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The importance of evaluating inpatients' satisfaction with emphasis on the aspect of confidence

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Abstract

Research background: The patients' confidence in physicians, as well as in healthcare personnel in general, is an important determinant of the patients' satisfaction and their loyalty. The patients' confidence as well as their overall satisfaction is influenced by many determinants, which are in a causal relation.

Purpose of the article: The main aim of the study is to find out which socio-demographic factors influence the confidence of inpatients in physicians, nurses, other medical personnel, as well as in the treatment as such. The inpatients' confidence is considered as an important dimension of the inpatients' satisfaction.

Methods: The questionnaire consists of 112 structured and semi-structured survey questions. It was inspired by the HCAHPS survey. The questionnaire was distributed both on-line and in paper form in the Czech Republic. The dataset consists of 1,479 observations (899 females and 580 males). The descriptive statistics and binary logistic regression were used to process all data.

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Findings & value added: The research revealed significant differences in the confidence of inpatients in physicians in relation to the physicians' communication styles regarding the inpatient's gender. Males are more tolerant to the communication styles of physicians than women. There exists a relatively strong linear relationship between confidence in physicians, nurses, other healthcare professionals, and confidence in a treatment. Also, it was determined that in cases when a physician talks about an inpatient as if she/he is not there, the patient's confidence in the medical personnel is reduced by 65%. Overall confidence in medical personnel is also gender biased i.e., in 87% of cases, women are more likely to have a higher confidence in medical personnel than men. The age of inpatients is not statistically significant and its impact on a confidence in medical personnel is neglectable.

Introduction

At present, patient care is perceived as a reflection of the doctor-patient relationship. This perception includes not only the holistic aspects of a treatment, but also emotional well-being and confidence. If healthcare facilities care about a patient's experiences and satisfaction, it is important to put into practice the systems which measure the patients' satisfaction and which increase healthcare facility's performance. Consequently, such systems would monitor more dimensions of a satisfaction, and they would point to the most significant trajectories and connections between the patient and the healthcare personnel, as well as the healthcare facility (McCleery *et al.*, 2014; Motwani *et al.*, 2015). Many countries use their own systems to measure the patient satisfaction; other use the international systems that have evolved over time, during which they have been modified depending on the intended use of the results obtained (for instance, the HCAHPS — Hospital Consumer Assessment of Healthcare Providers and Systems) (Herrin *et al.*, 2018; Mazurenko *et al.*, 2017; Siddiqui *et al.*, 2014). The patient satisfaction is a part of the quality of healthcare provided. Many theories on a satisfaction focus on examining patient's expectations and their subsequent confrontation with real experiences. Consequently, it is possible to determine the degree of agreement between the expected results and those that are felt (Bowling *et al.*, 2012; Parry *et al.*, 2008; Yang *et al.*, 2020).

Thus, the involvement of patients and professionals is very important for the development of tools which would measure and evaluate patient satisfaction, and which would reveal new causal relations. Measuring and evaluating of the patient satisfaction is extremely important, especially for determining the quality of the healthcare services (Niederhauser & Wolf, 2018; Zheng *et al.*, 2017). The higher the quality of healthcare provided, the higher the patient's commitment to treatment, and consequently, to the follow-up of healthcare professionals, which will ultimately lead to better

health outcomes, necessary for the patient and for the healthcare facility (Coleman *et al.*, 2005). The confidence in the healthcare providers declines as soon as the quality of healthcare services decreases, leading to greater patient's mobility both within a country and to the hospitals abroad.

These consistent facts motivated the team of authors to perform this research. Its main goal was to examine those factors which affect the confidence of hospitalized patients in physicians, nurses, other healthcare personnel and the confidence in the applied treatments. The presented research is devoted to the confidence of inpatients after hospitalisation toward physicians, nurses, other healthcare personnel and to the confidence in the applied treatments in the Czech Republic. The paper deals with the topic of confidence toward medical personnel with regard to inpatients' gender, age, and education level. It is organized as follows: in the following section, a literature review is proposed, followed by sections devoted to methodology, results, discussion, and conclusion.

Literature review

Many research studies examine the patient satisfaction and point to a wide range of factors and effects that affect it. This is a multidisciplinary area of research, as the patient satisfaction is directly linked both to the healthcare aspects and to the socio-economic and psychosocial factors (Briestenský & Ključnikov, 2019). The patient satisfaction is also determined by the socio-demographic characteristics (age, education, gender) and the need for the use of the healthcare services by the individual, the complexity of the diagnosis's treatment, the healthcare procedures, etc. Thus, there are no standardized methodologies enabling the measurement and evaluation of the individual dimensions of the patient satisfaction and their national and international comparability. The researches that are performed by the national and international research teams and the results they share represent a basis for a new platform that is required for a development of their own systems to measure and to evaluate the patients' satisfaction in the countries as well as for a creation of the national and international comparison platforms (Sopko & Kočišová, 2016). The discovery of new determinants of the patient satisfaction and the definition of new causal trajectories for a deeper examination of this issue to continuously improve the patients' satisfaction represent an important advantage of these researches.

In their study, Pavlova *et al.* (2017) identified and analysed the factors that affect the patients' satisfaction during their stay in the hospital in Bulgaria. The research sample consisted of 1,054 patients hospitalised in multi-

profile hospitals for active treatment, situated in eight cities. The results of the study concluded that the increasing number of hospitalisations (up to the third hospitalisation) lead to an increase of the patient satisfaction of the attitude of the physician and nurse, the servicing and the nursing care. However, the satisfaction regarding the necessary equipment, the obtained information, and the medical supervision decreases. Also, education and place of living played a role in the patients' satisfaction with hospitalisation. Patients living in rural areas were happier than patients living in the cities, and also patients with tertiary education and younger patients were more satisfied with health services and care in the healthcare facilities.

