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DOCTORS' OPINIONS ON THE PRO-INNOVATION ATTRIBUTES OF ORGANISATIONAL CULTURE – THE RESULTS OF EMPIRICAL RESEARCH*

Abstract

This article attempts to identify, in the opinion of medical personnel, the variables of pro-innovation culture and to determine the relationships between those variables and the level of innovation in hospitals. To this end, a questionnaire study was conducted among 51 physicians. The results suggest that, in the opinion of doctors, innovation is significantly associated with almost all the selected variables, namely: strategic orientation for development, access to resources and capital for the implementation of innovations, integration of personnel around strategic objectives, mechanisms to motivate and reward staff for innovation, effective communication and collaboration based on trust relationships, standardisation of rules and procedures, openness to change and innovation, except tolerance of minor errors in learning processes.

Keywords: pro-innovation organisational culture, doctors, public hospitals, Poland.

1. Introduction

Just as in other countries, the contemporary management of Polish hospitals requires proper and purposeful orientation of the action or process of innovation. When this is aligned with creative freedom and the appropriate culture, a foundation is established to enable organisations to generate innovations. In this context it is necessary to know the values, norms or rules that stimulate staff innovation. It should be stressed that

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both Polish and worldwide studies have devoted insufficient attention to pro-innovation culture in hospitals, whose formation can be particularly important to implementing successful change in the increasingly complex public health sector.

The article aims 1) to identify, in the opinion of doctors from public hospitals in north-eastern Poland, the variables of pro-innovation culture and 2) to determine the relationships between those variables and the level of innovation in health-service units. Its conclusions put new knowledge at the disposal of hospital managers in Poland and raise awareness of the linkages between the shaping of organisational culture and innovation.

2. The Attributes of Pro-innovation Culture – Literature Review

Nowadays, more and more emphasis is being placed on the importance of innovation to an organisation's success (Drucker 2002). It is thought that implementing innovations has positive outcomes for human resources. When these are combined in an appropriate organisational culture, opportunities for greater job satisfaction and commitment arise (Pocztowski 2008). Personal satisfaction, interest in new ideas and knowledge, lower staff turnover, increased staff morale and increased productivity are just some of the beneficial effects of innovation orientation in the organisation (Zhou *at al.* 2005). What is more, awareness of these benefits will increase interest in factors that enhance the innovative capacity of the organisation (Damanpour & Evan 1984, Koc & Ceylan 2007, Mayondo & Farrell 2003). One fairly powerful school of thought has held that the technologies, strategies and project management of companies are the most frequent sources of innovation. However, the frame of reference for determining the structure of pro-innovation culture has been expanded by studies of the contributions made to innovation at the juncture of human resource management and organisational culture (Tushman & O'Reilly 1997, Martins & Terblanche 2003). Numerous other studies, including Chatman and Jehn (1994), Dhanaraj and Parkhe (2006), Rose (2004), Deshpandé & Farley (2004), Martins and Terblanche (2003), Murray and Blackman (2006), Sawhney, Prandelli & Verona (2003), Osland and Bird (2000) and (Dobni 2008), also lie within the same stream of research. The latter, for example, has argued that a culture of innovation refers to qualities such as minimum bureaucracy, a tolerance of risk, promotion of employee initiatives, openness to new ideas, and cooperation between employees and organisational units (Dobni 2008). Rose, in turn, has emphasised that a culture of innovation is associated

with organisational structures based on teamwork, open communication, individuality and diversity, learning (including tolerance of mistakes and a positive approach to work), and the promotion of creative thinking and problem solving (Rose 2004). Chatman and Jehn, for their part, concluded that the basic elements of culture (shared values and beliefs and the behaviour expected as a result) affect innovation mainly through the socialisation and coordination of personnel. In this way, they argue, organisational cultures that support innovation must cultivate values of creativity, the freedom to take risks, teamwork, solution-oriented work and effective communication. What is more, they should create conditions in which trust and respect, and quick decision-making, can flourish (Chatman & Jehn 1994).

