopedia, 2022). The process of deciding which profession to choose is driven in fact by intrinsic and extrinsic motivation.

Recently conducted studies of this issue found different and contrasting results. For example, examination of motivational factors among nurses indicated a positive relation between the choice of the profession and intrinsic motivation (Natan and Becker, 2010). Another study that examined people who had made a career change to teaching, found that they were driven by both intrinsic and extrinsic motivation (Zuzovsky and Donitsa-Schmidt, 2014). During the COVID-19 pandemic, many decided to make a career change to a profession with a meaning. That is, driven by intrinsic motivation rather than by extrinsic motivation, such as the wages in exchange of work (Haski-Leventhal, 2022). Conversely, a study of people who made a decision as to the choice of a profession, showed that the effect of extrinsic motivation was three times stronger than that of intrinsic motivation (Bigi-Moyal, 2022). Studies conducted in recent year in the context of healthcare professions illustrated that the altruistic motivation had the highest weight. However, to this motivation were added the issue of prestige of the profession, together with the importance of opportunities of promotion, career, wages, workplaces, and others (Narayanasamy et al, 2019). To sum up, in order to examine what is the motivation that affects the choice of the medical imaging technician profession, it is highly important to understand the motivational factors and the natural inclinations that reinforce or weaken people's decision whether or not to learn this profession. This attributes importance to this study.

Methodology and findings

For answering the research question - "What are the motivational factors that affect the choice of the medical imaging technician profession and what is the extent of impact of each motivation type?" - a questionnaire-based research was conducted in Israel. The research comprised a closed-ended questionnaire with items related to motivation in choosing a profession on the labor market. The questionnaire consisted of a demographic part, a part that examined intrinsic motivational factors, and a part that examined extrinsic motivational factors, and it was formulated according to the literature (Armon and Shalev, 2013) that examined burnout and occupational choice difficulties among medical students. The questionnaire was administered in 2023 to 70 Israeli medical imaging technicians, to identify the extrinsic and intrinsic motivations that affected their choice to learn this profession. The snow-ball approach – namely, a friend brings friend - was employed to recruit the participants in the study. The questionnaire was applied online Google's forms software and safeguarded full anonymity of the respondents. The respondents' answers were ranked to a 5-point Likert scale (1 was the lowest score and 5 was the highest score. The reliability of the questionnaire was 0.83.

Table 1. Means and standard deviations of the research variables

	M	SD

Extrinsic Motivation – medical imaging technician	3.41	0.82
Intrinsic Motivation -medical imaging technician	3.60	0.88

* All variables were measured on a 1-5 scale.

Both intrinsic and extrinsic motivation for choosing the medical imaging technician profession were well above mean value. The intrinsic motivation was higher in the medical imaging technician profession (M=3.60, SD=0.88) than the extrinsic motivation (M=3.41, SD=0.82). T-test result showed a significant difference between the importance of the intrinsic and extrinsic motivations [$t(69) = 2.83$, $p < .01$]. So, the results indicated that respondents attributed a significantly greater importance to intrinsic motivations (M=3.60, SD=0.88) than to extrinsic motivations (M=3.41, SD=0.82) in the choice of a profession.

Table 2: Means and standard deviations of the intrinsic motivation items

Intrinsic motivation items	M	SD
Helping others	3.92	1.11
Matches the area of interest	3.77	1.14
Diversity	3.66	1.18
Independence	3.25	1.25
Creativity	3.11	1.21

Table 2 shows that helping others was the topic with the most important intrinsic motivation. Conversely, creativity was the least important topic. As to extrinsic motivation, the test results illustrated significant differences of importance between the items of this motivation type: $F(6,61) = 13.14$, $p < .001$, $\eta^2 = .56$ (see Table 3).

Table 3: Means and standard deviations of the extrinsic motivation items

Extrinsic motivation items	M	SD
Professional liability	4.10	1.12
Security	3.79	1.18
Demand	3.73	1.24
Quick entry into the position	3.12	1.40
High income	3.09	1.28
Prestige	2.90	1.18
Free time	2.76	1.34

Table 3 showed that professional liability was the topic with the most important extrinsic motivation, while free time was the topic with the least important extrinsic motivation.

Discussion and conclusions

The research findings showed that the motivational factors that affected the choice of the medical imaging technician profession were both extrinsic and intrinsic. These two motivation types were high. Nevertheless, the findings illustrated that the intrinsic motivation was higher and more influential than the extrinsic motivation at the stages of choosing the medical imaging technician profession. This can be accounted for by the fact that people who decide to learn this profession attribute more importance when choosing the profession to the personal and emotional reward, e.g., helping others, than to external reward, such as wages. The empirical literature supports this finding. Studies conducted in

the context of healthcare professions, found with reference to the choice of profession that the important motivational factors were the altruistic factors, namely the intrinsic ones (Narayanasamy et al, 2019). Moreover, the literature explains the importance of consolidated professional identity at the stages of making a decision, particularly with regard to the properties of the profession, e.g., helping others (Ehrhard, 2014; Wood 2004). Furthermore, recent studies of motivation in the choice of a profession found that after the COVID-19 pandemic, people who decided to make a career change chose meaningful professions with intrinsic motivation (Haski-Leventhal, 2022). On the other hand, qualitative research of doctors found that the participants attributed higher importance to extrinsic motivation and that the family helped them in the choice due to reasons of prestige and wages (Popper-Giveon and Keshet, 2016).