Bibhav and Jivika (2014) state that patients have explicit desires or requests for services when visiting hospitals. According to the authors, patient's dissatisfaction is associated with insufficient identification of their needs. The authors examined patient satisfaction in various wards — medical ward, surgical ward, orthopaedic ward, and gynaecology and obstetrics ward of the Civil Service Hospital in Kathmandu, Nepal. They used the method of a structured interview and observation. The authors focused on various information related to the treatment processes, including the payment information and the health recommendations when researching the patient satisfaction. Thus, they formulated many suggestions for improving patient's awareness and satisfaction.

Leddy and Wolosin (2005) examined patients' satisfaction with pain control by implementing the Joint Commission standards. The authors analysed the data for 26 quarters with more than 3,000,000 surveys from the 240 hospitals in the United States. The results of the analysis proved that it is very important for healthcare professionals to monitor the pain of their patients and to help them to manage this pain, because this factor significantly affects the level of satisfaction of patients with hospitalisation.

Gu and Itoh (2014) examined the factors that influence dialysis patient satisfaction and identify their contribution to overall satisfaction. To assess current patient satisfaction, they created a questionnaire with 32 closed questions that they distributed in 22 facilities in the regions of Japan. They received 807 valid answers. Japanese dialysis patients expressed a great satisfaction and a strong loyalty to the medical facility they were currently visiting. The higher the patient satisfaction with the medical facility, the higher the loyalty they would like to maintain. The basic determinants of the overall society were selected: satisfaction with the clinical environment, equipment, treatment, and therapy. The patients' quality of life was closely linked to their overall satisfaction.

Gutysz-Wojnicka *et al.* (2012) stated that in the conditions of the Republic of Poland, generally available validated scales for assessment of

patients' satisfaction with nursing care, are still absent in the healthcare facilities. The aim of their study was to evaluate patients' satisfaction with nursing care by the patients who were hospitalised in surgical and non-surgical wards through the Polish version of the Newcastle Satisfaction with Nursing Scale. The authors conducted the research through the questionnaires that were attended by 787 patients. The results showed that the level of education did not affect the experience with the nursing care level or the satisfaction with nursing care. The patient's age had a statistically significant effect on the results. The patients' satisfaction with nursing care was significantly higher in the surgical departments than in the non-surgical departments. The most satisfied were the patients in district hospitals, followed by the provincial hospitals, with university hospitals taking the third position.

Negi *et al.* (2017) focused on evaluation of the quality of the nurse-to-patient therapeutic communication. In designing their study, they assumed that effective communication is a very important aspect of the nursing career. When a patient is admitted to the ward, a therapist-nurse-patient relationship develops. The aim of the study was to determine the quality of a therapeutic communication of the nurse and the overall satisfaction of the patient during the hospital stay. There were 110 patients involved in the research. More than 80% of the patients confirmed that the nurse was helpful to the patient, and only 4.5% of the patients confirmed that the nurses were prompt in deciding on their care. The findings suggest that most (81.8%) of the patients agreed that the nurse was helpful and showed concern over them and 81 % of the patients agreed that privacy and confidentiality was maintained during the communication. Only a few patients (4.5%) agreed that nurses were prompt in decision-making regarding their care.

Mehta (2015) evaluated the importance of patients' satisfaction surveys in the hospitals for improving the quality of offered healthcare. It refers to the significance of the HCAHPS report and the financial losses associated with failing to meet the patient satisfaction targets. According to the author, patient satisfaction is not an objective measure of the quality of healthcare and, therefore, the introduction of the financial incentives related to patient satisfaction has certain limitations. The HCAHPS is the most studied system for measuring the patient's experience of their care at individual and hospital level. The patient's experience scores may also be related to more objective clinical quality measurements. As confirmed by the numerous studies, the hospitals that have a better collaboration with patients may also achieve higher rates of compliance with clinical healthcare standards and follow-up operation standards (Lim *et al.*, 2020; Zhao *et al.*, 2019; Lyu *et al.*, 2013; Glickman *et al.*, 2010).

Heidegger *et al.* (2006) focused on an examination of the patient satisfaction with anaesthesia care. The authors argued over the questions of what patient satisfaction is, as if it were to be measured and what factors influence the provision of a high level of patient satisfaction. It is also problematic to define the best way to improve the patient satisfaction with anaesthetic care, and also to what extent the decisions should be shared between the anaesthetist and the patient. These facts emphasise the importance of the development of the methodologies for measuring and evaluating the patient satisfaction in the individual health areas that are characterised by their specifics, a different complexity of the medical processes and a necessary co-operation of the patient.

Fiscella (2011) highlighted the importance of the patient's navigation processes as an effective tool for addressing racial, ethnic and socio-economic differences in the outcomes associated with the treatment of cancer. Their study described the Patient Navigation Research Program sponsored by the National Cancer Institute and the American Cancer Society. The main task of the trained navigator was an effective communication with the patient within which he evaluated the barriers associated with their lack of satisfaction. The author considered the involvement of the navigators to be an efficient way to increase the patient satisfaction in the treatment of demanding diagnoses. Miller and Pentiuik (2016) considered the introduction of measures to improve patient satisfaction to be essential in the healthcare market. Treatment brings many problems, such as feeding and swallowing in paediatric patients. Therefore, the authors initiated a pilot survey involving an interdisciplinary nutrition team aimed at improving patient satisfaction in the field of nutrition. It had been shown that it is the most important point for patients to understand the concerns of feeding and to provide important recommendations regarding treatment options. Patients were dissatisfied with the possibilities of meetings and the length of stay in the wards. The results provided valuable information for improving the patients' satisfaction in these wards.

