Empathy and resilience have an indirect effect on raising the level of the quality of care, as empathy is the basis for good interactions between medical workers and patients, and resilience, as a dynamic process, helps caregivers adapt well to difficult working conditions, risks or traumas experienced. The development of empathy and resilience in these medical workers is possible by a training method already employed among medical students in order to both improve the quality of care, but also to more effectively prevent professional burnout. The purpose of the study was to determine the level of empathy and the level of resilience, their possible correlations with each other, as well as the relationship of these variables with socio-demographic variables.

The study was carried out in 2021 among 31 doctors and 45 nurses using two main tools – the Emotional-Cognitive Empathy Questionnaire (EEP) devised by Ewa Wilczek-Rużyczka and the Resilience Measurement Scale(SPP-25) by Nina Oginska-Bulik and Zygfryd Juczynski, as well as a socio-demographic questionnaire.

The most valuable results of the study turned out to be the demonstration of statistically significant concordant associations of the empathy level with the resilience level both in general, and their individual factors as statistically significant intercorrelations. In addition, statistically significant differences were shown in the case of cognitive empathy – higher levels of empathy were found among people with longer work experience and women when compared to men. In the case of the level of other components of empathy, as well as resilience, differences so as to be statistically significant could not be confirmed.

It is recommended that empathy and resilience training sessions be implemented for health care workers, and that the study be continued with larger research groups, with additional control groups, to refine the programmes of these training sessions.

Key words: emotional empathy, cognitive empathy, health care, training
INTRODUCTION

As early as the 19th century, Charles Darwin argued that emotions are the primary regulators of social interaction, and that the interspecies communication of emotions is innate and has adaptive value. In this understanding, empathy, which involves recognizing emotions and adjusting social interactions accordingly, would provide an evolutionary advantage to individuals and groups with this ability (Darwin 1872).

There have also been several contemporary theoretical articles in the psychological literature that discuss the evolution of empathy and its neural substrates. For example, Leslie Brothers presented an evolutionary theory of empathy, defining the concept of empathy at different levels of maturation (Brothers 1989). Not only he, but other researchers (Hoffman 2000, Trevarthen et al. 1994) argue that empathy is an innate biological process in more evolved species. The term “empathy” itself comes from the Greek and was formed from a combination of the words en – “in what” and pathos – “suffering.” It would follow that it refers precisely to sharing someone’s unhappiness. But positive feelings such as joy can also be shared, which may be related in the findings of numerous scientists indicating that the mirror neurons system - MNS - may be involved in the process of empathy. The functioning of the MNS was first shown in monkeys in areas of the parietal-frontal cortex in relation to understanding and action recognition (Rizzolattiet al. 1996; Rizzolatti and Craighero, 2004; Gallese et al. 2009). In humans, using both neuroimaging techniques and electrophysiological methods, the presence of MNS has been demonstrated (Rizzolattiet al. 2001) in certain areas of the cerebral cortex, including the inferior parietal lobe (IPL) and inferior frontal gyrus (IFG).

However, there is no single, universally accepted definition of empathy in the subject literature, as it is defined based on different aspects of empathy. From an emotional perspective, empathy describes a person’s ability to empathize with the emotional states of another person (Eisenberg 2000; Hoffman 2006), while from a cognitive perspective, empathy is the ability to understand the beliefs, feelings and intentions of others (Decety et al. 2004).

There are also multidimensional approaches, the authors of which postulate that in the process of empathizing, there is both empathizing with another person’s emotional state and understanding what he or she is feeling, along with adopting his or her perspective (Davis 2001; Ickes et al. 2000; Decety et al. 2004).