Another finding that should be considered was the extrinsic motivational factors that were also high. The most affecting factor in the choice of the medical imaging technician profession in its level of importance was professional liability, followed by professional security. This can be accounted for by the fact that medical imaging technicians do not make the decision about the patients' diagnosis or the treatment. They perform the test and collect the data for the doctors who decide how to treat and heal diseases. That is, in practice, the responsibility for the identification of the pathology is incumbent on the decoding doctors. The medical imaging technicians are not formally acknowledged for their work of identifying the life-risking pathologies and, therefore, are not appreciated for this work. The empirical literature supports this finding since the workers' involvement in the decision-making process increases their sense of belonging (Davy et al, 1991). Workers' retention in a system is important and it transpires when the workers hear that their work is appreciated and acknowledged (Tomlinson, 2002). Workers' retention has become a particularly essential issue, when the supply is low in a certain field, such as the medical imaging technician profession. Retaining the existing staff is highly important. Hence, we should understand that acknowledgement is vital because the framework of responsibility defined for the medical imaging technician profession is connected to the motivation for choosing the profession. When we define and formally acknowledge the framework of responsibility of the medical imaging technicians, we would be able to retain the existing staff and encourage the choice of this profession. Studies indicate that workers of the healthcare services drop out from the medical imaging professions because they are not appreciated and receive low wages (Ministry of Health, 2022a, 2022b). Moreover, studies show that individuals who are at the stage of deciding what to learn, their decision is affected by the wages they are going to earn (Baker et al, 2018).

In summary, the data collected for this study are based on a sample of 70 medical imaging technicians in Israel. Nevertheless, the sample does not necessarily reflect the positions of the entire global population of these technicians, even though this concerns the same profession that operates the same machines all over the world. Yet, the findings of this quantitative research indicate that the intrinsic motivational factors for choosing the medical imaging technician profession are mainly related to people's personal wish to choose this profession. On the other hand, there are extrinsic motivational factors for choosing the medical imaging technician profession, although their importance was lower than that of intrinsic motivation. They were also found to be high and, therefore, they are also essential in the choice of the medical imaging technician profession.

It is highly important to understand what motivates people to choose the medical imaging technician profession. Understanding the motivational factors involved in the choice of the profession can help in realizing what should be improved and preserved in order to increase the supply required for this profession. This important study is a first milestone on the way to identifying the factors that can improve the low supply of this profession. Thus, further studies are necessary in order to explore what are the reasons for the current low supply of this crucial profession.

References

1. Armon, G. and Shalev, K. (2013). Burnout and occupational choice difficulties among medical students. In B. R. Doolittle (Ed.), Psychology of burnout: New research (pp. 137–148). Haup[pauge, NY: Nova Science Publishers.
2. Baker, R.A., Bettinger, E. A., Jacob, A, C. and Marinescu, J. D. (2018). The Effect of Labor Market Information on Community College Students' Major Choice. Economics of Education Review. https://doi.org/10.1016/j.econedurev.2018.05.005
3. Bamber, E. M. and Iyer, V. M. (2002). Big 5 Auditors Professional and Organizational Identification: Consistency or Conflict? Auditing, 21, 21-38. https://doi.org/10.2308/aud.2002.21.2.21
4. Bigi-Moyal, O., (2022). The motive that motivates: What do we look for at the place of work? Ph.D. dissertation. Israel: Ayelet – Israeli Association for Occupational Counselling and Career Development. [Hebrew]
5. Biloglav, Z., Medaković, P., Buljević, J., Zuvela, F., Padjen, I., Vrkić, D. and Curić, J. (2020). The analysis of waiting time ad utilization of computed tomography and magnetic resonance iaging in Croatia a nationwide survey Med J. 61(6), 538-546.
6. Boldor, N., Vaknin, S., Myers, V., Hakak, N., Somekh, M., Wilf-Miron, R., & Luxenburg, O. (2021). Reforming the MRI system: the Israeli National Program to shorten waiting times and increase efficiency. Israel Journal of Health Policy Research, 10, 1-8. https://doi.org/10.1186/s13584-021-00493-7
7. Calcalist Newspaper Supplement (2017). What is the chance that you will engage in the same profession as your parents? Retrieved from: https://www.calcalist.co.il/local/articles/0,7340. 8.12.2017. [Hebrew]
8. Collins, K. S. and Nolen, K. (2002). Enhancing your professional image (My Perspective). Radiologic Technology, 73(3).
9. Davy, J. A., Kinicki, A. J., & Scheck, C. L. (1991). Developing and testing a model of survivor responses to layoffs. Journal of vocational behavior, 38(3), 302-317. https://doi.org/10.1016/0001-8791(91)90032-H
10. Deci, E. L., Ryan, R. M. and Olafsen, A. H. (2017). Self-Determination Theory in Work Organizations: The State of a Science. Retrieved from https://www.researchgate.net/publication/312960448
11. Dingwall, R. and Lewis, P. S.C. (1983). The sociology of the profession: Lawyers, doctors, and others. New York, NY: Macmillan.
12. Ehrhard, R., (2014). Educational counselling: A profession looking for an identity. Tel Aviv: MOFET Institute. [Hebrew]
13. Erikson, E. H., (1968). Identity: Youth and crisis (p. 176). New York, NY: Norton.
14. Gati, I., (2016). Ways of assisting in making career decisions. Jerusalem: Hebrew University. [Hebrew]
15. Haaretz Daily Newspaper (2022). Horowitz and Liberman were proud of adding MRI machines but there was no one to operate them. Tel Aviv: Haaretz Publications [Hebrew]
16. Haski-Leventhal, D., (2022). The great resignation: Purpose and meaning matter more than ever. The Lighthouse. Macquarie: Macquarie Business School.
17. Hughes, E. C., (1958). Men and Their Work. London: Free Press.