Mohiuddin (2020) assessed the quality of healthcare and patient satisfaction in Bangladesh. He emphasized the causal connection — a higher level of patient satisfaction also affects a higher confidence in the results of healthcare, and it also leads to the observance of the healthcare instructions that achieve better health results. On the contrary, low and inadequate quality of healthcare result in the loss of the patient's confidence in providers, low use of public healthcare facilities and an increased outflow of patients to hospitals abroad. The author identified the main obstacles in terms of health services availability as follows: insufficient healthcare services, low quality of the health facilities, lack of the medical supplies, medical work-

load due to high patient's workload, distance to the healthcare facilities, long waiting times, very short consultations, low empathy of health professionals, mean and casual approach, aggressive search for financial gain, low level of skills and disrespect to patient's suffering.

In his study, Alghurair (2012) evaluated the importance of the relationship between a patient and a healthcare professional in optimal drug management. In addition to dispensing medicines, pharmacists should play a more active role in the patient's care processes. The author carried out the research through questionnaires, which involved 500 patients. The patients evaluated the perceived expertise of pharmacists, the quality of the pharmacist-patient relationship together with self-efficacy. The results of the analyses confirmed the existence of a significant positive correlation between a perceived expertise and a patient satisfaction. No significant relationship was confirmed between the patient, the perceived expertise of the pharmacist and the quality of the relationship and the self-efficacy of the drugs.

Sembinging *et al.* (2018) viewed the evaluation of the patients' satisfaction from a psychological point of view. According to him, satisfaction is the result of comparing the performance or the results that the patient really feels with the results he had already expected. The author focused on the application of the Importance Performance Analysis (IPA) and the Customer Satisfaction Index (CSI) that are applied to assess the level of agreement between performance and expectations. Questionnaires and interviews were used in this case. The results of the research concluded that the respondents were very satisfied with the healthcare in the examined hospitals.

Koichiro *et al.* (2012) drew attention to the facts related to the formation of the patient's experience with healthcare and their evaluation. Although, several studies have been conducted in the field of the patient satisfaction, the studies that would clarify how patients combine their experiences with several forms of healthcare (nursing care, physician care, etc.) absent. Also, the form of the combination of experiences and their evaluation according to the authors may vary depending on the severity of the diseases. The research was carried out in five hospitals in St. Louis (Missouri), and the attributes were analysed: admission process, nursing care, physician care, personnel care, food, and room environment. For seriously ill patients, physician care was more important than personnel care. The conclusions of the analyses showed that if healthcare managers would like to increase the satisfaction of their patients, they should first improve nursing care and care for employees.

Glenn *et al.* (2012) focused on revealing the principles of how patients perceive their physicians. The patients appreciate physicians who are friendly and caring, and if they ask for feedback from patients, they see it

as a sign of care, respect, and concern. The authors justified the importance of using tools to find out how patients perceive their physicians, which will reveal the details that patients consider as very important in the process of caring for them, even if physicians may not consider them so important. The difference in the perception of physicians and patients encourages the development of new methods aimed at improving the patient satisfaction with the healthcare provided. Patient satisfaction is an important dimension in several healthcare areas, including dentistry. This is also evidenced by the study by Krausch-Hofmann *et al.* (2016), expressing that it is necessary to incorporate the evaluation of the therapeutic benefits and other health characteristics into the process of the patient satisfaction evaluation. Many procedures may be desired by patients for reasons other than health (aesthetics) that may also change the evaluation dimensions of the patient satisfaction. The authors also emphasized the importance of the demographic factors in examination of the changes in the patient satisfaction with a given performance. Particular attention in the patient satisfaction research should be given to paediatric patients who require the application of specific methods depending on the type of medical procedure, the treatment process, and the patient's age. These studies are often combined with the psychological dimensions and their parents play an important role in providing the data on children patient satisfaction (Nakahata *et al.*, 2015).

Mann *et al.* (2016) applied limited data from the HCAHPS surveys that had shown that the satisfaction scores increased in almost all the domains except for a communication with physicians. The authors evaluated that there had been a significant improvement in the patient satisfaction with physicians over the last 7 years, but this improvement had not been seen in all of the hospitals. They considered as important the fact that the overall differences in satisfaction between the hospitals are gradually diminishing, which is a signal for the continuation of sharing the best practices in healthcare practice. Among the respondents, a total of 89.75% were satisfied with the services they received during hospitalisation, while 0.57% reported dissatisfaction. The demographic characteristics of inpatients, such as patient's gender, occupation, age, and residence had significant associations with satisfaction, while monthly income and marital status did not. An increase in the satisfaction related to physicians' and nurses' attitudes to patients, costs and environment may improve an overall level of the patient satisfaction. Hospital management should pay more attention to the patient satisfaction, and it should improve the quality of healthcare services that would have a positive effect on the overall satisfaction of hospitalised patients and on an increase of their experiences. The HCAHPS is a well-established and internationally recognised scale for measuring the patient's

experience with hospital inpatient care. Therefore, in recent years, the researchers have been investigating the adaptability of this method within the healthcare systems of the other countries (Giordano *et al.*, 2010; Siddiqui *et al.*, 2014).