According to Martins and Martins, the necessary elements for the formation of a pro-innovation culture are organisational strategy and structure, relationships of trust, managerial behaviour that stimulates innovation, the internal environment, customer orientation (internal and external) and support management (Martins & Martins 2002). At the same time, as Martins and Terblanche have demonstrated, it is expected that organisations seeking to build a pro-innovation culture should reject the practices and behaviours that hinder innovation, such as stiffness, predictability or control (Martins & Terblanche 2003). The signals organisations send out, which should facilitate changes in the thinking and actions of employees (Kunecka 2013) so that they take an interest in new ideas and knowledge, respond to changes and take on new challenges (Jończyk 2013), are further important factors. This leads us to the conclusion that the successful development of an innovation culture may ultimately depend on human-resource management practices which, if properly formulated, will stimulate innovation-oriented attitudes and behaviour in staff (Buchelt 2010, Dobni 2008). The conclusions drawn about the structure of pro-innovation culture in a number of other studies, which we cannot refer to here because there is insufficient space, are similar to those presented above in this review of the literature. A distillation of both categories produces the following list of the most common attributes of pro-innovation culture in organisations:

- strategic orientation towards growth and innovation,
- high tolerance of risk and openness to change,
- focus on flexibility and mobility,
- flat organisational structures,
- relationships based on trust and collaboration (inside and outside the organisation),

- the availability of capital for innovation,
- motivation and reward mechanisms for innovation,
- emphasis on creativity and learning, including tolerance for minor errors.

It is worth noting in this context that it is important for an organisation's strategy that employees understand the pro-innovation vision and mission for the future and make the effort to close the gap between it and the current situation. Martins expands on this by pointing to the significance of identifying the organisation's objectives and how employees can be involved in achieving them (Martins 1987). Lock and Kirkpatrick have argued that it is necessary to set the objectives necessary to implement specific standards of innovation and achievement. The measurements applied to gauge how far the objectives have been achieved are then used as a springboard for improved creativity and innovation (Lock & Kirkpatrick 1995).

Building a pro-innovation culture generates an organisational structure characterised by values such as openness, high sensitivity to change, informal staff relations and hence a lack of rigid rules, flexibility and decentralisation throughout the organisation, and equality in decision making and team cooperation. It is important in this respect that personnel understand each other's views and styles of operation, that they are able to reach decisions despite differences of opinion, that they can communicate effectively and that they are open to new ideas.

Relationships based on trust constitute a further attribute of pro-innovation culture. There has been broad advocacy in the literature that has appeared since 1990 of a new approach to culture based on trust (Barret 1997). According to Frohman and Pascarella, trust relationships within an organisation are associated with mutual openness and emotional security which, in turn, may promote the development of a pro-innovation working atmosphere (Frohman & Pascarella 1990). Shaw, meanwhile, has suggested that a high degree of innovation can be achieved if the organisational culture created by management promotes a high degree of confidence (Shaw 1997).

The organisational environment in which the resources and mechanisms used to motivate and reward innovation are accessed is also an essential element of the culture of innovation. One aspect of this as a determinant of the idea of innovation is a focus on the terms and conditions of work. It can be argued that if workers feel they have the freedom to create new ideas and to participate in decision-making, the organisation will develop. The objective is to build awareness and provoke a desire to be creative, take new initiatives and seek new ways to solve problems. Generating new ideas

soon prompts the question of how to convince others of their value and, if they are adopted, of how to manage their implementation. In this regard it is important to establish rules and regulations, which should include provisions for rewarding and motivating personnel when they generate and develop innovation.

The last of the highlighted features of a culture of innovation is the organisation's ability to learn. The important values here are open communication, the ability to share knowledge and the capacity to tolerate errors. According to Filipczak, the promotion of innovation and change is based on open communication within the organisation at various levels (Filipczak 1997). On the other hand, as Tushman and O'Reilly emphasise, a low level of tolerance for error, especially in relations with superiors, can hamper innovation. Where there is tolerance, though, errors provide an occasion for open discussion and an opportunity to learn from mistakes (Tushman & O'Reilly 1997). It is important in creating a culture of innovation that managers have both internal and external access to the knowledge they have created, that they are encouraged to generate new ideas, that they stress the positive aspects of innovation and that they support staff when implementation is underway. Finally, no process of learning can proceed without knowledge sharing, which supports dialogue and creates the conditions for frequent staff interaction.