18. Indeed Editorial Team (2021). Definitive Guide to the Rational Model of Decision Making. Retrieved from: https://www.indeed.com/career-advice/career-development/rational-model-of-decision-making
19. Kremer, L. and Hofman, J. E. (1982). Personality Characteristics and Teaching Behavior. Education, 102(4), 359-365.
20. Kuzminsky, L., (2008). Professional identity in teaching. Shviley Mehkar, 15, 13-17. [Hebrew]
21. Lerner, J. S., Li, Y., Valdesolo, P. and Kassam, K. S. (2015). Emotion and Decision Making. Annual Review of Psychology, 66, 799-823. https://doi.org/10.1146/annurev-psych-010213-115043
22. Marcia, J. E., (1966). Development and validation of ego identity status. Journal of Personality and Social Psychology, 3, 551-558. https://psycnet.apa.org/doi/10.1037/h0023281
23. Marks, A., Scholarios, D. and Locker, C. (2002). Identifying a Profession: The Creation of Professional Identities within Software Work. Presented at the 18th Egos Colloquium, July, 2002, Barcelona, Spain
24. Mavrodinova, S., Kostova, E., Stoyanova, S., Georgieva, A. and Redjeb, S. (2022). Attitudes for professional realization of students from the Specialty X-Rays Laboratory. Assistant in the Medical College, Medical University of Varna, Bulgaria.
25. McKeon, G. J. and Simons, I. L. (1981). Identities and Interactions. London: Free Press.
26. Michlol Jewish Encyclopedia (2022). Self-determination theory. Retrieved from: https://www.hamichlol.org.il/%D7%AA%D7%90%D7%95%D7%A8%D7%99%D7%99%D7%AA_%D7%94%D7%94%D7%92%D7%93%D7%A8%D7%94_%D7%94%D7%A2%D7%A6%D7%9E%D7%99%D7%AA
27. Ministry of Health (2022a). About the profession of X-Rays technicians and imaging. Jerusalem: Ministry of Health. [Hebrew]
28. Ministry of Health (2022b). National Program for the reinforcement of healthcare system workers and prevention of burnout: Findings of the National Survey. Jerusalem: Ministry of Health. [Hebrew]
29. Moor, W. E., (1970). The Professions Roles and Rules. Verona, NY: Russel Sage.
30. Narayanasamy, M., Ruban, A. and Sankaran, P. S. (2019). Factors influencing to study medicine: a survey of first-year medical students from India. Korean J Med Educ., 31(1), 61. https://doi.org/10.3946%2Fkjme.2019.119
31. Natan, M. B. and Becker, F. (2010). Israelis' perceived motivation for choosing a nursing career. Nurse education today, 30(4), 308–313. https://doi.org/10.1016/j.nedt.2009.08.006
32. Oplatka, I.. (2015). Fundamentals of education administration: Leadership and management of educational organizations and the approach. Haifa: Pardess publishing. [Hebrew]
33. Popper-Giveon, A. and Keshet, Y. (2016). "It's every Family's dream": choice of a medical career among the Arab minority in Israel. Journal of Immigrant and Minority Health, 18(5), 1148–1158. https://doi.org/10.1007/s10903-015-0252-7
34. Rouger, M., (2018). Levelling EU qualifications for radiographers. In: J. McNulti (2018), European Federation of Radiographers.
35. Shaarey Mada and Mishpat Academic Center (no date). X-Rays technicians – Is it worthwhile learning the profession? https://mishpat.ac.il/%D7%98%D7%9B%D7%A0%D7%90%D7%99-%D7%A8%D7%A0%D7%98%D7%92%D7%9F-%D7%9C%D7%9C%D7%9E%D7%95%D7%93/
36. Smith, T. M., (2007). Radiographers' role in radiological reporting: a model to support future. The Medical Journal of Australia, 186(2), 629-631. https://doi.org/10.5694/j.1326-5377.2007.tb01080.x
37. State Comptroller (2015). Ministry of Health Advanced Imaging Tests – Annual Report 65C. Jerusalem: Prime Minister Office. [Hebrew]
38. State of Israel (2022a). Law of Regulation Principles. Chapter 1: Aim and definitions. Jerusalem: State of Israel. [Hebrew]
39. State of Israel (2022b). A Bill Regulating the Engagement in Healthcare Professions (Amendment No. 407 – Regulation of X-Rays Radiography and Imaging Profession). Jerusalem: State of Israel. https://www.gov.il/he/departments/policies/dec407-2023 [Hebrew]
40. Tomlinson, A., (2002). High Technology workers want Respect. Survey Canadian Human Resources Reporter, 15(3), 2.

41. Twobig, P. L., (2006). Education, Expertise, Experience and the Making of Hospital Workers in Canada, 1920-1960. https://www.erudit.org/en/journals/scientia/1900-v1-n1-scientia3150/800522ar/abstract/
42. Vanckaviciene, A., (2014). Supply and demand for radiographers in Lithuania: A prognosis for 2012–2030. Radiology, 83(7), 1292-1300. https://doi.org/10.1016/j.ejrad.2014.04.009
43. Wackerhausen, S., (2009), Collaboration, professional identity and reflection across boundaries. Journal of Inter-Professional Care, 231(5), 455-473. https://doi.org/10.1080/13561820902921720
44. Wood, W., (2004). The heart, mind, and soul of professionalism in occupational therapy. The American Journal of Occupational Therapy, 58, 249-257. http://www.aota.org/Pubs/AJOT_1.aspx
45. Zuzovsky, R. and Donitsa-Schmidt, S. (2014). Turning to teaching: Second career student teachers' intentions, motivations, and perceptions about the teaching profession. International Education Research, 2(3), 1–17. http://dx.doi.org/10.12735/ier.v2i3p01