Aoki *et al.* (2020) conducted a study to develop the Japanese version of the HCAHPS and to examine its structural validity, criterion-related validity, and internal consistency reliability. The research sample included 48 hospitals and 6,522 patients over the age of 16 who were hospitalised and later released from the participating hospitals. The results showed that the Japanese HCAHPS had acceptable psychometric properties for assessing the patient's experience with hospital inpatient care. Hence, the authors recommended an application of this scale to improve the patient's experience with the hospital inpatient care. The implementation of the HCAHPS into the health systems of several countries will support the creation of international benchmarking indicators and the improvement of the methodological processes of measurement and evaluation and subsequently, the gradual improvement of the quality of healthcare in the individual countries (Mazurenko *et al.*, 2017; Siddiqui *et al.*, 2014; Mann *et al.*, 2016; Giordano *et al.*, 2010; Aoki, 2020).

All the presented studies provide a valuable illustration of the need to investigate this methodologically demanding issue of the patient satisfaction.

Research methodology

The fulfilment of the aim of the study was determined by the implementation of research aimed at evaluating inpatient satisfaction in healthcare facilities in the Czech Republic. To the best of our knowledge, this was the first complex research aimed at evaluating several dimensions of inpatients' (all observations in our study required admission into a hospital) satisfaction with healthcare services.

The research questionnaire consisted of 112 structured and semi-structured questions. When constructing the research questions, the research team was inspired by the questions used in the Hospital Consumer Assessment of Healthcare Providers and Systems, as well as the recommendations of healthcare facilities in the Czech Republic and expert meetings of experts in quality and healthcare management. Furthermore, the results of research carried out in cooperation with the Ministry of Health of the Slovak Republic, as well as the Institute of Health Policy, were used.

The study and its concept did not contain any of medical records or archived samples, therefore it did not require the ethics committee approval.

Our research was focused on evaluation of inpatient satisfaction with various aspects of healthcare during hospitalization (hospital environment, communication with healthcare professionals, aspects of confidence in healthcare professionals and treatment, satisfaction with healthcare services, availability of healthcare professionals, etc.) with the complete exclusion of sensitive healthcare data about health condition, laboratory results of the patient or medical treatment. All obtained data were fully anonymised. The main benefit of this kind of patient satisfaction research is that they are usually the effective feedback for health care providers, health insurers, and the Ministry of Health, and thus contribute to improvement in healthcare quality and efficiency. All aspects in this research were conducted with respect to the seventh revision of the World Medical Association — Declaration of Helsinki (2020). All respondents who participated in the research confirmed their informed consent at the beginning of the questionnaire.

The questionnaire was distributed in the online environment, via healthcare facilities and disseminated also through experts working in healthcare institutions, academia, etc. Universities and patient organizations were also asked to provide help with questionnaire distribution and to participate in our research. The data presented in the study were collected from May to December 2020 in the Czech Republic. In total, 1479 observations were collected. Survey attended 899 females and 580 males. Among them, 8% were aged under 20 years, 62 % were aged 21–37 years, 19% were aged 38–54 years, 7% were aged 55–70 years and the rest, 4% of inpatients were aged 71 and more.

The first part of the analysis is devoted to description of confidence in physicians, nurses, other medical personnel and decisions regarding health condition and treatment in relation to socio-demographic characteristics of inpatients (gender, education level and age). The second part of the analysis use binary logistic regression to assess the determinants of overall inpatients' confidence toward medical personnel.

Results

In this study we focus on the confidence, resp. confidence of inpatients after hospitalisation toward medical personnel. Figure 1 depicts confidence of inpatients toward physicians who treated them with respect to their education level and the physicians' communication style. Boxplots on the Fig-

ure 1 depicts answers of inpatients on the 0–10 points Likert scale on the question: Have you had confidence in the attending physician who treated you? We note that there exists substantial difference in confidence of inpatients in physicians in relation to physician communication style, regarding the gender of the inpatient, even if the median score was 8 points, and standard deviation of answers was also equal for both genders. Males can be seen as more tolerant to the communication style of the physicians as females are. As regards gender and education of inpatients, biggest differences can be stated for 1st level university degree, and 3rd university degree level, where males are much less susceptible to physicians' communication style.

Figure 2 plot the confidence of inpatients toward nurses who cared for them with respect to education level of inpatients and nurses' communication style. Boxplots on the Figure 2 depicts answers of inpatients on the question: Have you had confidence in nurses who treated you? In the case of nurses, we observe a seemingly opposite pattern as in the case of physicians, as far as education is concerned. The biggest differences can be found in the case of inpatients with the primary educational attainment, meaning that these inpatients are seriously prone to the way the nurses communicate in relation to them. Males with secondary education without GCSE (General Certificate of Secondary Education) and females with 1st university degree education are also highly susceptible to the communication style of nurses in relation to confidence. The biggest gender differences in terms of confidence in nurses are observed for the following educational levels: males with secondary education without GCSE (General Certificate of Secondary Education) and females with 1st university degree education.

Thirdly, we focus analysis on the confidence of inpatients toward other medical personnel. Figure 3 proposes answers of inpatients regarding their age (continuous variable age was binned into quintiles) and educational level on the question: Have you had confidence in other medical personnel who treated or nursed you (physiotherapists, psychologists)? What is interesting are the gender differences in the case of inpatients with 2nd and 3rd university degree. We observe here bigger volatility of answers, and the pattern of low confidence of younger males. The pattern of low confidence of younger male inpatients in other medical personnel can be seen also in education level secondary education with GCSE. Very low confidence in other medical personnel is documented in case of females aged between 21 and 37 years. Relatively low confidence in other medical personnel is documented also for seniors with low educational level.

