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Exploring the acceptance of e-learning in continuing pharmacy education

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Abstract

Background: The results of studies on e-learning have been varied but there exists a general consensus on the benefits of this alternative medium of learning: high accessibility, flexibility, time and cost/investment benefits.

Aims: The aim of this study was to explore the popularity of e-learning among pharmacists and identify possible reasons why this may not be an accepted mode of education. We wanted to verify the hypothesis if younger pharmacists use more often e-learning and check the correlation between e-learning users and the population size of their regions of residence.

Method: A survey was designed and distributed among pharmacists who took part in continuing education.

Results: Over half of participants (54%) live in cities with >100,000 inhabitants; whereas, 14.2%, 21.2% and 10.6% pharmacists were recruited from sites with 30,000-100,000, 10,000-30,000 and <10,000 residents, respectively. The result showed that the participation rate for e-learning courses was significantly higher amongst pharmacists ≤35 years. (73.2%) compared to those >35 years of age (48.4%). The most common barrier for non-participation in e-learning was 'preference to have a direct contact with the tutors'.

Conclusion: Younger pharmacists are more frequent users of e-learning. The main reason for non-participation in e-learning is the lack of face-to-face contact with tutors. The results showed no statistical significant difference regarding the participation rate and place of residence.

Keywords: *Continuing Pharmacy Education, e-Learning, Online Learning*

Introduction

E-learning has been widely utilised for education in the United States and other developed countries, including Poland (Aggarwal *et al*., 2011). According to Polish pharmaceutical law requirements, every practicing pharmacist must gain 100 educational credits during a 5-year period. The educational credit pool is sub-divided into two groups – those with and those without an exam (Brandys *et al*., 2006); so called hard and soft credits. Pharmacists need to collect at least 50 hard credits and 50 soft credits during a five years long period (Nesterowicz *et al*., 2011). The educational process remains under the control of accredited Centres of Postgraduate Education working in cooperation with the Local Pharmaceutical Boards. Every pharmacist has his own 'educational card' where points are recorded (Brandys *et al*., 2006). The duty to participate in the accredited educational courses to keep the professional license makes life-long learning obligatory for pharmacists in Poland (Nesterowicz *et al*., 2011).

Numerous studies on medical and pharmaceutical staff have been conducted in the past decade to assess the efficiency of e-learning in their current and continuing education. The results have been varied but there exists a general consensus on the benefits of this alternative medium of learning: high accessibility, flexibility, time and cost/investment benefits (Aggarwal *et al*., 2011). The drawbacks enumerated by participants are generally related to the methods of execution and not to e-learning in itself. The results of a study on the perception of pharmacy students to online lectures indicate that the disadvantages were outweighed by the advantages [Freeman *et al*., 2006).

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Continuing education for pharmacists takes place in the context of adult learning. Therefore, e-learning courses as an alternative to on-site training, need to respect the principles of adult learning and adapt to the curriculum and methods designed to best suit the needs of learners (Legreid *et al*., 2010; Aggarwal *et al*., 2011).

When engaged in a learning process, adults differ from minors in the following areas: degree of motivation, amount of previous experience, level of engagement in the learning process, and how learning is applied.

Some of the studies conducted on the efficiency of e-learning have shown that when well-designed, the courses result in knowledge gains similar to, and at times superior to on-site learning (Chumley-Jones *et al*., 2002; Fordis *et al*., 2005). In addition, several courses have also shown evidence of significant self-reported practice change (Aggarwal *et al*., 2011).

Disadvantages of e-learning include the amount of time required to prepare lectures, students' sense of isolation from the instructor, 'screen fatigue', computer malfunctions, and the inability to have immediate answers to questions that may arise when students are viewing lectures [Freeman *et al*., 2006). While engaged in a learning process, learners are able to retain information better if all senses are engaged: sight, hearing, touch and smell (Lieb, 1991). This is not possible with e-learning.

The lack of operating computer skills compounded by lack of interaction with an instructor, may lead learners into a state of liminality as described by Land and Meyer – 'the sense of discomfort we feel when we do not quite understand the rules or the context of a new situation' [Taylor & Hamdy, 2013).

Many adults prefer learning by interaction and in a social setting and are motivated by creating new acquaintances (Lieb, 2013). According to an Australian study on the implementation of an online pre-registration course for pharmacists, online education cannot adequately address all the skills and attitudes required by, as in the case of the study, a novice health professional. This is primarily because online learners can feel disconnected from co-participants due to the absence of face-to-face contact (Karaksha *et al*., 2013).