MOTIVATION FOR CHOOSING THE MEDICAL IMAGING TECHNICIAN PROFESSION

https://doi.org/10.47743/jopafl-2024-31-39

MARKOVICH Sarit H. Malul
Alexandru Ioan Cuza University of Iasi
Iasi, Romania
saritm4@gmail.com

ANDREI Andreia Gabriela
Alexandru Ioan Cuza University of Iasi
Iasi, Romania
andrei.andreia@gmail.com

Abstract: The paper presents the context and findings of a study focused on motivational factors affecting the choice of the medical imaging technician profession. This profession is important around the globe, and more and more required on the labour market. Still, the supply of imaging technicians is low in many countries, so the waiting time for the tests is unreasonably long. This delays the diagnosis and treatment of illnesses on time and, undoubtedly, harms the public's basic right for healthcare services. This study assumes that there are motivational factors that affect people's decision to choose, and therefore learn the medical imaging technician profession. Aiming to understand what are those factors that affect this process of choice, the study focused on the case of Israel. A questionnaire-based survey was administered to 70 medical imaging technicians working in the Israeli healthcare system with the view to examine what has motivated them to choose this profession. The paper presents the empirical results indicating that both intrinsic and extrinsic motivation are high and have an impact on the process of choice. The findings offer valuable insights that might help improving the supply of imaging technician profession, and the retention of employees in the healthcare system.
Keywords: profession choice, intrinsic motivation, extrinsic motivation, medical imaging technician profession, supply and demand in the healthcare system.

Introduction

This paper explores the motivational factors affecting the decision to learn the medical imaging technician profession that is one of the important professions in the field of medicine. Medical imaging technicians perform tests and radiograms in order to diagnose and treat illnesses. In spite of their importance, the supply of these technicians is low (Smith, 2007; Vanckaviciene, 2014). The low supply causes problems in the way the profession is conducted, for example, the Israeli Ministry of Health. Although the Ministry has added five imaging machines, in fact there is no possibility to operate them due to the shortage of workers in this profession. Thus, the wide public is facing long waiting time to undergo the test (Haaretz Daily Newspaper, 2022). The Literature Review illustrates that choosing a profession is a complex process and people must choose between alternatives (Gati, 2016). People have to decide which profession they wish to choose for life. Hence, it is important to examine what are the motivational factors that affect the choice of the medical imaging technician profession. Studies indicate that there are intrinsic motivational factors, namely choice based on people's wish and the fact that the choice and

practice of this profession lead to satisfaction and pleasure. There are also extrinsic motivational factors that stimulate the choice, e.g., financial reward and prestige (Deci et al, 2017; Michlol Jewish Encyclopedia, 2022). Once we understand which motivation can drive people to learn the profession, this will facilitate improvement of the supply. Therein resides the motivation and importance of conducting this study. The research aimed to examine the motivational factors that affected the choice of the medical imaging technician profession, as well as explore the extent of impact of each motivation type on the choice of the medical imaging technician profession.

Literature Review

Choosing a profession

The literature indicates that there are two main mechanisms in the process of decision-making and both of them are acting on the deciding individuals. The first mechanism functions rationally, namely it works on the logic that determines what is good and worthy. The simplification of this complex process is taking the decision and fragmenting it into small components. This allows the potential candidates to choose an ability of coping with that complex decision (Indeed Editorial Team, 2021). The second mechanism is the emotional mechanism of the decision-makers. This mechanism functions according to the existing emotion that motivates potential candidates to make one decision or another. This is a highly powerful mechanism that can sometimes be damaging, leading to misguided decisions during the process of choice that is so important (Lerner et al, 2015). The rational mechanism originates from the economic approach while the emotional mechanism originates in the psychological approach (Oplatka, 2015).

Consolidation of professional identity

The decision-making process is developed throughout the individuals' process of self-identity consolidation. During the period of adolescence, there is a stage that is connected to the issue of deciding which profession to learn. This transpires when individuals are actually asking: Who am I?. This question encompasses other questions, such as: Where am I headed? What is my self-esteem? What are my goals (Erikson, 1968). This is the stage whereby individuals realize they need to make a decision and a choice that are associated with a long-term commitment. The choice of career should match the individuals' ideology and wishes out of the alternatives that exist on the labor market. The understanding of who am I, what do I want, and how do I see myself on the one hand, and how does the environment perceive me and my essence on the other hand and sees me and my essence (Marcia, 1966). When making the decision regarding the profession for life, people should understand that therein exists also a professional identity. This also constitutes their self-esteem towards the profession that comes from the essence of and identification with the profession (Bamber and Iyer, 2002). Be its definition, the profession is a common area with theoretical and practical knowledge that is acquired by learning and formal qualification (Dingwell and Lewis, 1983). Professional identity maintains interrelations between the way professionals perceive themselves and the way the environment perceives them (Kuzminsky, 2008). In fact, work provides the sub-culture of the individuals, shaping part of their self-identity and comprising part of their personality (Hugues, 1958).