According to Mark Davis, empathic factors are genetically determined, and the main mechanism needed for the proper development of empathy is emotional (Davis 2001), which is undoubtedly influenced by educational factors (Strus 2012). Davis’ research model was based on an inclusive definition and assumes (Davis 2001) that a typical empathic “episode” goes as follows: the person of the observer comes into contact with the observed in some way, and some kind of relationship on the part of the observer (cognitive, affective and/or behavioral) takes place. Also according to Ewa Wilczek-Rużyczka, empathy is understood...
as either an emotional-cognitive or emotional-cognitive-behavioral construct, in connection with which it consists in adopting the perspective of the other person, and in the case of, for example, a sick person, demonstrating understanding towards the emotions experienced, as well as communication, both verbal and non-verbal, thanks to which the therapeutic team is able to express understanding towards the patient’s condition and provide appropriate care (Wilczek-Rużycka 2017).

William Laughey with colleagues in a more recent study (Laughey et al. 2020) confirmed the claim that clinical empathy is practiced both cognitively and affectively, with affective empathy being more profound, and identified modifying factors, including barriers that either block empathy or promote cognitive functions over affective empathy – eliminating distressing experiences, the main one being time pressure.

Since nurses and doctors in their work often experience difficult situations related to communication with patients and their families - sometimes concerning threats to health and even life itself, therefore, the ability to show empathy, which is of great importance especially in caregivers, is of considerable importance (Wilczek-Rużycka 2017).

Balance and acceptance of suffering enables professionals to understand the experiences they face on a daily basis. In addition, cultivating compassion promotes resilience and self-compassion and will ultimately enable professionals to deal with suffering and death without compassion fatigue and with compassion satisfaction (Duarte et al. 2016). Compassion fatigue is defined as the cost of caring for others or attending to their emotional pain (Figley 2004). Compassion fatigue can cause communication deficits with patients, family members and other colleagues (Nolte et al., 2017) and is considered an avoidance mechanism adopted in response to the suffering of patients and their families (Babineau et al., 2019). Professional burnout, on the other hand, is a syndrome characterized by emotional exhaustion, depersonalization (Lahana et al., 2017) and lack of personal fulfillment at work, occurring as a consequence of continuous exposure to occupational stress (Cañadas-De la Fuente et al. 2018; Maslach and Jackson 1981).

In addition, integrated studies data collected from many countries as far back as the 20th century indicate that people working in health professions are at risk of high rates of chronic stress and burnout (Felton 1998). According to a number of authors (Dyrbye et al. 2010; Neumann et al. 2011; Ward et al. 2012), several factors contribute to burnout among healthcare professionals, including high patient volumes and overwhelming time pressures and demands, as well as limited or insufficient resources. This phenomenon, these authors add, may begin earlier with the observed decline in empathy during student and professional practice, leading to the alarming rates of burnout among medical students and other healthcare professionals.

It is believed that the ability to empathize develops with age, as the process of growing up and functioning as an adult is accompanied by increasing empathy, so it is possible to develop empathy using a training method, which is of particular
importance in increasing the quality of care provided and is expected to protect
care givers from stress and professional burnout, as demonstrated by Ewa
Wilczek-Rużyczka in her research (Wilczek-Rużyczka 2008).

Factors also protecting against harmful and stressful experiences can includ-
eresilience and, in a broader approach, it should be understood as a dynamic
process characterized by a person’s relatively good adaptation to prevailing con-
ditions despite the identified threats or traumas experienced by that individual
(Lutharr2006), as the traditional view of resilience as a static character trait has
been debunked (Luthanset al. 2006; Cazaet al. 2012), and numerous rese-
archers (Soodet al. 2011; Macheet al. 2016; Grabbeet al. 2021) have provided
ample evidence that identifies its dynamic and transitional quality.

Thus, optimizing resilience can deepen empathy, which has been shown in
research (Krasneret al. 2009), as resilience coaching has been confirmed to en-
hance empathy. However, there is not a full consensus in the literature regarding
this relationship – some studies show a correlation between resilience and empathy
(Morice-Ramatet al. 2018), but others (McFarland, et al. 2017) have failed to
confirm this.