Confidence in the decisions regarding health condition and treatment of the inpatients was measured through a question: Have you had confidence in the decisions regarding your health condition or your treatment? The answers of inpatients regarding their age and educational level are shown on Figure 4. We observe relatively consistent answers of inpatients with secondary education. The least confident in terms of health condition and treatment are young males with secondary education without GCSE. Relatively low level of confidence is documented also for middle-aged and elderly male inpatients with primary education. The lowest degree of confidence in decisions regarding health condition and treatment were revealed by females with 1st university degree education. On the other hand, the highest scores in terms of confidence in treatment were documented for inpatients, males, and females, with 3rd university degree.

The interdependence of individual domains of confidence is presented in Table 1 in the form of Spearman's correlation coefficient. All the correlation coefficients are statistically significant, and all the values are above 0.6, thus we assume that there exists a linear relationship between measured confidence in physicians, nurses, other medical personnel, and confidence in treatment.

In next stage of the analysis, we will focus on the overall confidence of inpatients in physicians, nurses, other medical personnel, and treatment. We do so by aggregation of individual items of confidence. We count the scores of Likert scale for four above-mentioned domains, thus confidence in in physicians, nurses, other medical personnel, and treatment as a whole, and we obtain the overall individual confidence score with possible score from 0 to 40. Figure 5 propose view on overall confidence of inpatients in the healthcare services with respect to their occupation and gender. We notice lowest overall confidence in medical personnel in case of unemployed individuals, individuals in care for families, especially males and disables females. On the other hand, the highest levels of confidence in medical personnel and services can be found among full-time workers, male pensioners, and male students.

To detect statistically significant variables that affect the confidence of inpatients toward medical personnel, we run binary logistic regression. For analysis purpose, we divide our sample of inpatients into two categories: those who do not have confidence in medical personnel, and those who do. We rank among those individuals who do not have confidence in medical personnel those inpatients whose overall confidence score is from the interval [0–20] and among those who have confidence in medical personnel inpatients whose overall confidence score is from the interval [0–40]. The equation of the Logit model formula is as follows (Cox, 1958):

$$\ln\left(\frac{\Pr(\text{CONFIDENCE} = \text{yes})}{1 - \Pr(\text{CONFIDENCE} = \text{yes})}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (1)$$

where $\ln(\text{CONFIDENCE}=\text{yes})$ express probability that a patient has confidence in medical personnel, whereas probability that a patient does not have confidence in medical personal is equal to $1 - \Pr(\text{CONFIDENCE}=\text{yes})$. Generally $\text{CONFIDENCE}=\text{yes}$ may be marked as a phenomenon that belongs to the 1st group, while the $\text{CONFIDENCE}=\text{no}$ is an opposite manifestation, thus it belongs to the 2nd group. The expression $\left(\frac{\Pr(\text{CONFIDENCE} = \text{yes})}{1 - \Pr(\text{CONFIDENCE} = \text{yes})}\right)$ is marked as *odds* or probability that a patient will have confidence in medical personnel to probability that he/she will not have confidence in medical personnel. Its logarithm is marked as *logit*. β_0 is a regression parameter, $\beta_1 \dots \beta_n$ are unknown logistic regression coefficients that we estimate. β_0 is a representation of a natural logarithm of a phenomenon probability. $X_1 \dots X_n$ are explanatory variables that are described underneath this paragraph. Consequently, mathematical editing of this expression will result in allocation probability to the 1st group that is:

$$\Pr(\text{CONFIDENCE} = \text{yes}) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n)}} \quad (2)$$

Explanatory variables in the regression are described in Table 2.

Regression analysis results are in the Table 3, and the table contains only regression coefficients that are statistically significant and contribute to explanation of the overall confidence. The model correctly classified 94% of cases. To test the fit of the model, we use Hosmer-Lemeshow global goodness of fit test.

Hosmer-Lemeshow test Likelihood Ratio Chi-Square is 6.605 on 8 degrees of freedom, with p value 0.640, thus we cannot reject the null hypothesis that involve the idea that the model is well-fitted. The results of regression propose the global view on determinants of the inpatients level of confidence towards medical personnel. We can state that in the cases when attending physician speaks about inpatient as if they were not there, the likelihood that the inpatient will have confidence in medical personnel diminishes by 65%. The overall confidence in medical personnel is also gender biased, as being a female increases the odds to have confidence in medical personnel by 87%. The age of the inpatients is not distinctly statistically significant variable and its impact on the observed phenomenon is negligible. Among Likert scale questions, the highest positive impact on

inpatients' confidence has the level of cooperation between the individual members of the nursing personnel; comprehensibility of the answers of nurses about important questions of inpatients; and the comprehensibility of the answers of physicians about important questions of inpatients. We document also weaker, but still positive, impact on inpatients' confidence of the comprehensibility of information obtained from the medical personnel; willingness of medical personnel to communicate with inpatients about their difficulties and troubles; and level of involvement of inpatients into decision-making process about your care and treatment.

Discussion

The quality of healthcare is significantly determined by the human resources — physicians, nurses and other personnel providing the diagnostic and treatment processes in healthcare facilities. The patients' satisfaction is a very widespread issue, influenced by many dimensions, and also by psychosocial factors of a patient, their experience, including the level of the healthcare dependence. The patient's confidence is an important determinant of patient satisfaction and it is a process that is built from the patient's first experience with the physician, or with medical personnel, respectively. Also, it represents the basis of the patient's loyalty to the healthcare facility or to its personnel, respectively. Similarly, it affects the process of the patient's migration to the other locations where healthcare is provided. The patient's confidence in physicians and healthcare personnel and treatment procedures, strengthens the patient's belief in the quality of the provided healthcare service, which influences the patient's faster recovery. The analyses' results show interesting findings, which are discussed in the following paragraphs.