The factors that define professional identity

One of the factors that define the professional identity of people and society is the prestige of the profession. A profession is considered more prestigious when the wide public understands that the knowledge of this profession is only in the hands of the professional and they have the necessary competence for finding a solution to the problem they are facing. Professionals with the required suitable qualification, and only they, can assess and judge the performance (Marks et al, 2002). The more prestigious the profession, the more satisfied people are. This sense of satisfaction increases the consolidation of people's professional identity (Moor, 1970). Another factor in the consolidation of professional identity is the professional image. When individuals feel at ease to advertise that they engage in this profession (Kremer and Hofman, 1982), and the wide public perceives the professional image as high, that implies that the public formally acknowledges the profession, its authority, certificates, and so on. All these are highly important in the consolidation of the professional identity (Wackerhausen, 2009). Furthermore, the conditions of induction into the profession result in the consolidation of professional identity. When the induction conditions are strict, the profession requires more specializations, and there are continued study pathways, individuals develop a unique feeling that stimulates the consolidation of professional identity (McKeon and Simons, 1981). The public's concept that it is important to consolidate a professional identity for a profession, can also affect potential students in the decision-making process. Individuals usually do not make the decision alone. They consult their immediate family, friends, and information from various sources about the diversified professions that interest them and are offered on the labor market. Research findings indicate that children frequently choose the profession of one of their parents due to the acquaintance and conversation about it in the family, evoking a wish to choose the profession (Calcalist Newspaper Supplement, 2017). Hence, the consolidation of an important professional identity among the population can affect one's choice. This paper engages in the choice of the medical imaging technician profession. Research findings indicate that the prestige and professional image of this profession are low (Mavrodinova et al, 2022) and its professional identity is not consolidated (Twobig, 2006).

Professional image of medical imaging technicians

From a historical point of view, the work of medical imaging technicians has been considered as only having to push a button of the machines. This impression has apparently been formed as a result of qualification and licensing problems that this profession experiences in some of the world countries. People are accustomed to thinking that every person can press a button after several weeks of training (Collins and Nolen, 2002). Yet, this is entirely wrong! Many studies have found that when medical imaging technicians are involved in the reporting, and that they have the knowledge, education, and ability to report, this entails an important rationalization of time and money (Mavrodinova et al, 2022; Rouger, 2018). In Israel, only in 2023, has the Israeli Parliament Health Committee ratified the law regulating the engagement in healthcare professions. (State of Israel, 2022b). The law defined the profession from the aspect of qualification and training of students who had learned in Israel and those who had learned in other countries (State of Israel, 2022a).

Supply of medical imaging technician

This profession is one of the healthcare professions that are important to the entire population. Without the medical imaging technicians, people will not have the right for healthcare that is the basic need of life to which every country is committed. The medical imaging technicians perform imaging tests for the purpose of diagnosis and treatment in different and varied areas. For example: MRI, ultrasound, catheterizations, nuclear medicine, CT, and more. This field has increasingly grown in the last years due to technological developments. The growing demand for performing the tests and the aging of the population are the reasons why the world needs more competent people who practice this profession (Shaarey Mada and Mishpat Academic Center, no date; Smith, 2007; Vanckaviciene, 2014). However, in reality, the situation is different. There are insufficient medical imaging technicians on the labor market, i.e., the supply is low and the demand is high (Smith, 2007; Vanckaviciene, 2014). In many countries around the globe, the time of waiting for an imaging test is unreasonably long and it is not in line with the actual need for performing a high-quality diagnostic test on time. In most cases, doctors cannot know how to diagnose and treat the patients without the test. Due to the particularly long waiting time for an MRI test, people are referred to an alternative test, the CT, that involves exposure to unnecessary ionizing radiation that, in itself, is dangerous to the patients. In some countries around the world, an international standard for performing the test has been defined, while in other countries there is no definition of this kind of standard. Nevertheless, even in countries that do have a standard, it specifies a long time of up to 40 days. Moreover, even when there are machines that can be used for performing the test, they are not fully operational since the number of medical imaging technicians is insufficient. Thus, it is unnecessary to purchase additional machines when no one can operate them (Biloglav et al, 2020). A long waiting time prevents giving the diagnosis and treatment on time, entailing a low level of the wide public's satisfaction with the healthcare system. Moreover, it directly affects the mental health that results from the frustration of a long wait for the test (Biloglav et al, 2020).

In Israel, too, the waiting time for an MRI test is especially long (Boldor et al, 2021). Compared to the other OECD member-states, the number of MRI machines in Israel is low and the number of tests performed on these machines is high. This reflects the existing load and distress of appointments (Blanc, 2021). The Israeli Ministry of Health does not have an exact number of medical imaging technicians on the labor market. This is due to the fact that in 2005 it stopped issuing status acknowledging certificates to this profession. Although there is no numerical data, the shortage is felt, particularly because of the long waiting time for the test (Haareta Daily Newspaper, 2022; State Comptroller, 2015).

Motivational factors for choosing a profession

The question is raised as to the factors that motivate individuals to choose the medical imaging technician profession. Understanding these motives can help in the improvement of the existing low supply of this profession. The Self-Determination Theory is seeking those natural factors embodied in people and encouraging them to work and prosper at their place of work. An effective organization is an organization that encourages workers to perform on a high quality and makes them prosper. The theory divides these factors in two: autonomous motivational factors, i.e., intrinsic motivation, and controlled motivational factors, namely extrinsic motivation. Intrinsic motivation implies that individuals engage

in a certain action, such as professional practice, out of wish, interest, pleasure, and enthusiasm, without an external reward but out of love. For example: wish to help others, the profession compliance with one's area of interest. Extrinsic motivation implies that individuals engage in an action that is motivated from an external source, such as financial or emotional reward, social appreciation, prestige and so on (Deci et al, 2017; Michlol Jewish Encyclopedia, 2022). The process of deciding which profession to choose is driven in fact by intrinsic and extrinsic motivation.