Thus, resilience represents one of the most important of the resources that
an individual can possess and which can help in coping with negative events,
and here severe stress. It is a significant protection for those exposed to secondary
trauma and can foster the phenomenon of post-traumatic growth (Oginska-Bulik
2018) and refers to mechanisms that promote the positive functioning of an
individual despite adversity, life difficulties as well as traumatic experiences that
happened both in the past or are ongoing now (Rutter 1987; Lutharet al. 2000;
Mastenet al. 2003).

This process consists of the interplay of a number of factors – both risks or
vulnerabilities and those that oppose them – that perform protective functions
(Borucka et al. 2008). Resilience, in this view, is also sometimes seen as a
developmental process, allowing the gradual acquisition of skills to use internal
and external resources to better adapt to future or currently identified adversities,
making resilience-enhancing interventions possible. Of particular importance are
long-term resilience training programs, which admittedly vary widely, but most
are designed to promote development in psychosocial, behavioral and cognitive
aspects. This type of therapy avoids unwanted symptoms by encouraging ef-
fective communication, intimacy and reducing anxiety (Sautteret al. 2009).

**Purpose of the study**

In the above discussion – citing the results of numerous studies- both the pos-
itive impact of empathy (Wilczek-Rużyczka 2008) and resilience (Sautteret al.
2009) on the quality of care and the protection of medical workers from burnout
and dehumanization, as well as the possibility of their development of empathy
and resilience by a training method – we undertook a study to determine the level
of empathy and the level of resilience, their possible mutual correlations, as well
as the relationship of these variables with independent variables.
MATERIAL AND METHOD

Characteristics of the respondents
The self-study included 31 doctors and 44 nurses – 75 respondents, of whom up to 85% of the total respondents were women – 64 persons. The average participant age is 44 years, and their age range is 23-84. In terms of place of residence, two groups of respondents predominate, namely, those living in rural areas and in cities up to 100 thousand each – 32 respondents, or 42% each.

Method
The research was carried out in 2021 using two main tools – the Emotional-Cognitive Empathy Questionnaire EEP and the Resilience Measurement Scale SPP-25, as well as a socio-demographic questionnaire.

The Emotional-Cognitive Empathy Questionnaire EEP, devised by Ewa Wilczek-Rużyczka to measure the levels of emotional and cognitive empathy, and after summing up emotional-cognitive empathy, is a self-description tool and consists of 16 statements. The study can be implemented individually or in groups. Each person participating in the study responds to the given statements by surrounding the appropriate number, indicating the selected statement from among:
• 0 – never;
• 1 – occasionally;
• 2 – rarely;
• 3 – sometimes;
• 4 – frequently.

For both areas, a maximum total of 64 points can be obtained as determining one’s level of emotional-cognitive empathy. However, in the case of the subscales – measuring the level of emotional empathy was included in seven statements giving a score of up to 28 points, while in the measurement of cognitive empathy, nine statements are used – with a maximum of 36 points. The internal consistency of the test, as determined by the Cronbach’s Alpha index, is 0.84 for the measurement of the EEP total value, and for the subscales – 0.80 for emotional empathy and 0.73 for cognitive empathy, respectively.

Resilience Measurement Scale – SPP-25 (Oginska-Bulik et al. 2008) is a tool that was developed by Nina Oginska-Bulik and Zygfryd Juczynski to measure the overall level of resilience, treated as a personality characteristic, and the five factors that comprise it:
• persistence and determination in action;
• openness to new experiences; and a sense of humor;
• personal competence to cope with and tolerate negative emotions;
• tolerance of setbacks and seeing life as a challenge;
• an optimistic attitude toward life and the ability to mobilize in difficult situations.