The importance of e-learning is gradually garnering wide acclaim. One of the more recent developments in the field is Massive Open Online Course (MOOC) which allows unlimited participation and open access via the internet. In addition to traditional course materials such as videos, prescribed readings and problem sets, MOOCs provide an interactive user forum that serves as a virtual community for students, professors, and teaching assistants (Lewin, 2013).

The aim of the study

The aim of this study was to explore the popularity of e-learning among pharmacists and identify possible reasons why this may not be an accepted mode of education. We also wanted to verify the hypothesis if younger pharmacists use more often e-learning solution in their continuing pharmacy education (CPE) in comparison to their older colleagues and check the correlation between e-learning users and the population size of their regions of residence (village, town, city). Four research questions were posed to guide the study:

- How does e-learning contribute to continuing pharmacy education?
- What are the reasons for not participating in continuing pharmacy education using e-learning?
- Is there a correlation between learners' age and usage of e-learning?
- Is there a correlation between usage of e-learning and the size of users' place of residence (village, town or city)?

Methods

The study was conducted from April 1st to November 30th 2013. A survey was designed for pharmacists who took part in CPE courses. It was distributed among participants of an on-site continuing education course in Krakow as well as different community pharmacists in the city of Krakow and the small town of Brzesko in Poland.

In the first question of the survey we collected demographic information such as age, gender and membership with regional pharmaceutical chamber. In the second question we asked about the size of the place where the questioned person lived. In the third question we asked about enrolment in continuing pharmacy education e-learning courses. Respondents who answered the third question with 'No' were posed a fourth question which asked about their reasons of not attending e-learning courses in continuing pharmacy education.

The study was approved by the Bioethical Commission of Jagiellonian University, opinion no. KBET/235/B/2010 (Bioethical Commission of the Jagiellonian University, 2013).

Statistical analysis

Data were analysed using SPSS software v.17 (Chicago, IL, USA). For description of the numeric variables, median, mean, standard deviation (SD) and interquartile range (IQR) were used; while, for categorical variables, relative frequency percentages were reported. Using Kolmogorov-Smirnov test, the normality of distribution was checked for continuous variables. The Mann-Whitney U test was applied to compare the mean rank of the non-normally distributed continuous variables between the males and females. In addition, Pearson Chi square test was performed to compare the prevalence rate of participation or reasons for non-participation between different subgroups of study based on participants' sex, age group, and place of residence. A two-tailed *p*-value of less than 0.05 was considered to indicate statistically significant difference in all analytical procedures.

Results

A total number of 113 pharmacists responded to the survey. The study population consisted of 92 (81.4%) females and 21 (18.6%) males with a mean age of 33.6 (SD=9.6) years and 34.1 (SD=11.5) years respectively. The results of the Mann-Whitney U test showed no statistically significant difference in the mean age of males and females (p=0.954). Regarding the region of residence, over half of participants (n=61, 54%) live in large cities with >100,000 inhabitants; whereas, 16 (14.2%), 24 (21.2%) and 12 (10.6%) pharmacists were recruited from smaller sites with 30,000-100,000, 10,000-30,000 and <10,000 residents, respectively.

Seventy-five (66.4%) pharmacists had participated in at least one e-learning course in continuing pharmacy education in Poland, while the other 38 (33.6%) had not. The result from Pearson *chi* square test showed no significant difference in the rate of participation between the male (66.7%) and female (66.3%) pharmacists (*chi* value=0.001, p=0.975). As shown in Figure 1, those pharmacists who had not participated in e-learning courses in continuing pharmacy education were generally older (median=32 (IQR=25) years vs. median=30 (IQR=6) years). The result of the Chi square test showed that the participation rate for e-learning courses was significantly higher amongst pharmacists ≤35 years (73.2%) compared to those >35 years of age (48.4%) (*chi* value=6.19, p=0.013). Moreover, the highest rate of participation in e-learning courses was found in the subgroup of pharmacists who were living in regions with 10,000-30,000 inhabitants while the lowest rate was observed in pharmacists living in small cities with <10,000 residents (Figure 2). The results of the *chi* square test showed no statistical significant difference regarding the participation rate and place of residence (*chi* value=1.35, p=0.717).

