

EVALUATION OF THE NECESSITY OF EDUCATION IN THE FIELD OF MANUAL MEDICINE IN BULGARIA AND TRAINING WITH A PC BASED PROGRAMME (ADAPTED TO THE LEVEL OF COMPETENCES OF DIFFERENT TYPES OF USERS)

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Abstract

According documents of the European Center for Development of professional education and training the electronic learning (e-learning) is "education and training, mediated by information and communication technologies, including different formats and hybrid methodologies, like programming systems, Internet, CD-ROM, education by PC in regime of real time, and other electronic or interactive devices." E-learning is "an application of modern multi-media technologies and Internet, with the objective of amelioration of the quality of education"

The objective of current research was the evaluation of the necessity of vocational education and training in 'manual medicine' - between different groups of health professionals, during their studies in this thematic field.

The goal of the investigation was the evaluation of the necessity of development of the manual medicine in the country, and to the readiness of the target groups to receive the possibility of access and to use with efficacy electronic education and practical training on this subject. We decided to orient the investigation to actual users (staff of rehabilitation departments: medical doctors – specialists and trainees in Physical and rehabilitation medicine; and physiotherapists) and to potential future beneficiaries [students in Medicine (M) of the course V (before the practical last year of studies), students of the bachelor's degree in Medical Rehabilitation and Ergotherapy (MRET) and in Kinesitherapy (KT) from the courses II & III (before the practical summer stage) and from the course IV (before the last clinical semester), and students of the Master's degree in „Medical Rehabilitation & Balneology“ (MRB) and in "Medical Rehabilitation & Ergotherapy (MRET)" before the last practical part of studies].

Current work presents the results of a detailed questionnaire, evaluating the necessity of education in the field of manual medicine of a total of 1186 students and staff. We analyzed results of the study of different types of potential users (students and staff), as follows: students in Medicine, in Medical rehabilitation and Occupational therapy, in Medical Rehabilitation and Balneology, and in Physiotherapy (Kinesiotherapy); and staff of rehabilitation departments, clinics and hospitals - during the process of long life learning (medical doctors - specialists or trainees in Physical and Rehabilitation Medicine /PRM/; physiotherapists; bachelors and masters in Medical rehabilitation, Balneology and Ergotherapy). All these members of the multidisciplinary rehabilitation team are the users of our own PC based electronic course of manual medicine, including manual diagnostics and manual therapy (distractions, mobilizations and manipulations).

The final statistical evaluation of results was realized using the statistical package SPSS, version 19. For statistical significant effects we consider results with value of $p < 0.05$, but in some cases we obtained lower p values ($p < 0.01$).

The results of our investigation proved that rehabilitation staff and students in Bulgaria have the potential to accept an electronic educational platform on „Manual medicine“. Most of them are familiar with Internet and e-learning. An important part of respondents prefer a bilingual education (in native language and in English).

The areas of biggest interest are manual mobilizations and manipulations. Preferred localizations of the manual procedures are the spine, the hip, the knee and the sacro-iliac joint.

Most of respondents would like to receive detailed information about combination of manual therapy with other types of kinesitherapy, hydro and balneo-therapy and balneo-kinesitherapy. All of them are interested in e-learning on manual medicine.

After the analysis of the future users, we prepared e-learning programme with the goal to ameliorate the level of vocational competence of all these types of medical staff and students. After an analysis of the actual level of competences of the user, the educational programme offers a list of diagnostic and therapeutic procedures; including theoretical bases and practical skills (tips and trips), including presentation of clinical cases. After the education the student must accomplish a series of tests designated to analyze the efficacy of the educational process.

In conclusion we accentuate on the importance of vocational training of the medical staff for the quality of care and the quality of life of patients.

Keywords: Manual medicine, manual diagnostics, distraction, mobilization, manipulation.

1 INTRODUCTION

Learning is a process of adaptation and generation of problem solving capability through acquiring knowledge, skills, attitudes, or values, based on study, experience or teaching, leading to long-term changes in personal behavior. Information and communication technologies play a key role in contemporary education and long life learning [1, 2, 3].