3. Methodology

The study investigated correspondences between the pro-innovation-culture attributes defined in the literature and the opinions of 51 doctors. With regard to the characteristics presented in the literature, it was concluded that there is no universal set of attributes for pro-innovation culture in public hospitals. This is because these parameters do not take into account the interaction between the culture of innovation and the socio-organisational features, which are often different for different entities. Since the set of pro-innovation-culture attributes defined in the literature concerned enterprises, it was decided that, in relation to hospitals, this could only constitute a starting model. When constructing a theoretical model attention was paid to the specific characteristics of public hospitals and to the particular nature of the healthcare market, whose singularity, and distinction from other markets, has been well documented in the literature (Arrow 1963, Culyer 1971, Pauly 1988). In general, health represents a specific value in a particular ethical dimension and is not a commodity.

There is also the matter of price. In a certain sense, there is no price and health can be regarded as priceless. The provision of healthcare services is marked by a specific type of professionalism that derives, among other things, from the staff's incomparably greater knowledge when compared to the patient (information asymmetry). Medical services are usually indivisible, which means that they are "produced" (granted) and "consumed" (derived). Furthermore, in an instance of the principle of the inseparability of sales and consumption, the doctor and the remaining medical staff are "part of" a service for which the patient must always be present. What is more, access to medical services is not governed by market mechanisms, such as the purchase of standardised services, but by guarantee of the Polish Constitution. That said, the system does unite and amalgamate the public hospitals in overall strategic roles (Kožuch 2004, Boyne 2002, Frączkiewicz-Wronka 2009). It should be noted that the objectives of the public hospitals, such as equality, fairness and efficiency, are numerous, multi-dimensional and often difficult to reconcile. These units are subject to undue political influence, such as from specific interest groups and the mass media. More than this, because they run no risk of being eliminated by competition, criteria other than financial ones are applied to judge their success. Meanwhile, there is an excessive tendency in different public hospitals for the authorities to intervene, which leaves managers little autonomy. On the whole, public hospitals have highly bureaucratic structures and organisational-cultural attributes that identify them as weak, negative, conservative and hierarchical organisations (Sułkowski & Seliga 2012).

Based on the above, as well as on previous experience, an empirical questionnaire was constructed to investigate the attributes of pro-innovation culture in public hospitals. Its 20 questions were answered according to a seven-point, bipolar scale by 51 doctors working in four public hospitals in north-eastern Poland. The analysis began with the reduction of interrelated variables, for which a Hellwig parametric method was employed. The results permitted the most representative variables to be chosen and the satellite variables to be rejected. In this way eight attributes of pro-innovation culture were selected: strategic orientation for development, access to resources and capital for the implementation of innovations, integration of personnel around strategic objectives, mechanisms to motivate and reward staff for innovation, effective communication and collaboration based on trust relationships, standardisation of rules and procedures, openness to change and innovation, and tolerance of minor errors in learning processes.

Table 1. Impact of Each Variable on the Level of Innovation in the Opinion of Doctors

| Variable | Value of statistics <i>chi-square</i> | Level of significance |
|--|--|--------------------------|
| Strategic orientation for development | 45.5164 | 0.0000 |
| Access to resources and capital for the implementation of innovations | 39.5562 | 0.0000 |
| Integration of personnel around strategic objectives | 37.5779 | 0.0000 |
| Mechanisms to motivate and reward staff for innovation | 41.3911 | 0.0000 |
| Effective communication and collaboration based on trust relationships | 32.7540 | 0.0001 |
| Standardisation of rules and procedures | 25.5818 | 0.0024 |
| Openness to change and innovation | 44.5222 | 0.0000 |
| Tolerance of minor errors in learning processes | 17.5145 | 0.0413 |

Source: author's own study.

The next research stage involved analysing the opinions of 51 doctors with regard to the impact of the selected variables on the level of innovation in hospitals. To this end, correspondence analysis was used to combine the reduction in the size of the objects and the doctors' ratings of different characteristics in a perceptual map. The advantage of this method is that it offers a clear, graphical representation of the co-occurrence of categories of variables. The results are interpreted based on the position of points on a graph depicting categories of variables. The salient information concerns the position of a point in relation to the centre of projection, the position of a point relative to other points defining categories sharing the same features, and the location of a point relative to points describing other categories of features. The correspondence analysis in this study was carried out for the eight previously noted variables and the assessment of innovation. It began by determining the degree of dependence and independence using a chi-square test, for which the calculations were performed using the STATISTICA 10 package. The results of the significance test appear in Table 1, which presents the significance levels of the relationships between the variables analysed. The lowest correlation was returned for the "tolerance for minor errors in learning processes" variable.