First, there are significant differences in the confidence of the hospitalised patients in their physicians in a relation to the physician's communication style depending on gender. Male patients are more tolerant to the communication style than female patients. This implies the importance of the differentiation criterion for the patient satisfaction assessment that is gender biased. In terms of education, the inpatients with primary education level had a negative perception of the way nurses communicate with them. Men with a secondary education without GCSE and women with the first degree of tertiary education of the first level were also very vulnerable to nurse's communication style with regard to confidence. Based on these findings, it is possible to agree with the idea that gender and education play an important role in patient's confidence in a relation to the physician's

communication. Therefore, communication with the patient should be careful in any case. This is also related to the findings by Ogden *et al.* (2002), which show that most of the physicians and the patients consider verbal expression of uncertainty to be potentially harmful to patient's confidence. Those patients who expressed that both verbal and behavioural manifestations of uncertainty have the most harmful effects on their self-confidence were less educated young ones. In this way, consistency with the findings in this study is evident. By addressing the problem, it can be concluded that the respectful communication is also one of the prerequisites for confidence between the physician and the patient. Giedrikaite *et al.* (2008) also agree with this and point out in their study that 94.2% of patients thought that physicians communicated with them with respect, while 62.8% of physicians perceived patients' communication as respectful, and 36% of physicians considered patients' communication as partially respectful. Communication was obviously associated with confidence, and the findings in the presented study further expand this knowledge in terms of gender and education.

Also, there was a greater instability of responses and a pattern of low confidence of young male inpatients in other healthcare personnel. A pattern of low confidence of younger male inpatients was also found in men with secondary education. Relatively low confidence in other healthcare personnel was also found in the case of seniors with a low level of education. This can be compared with the findings by Pavlova *et al.* (2017), who revealed that patients with tertiary education and younger patients were more satisfied with health services and care in the healthcare facilities. In this study, the least confidence in the treatment procedures was found in case of young inpatients with secondary education without a GCSE. A relatively low level of confidence in treatment procedures was also found in the case of middle-aged patients and in the case of elderly male inpatients with primary education. The highest level of confidence in treatment procedures was found in the group of inpatients with the third degree of university education. In this way, the results identified in the presented study are consistent with the results by Pavlova *et al.* (2017), who conducted their research in Bulgaria.

This study has also revealed that there is a relatively strong linear relationship between measured confidence in physicians, in nurses, in other healthcare personnel and in confidence in treatment procedures. It may be stated that in those cases where the treating physician talks about the patient as if the patient is not there, the probability of confidence in the healthcare personnel will be reduced by 65%. This implies the importance of the ethical factors in building the patient's confidence in healthcare per-

sonnel. In this context, it is possible to highlight the findings of many studies confirming that confidence in physicians is associated with not only the treatment and diagnostic processes, but also with information and legal processes. Consistent with the findings of this study, Beltran-Aroca *et al.* (2019) have found that the relationship of confidence and cooperation between the patient and the physician is also created on the basis of respect for the patient's rights — confidentiality keeping, respect for privacy, and intimacy. This also raises the issue of ethics in building confidence between the patient and the healthcare personnel (Singh *et al.*, 2016). This indicates the fact that while patient's confidence is affected or threatened by many situations arising from the activities of physicians and also from the point of view of health infrastructure (Wolcott *et al.*, 2009; Senić & Marinković, 2013; Chen *et al.*, 2016; Segal *et al.*, 2014; Iraburu *et al.*, 2006), a violation of confidential health information is a serious ethical and communication problem that has historically received a limited empirical, theoretical, and/or practical attention (Brann & Mattson, 2004).

The overall confidence in healthcare personnel is also gender-dependent — women are 87% more likely to have higher confidence in healthcare personnel than men. The age of hospitalised patients is not statistically significant and its impact on a confidence in healthcare personnel is negligible. The research studies on patient satisfaction make a limited use of gender as a basic differentiation criterion, and they examine the patient's confidence to a crucial extent as a partial component of healthcare quality (Liubarskiene *et al.*, 2004). The quality of healthcare is usually also examined with the communication and organisational aspects via patient's participation in a medical decision-making, availability and safety of healthcare.

In general, based on the findings in this study, it is possible to agree with Liubarskiene *et al.* (2004), who confirmed that gender and level of education have an impact on patients' confidence in healthcare. Their findings fully correspond to the results of this study. In addition, Liubarskiene *et al.* (2004) also show that more than half of the respondents did not have confidence in the healthcare system, but had confidence in doctors. This finding is very important for policy makers, as it declares a significant discrepancy between the organizational level and the implementation level (doctors, medical personnel). This area — the impact of the healthcare system and its macro-economic parameters — is a strong topic for future research. Following this idea, it can be emphasized that the different health literacy of patients also plays an important role in this issue, i.e., different education level of the hospitalised patients affects the level of a confidence in physicians and healthcare personnel. This can be explained by the fact

that the patients with adequate health literacy are more demanding with regard to the information provided by nurses. The largest proportion of patients satisfied with the information portion received was among the patients with insufficient health literacy (Zagurskiene & Miseviciene, 2010). Thus, future research efforts of scientists should be focused on patients' confidence in a relation with their level of health literacy. This topic is receiving more and more attention and should be further developed in the issues presented by this study (Sorensen *et al.*, 2013; Nutbeam, 2017; Dukic *et al.*, 2013; Rolová, 2020).