Recently conducted studies of this issue found different and contrasting results. For example, examination of motivational factors among nurses indicated a positive relation between the choice of the profession and intrinsic motivation (Natan and Becker, 2010). Another study that examined people who had made a career change to teaching, found that they were driven by both intrinsic and extrinsic motivation (Zuzovsky and Donitsa-Schmidt, 2014). During the COVID-19 pandemic, many decided to make a career change to a profession with a meaning. That is, driven by intrinsic motivation rather than by extrinsic motivation, such as the wages in exchange of work (Haski-Leventhal, 2022). Conversely, a study of people who made a decision as to the choice of a profession, showed that the effect of extrinsic motivation was three times stronger than that of intrinsic motivation (Bigi-Moyal, 2022). Studies conducted in recent year in the context of healthcare professions illustrated that the altruistic motivation had the highest weight. However, to this motivation were added the issue of prestige of the profession, together with the importance of opportunities of promotion, career, wages, workplaces, and others (Narayanasamy et al, 2019). To sum up, in order to examine what is the motivation that affects the choice of the medical imaging technician profession, it is highly important to understand the motivational factors and the natural inclinations that reinforce or weaken people's decision whether or not to learn this profession. This attributes importance to this study.

Methodology and findings

For answering the research question - "What are the motivational factors that affect the choice of the medical imaging technician profession and what is the extent of impact of each motivation type?" - a questionnaire-based research was conducted in Israel. The research comprised a closed-ended questionnaire with items related to motivation in choosing a profession on the labor market. The questionnaire consisted of a demographic part, a part that examined intrinsic motivational factors, and a part that examined extrinsic motivational factors, and it was formulated according to the literature (Armon and Shalev, 2013) that examined burnout and occupational choice difficulties among medical students. The questionnaire was administered in 2023 to 70 Israeli medical imaging technicians, to identify the extrinsic and intrinsic motivations that affected their choice to learn this profession. The snow-ball approach – namely, a friend brings friend - was employed to recruit the participants in the study. The questionnaire was applied online Google's forms software and safeguarded full anonymity of the respondents. The respondents' answers were ranked to a 5-point Likert scale (1 was the lowest score and 5 was the highest score. The reliability of the questionnaire was 0.83.

Table 1. Means and standard deviations of the research variables

	M	SD

Extrinsic Motivation – medical imaging technician	3.41	0.82
Intrinsic Motivation -medical imaging technician	3.60	0.88

* All variables were measured on a 1-5 scale.

Both intrinsic and extrinsic motivation for choosing the medical imaging technician profession were well above mean value. The intrinsic motivation was higher in the medical imaging technician profession (M=3.60, SD=0.88) than the extrinsic motivation (M=3.41, SD=0.82). T-test result showed a significant difference between the importance of the intrinsic and extrinsic motivations [$t(69) = 2.83$, $p < .01$]. So, the results indicated that respondents attributed a significantly greater importance to intrinsic motivations (M=3.60, SD=0.88) than to extrinsic motivations (M=3.41, SD=0.82) in the choice of a profession.

Table 2: Means and standard deviations of the intrinsic motivation items

Intrinsic motivation items	M	SD
Helping others	3.92	1.11
Matches the area of interest	3.77	1.14
Diversity	3.66	1.18
Independence	3.25	1.25
Creativity	3.11	1.21

Table 2 shows that helping others was the topic with the most important intrinsic motivation. Conversely, creativity was the least important topic. As to extrinsic motivation, the test results illustrated significant differences of importance between the items of this motivation type: $F(6,61) = 13.14$, $p < .001$, $\eta^2 = .56$ (see Table 3).

Table 3: Means and standard deviations of the extrinsic motivation items

Extrinsic motivation items	M	SD
Professional liability	4.10	1.12
Security	3.79	1.18
Demand	3.73	1.24
Quick entry into the position	3.12	1.40
High income	3.09	1.28
Prestige	2.90	1.18
Free time	2.76	1.34

Table 3 showed that professional liability was the topic with the most important extrinsic motivation, while free time was the topic with the least important extrinsic motivation.

Discussion and conclusions

The research findings showed that the motivational factors that affected the choice of the medical imaging technician profession were both extrinsic and intrinsic. These two motivation types were high. Nevertheless, the findings illustrated that the intrinsic motivation was higher and more influential than the extrinsic motivation at the stages of choosing the medical imaging technician profession. This can be accounted for by the fact that people who decide to learn this profession attribute more importance when choosing the profession to the personal and emotional reward, e.g., helping others, than to external reward, such as wages. The empirical literature supports this finding. Studies conducted in

the context of healthcare professions, found with reference to the choice of profession that the important motivational factors were the altruistic factors, namely the intrinsic ones (Narayanasamy et al, 2019). Moreover, the literature explains the importance of consolidated professional identity at the stages of making a decision, particularly with regard to the properties of the profession, e.g., helping others (Ehrhard, 2014; Wood 2004). Furthermore, recent studies of motivation in the choice of a profession found that after the COVID-19 pandemic, people who decided to make a career change chose meaningful professions with intrinsic motivation (Haski-Leventhal, 2022). On the other hand, qualitative research of doctors found that the participants attributed higher importance to extrinsic motivation and that the family helped them in the choice due to reasons of prestige and wages (Popper-Giveon and Keshet, 2016).