4. Results

The results of the correspondence analysis are presented in graphical form for greater transparency. Each of the graphs displays the statistically significant effect of each of the variables on the amount of innovation in a hospital. This format was used to present the different levels of assessment of the innovation and pro-innovation-culture variables, where a value of -1 meant “no variable”, 0 – “no opinion of the respondent”, 1 – “low level of variable” and 2 – “high level of variable”. All of the results are presented in a two-dimensional system which, in all but one case, explained more than 80% of the inertia. The coordinate in the row was the level of innovation in the hospital, and the coordinates in the column were the other variables. Fig. 1 presents an analysis of the links between the assessment of the level of innovation and the “strategic orientation for development” variable.

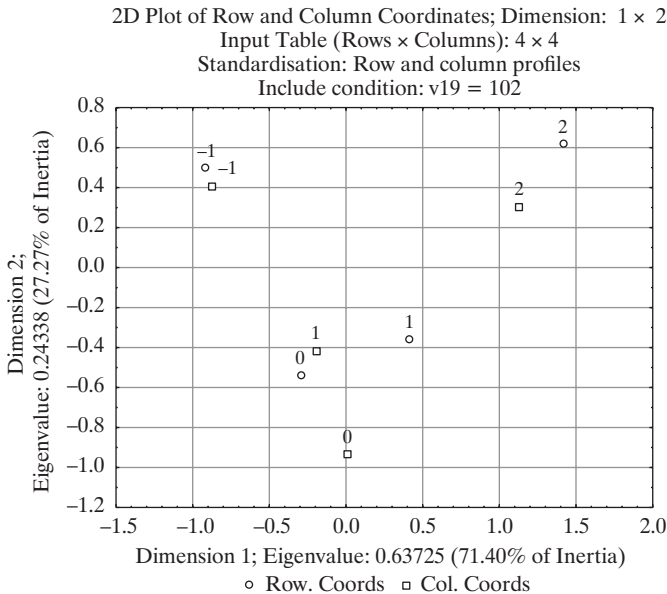


Fig. 1. Links between the Assessment of the Level of Innovation and the “Strategic Orientation for Development” Variable

Source: author’s own study.

A two-dimensional projection area explained 98.67% of the total inertia in the analysis of the links between the assessment of the level of innovation and strategic orientation for development. If we consider the horizontal axis

in Fig. 1, which has a higher proportion of inertia, doctors who evaluated the “strategic orientation for development” variable highly are located on the right-hand side relative to the centre axis, while doctors who thought the hospital does not exist for the development of strategic orientation are found to the left. Doctors who considered there was no innovation at their units are indicated by the row coordinates at the far left on the left-hand side, while doctors who evaluated innovation highly at their hospitals are found on the right. These findings suggest that physicians who evaluated the “strategic orientation for development” variable highly also rated the level of innovation at their hospitals highly. Meanwhile, doctors who thought that no strategic action oriented to development was being taken also thought that there was a lack of innovation at their hospitals.

Fig. 2 presents an analysis of the links between the assessment of the level of innovation and the “access to resources and capital for the implementation of innovations” variable.

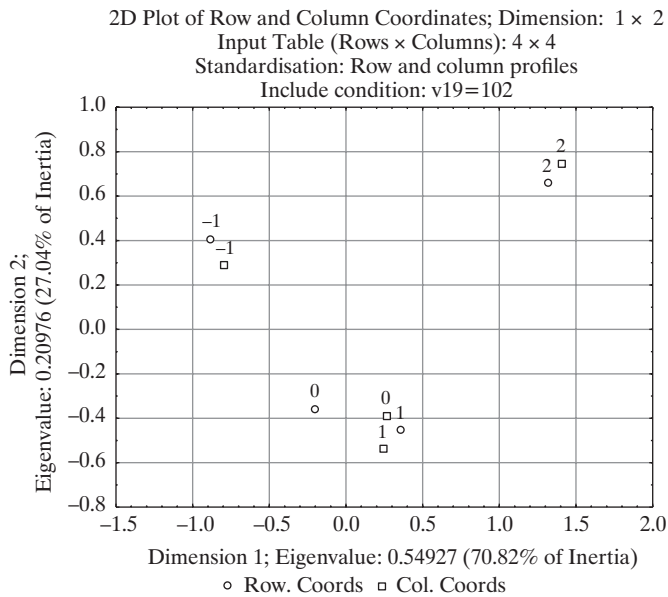


Fig. 2. Links between the Assessment of the Level of Innovation and the “Access to Resources and Capital for the Implementation of Innovations” Variable

Source: author’s own study.

