



# Assessment of innovativeness and openness to change among nurses, midwives and paramedics

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## Abstract

**Introduction:** Innovativeness, which is associated with the continuous improvement of the current healthcare system, the implementation of new ideas, the introduction of new products and equipment in the medical environment, and the change that causes the modification of existing habits and procedures, affect the development of the healthcare system and improve the quality of patient care.

**Aim:** The aim of the study was to assess the innovativeness and the openness to change of nurses, midwives and paramedics.

**Material and methods:** The research was conducted from November 2023 to April 2024. The total number of people participating in the survey 123 respondents. The following methods were the survey technique was used, and the method of estimation, using rating scales.

**Results and discussion:** The study shows that nurses, midwives and paramedics have similar values of levels of innovativeness and openness to change. Openness to change is at a high level, while innovativeness, according to the adopted key, is described as above average. In the case of nurses, age, seniority, education and the position held have an impact on the level of openness to change.

**Conclusions:** The level of innovativeness in this group of respondents is significantly influenced by education and position. The level of openness to changes of midwives is influenced by age, education and position, while their innovativeness is influenced by the place of residence, education and position. Paramedics have a level of openness to change and innovativeness at an equal level regardless of the parameters taken into account, only the position they hold makes a difference in results.

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## 1. INTRODUCTION

Change is the acknowledgement of the fact that something becomes different to what it previously used to be. It is necessary in order to support the development of the company. The decision to effect change should be made by the manager as well as the employees, which ensures the implementation process occurs seamlessly and the introduced change will be widely accepted. Changes affect everyone in personal life and at work. Most people perceive them as a threat. Nevertheless, changes are indispensable for improving the performance of the company. The introduction of the change involves the adequate organisation of its implementation and the choice of measures. The attitude of leaders, proper employee motivation and internal communication within the company are essential. It is hardly conceivable that the development of human beings, civilisations and organisations could occur without changes constantly taking place in the world around us. A key role in the change implementation process is played by the change advocate, who should be able to communicate with employees, manage relationships with others, be prepared to learn and gain new experience. The most important trait is the credibility of the advocate, which fosters experience and excellence in a given field as well as relationships with people.<sup>1</sup>

Innovation is defined as the process of implementing a new or significantly improved product, item or service. In economic practice, the workplace or interactions with the environment, it is a key element of the dynamic of development in various organisational and social contexts. It is a dynamic process which requires creativity, flexibility, strong commitment and readiness to undertake risks. Innovations have been introduced increasingly quickly over the years. A case in point is the 18th century, when introducing innovations took about 60 years. Nowadays, it takes half as much time.<sup>2</sup> Organisations frequently face barriers against introducing innovations and low level of employee innovativeness. The unwillingness to implement new solutions and the limited degree of innovativeness result largely from the limited development potential of these entities. Employee innovation involves constantly seeking and applying new ideas, inventions, scientific research and novel conceptions.<sup>3</sup>

An innovative organisation is characterised by its ability to continuously create and launch novel solutions to the market and hire employees with creative and adaptive skills. Such a company develops innovative potential predicated on core competences, actively utilising knowledge resources and remaining open to new ideas. It is also essential to develop personnel

competences, foster relationships with the local community, effectively manage knowledge, and approach changes flexibly while taking advantage of state-of-the-art technologies. Innovation drives change in organisations enabling them to adapt to changing conditions. Organisations which introduce innovative processes stand a better chance of maintaining their competitiveness, creating value for their clients and achieving market success. Innovation allows organizations not only to react to changes but also to create them and set new trends. Changes and innovations can be stimulated in many ways, but the most important is the triggering mechanism. Those affected by the change must be interested in it, and the personnel involved must realize that the process will be long, possibly even longer than initially anticipated, and that not all introduced changes will prove entirely positive. The organisation must be prepared to properly assess the accepted change, approach it critically, and be ready to rectify the process following the introduction of the change.<sup>4</sup>