Another finding that should be considered was the extrinsic motivational factors that were also high. The most affecting factor in the choice of the medical imaging technician profession in its level of importance was professional liability, followed by professional security. This can be accounted for by the fact that medical imaging technicians do not make the decision about the patients' diagnosis or the treatment. They perform the test and collect the data for the doctors who decide how to treat and heal diseases. That is, in practice, the responsibility for the identification of the pathology is incumbent on the decoding doctors. The medical imaging technicians are not formally acknowledged for their work of identifying the life-risking pathologies and, therefore, are not appreciated for this work. The empirical literature supports this finding since the workers' involvement in the decision-making process increases their sense of belonging (Davy et al, 1991). Workers' retention in a system is important and it transpires when the workers hear that their work is appreciated and acknowledged (Tomlinson, 2002). Workers' retention has become a particularly essential issue, when the supply is low in a certain field, such as the medical imaging technician profession. Retaining the existing staff is highly important. Hence, we should understand that acknowledgement is vital because the framework of responsibility defined for the medical imaging technician profession is connected to the motivation for choosing the profession. When we define and formally acknowledge the framework of responsibility of the medical imaging technicians, we would be able to retain the existing staff and encourage the choice of this profession. Studies indicate that workers of the healthcare services drop out from the medical imaging professions because they are not appreciated and receive low wages (Ministry of Health, 2022a, 2022b). Moreover, studies show that individuals who are at the stage of deciding what to learn, their decision is affected by the wages they are going to earn (Baker et al, 2018).

In summary, the data collected for this study are based on a sample of 70 medical imaging technicians in Israel. Nevertheless, the sample does not necessarily reflect the positions of the entire global population of these technicians, even though this concerns the same profession that operates the same machines all over the world. Yet, the findings of this quantitative research indicate that the intrinsic motivational factors for choosing the medical imaging technician profession are mainly related to people's personal wish to choose this profession. On the other hand, there are extrinsic motivational factors for choosing the medical imaging technician profession, although their importance was lower than that of intrinsic motivation. They were also found to be high and, therefore, they are also essential in the choice of the medical imaging technician profession.

It is highly important to understand what motivates people to choose the medical imaging technician profession. Understanding the motivational factors involved in the choice of the profession can help in realizing what should be improved and preserved in order to increase the supply required for this profession. This important study is a first milestone on the way to identifying the factors that can improve the low supply of this profession. Thus, further studies are necessary in order to explore what are the reasons for the current low supply of this crucial profession.

References

1. Armon, G. and Shalev, K. (2013). Burnout and occupational choice difficulties among medical students. In B. R. Doolittle (Ed.), Psychology of burnout: New research (pp. 137–148). Haup[pauge, NY: Nova Science Publishers.
2. Baker, R.A., Bettinger, E. A., Jacob, A, C. and Marinescu, J. D. (2018). The Effect of Labor Market Information on Community College Students' Major Choice. Economics of Education Review. https://doi.org/10.1016/j.econedurev.2018.05.005
3. Bamber, E. M. and Iyer, V. M. (2002). Big 5 Auditors Professional and Organizational Identification: Consistency or Conflict? Auditing, 21, 21-38. https://doi.org/10.2308/aud.2002.21.2.21
4. Bigi-Moyal, O., (2022). The motive that motivates: What do we look for at the place of work? Ph.D. dissertation. Israel: Ayelet – Israeli Association for Occupational Counselling and Career Development. [Hebrew]
5. Biloglav, Z., Medaković, P., Buljević, J., Zuvela, F., Padjen, I., Vrkić, D. and Curić, J. (2020). The analysis of waiting time ad utilization of computed tomography and magnetic resonance iaging in Croatia a nationwide survey Med J. 61(6), 538-546.
6. Boldor, N., Vaknin, S., Myers, V., Hakak, N., Somekh, M., Wilf-Miron, R., & Luxenburg, O. (2021). Reforming the MRI system: the Israeli National Program to shorten waiting times and increase efficiency. Israel Journal of Health Policy Research, 10, 1-8. https://doi.org/10.1186/s13584-021-00493-7
7. Calcalist Newspaper Supplement (2017). What is the chance that you will engage in the same profession as your parents? Retrieved from: https://www.calcalist.co.il/local/articles/0,7340. 8.12.2017. [Hebrew]
8. Collins, K. S. and Nolen, K. (2002). Enhancing your professional image (My Perspective). Radiologic Technology, 73(3).
9. Davy, J. A., Kinicki, A. J., & Scheck, C. L. (1991). Developing and testing a model of survivor responses to layoffs. Journal of vocational behavior, 38(3), 302-317. https://doi.org/10.1016/0001-8791(91)90032-H
10. Deci, E. L., Ryan, R. M. and Olafsen, A. H. (2017). Self-Determination Theory in Work Organizations: The State of a Science. Retrieved from https://www.researchgate.net/publication/312960448
11. Dingwall, R. and Lewis, P. S.C. (1983). The sociology of the profession: Lawyers, doctors, and others. New York, NY: Macmillan.
12. Ehrhard, R., (2014). Educational counselling: A profession looking for an identity. Tel Aviv: MOFET Institute. [Hebrew]
13. Erikson, E. H., (1968). Identity: Youth and crisis (p. 176). New York, NY: Norton.
14. Gati, I., (2016). Ways of assisting in making career decisions. Jerusalem: Hebrew University. [Hebrew]
15. Haaretz Daily Newspaper (2022). Horowitz and Liberman were proud of adding MRI machines but there was no one to operate them. Tel Aviv: Haaretz Publications [Hebrew]
16. Haski-Leventhal, D., (2022). The great resignation: Purpose and meaning matter more than ever. The Lighthouse. Macquarie: Macquarie Business School.
17. Hughes, E. C., (1958). Men and Their Work. London: Free Press.