A two-dimensional projection area explained 97.86% of the total inertia in the analysis of the links between the assessment of the level of innovation and

the “access to resources and capital for the implementation of innovations” variable. If we consider the horizontal axis in Fig. 2, which has a higher proportion of inertia, doctors who evaluated the influence of the “access to resources and capital for the implementation of innovations” variable highly are located on the right-hand side relative to the centre axis, while doctors who thought there was a lack of access to resources and capital for the implementation of innovations are found to the left. Doctors who considered there was no innovation in their units are indicated by the row coordinates at the far left on the left-hand side, while doctors who evaluated innovation highly at their hospitals are found on the right. These observations suggest that physicians who evaluated the “access to resources and capital for the implementation of innovations” variable highly, also evaluated the level of innovation in their hospitals highly. By contrast, the doctors who highlighted a lack of access to resources and capital for the implementation of innovation also acknowledged that there was a lack of innovation in their hospitals.

Fig. 3 presents an analysis of the links between the assessment of the level of innovation and the “integration of personnel around strategic objectives” variable.

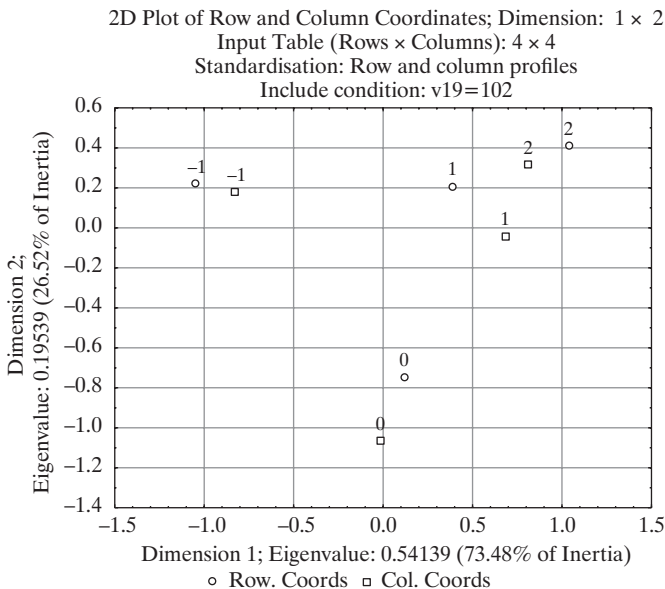


Fig. 3. Links between the Assessment of the Level of Innovation and the “Integration of Personnel around Strategic Objectives” Variable

Source: author’s own study.

The two-dimensional projection area explained 100% of the total inertia in the analysis of the links between the assessment of the level of innovation and the integration of personnel around strategic objectives at the hospitals. The doctors who evaluated the “integration of personnel around strategic objectives” variable at a high or low level are represented by the points on the right-hand side relative to the centre axis, while those on the left-hand side represent doctors who reported no occurrence of this variable. Doctors who believed that their hospitals had no innovation are represented by the points at the far left on the left-hand side, while those on the right represent doctors who reported the occurrence of innovation at either a high or low level. This leads us to conclude that doctors who stated that their hospitals integrated personnel around strategic objectives also rated the level of innovation at their hospitals highly. By contrast, physicians who reported no occurrence of the integration of personnel around strategic objectives at their hospitals also indicated a lack of innovation.