The main goal of contemporary education is to prepare the future Digital citizens of the Information society. An *information society* is a society where the creation, the distribution, the use, the integration and the manipulation of information is a significant economic, political, and cultural activity. Its main driver are digital information and communication technologies, which have resulted in an information explosion and are profoundly changing all aspects of social organization, including the economy, education, health, warfare, government and democracy [4, 5].

According documents of the European Center for Development of professional education and training the electronic learning (e-learning) is “education and training, mediated by information and communication technologies, including different formats and hybrid methodologies, like programming systems, Internet, CD-ROM, education by PC in regime of real time, and other electronic or interactive devices.” *E-learning* is “an application of modern multi-media technologies and Internet, with the objective of amelioration of the quality of education” [6].

The goal of the investigation was the evaluation of the necessity of development of the manual medicine in the country, and of the readiness of the target groups to receive the possibility of access and to use with efficacy electronic education and practical training on this subject. We decided to realize the investigation into actual possible users – staff of Departments and Clinics of Physical and Rehabilitation medicine (PRM) and rehabilitation hospitals [medical doctors – PRM specialists and PRM trainees; and physiotherapists] and into potential future beneficiaries [students in Medicine (M) of the course V (before the practical last year of studies), students of the bachelor's degree in Medical Rehabilitation and Ergotherapy (MRET) and in Kinesitherapy (KT) from the courses II & III (before the practical summer stage) and from the course IV (before the last clinical semester), and students of the Master's degree in „Medical Rehabilitation & Balneology“ (MRB) and in “Medical Rehabilitation & Ergotherapy (MRET)” before the last practical part of studies].

2 GOAL AND TASKS

2.1 Goal

The objective of current research was to effectuate an evaluation of the necessity of vocational education and training in ‘manual medicine’ – of different groups of health professionals (staff and students), during their studies in this thematic field.

2.2 Tasks

1. Definition of target groups:

- *Staff*: medical doctors – specialists in Physical and rehabilitation medicine (PRM) and PRM trainees; physiotherapists;
- *Students*: students in specialty „Medicine“ („Master's degree“ – education in Bulgarian and in English), students in „Medical rehabilitation & Ergotherapy (MRET)” and in “Medical

Rehabilitation and Balneology“ („Master’s degree“) and students in MRET and in „Kinesitherapy“ („Bachelor’s degree“);

2. Questionnaire

- formulation of questions, creation of the questionnaire and
- its adaptation to the level of competence of different types of staff and/or students;

3. Realization of studies:

- during the courses of long life learning of medical doctors and physiotherapists; or
- during students’ education – after the end of lectures and exams of disciplines related with the thematic of current study (Physical & Rehabilitation Medicine, Natural & Pre-formed physical modalities; Medical Rehabilitation & Ergotherapy and Medical Rehabilitation & Balneology in patients suffering from different diseases);

4. Statistical evaluation of obtained data and analysis of results

5. Discussion and preparation of e-learning platform on manual medicine

6. Conclusion

3 MATERIAL AND METHODS

3.1 Design of the study

Current work presents the results of a detailed questionnaire, evaluating the necessity of education in the field of manual medicine of a total of 1186 students and staff. We analyzed results of the study of different types of potential users (students and staff), as follows: students in Medicine, in Medical rehabilitation and Occupational therapy, in Medical Rehabilitation and Balneology, and in Physiotherapy (Kinesiotherapy); and staff during the process of long life learning (medical doctors - specialists or trainees in Physical and Rehabilitation Medicine /PRM/; physiotherapists; bachelors and masters in Medical rehabilitation, Balneology and Ergotherapy). All these members of the multidisciplinary rehabilitation team are the users of our own PC based electronic course of manual medicine, including manual diagnostics and manual therapy (distractions, mobilizations and manipulations).

The investigation was effectuated during the period February 2009 – November 2016 with *medical doctors – PRM specialists and PRM trainees, and physiotherapists* (during the courses of long life learning /LLL/, organized by the Medical Universities of Sofia and Pleven) and with different types of *students* [students in Medicine of the Medical University of Pleven (*education in Bulgarian and in English*) and students in KT & MRET & MRB of the Medical University of Sofia, Sofia University and Medical University of Pleven]. The target groups received questionnaires electronically (by e-mail) or directly (after the end of lectures and after the exam of the corresponding discipline).