These authors view resilience as a self-regulatory mechanism that is universal in nature, and should protect against the negative effects of experienced events,
both traumatic and everyday. The scale can therefore be used in measuring the personality predispositions of people who are exposed to stress, including those of a traumatic nature. For this reason, it can be used as a selection tool for certain professions with a high risk of exposure to stress. The SPP-25 questionnaire is a self-description tool completed either individually or in groups, and the subjects respond to the statements given, which are rated on a 5-point Likert-type scale (from 0 – definitely no, to 4 – definitely yes). The scale obtained satisfactory psychometric properties, as according to the authors (Oginska-Bulik et al. 2008) the internal consistency, determined by Cronbach’s alpha, is 0.89 for the whole scale. The reliability of the extracted 5 subscales is similar and ranges from 0.67 to 0.75. Since each subscale includes only 5 statements, the obtained indicators should be considered satisfactory.

The author’s socio-demographic questionnaire, is composed of 11 closed and open-ended questions to determine independent variables.

RESULTS

The levels of both emotional and cognitive empathy and the summed total score (according to the EEP), as well as the levels of all resilience factors and the summed total score were higher in the nurses’ group than in the doctors’ group, but the differences were not statistically significant, as shown in Table 1 and Table 2.

Table 1. Levels of types of empathy according to the EEP Questionnaire in the study groups of doctors and nurses

| Type of empathy      | Profession | U Mann |  |  |
|----------------------|------------|--------|--------|
|                      | Doctors(N = 31) | Nurses (N = 44) | -WhitneyTest |
|                      | M | Me | SD | M | Me | SD | Z | p |
| Emotional            | 22.94 | 23.00 | 2.90 | 23.57 | 24.00 | 3.35 | -1.163 | 0.245 |
| Cognitive            | 29.71 | 31.00 | 4.12 | 31.50 | 31.00 | 3.25 | -1.826 | 0.068 |
| Empathy in general   | 52.85 | 53.00 | 6.56 | 55.07 | 56.00 | 6.03 | -1.698 | 0.090 |

Source: own research *significant at p < 0.05 level

Table 2. Levels of resilience factors according to SPP-25 in the study groups of doctors and nurses

| Resilience factors | Profession | U Mann |  |  |
|--------------------|------------|--------|--------|
|                    | Doctors (N = 31) | Nurses (N = 44) | -WhitneyTest |
|                    | M | Me | SD | M | Me | SD | Z | p |
| perseverance and determination in action | 15.16 | 15.00 | 2.38 | 16.18 | 16.00 | 2.73 | -1.619 | 0.105 |
| openness to new experiences and a sense of humor | 14.94 | 15.00 | 2.49 | 15.98 | 16.00 | 2.47 | -1.701 | 0.089 |
| Personal competence to cope and tolerance of negative emotions | 15.00 | 14.00 | 6.21 | 15.09 | 15.00 | 2.86 | -1.033 | 0.301 |
| tolerance for failure and treating life as a challenge | 14.52 | 15.00 | 2.93 | 15.20 | 15.50 | 3.30 | -1.028 | 0.304 |
| optimistic attitude to life and the ability to mobilize oneself in difficult situations | 13.03 | 13.00 | 3.38 | 14.55 | 15.00 | 3.58 | -1.794 | 0.073 |
| resilience in general | 72.65 | 73.00 | 13.64 | 77.00 | 75.50 | 13.40 | -1.286 | 0.198 |

Source: own research *significant at p < 0.05 level
On the other hand, in analyzing the determinants of empathy according to gender, the results summarized in Table 3 allow us to confirm a statistically significantly higher level of cognitive empathy and total empathy in the female respondents in relation to men. In the case of emotional empathy, the confirmed statistical significance of the difference of these averages was 0.009, and total empathy was slightly lower – as it reached only the level of significance of 0.018 differences, and this is due to the small (non-significant) differentiation of these groups in terms of emotional empathy (Table 3).

The levels of all resilience factors and the summed total score were also higher in the women’s group than in the men’s, but the differences were not statistically significant, as shown in Table 4.