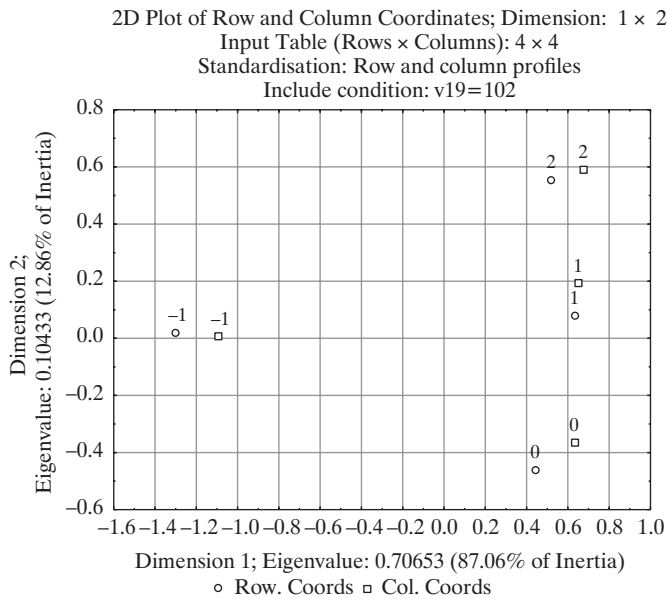


Fig. 4. Links between the Assessment of the Level of Innovation and the “Mechanisms to Motivate and Reward Staff for Innovation” Variable

Source: author’s own study.

Fig. 4 presents an analysis of the links between the assessment of the level of innovation and the “mechanisms to motivate and reward staff

for innovation” variable, in which the two-dimensional projection area explained 99.92% of the inertia.

The location of the points representing the relationship between the “mechanisms to motivate and reward staff for innovation” variable and the level of innovation leads us to conclude that doctors who evaluated the former highly also rated the level of innovative action as high. The same relationship applied to a low evaluation of both variables or an absence of both variables.

Fig. 5 presents an analysis of the links between the assessment of the level of innovation and the “effective communication and collaboration based on trust relationships” variable, in which the two-dimensional projection area explained 96.46% of the total inertia. The points plotting the relationship between the “effective communication and collaboration based on trust relationships” variable and the level of innovation led us to conclude that doctors rated both the tested variable and the level of innovation in their hospitals highly. Doctors who reported a low level of, or an absence of, the “effective communication and collaboration based on trust relationships” variable also reported a low level of, or an absence of, the innovation variable.

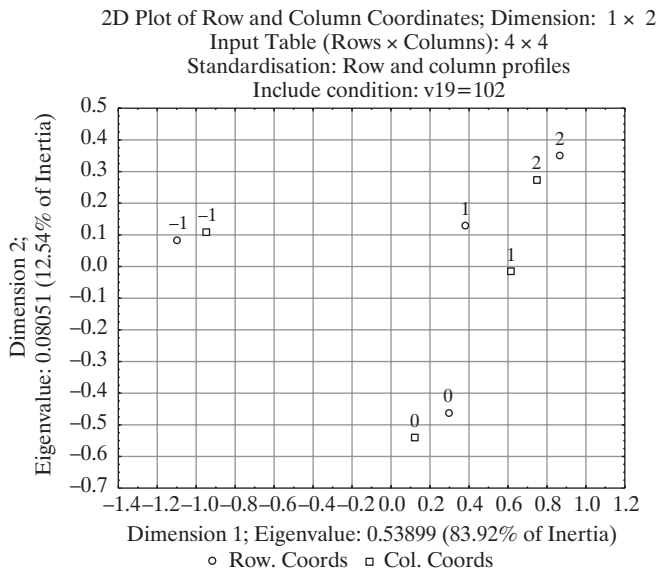


Fig. 5. Links between the Assessment of the Level of Innovation and the “Effective Communication and Collaboration Based on Trust Relationships” Variable

Source: author’s own study.

Fig. 6 presents an analysis of the links between the assessment of the level of innovation and the “standardisation of rules and procedures” variable, in which the two-dimensional projection area explained 98.03% of the total inertia.

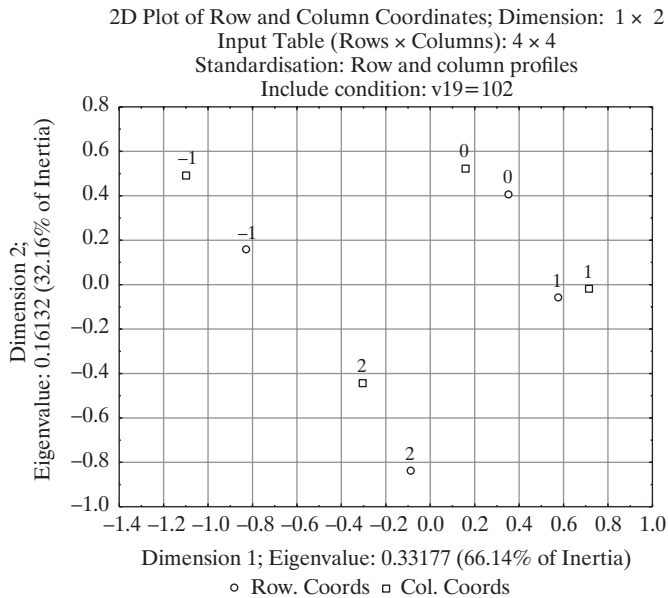


Fig. 6. Links between the Assessment of the Level of Innovation and the “Standardisation of Rules and Procedures” Variable

Source: author’s own study.