Figure 1: Box plot of age of the subgroup of pharmacists who had or had not participated in e-learning courses for continuing pharmacy education in Poland

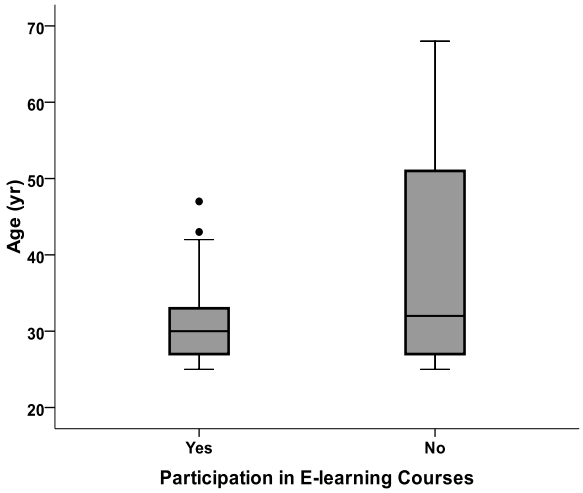
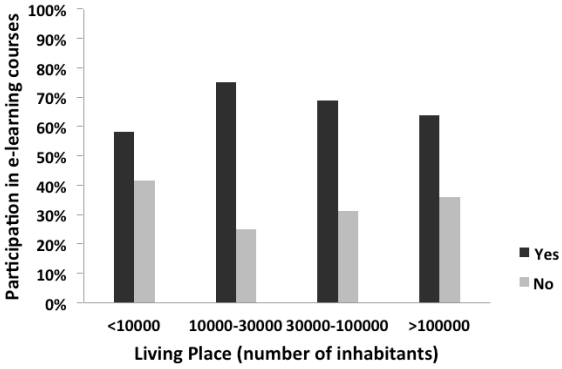


Figure 2: Rate of pharmacists' participation in e-learning courses for continuing pharmacy education in Poland within different living place regarding population size



According to those who had not participated in continuing pharmacy education by e-learning mode, the most common barrier described was 'preference to have a direct contact with the tutors' for continuing pharmacy education, which was reported in 60.5% (23 out of 38) of cases. Subgroup analysis showed that 'preference to have a direct contact with the tutors' remained the most common reason of both males and females (Figure 3) and in those ≤35 years or >35 years of age (Figure 4). No significant difference was observed in the prevalence of different reasons for non-participation in e-learning courses regarding either gender (Chi value=1.79, p=0.618) or age group (*chi* value=2.15, p=0.542) of the pharmacists. Figure 5 illustrates the prevalence of common reasons for non-participation in e-learning courses. As is shown, the lowest prevalence- 'limited access to the internet' was seen among respondents who lived in large cities (4.5%); however, the result of Chi square test showed that these differences were not statistically significant (*chi* value=11.87, p=0.221).

Figure 3: Main reasons of non-participation in e-learning courses for continuing pharmacy education by male and female Polish pharmacists

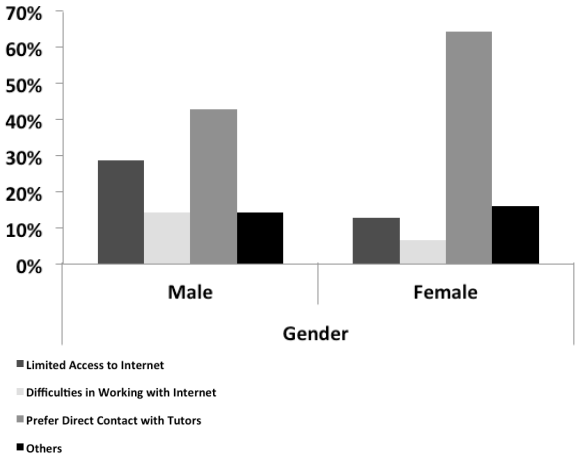


FIGURE 4: Main reasons of non-participation in e-learning courses for continuing pharmacy education in Polish pharmacists aged ≤35 years or >35 years