When considering the level of education as another presumed factor that may affect the level of empathy or resilience among the subjects, it was found that in the case of the level of empathy, education was not a differentiating factor. Nurses with secondary education had higher average scores for the parameter of emotional, cognitive and total empathy, however, these differences when compared to doctors and nurses with higher education were not statistically significant (Table 5).

**Table 3. Levels of types of empathy according to the EEP Questionnaire by gender of respondents**

<table>
<thead>
<tr>
<th>Type of empathy</th>
<th>Profession</th>
<th>U Mann -Whitney Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Doctors (N = 31)</td>
<td>Nurses (N = 44)</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>Me</td>
</tr>
<tr>
<td>Emotional</td>
<td>23.47</td>
<td>24.00</td>
</tr>
<tr>
<td>Cognitive</td>
<td>31.27</td>
<td>31.00</td>
</tr>
<tr>
<td>Empathy in general</td>
<td>54.73</td>
<td>56.00</td>
</tr>
</tbody>
</table>

Source: own research *significant at p < 0.05 level

**Table 4. Levels of resilience factors according to SPP-25 by gender of respondents**

<table>
<thead>
<tr>
<th>Resilience factors</th>
<th>Profession</th>
<th>U Mann -Whitney Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Doctors (N = 31)</td>
<td>Nurses (N = 44)</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>Me</td>
</tr>
<tr>
<td>perseverance and determination in action</td>
<td>157.3</td>
<td>16.00</td>
</tr>
<tr>
<td>openness to new experiences and a sense of humor</td>
<td>15.48</td>
<td>15.00</td>
</tr>
<tr>
<td>Personal competence to cope and tolerance of negative emotions</td>
<td>14.92</td>
<td>14.50</td>
</tr>
<tr>
<td>tolerance for failure and treating life as a challenge</td>
<td>14.69</td>
<td>15.00</td>
</tr>
<tr>
<td>optimistic attitude to life and the ability to mobilize oneself in difficult situations</td>
<td>13.80</td>
<td>14.00</td>
</tr>
<tr>
<td>resilience in general</td>
<td>74.62</td>
<td>74.50</td>
</tr>
</tbody>
</table>

Source: own research *significant at p < 0.05 level
On the other hand, in analyzing the differences in the levels of resilience factors by education (Table 6), statistically significant differences were observed for one of these factors – "optimistic attitude to life and the ability to mobilize oneself in difficult situations." The average of this level in nurses with secondary education was higher than in the population of doctors and nurses with higher education, and the confirmed statistical significance of the difference of these averages was 0.025. In the other dimensions, nurses with higher education showed a higher average level of resilience, but this was not a statistically significant difference (Table 6). On this basis, it can be concluded that education has a limited effect on the level of empathy and resilience. The data collected shows that respondents with lower education are more optimistic about life and better able to mobilize themselves in difficult situations than those with higher education.

From the data obtained, summarized in Table 7, it is clear that those with longer work experience show higher levels of cognitive empathy, as the confirmed statistical significance of the concordant relationship in this case was 0.032. In contrast, age is not a variable that correlates statistically significantly with levels of types of empathy, as for each type of empathy analyzed p>0.050, although for cognitive empathy there was some concordant statistical trend (p<0.10) p=0.073 (Table 7).
On the other hand, analyzing the association of resilience factor levels with age and with seniority, for none of the resilience factors could show a statistically significant relationship with these independent variables, and only a certain consistent statistical trend in the association of optimistic attitudes to life and the ability to mobilize oneself in difficult situations with seniority was signaled (p<0.010) p=0.072 (Table 8).

The most valuable results of this research turned out to be the demonstration (Table 9), using Spearman’s rank correlation coefficient, of statistically significant associations of almost all sets of levels of resilience factors according to SPP-25EEP with the levels of types of empathy according to the respondents’ EEP Questionnaire – finding that higher levels of resilience factors are associated with high levels of types of empathy, as well as the summary values of these variables, and at the 0.002 level of significance. The aforementioned exception is the lack of confirmation of a statistically significant correlation of the resilience factor, defined as an optimistic attitude toward life and the ability to mobilize oneself in difficult situations with emotional empathy.