The doctors who evaluated the “standardisation of rules and procedures” variable as low are found on the right-hand side of the horizontal axis (relative to the centre axis), which has a higher share of the inertia, while the doctors who reported no standardisation of rules and procedures are found to its left-hand side. The doctors who believed there was a lack of innovation at their hospitals are represented by the row coordinates furthest to the left on the left-hand side, while the doctors who rated innovation as low lie to the right. These findings suggest that doctors who gave a low evaluation of the standardisation of rules and procedures also rated innovation at their hospitals as low. Finally, physicians who reported a lack of standardisation of rules and procedures also reported a lack of innovation at their hospitals.

Fig. 7 presents an analysis of the links between the assessment of the level of innovation and the “openness to change and innovation” variable, in which the two-dimensional projection area explained 86.01% of the total inertia.

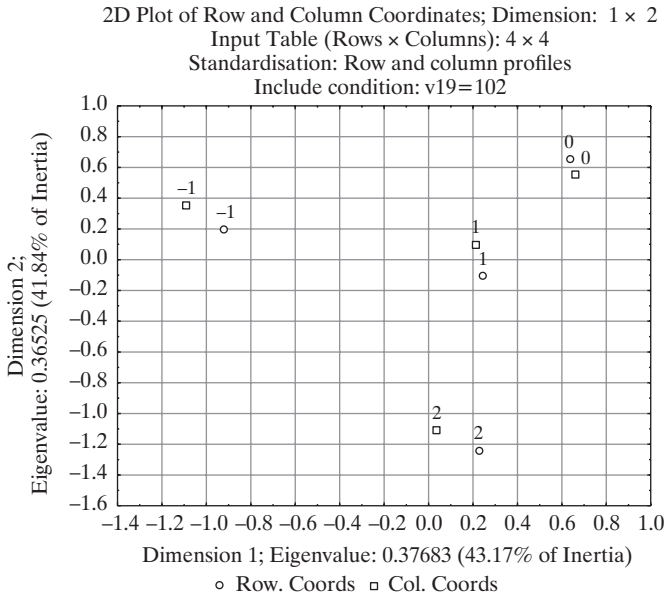


Fig. 7. Links between the Assessment of the Level of Innovation and the “Openness to Change and Innovation” Variable

Source: author’s own study.

The location of the points representing the relationship between the “openness to change and innovation” variable and the level of innovation suggests that doctors recognised both a lack of openness to change and innovation, and a lack of innovation, at their hospitals. Doctors who expressed no opinion on the issue of openness to change and innovation also gave no view regarding the level of innovation.

Fig. 8 presents an analysis of the links between the assessment of the level of innovation and the “tolerance of minor errors in learning processes” variable, in which the two-dimensional projection area explained 94.01% of the total inertia.

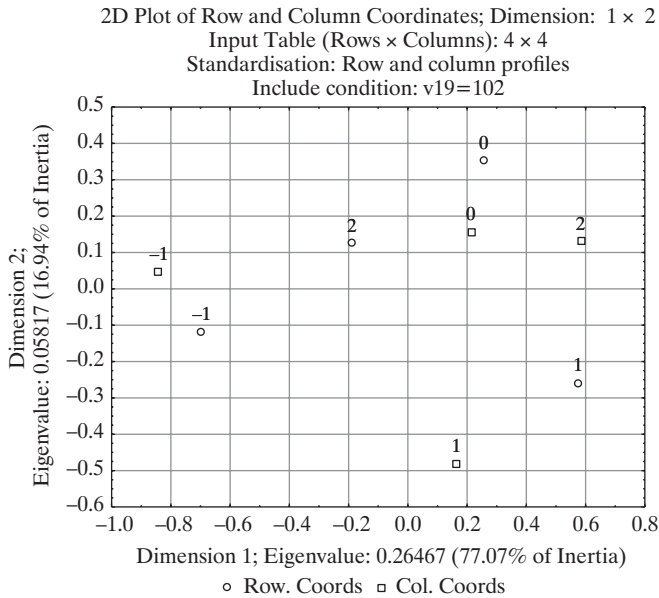


Fig. 8. Links between the Assessment of the Level of Innovation and the “Tolerance of Minor Errors in Learning Processes” Variable

Source: author’s own study.