The medical community is developing dynamically. Implementing changes and innovations is a crucial element of the healthcare system. The preparedness of healthcare workers for changes and innovations results from their ability to accept and adapt to new technologies and processes in the workplaces. This is a key factor determining the effectiveness of change implementation in healthcare systems. Workers are open to new challenges, flexible in decision-making and actively committed to the process of implementing changes. The healthcare system requires constant changes and the introduction of innovations. A good organisation is innovative and pursues continuous development. Advances in medical and digital technologies impact the necessity of implementing innovations in the healthcare system. In medical entities health is a product, which cannot be construed as a typical outcome of economic activity. Nowadays, the level and quality of healthcare are increasingly emphasised. Measures should be undertaken in such a way as to meet the needs of the patient and their family. These days the impact of the openness to change and innovation of medical staff on patient care is crucial. Medicine has been flourishing, responding to patients' needs, and improving its practices, hence the need to develop an attitude of openness to change and innovation among medical staff.<sup>5</sup>

## 2. AIM

The aim of the study was to examine the innovativeness and openness to change of nurses, midwives, and paramedics, and to determine whether these traits

depend on the profession, gender, age, years of experience, place of residence, education, and the position held by the respondents.

### 3. MATERIAL AND METHODS

The research was conducted from November 2023 and April 2024. Three groups of medical personnel participated in the study. The sample group totalled 123 respondents. The study was carried out across the entire territory of Poland online by means of a Google form.

The study employed a literature analysis method using the classical technique, a diagnostic survey using the questionnaire technique and an author's questionnaire form and an estimation method using rating scales.<sup>6</sup>

And the employment of the openness to change test and the innovation test.<sup>7,8</sup>

The statistical processing of the data collected was performed by means of IBM SPSS Statistics software.

### 4. RESULTS AND DISCUSSION

The research included 123 respondents working in selected medical professions. Nurses accounted approximately for half of the respondents (49.6%), while female and male midwives accounted for 26.8%, and male and female paramedics made up 23.6%, representing a smaller share of the study. The research included only female nurses, and nearly all the midwives studied were female (97.0%). Among paramedics, males (86.2%) outnumbered females (13.8%).

The ages of the nurses participating in the research ranged from 22 to 51 years, while the midwives' ages ranged from 22 to 55 years, and the paramedics' ages ranged from 23 to 50 years. The nurses in the study had worked between 0 and 30 years, with an average of just over 6 years. The midwives had worked for 0 to 30 years, averaging approximately 9 years of experience. The paramedics had worked for 0 to 31 years, with an average of just over 7.5 years.

Half of the nurses (50.8%) lived in cities with more than 500,000 inhabitants, while 23.0% resided in cities with populations between 50,000 and 500,000; 21.0% lived in the countryside, and 4.9% were residents of cities with fewer than 50,000 inhabitants. The majority of the midwives (60.6%) lived in cities with more than 500,000 inhabitants, with a quarter living in cities of 50,000 to 500,000 (24.2%). Significantly fewer midwives lived in cities under 50,000 inhabitants (9.1%) or in the countryside (6.1%).

Among paramedics, the largest group lived in cities with a population of 50,000 to 500,000 (34.5%), with

a quarter living in cities under 50,000 (24.1%), and a fifth in rural areas (20.7%) or cities with over 500,000 inhabitants.

Most nurses held a bachelor's degree (65.6%), one in three respondents had a master's degree (32.8%), and one had a secondary education (1.6%). The majority of midwives had a master's degree (66.7%), while one in three held a bachelor's degree (33.0%). Among paramedics, the highest percentage had a master's degree (44.8%), slightly fewer had a bachelor's degree (37.9%), and the fewest had a secondary education (17.2%).

The vast majority of respondents worked in execution-focused positions. Among nurses, this was 93.4%, midwives 93.9%, and paramedics 89.7%. Conversely, 6.6% of nurses, 6.1% of midwives, and 10.3% of paramedics held managerial positions.

No statistically significant differences were found between the professions in terms of innovation levels—respondents demonstrated an above-average approach, but still fell short of the creativity levels seen in the best organizations. However, in terms of openness to change, a high level of this trait was observed among the respondents. A statistically significant difference between representatives of the surveyed professions was noted only in the case of professional mobility, which is statistically significantly higher among nurses than among paramedics.