Table 7. Relationship of the levels of types of empathy according to the EEP Questionnaire with age and with seniority of the subjects according to Spearman’s rank correlation coefficient

<table>
<thead>
<tr>
<th>Type of empathy</th>
<th>Significance of the relationship of the levels of types of empathy (according to Spearman’s rank correlation coefficient)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>with seniority</td>
</tr>
<tr>
<td>Emotional</td>
<td>rho 0.104</td>
</tr>
<tr>
<td>Cognitive</td>
<td>rho 0.249</td>
</tr>
<tr>
<td>Empathy in general</td>
<td>rho 0.198</td>
</tr>
</tbody>
</table>

Source: own research *significant at p < 0.05 level

Table 8. Relationship of levels of resilience factors according to SPP-25EEP with age and with the seniority of respondents according to Spearman’s rank correlation coefficient

<table>
<thead>
<tr>
<th>Resilience factors</th>
<th>Significance of the relationship of resilience factor levels (according to Spearman’s rank correlation coefficient)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>with seniority</td>
</tr>
<tr>
<td>perseverance and determination in action</td>
<td>rho 0.008</td>
</tr>
<tr>
<td>openness to new experiences and a sense of humor</td>
<td>rho 0.046</td>
</tr>
<tr>
<td>Personal competence to cope and tolerance of negative emotions</td>
<td>rho 0.131</td>
</tr>
<tr>
<td>tolerance for failure and treating life as a challenge</td>
<td>rho 0.002</td>
</tr>
<tr>
<td>optimistic attitude to life and the ability to mobilize oneself in difficult situations</td>
<td>rho 0.209</td>
</tr>
<tr>
<td>resilience in general</td>
<td>rho 0.078</td>
</tr>
</tbody>
</table>

Source: own research *significant at p < 0.05 level
From the analysis of the cited studies, of which, as mentioned, the most valuable results turned out to be the demonstration of statistically significant concordant relationships between the level of empathy and the level of resilience both overall and their individual factors as statistically significant intercorrelations. This result partially corroborates the results of a study from the COVID-19 pandemic period by a Spanish research team (Ruiz-Fernández et al. 2021), which found that empathy, resilience and mindfulness were the main protective predictors of compassion fatigue, compassion satisfaction and burnout, respectively. These were particularly challenging working conditions in health care during this period (Shanafelt et al. 2020). Noteworthy are the results of a study (Wu et al. 2022) extending the aforementioned observations – confirming that resilience as a variable partially mediated the relationship between empathy and educational burnout among medical students – which will contribute to a better understanding of the mechanism of empathy and constructive suggestions for protecting and improving the empathy and resilience of medical students. This is particularly important in view of the results obtained by Megan Brown’s team of researchers, confirming both the positive effects of empathy and resilience on the quality of care and the protection of medical workers from burnout and dehumanization (Brown et al. 2022).

In our own presented research, it was also possible, but only in some cases, to demonstrate significant relationships of these dependent variables – or their elements – with some assumed independent variables. The relationship of the subjects’ age with the level of empathy and the level of resilience – or their com-

Table 9. Relationship of the levels of resilience factors according to SPP-25EEP with levels of types of empathy according to the EEP Questionnaire of the subjects according to the Spearman rank correlation coefficient