Conclusions

The aim of the presented study was to determine socio-demographic factors that are in the background of confidence toward medical personnel. We use data obtained via questionnaire, which was distributed to inpatients after their stay in hospital. The study points to the strong relations in an examination of patient satisfaction and its individual dimensions altogether with their penetration into the macro and micro-healthcare systems of the countries. It will also support the development of the latest methodologies, and also the improvement of the existing ones that are directly associated with the demographic, health, geographical, social, and other determinants. The success of the development of these methodologies is directly proportional to the conceptual and systematic solution of the problem of patient satisfaction, and also to the understanding of its complex relations between the health system and the social system. The parameter of individuality is also important when exploring the possibility of increasing patient's satisfaction in the treatment processes as the individual assumptions of the individual and their lifestyle will be crucial determinants of keeping the current state, and also increasing her or his satisfaction, confidence in medical personnel and loyalty to the healthcare facility.

The results of the study indicate that there exists a relatively strong linear relationship between a confidence in physicians, nurses, other healthcare professionals and a confidence in treatment. It suggests that the overall confidence in healthcare services is a complex issue and it is dependent on various factors. It is stated that the individual domains of confidence, and/or level of confidence in healthcare personnel vary with the inpatients' gender, age, and education level. Co-operation between the individual members of the nursing personnel; comprehensibility of the answers of nurses to important questions of inpatients; and the comprehensibility of the answers of physicians to important questions of inpatients are also con-

fidence-generating factors. Education and gender have a significant impact on patient's confidence in the physicians and the healthcare personnel. Education also directly affects the level of health literacy that creates a framework for further systematic research of the patient satisfaction issue. The complexity of health literacy, whether from a systemic or conceptual point of view, puts a pressure on a deeper scientific and also professional research into the issue in the treatment of different types of the diagnoses, and also the need to share the research results within the national and the international research platforms. This will also create space for the construction of the concepts of the national and the international benchmarking indicators in this field and to support the creation of a health literacy system within the individual countries that will help in the design of the quality targeted prevention programmes. However, the creation of successful and cost-effective prevention programmes without the complementary creation of health literacy concepts is not possible. Another topic for the ongoing research in this area is to examine the impact of the healthcare system and its macro-economic parameters on patient satisfaction and a confidence in physicians, healthcare professionals and medical treatment.

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Annex

Table 1. Interdependence of confidence domains

	Have you had confidence in the attending physician who treated you?	Have you had confidence in nurses who treated you?	Have you had confidence in other medical personnel who treated or nursed you (physiotherapists, psychologists)?	Have you had confidence in the decisions regarding your health condition or your treatment?
Have you had confidence in the attending physician who treated you?	1.000	.622**	.706**	.675**
Have you had confidence in nurses who treated you?	.622**	1.000	.624**	.612**
Have you had confidence in other medical personnel who treated or nursed you (physiotherapists, psychologists)?	.706**	.624**	1.000	.660**
Have you had confidence in the decisions regarding your health condition or your treatment?	.675**	.612**	.660**	1.000

** : Correlation is significant at the 0.01 level (2-tailed).

Table 2. Explanatory variables

Variable	Type of variable
Gender	binary variable reaching values 0 if male, 1 if female
Age	continuous variable reaching values from 18 to 92
When you had important questions and asked a physician, did you get answers that you understood?	Continuous interval variable obtaining values from 0 to 10.
When you had important questions and asked the nurse, did you get answers that you understood?	Continuous interval variable obtaining values from 0 to 10.
To what extent was the information obtained from the medical personnel understandable to you?	Continuous interval variable obtaining values from 0 to 10.
Evaluate how the personnel were willing to communicate with you about your difficulties and troubles.	Continuous interval variable obtaining values from 0 to 10.
How do you evaluate the cooperation between the individual members of the nursing personnel?	Continuous interval variable obtaining values from 0 to 10.
Have you been involved in the decision-making process about your care and treatment to the extent you would prefer?	Continuous interval variable obtaining values from 0 to 10.

Table 3. Logistic regression – overall confidence

	B	S.E.	Wald	df	Sig.	Exp(B)
Did the attending physician speak about you as if you were not there? (yes)	-1.042	.370	7.934	1	.005	.353
Gender (females)	.627	.373	2.817	1	.093	1.871
Age	.016	.012	1.666	1	.197	1.016
When you had important questions and asked a physician, did you get answers that you understood?	.271	.105	6.665	1	.010	1.311
When you had important questions and asked the nurse, did you get answers that you understood?	.346	.089	15.090	1	.000	1.414
To what extent was the information obtained from the medical personnel understandable to you?	.228	.113	4.053	1	.044	1.256
Evaluate how the personnel were willing to communicate with you about your difficulties and troubles.	.144	.100	2.059	1	.151	1.155
How do you evaluate the cooperation between the individual members of the nursing personnel?	.511	.108	22.224	1	.000	1.667
Have you been involved in the decision-making process about your care and treatment to the extent you would prefer?	.200	.088	5.113	1	.024	1.221
Constant	-8.298	1.165	50.702	1	.000	.000