Doctors who identified a high level of tolerance of minor errors in learning processes also reported a low level of innovation at their hospitals, while those who reported the former variable as absent also reported a lack of innovation at their hospitals.

5. Conclusion

Using correspondence analysis, this article attempted to identify the variables that, in the opinion of medical staff, make up innovation culture. The use of correspondence analysis permitted a straightforward, graphical depiction of the relationship between the innovation variables and the organisational culture of innovation in hospitals. Although as an exploratory technique this analysis was not able to provide information on how strong the relationships between the variables were, it did offer the opportunity to show the similarities and differences in the assessment of individual variables. It was found in this way that doctors who rated the individual variables of innovation and organisational culture highly, mostly

gave the same answer regarding the level of innovation in their hospitals. Meanwhile, doctors who rated the characteristics of innovation culture as poor also applied the same evaluation to innovation at their hospitals. The variables concerned included strategic orientation for development, access to resources and capital for the implementation of innovations, integration of personnel around strategic objectives, mechanisms to motivate and reward staff for innovation, and effective communication and collaboration based on trust relationships. A different relationship was observed in the case of the “tolerance of minor errors in learning processes” variable. Doctors who gave it a high assessment rated innovation at their hospitals as low, that is, they took the view that high tolerance for minor errors does not go hand in hand with innovation. This may be because medical care is an especially sensitive form of service provision in which even small errors can have an irreversible effect on the health or life of patients. It may be concluded in general terms that the study found a relationship between the variables studied and confirmed the validity of the characteristics selected as indicators of innovation in the organisational culture of the hospitals. Leaving the “tolerance of minor errors in learning processes” variable aside as an exception, these were: strategic orientation for development, access to resources and capital for the implementation of innovations, integration of personnel around strategic objectives, mechanisms to motivate and reward staff for innovation, and effective communication and collaboration based on trust relationships. At the same time, being aware of the imperfections of the research, it should be emphasised that the above analysis is only an introduction to further research into pro-innovation culture in public hospitals. In particular, it would be important to consult and study the opinions of other professional groups, such as nurses and managers, on the development of pro-innovation organisational culture in public hospitals. The credibility of such an approach is supported by the cultural diversity of the various occupational subcultures in hospitals, which present different sets of values and behaviours with respect to that place of work. At the same time, more and more voices are being heard raising the urgent need to take account of cultural factors when making changes in management. This is all the more justified because it is a need that has long been recognised by the top-level personnel running enterprises.

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Abstract

Atrybuty proinnowacyjnej kultury organizacyjnej w opinii lekarzy – wyniki badań empirycznych

Celem artykułu jest próba rozpoznania zmiennych charakteryzujących proinnowacyjną kulturę organizacyjną w opinii personelu lekarskiego poprzez określenie związków pomiędzy zmiennymi wzorca określonego na podstawie literatury a poziomem innowacyjności danych szpitali. W związku z realizacją postawionego celu przeprowadzono badania kwestionariuszowe wśród 51 lekarzy. Wyniki sugerują, że w opinii lekarzy zmienna innowacyjności jest w istotnym stopniu powiązana prawie ze wszystkimi wyróżnionymi zmiennymi, takimi jak: strategiczne zorientowanie na rozwój, dostęp do zasobów i kapitału na wdrażanie innowacji, zintegrowanie personelu wokół celów strategicznych, mechanizmy motywowania i nagradzania personelu za innowacyjność, skuteczna komunikacja i współpraca oparte na relacjach zaufania, standaryzacja norm i zasad postępowania, otwartość na zmiany i innowacje, z wyjątkiem tolerancji na drobne błędy w procesach uczenia się.

Słowa kluczowe: proinnowacyjna kultura organizacyjna, lekarze, publiczne szpitale, Polska.