<table>
<thead>
<tr>
<th>Resilience factors</th>
<th>Significance of the relationship (according to Spearman’s rank correlation coefficient) levels of resilience factors with individual levels of types of empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With emotional</td>
</tr>
<tr>
<td></td>
<td>rho</td>
</tr>
<tr>
<td>perseverance and determination in action</td>
<td>0.203</td>
</tr>
<tr>
<td>openness to new experiences and a sense of humor</td>
<td>0.263</td>
</tr>
<tr>
<td>Personal competence to cope and tolerance of negative emotions</td>
<td>0.329</td>
</tr>
<tr>
<td>tolerance for failure and treating life as a challenge</td>
<td>0.250</td>
</tr>
<tr>
<td>optimistic attitude to life and the ability to mobilize oneself in difficult situations</td>
<td>0.166</td>
</tr>
<tr>
<td>resilience in general</td>
<td>0.275</td>
</tr>
</tbody>
</table>

Source: own research *significant at p < 0.05 level

DISCUSSION

From the analysis of the cited studies, of which, as mentioned, the most valuable results turned out to be the demonstration of statistically significant concordant relationships between the level of empathy and the level of resilience both overall and their individual factors as statistically significant intercorrelations. This result partially corroborates the results of a study from the COVID-19 pandemic period by a Spanish research team (Ruiz-Fernández et al. 2021), which found that empathy, resilience and mindfulness were the main protective predictors of compassion fatigue, compassion satisfaction and burnout, respectively. These were particularly challenging working conditions in health care during this period (Shanafelt et al. 2020). Noteworthy are the results of a study (Wu et al. 2022) extending the aforementioned observations – confirming that resilience as a variable partially mediated the relationship between empathy and educational burnout among medical students – which will contribute to a better understanding of the mechanism of empathy and constructive suggestions for protecting and improving the empathy and resilience of medical students. This is particularly important in view of the results obtained by Megan Brown’s team of researchers, confirming both the positive effects of empathy and resilience on the quality of care and the protection of medical workers from burnout and dehumanization (Brown et al. 2022).

In our own presented research, it was also possible, but only in some cases, to demonstrate significant relationships of these dependent variables – or their elements – with some assumed independent variables. The relationship of the subjects’ age with the level of empathy and the level of resilience – or their com-
ponents – was not confirmed, while longer job tenure was statistically significantly associated only with higher levels of one type of empathy – cognitive, and in the case of resilience factors, the relationship with the number of years worked was not significantly confirmed.

Examining the determinants of the analyzed variables dependent on occupation, it is true that nurses obtained higher average scores during the EEP questionnaire, but this was not statistically significant. Gender was shown to be a factor that significantly influenced the level of empathy, as in the study group women were characterized by a higher level of cognitive empathy than men, but in the case of the level of resilience such a difference, as being statistically significant, was not found. The lack of this confirmation in statistical analyses may have been due to the potential limitations of the study, namely the relatively small study group of 75 people, or the large disproportion in numbers – 64 women as opposed to 11 men. Also, the disproportion between the number of people representing the nursing profession versus the medical profession – but with a smaller size of 44 to 31 people – may have made it difficult to confirm the statistical significance of the differences in the mean values of empathy and resilience.

However, it was found, but without demonstrating statistical significance, that in all types of empathy and resilience factors, the average scores were higher in the nursing group – as in the women’s group relative to the men’s group, the similarity probably being a result of the female dominance of this profession. Perhaps it would be more advantageous, when looking for significant differences between the aforementioned professional groups in terms of levels of empathy and resilience, to compare only nurses with doctors, in order to avoid a possible confounding factor – gender.

A similar situation may apply to education, as a differentiating factor – where statistical significance was not confirmed, since out of the 75 people surveyed, as many as 65 had graduated from college, and only 10 nurses had only a high school education. The aforementioned limitations and problems are not the result of an erroneous selection of research groups in terms of structure by gender, occupation or education, as it corresponds more or less to the proportions in the entire population of these professions. One could consider, for possible future studies, increasing the size of the groups, expanding territorially – not limited to Malopolska – and adding a control group - people from outside medical professions themselves.