Women and men were compared collectively in terms of the particular variables. The analysis showed that women exhibited a significantly higher level of perceived educational and professional goal alignment, demand for professional information and professional mobility than men.

The study among nurses showed that with increasing age, there was a greater openness to changes in the environment, higher self-assessment of the effectiveness in achieving educational and professional goals, and a stronger sense of shared educational and professional goals. Age in this group did not significantly correlate with the other variables, including innovation. Similarly, the longer the work experience of nurses, the greater their openness to changes in the environment, the higher their self-assessment of the effectiveness in achieving educational and professional goals, and the stronger their sense of shared educational and professional goals, while their demand for professional information decreased. Work experience in this group did not significantly correlate with the other variables, including innovation.

The analysis showed that among midwives, the higher the age, the lower the openness to changes in the environment and the lower the sense of shared edu-

cational and professional goals. However, with increasing age, professional mobility rises. Age in this group did not significantly correlate with the other variables, including innovation. Similarly, the longer the work experience of midwives, the higher their professional mobility. Work experience in this group did not significantly correlate with the other variables, including innovation and openness to changes in the environment.

Among paramedics, the higher the age, the lower the effectiveness of professional development in the workplace. The other variables, including innovation and openness to changes in the environment, did not correlate with the age of medical rescuers. The longer the work experience of paramedics, the lower the effectiveness of professional development in the workplace. The other variables, including innovation and openness to changes in the environment, did not correlate with the work experience of paramedics.

Nurses from cities with over 500,000 residents achieved a higher effectiveness in professional development in the workplace compared to nurses from cities with populations under 50,000. Midwives from towns with populations under 50,000 showed a significantly higher level of innovation than midwives from cities with populations between 50,000 and 500,000. Place of residence did not affect openness to change or innovation among paramedics.

Nurses with a master's degree showed significantly greater openness to change, and midwives with a master's degree demonstrated higher levels of innovation. In the case of paramedics, education did not influence innovativeness or openness to change.

The study also revealed that individuals in managerial positions exhibited significantly higher levels of innovation, openness to changes in the environment, self-assessment of the effectiveness in achieving educational and professional goals, and a sense of shared educational and professional goals compared to those in execution-level positions.

## 5. DISCUSSION

The world is constantly changing, and so are patients and their needs. Innovation and openness to change among medical staff should be a priority for human resources management in healthcare institutions. Introducing new solutions into practice contributes to improving patient care, addressing their problems, and enhancing organizations that continuously evolve to fulfil the goal of meeting patients' needs at a satisfactory level. Many institutions are constantly updating internal procedures to reduce the number of adverse events.<sup>9</sup>

In the author's study, the analysed professional groups demonstrated an above-average level of innovation. Similar results were found in research conducted among nursing faculty and the Academic Medical Center affiliated with the university by the lecturers and practitioners of Innovation Scholarly Interest from Midwestern University in Arizona. The study showed that nurses were innovative, but often unaware of this valuable quality within their profession.<sup>10</sup>

In the authorial study, nurses, midwives and paramedics demonstrated a high level of openness to change. However, different results were reported in research conducted in Poland's Podkarpackie Voivodeship by Bartosiewicz et al. In the aforementioned study, nurses exhibited an average level of openness to change. The presented data may stem from the fact that the study was conducted in only one voivodeship, where most of the respondents had only secondary medical education.<sup>11</sup>

In the author's study, no correlation was found between the profession and the level of innovation and openness to change among nurses, midwives, and paramedics. All the studied groups achieved similar results.

Similar findings were reported in research conducted on the general population by Żmurkowiak. It was established that the level of innovation depends on the level of knowledge acquired during education for the profession and the use of modern technology in both science and technique. The author's study took account of a medical group which had a similar educational process and comparable qualifications; thus, the innovation and openness to change among the participants should be at a similar level, which was confirmed by the conducted study.<sup>12</sup>

In the presented study, it was not possible to examine innovation and openness to change by gender across all professional groups. In the case of paramedics, gender did not influence innovation. Research conducted by Sinval et al. in a multi-sector population produced results consistent with those presented in this work. This may be attributed to the current state of gender equality in the world. Today, both women and men have equal rights to creative thinking, implementing changes, and personal development, which bodes very well for the future.<sup>13</sup>

In the author's study presented in this work, the results indicated that the higher the age and work experience, the greater the openness to change among nurses. However, the group of midwifery personnel studied by the author of the work showed that the higher the age, the lower the openness to change.