Figure 1. Confidence in physicians

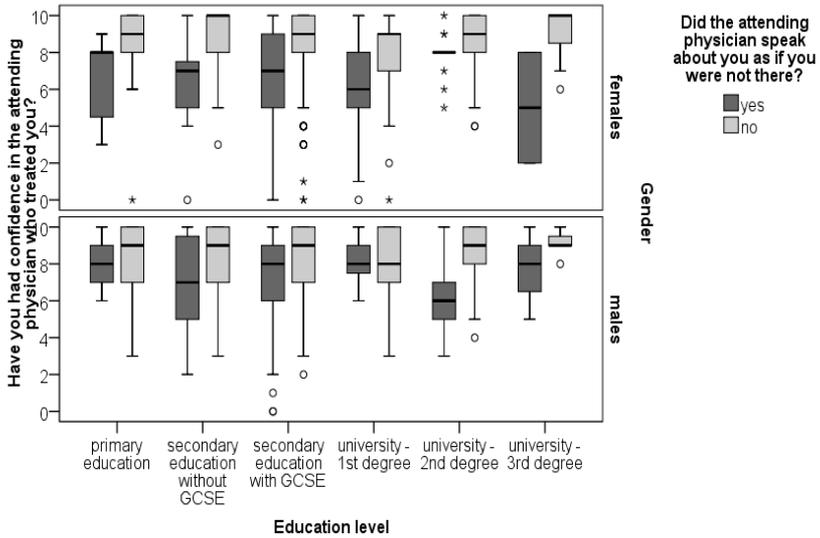


Figure 2. Confidence in nurses

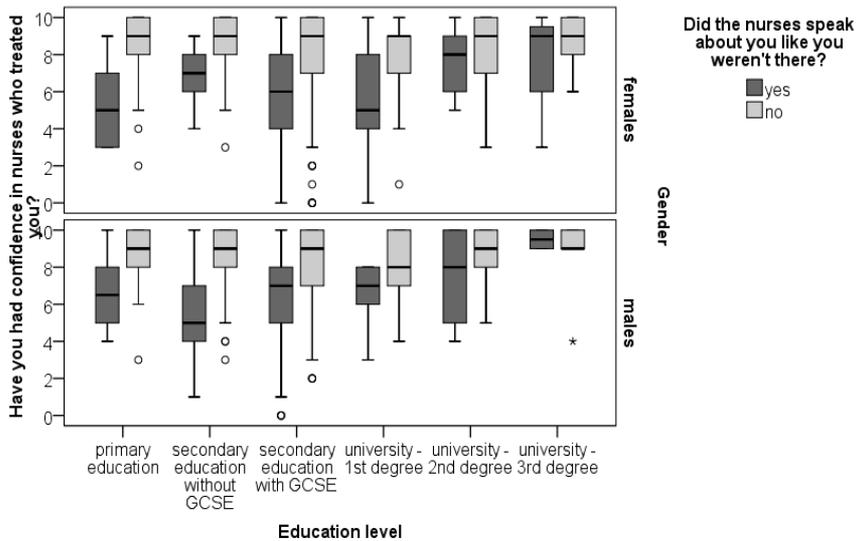


Figure 3. Confidence in other medical personnel

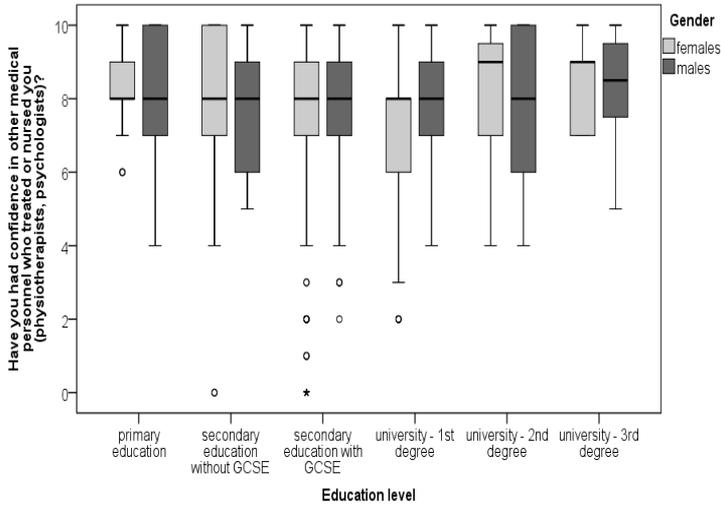


Figure 4. Confidence in decisions regarding treatment

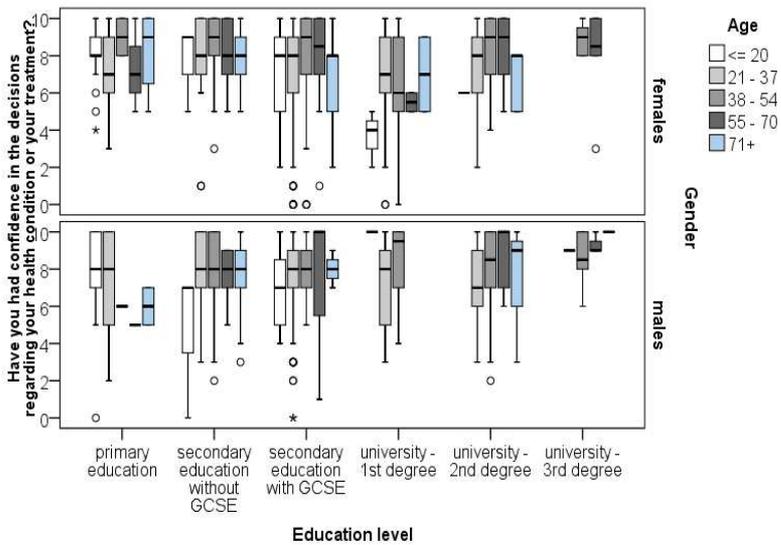


Figure 5. Overall confidence