This justifies referring to the results of an earlier study with larger groups, since it included 263 doctors and 403 nurses, since the material collected showed statistically significant differences in the level of empathy, not only by gender, but also between nurses and doctors (Wilczek-Rużyczka 2008: Wilczek-Rużyczka & Zaczyk 2022). The fact that Joanna Kliszcz came to different conclusions in her study, but-importantly-among physiotherapy students, also supports the continuation of the extended study for verification, as admittedly higher reactivity was manifested by women, but they did not significantly outperform men in terms of empathy, or emotional intelligence (Kliszcz 2017).
Thus, the demonstration in our own research of statistically significant concordant relationships between the level of empathy and the level of resilience, as well as the reports cited on the possibility of developing these positive resources with training methods, allows us to assume that the application of training aimed at one of these resources will indirectly raise the level of the other as well. This is a very important conclusion, since both empathy and resilience in helpers significantly increase the quality of care provided and are defensive in nature. This is supported by the results of Kathi Kemper and Michael Khirallah, who showed that an internet training involving a choice of several one-hour body and mind skills modules (e.g. introduction to stress, resilience and relaxation; autogenic training; guided imagery and hypnosis for pain, insomnia and habit change; introduction to mindfulness; mindfulness in daily life) reaches a variety of stressed health professionals and is associated with immediate improvements in stress levels, mindfulness, empathy and resilience (Kemper et al. 2015). Thus, such interventions should be implemented, through, for example, post-graduate training, or even during academic training, with a view to the quality of care provided and patient satisfaction, as well as protecting medical professionals from the negative effects of the mental and physical stresses associated with their profession. This is also in line with the message of other researchers, as, for example, Ronald Epstein and Michael Krasner define resilience as the ability to respond to stress in healthy ways, and argue that resilience is key to improving the quality of care and sustainability of health care workers (Epstein et al. 2013).

For this reason, resilience should be included in compassion cultivation intervention programs. The implementation of training programmes to develop empathy and resilience is supported by the demonstrated positive associations of cognitive empathy with affective empathy, the work-related well-being of being and meaning with affective empathy but not with cognitive empathy, and resilience with cognitive and to a lesser extent affective empathy (Waddimba et al. 2021) by the Anthony Waddimba positive research team.

Neuroscience research has shown that stress at work weakens the reward system while strengthening the punishment system (see Figure 1). This situation is not conducive to health and causes occupational exhaustion (Pąchalska 2019). Positive links between cognitive empathy and affective empathy and resilience in stressful situations at work strengthen the weakened reward system. This promotes the formation of connections from the basal frontal cortex to the anterior (emotional) part of the cingulate cortex. At the same time, the punishment system is weakened.

In the course of work in the profession, empathy and resilience can modify the minimal (working) self and the longitudinal (autobiographical) self, which is associated with the sustainable development of health professionals and ensures the quality of medical services (Pąchalska 2019; Wilczek-Rużyczka & Zaczyk 2022). These are the reasons for implementing empathy and resilience development training programs.
CONCLUSIONS

The following conclusions can be drawn from the results of the study in relation to the already published effects of the work of other researchers:

1. Statistically significant concordant relationships between the level of empathy and the level of resilience were shown both in general and individual factors.

2. The relationship of the age of the subjects with the level of empathy and the level of resilience – or their components – was not confirmed, while a longer length of service was statistically significantly associated only with higher levels of cognitive empathy, and in the case of resilience factors, the relationship with years worked was not significantly confirmed.

3. Gender was shown to be a factor that significantly affects the level of empathy, as in the study group women had higher levels of cognitive empathy than men, but in the case of the level of resilience such a difference was not found to be statistically significant, although it occurred in each of its factors.

4. It is necessary to continue research on larger groups of health care workers with the addition of control groups, as in the presented study the relatively small number of subjects may have been a limitation in confirming the statistical significance of the results obtained.

5. It is recommended to implement empathy and resilience development training aimed at health care workers, as both empathy and resilience in helpers significantly increase the quality of care provided and are defensive in nature.

REFERENCES


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