18. Indeed Editorial Team (2021). Definitive Guide to the Rational Model of Decision Making. Retrieved from: https://www.indeed.com/career-advice/career-development/rational-model-of-decision-making
19. Kremer, L. and Hofman, J. E. (1982). Personality Characteristics and Teaching Behavior. Education, 102(4), 359-365.
20. Kuzminsky, L., (2008). Professional identity in teaching. Shviley Mehkar, 15, 13-17. [Hebrew]
21. Lerner, J. S., Li, Y., Valdesolo, P. and Kassam, K. S. (2015). Emotion and Decision Making. Annual Review of Psychology, 66, 799-823. https://doi.org/10.1146/annurev-psych-010213-115043
22. Marcia, J. E., (1966). Development and validation of ego identity status. Journal of Personality and Social Psychology, 3, 551-558. https://psycnet.apa.org/doi/10.1037/h0023281
23. Marks, A., Scholarios, D. and Locker, C. (2002). Identifying a Profession: The Creation of Professional Identities within Software Work. Presented at the 18th Egos Colloquium, July, 2002, Barcelona, Spain
24. Mavrodinova, S., Kostova, E., Stoyanova, S., Georgieva, A. and Redjeb, S. (2022). Attitudes for professional realization of students from the Specialty X-Rays Laboratory. Assistant in the Medical College, Medical University of Varna, Bulgaria.
25. McKeon, G. J. and Simons, I. L. (1981). Identities and Interactions. London: Free Press.
26. Michlol Jewish Encyclopedia (2022). Self-determination theory. Retrieved from: https://www.hamichlol.org.il/%D7%AA%D7%90%D7%95%D7%A8%D7%99%D7%99%D7%AA_%D7%94%D7%94%D7%92%D7%93%D7%A8%D7%94_%D7%94%D7%A2%D7%A6%D7%9E%D7%99%D7%AA
27. Ministry of Health (2022a). About the profession of X-Rays technicians and imaging. Jerusalem: Ministry of Health. [Hebrew]
28. Ministry of Health (2022b). National Program for the reinforcement of healthcare system workers and prevention of burnout: Findings of the National Survey. Jerusalem: Ministry of Health. [Hebrew]
29. Moor, W. E., (1970). The Professions Roles and Rules. Verona, NY: Russel Sage.
30. Narayanasamy, M., Ruban, A. and Sankaran, P. S. (2019). Factors influencing to study medicine: a survey of first-year medical students from India. Korean J Med Educ., 31(1), 61. https://doi.org/10.3946%2Fkjme.2019.119
31. Natan, M. B. and Becker, F. (2010). Israelis' perceived motivation for choosing a nursing career. Nurse education today, 30(4), 308–313. https://doi.org/10.1016/j.nedt.2009.08.006
32. Oplatka, I.. (2015). Fundamentals of education administration: Leadership and management of educational organizations and the approach. Haifa: Pardess publishing. [Hebrew]
33. Popper-Giveon, A. and Keshet, Y. (2016). "It's every Family's dream": choice of a medical career among the Arab minority in Israel. Journal of Immigrant and Minority Health, 18(5), 1148–1158. https://doi.org/10.1007/s10903-015-0252-7
34. Rouger, M., (2018). Levelling EU qualifications for radiographers. In: J. McNulti (2018), European Federation of Radiographers.
35. Shaarey Mada and Mishpat Academic Center (no date). X-Rays technicians – Is it worthwhile learning the profession? https://mishpat.ac.il/%D7%98%D7%9B%D7%A0%D7%90%D7%99-%D7%A8%D7%A0%D7%98%D7%92%D7%9F-%D7%9C%D7%9C%D7%9E%D7%95%D7%93/
36. Smith, T. M., (2007). Radiographers' role in radiological reporting: a model to support future. The Medical Journal of Australia, 186(2), 629-631. https://doi.org/10.5694/j.1326-5377.2007.tb01080.x
37. State Comptroller (2015). Ministry of Health Advanced Imaging Tests – Annual Report 65C. Jerusalem: Prime Minister Office. [Hebrew]
38. State of Israel (2022a). Law of Regulation Principles. Chapter 1: Aim and definitions. Jerusalem: State of Israel. [Hebrew]
39. State of Israel (2022b). A Bill Regulating the Engagement in Healthcare Professions (Amendment No. 407 – Regulation of X-Rays Radiography and Imaging Profession). Jerusalem: State of Israel. https://www.gov.il/he/departments/policies/dec407-2023 [Hebrew]
40. Tomlinson, A., (2002). High Technology workers want Respect. Survey Canadian Human Resources Reporter, 15(3), 2.

41. Twobig, P. L., (2006). Education, Expertise, Experience and the Making of Hospital Workers in Canada, 1920-1960. https://www.erudit.org/en/journals/scientia/1900-v1-n1-scientia3150/800522ar/abstract/
42. Vanckaviciene, A., (2014). Supply and demand for radiographers in Lithuania: A prognosis for 2012–2030. Radiology, 83(7), 1292-1300. https://doi.org/10.1016/j.ejrad.2014.04.009
43. Wackerhausen, S., (2009), Collaboration, professional identity and reflection across boundaries. Journal of Inter-Professional Care, 231(5), 455-473. https://doi.org/10.1080/13561820902921720
44. Wood, W., (2004). The heart, mind, and soul of professionalism in occupational therapy. The American Journal of Occupational Therapy, 58, 249-257. http://www.aota.org/Pubs/AJOT_1.aspx
45. Zuzovsky, R. and Donitsa-Schmidt, S. (2014). Turning to teaching: Second career student teachers' intentions, motivations, and perceptions about the teaching profession. International Education Research, 2(3), 1–17. http://dx.doi.org/10.12735/ier.v2i3p01