Among paramedics, age and work experience did not influence the studied parameters.

Research conducted in the southeastern part of Poland by Bartosiewicz et al. yielded opposite results in this regard. In that study, younger nurses and those with less experience were more open to change. The obtained results may stem from the fact that older individuals are less inclined to update their professional knowledge and engage in self-education compared to younger individuals, who may have a greater desire for development in order to secure better job positions or enhance their competencies.

The differences may also arise from the fact that the aforementioned study was conducted in 2017, which may indicate a current development in awareness and openness to change among older nurses.<sup>11</sup>

The authorial study demonstrated that nurses from large cities achieved a higher effectiveness in professional development in the workplace, while midwives from smaller towns exhibited a higher level of innovation. It can certainly be stated that healthcare workers in larger cities have better access to training and modern technologies, whereas the lack of such access in smaller towns compels greater personal activity.

In the presented study, nurses and midwives with higher education demonstrated greater innovation or openness to change, while among paramedics, education did not have an impact. Research conducted by Bartosiewicz and Róžański on the readiness of Polish nurses to prescribe medications yielded similar results.

Nurses with higher education and additional qualifications exhibited a greater readiness to prescribe medications and issue prescriptions, indicating their increased openness to change. Similar findings were reported in studies by Węgrzyn conducted on the general population of workers in the European Union. In the analysed study, the education and qualifications of employees influenced their level of innovation. Countries with a high level of education among workers and specialists also exhibited high levels of innovation. The formal education of employees determines the innovative potential of organizations. The cited studies suggest that in the healthcare sector, by enhancing their qualifications, healthcare professionals become more competent and creative individuals providing patient care.<sup>14,15</sup>

In the conducted study, the author found that individuals in managerial positions had a higher level of innovation and openness to change. Research conducted by Róžański on the general population found similar results. The study indicated that individuals in managerial roles are expected to introduce innovations that improve the overall quality of work within

the organization. An innovative leader who is open to change encourages action and development among their employees and serves as a role model. Therefore, these are important traits sought during recruitment for managerial positions.<sup>7</sup>

Changes and innovations present in today's world, including in healthcare organizations, contribute to the continuous development of employees. It is important for employees to engage in education not only for necessary procedures but also to cultivate innovative thinking. Implementing changes by practitioners and providing evidence-based innovative patient care enhance the quality of patient care. Joint decision-making regarding changes and innovations fosters trust among staff, attachment to the organization, and a sense of high competence in their chosen profession.<sup>16</sup>

## 6. CONCLUSIONS

1. Nurses, midwives, and paramedics exhibit an above-average level of innovation and a high level of openness to change; the studied parameters do not depend on the profession performed.
2. The level of openness to change and innovation among nursing and midwifery staff cannot be assessed based on gender due to the small number of respondents; in the case of paramedics, gender does not influence innovation or openness to change.
3. Among nurses, the higher the age, the greater the openness to change, while among midwives, the opposite is true – the higher the age, the lower the openness to change; age does not affect innovation in either group; among paramedics, age does not influence the studied parameters.
4. The longer the work experience, the greater the openness of nurses to change; the innovation of nurses does not depend on experience; in the case of midwives and paramedics, work experience does not affect innovation and openness to change.
5. Innovation and the level of openness to change do not depend on the place of residence of nurses and paramedics; midwives from small towns exhibit a significantly higher level of innovation, but their place of residence does not influence their openness to change.
6. Nurses with a master's degree stand out for their higher level of openness to change, while midwives demonstrate a higher level of innovation; for paramedics, education does not impact the studied parameters.
7. Individuals in managerial positions show, in a statistically significant way, a higher level of innovation and openness to change than those in executive positions.

**CONFLICT OF INTEREST**

None declared.

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