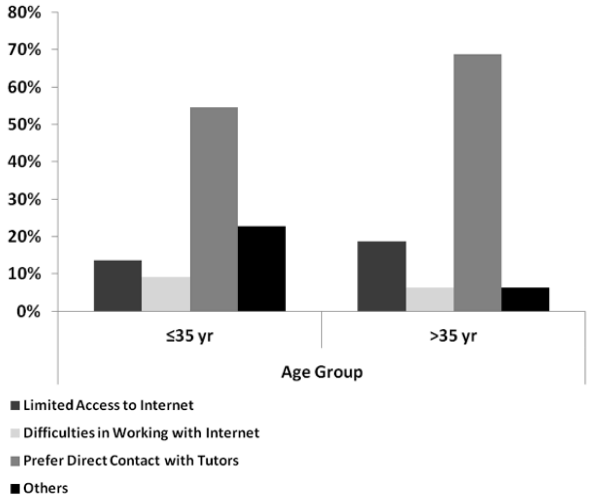
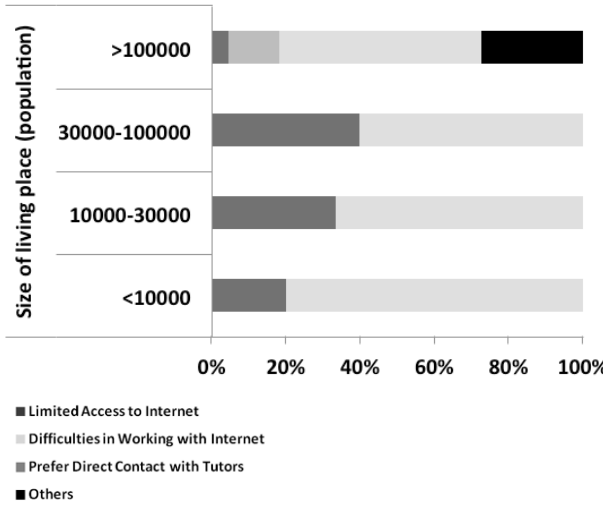


Figure 5: Main reasons for non-participation in e-learning courses for continuing pharmacy education in Poland regarding different living place



Discussion

Malcolm Knowles describes the process of adult learning as self-directed inquiry (Knowles, 1990). In a study on the implications of adult learning in medical education, Taylor & Hamdy list the following needs: 1) relevance and goal of what they are learning; 2) autonomy and self-directedness; 3) connection with past experiences; 4) readiness to learn; 5) orientation to learning practical aspects; 6) motivation, 7) respect: be treated as equals by their instructors (Lieb, 1991; Taylor & Hamdy, 2013).

E-learning systems have become important tools in the continuing education of pharmacists and other healthcare specialists (Nesterowicz *et al*., 2013). As seen from the results of the study, the majority of pharmacists (66.4%) had taken part in an e-learning continuing pharmacy education course at least once.

This study also showed that there was no significant difference in gender distribution among users of e-learning platforms. However, the difference in age distribution was noted: younger pharmacists use e-learning platforms more frequently than their older colleagues.

Some literature state that e-learning solutions are very convenient for people who are interested in updating their knowledge but live far away from academic centres or cannot travel easily within the country due to geographical barriers (Khakurel, 2007). Remote learning therefore makes it possible for them to enrol in such courses and save time and money that would have been otherwise spent on travel costs. In regions where universities are not available, people can access information and educate themselves via the web which is a cheap solution and moreover, will additionally raise the level of education, literacy and economic development (Aggarwal, 2009). However, in our intervention group we did not find statistically significant correlation between the participation rate in e-learning courses and the size of the place of residence.

There appears to be a need for improving connectedness between trainees and tutors in e-learning courses.16 The most common reason described by pharmacists in the study who did not take part in e-learning courses was that they preferred face-to-face contact with a tutor. Presenting an online module comes with unique challenges, some of which could be addressed by incorporating emerging technologies to create a more authentic learning environment (Rohwer *et al*., 2013] that allows synchronous and asynchronous communication between trainees and their tutors, as well as amongst trainees.

In 2007 a telephone survey was conducted all over France where 300 hospital doctors were interviewed. They were asked about issues related to their continuing medical education. Among them, 165 (55%) reported organisational difficulties, 143 (48%) reported having personal difficulties such as availability, and 135 (45%) spoke of financial limitations. The improved development and enhancement of e-learning could be a solution to some of these challenges (Maisonneuve, 2008).

Conclusions

Today the majority of pharmacists choose to take part in e-learning continuing education courses in Poland.

Younger pharmacists are more frequent users of e-learning modules, with men and women equally taking part in e-learning courses.

Based on the achieved results, we noticed that the main reason for non-participation in e-learning courses is the lack of face-to-face contact with tutors.

Authors' contributions

Krzysztof Nesterowicz designed and conducted the research, collected and prepared data, drafted the manuscript. Andreea Neacsu was involved in drafting the

introduction and discussing the results. Seyed-Mohammad Fereshtehnejad was involved in drafting and revising the manuscript critically, helped with statistical analysis of obtained results and created figures. András Nemeslaki played a supervisory role and was involved in revising the manuscript critically. All authors read and approved the final manuscript.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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