We must underline that the discipline ‘Physical & Rehabilitation Medicine’ is done during the fifth year of education in Medicine (and during the sixth year future medical doctors have only practical training). We must put emphasis on the facts, that all students of the master’s programme in Medical Rehabilitation & Balneology have the degree of Professional Bachelor in Rehabilitation and most of them are working in PRM Departments or Clinics in different hospitals (stationary rehabilitation for inpatients) or in Medical centres (ambulatory rehabilitation for outpatients). We adapted part of questions to the age and professional competence of students. Tests were translated in Bulgarian language for Bulgarian students, for students in Medicine – education in English the tests were presented in English language.

3.2 Methods

For current study we applied different **methods**:

- **Screening,**
- **Questionnaires,**
- **Analysis of documents,**

- **Statistics.**

3.3 Statistical methods

The final statistical evaluation of results we made with the **statistical package SPSS**, version 19: options two samples comparison with parametrical analysis of variances ANOVA and non-parametrical distribution and correlation analysis, as follows: *t-test* (t-criterion, p value), *Signed test*, *Signed rank test*, *Kolmogorov – Smirnov test*, *Mann – Whitney (Wilcoxon) W test* (*W медиана*). For statistical significant effects we consider results with value of $p < 0.05$, but in some cases we obtained lower p values ($p < 0.01$).

3.4 Distribution of the respondents

The questionnaire was proposed to the cited target groups.

We received complete questionnaires from a total of 1186 respondents (students and staff).

The distribution of respondents (in absolute numbers) is presented in Table 1.

Table 1. Distribution of respondents – category of staff and students (number).

TOTAL	PRM specialists	PRM residents <i>(during the final exam for specialty)</i>	PRM trainees	Physio-therapists <i>(Bachelors)</i>	Physio-therapists <i>(Masters)</i>	Students
1186	219	26	13	296	122	510

Our respondents were students in Medicine of the Medical University of Pleven (education in Bulgarian and in English); students in Medical rehabilitation & Ergotherapy (MRET) and Kinesiotherapy (KT) – Bachelor's degree; and students in MRET and Medical rehabilitation & Balneology (MRB) of the Medical University of Sofia, Sofia University and Medical University of Pleven. The distribution of students by specialties (absolute numbers) is presented in Table 2.

Table 2. Distribution of respondents – students in different specialties (number).

TOTAL NUMBER OF STUDENTS	SPECIALTY OF EDUCATION		
	MEDICINE <i>In Bg and in English</i>	MRET and KT - <i>Bachelor's degree</i>	MRET and MRB - <i>Master's degree</i>
510	197	217	96

The distribution of students by age and sex is presented in table 3 and figure 1.

Table 3. Age of respondents (absolute value)

TOTAL	Age 20-39	Age 40-59	Over 60 years
1186	618	561	7

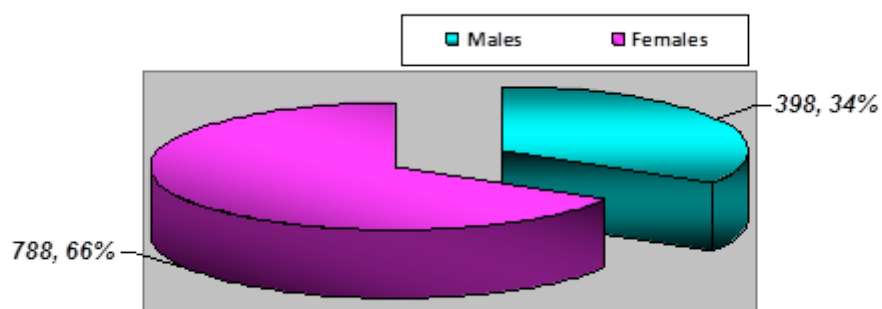


Figure 1. Distribution of respondents (M:F) – in absolute values and in per cent

4 ANALYSIS OF RESULTS

Most of our respondents access the Internet sources of information every day. The detailed presentation of answers is on Figure 2:

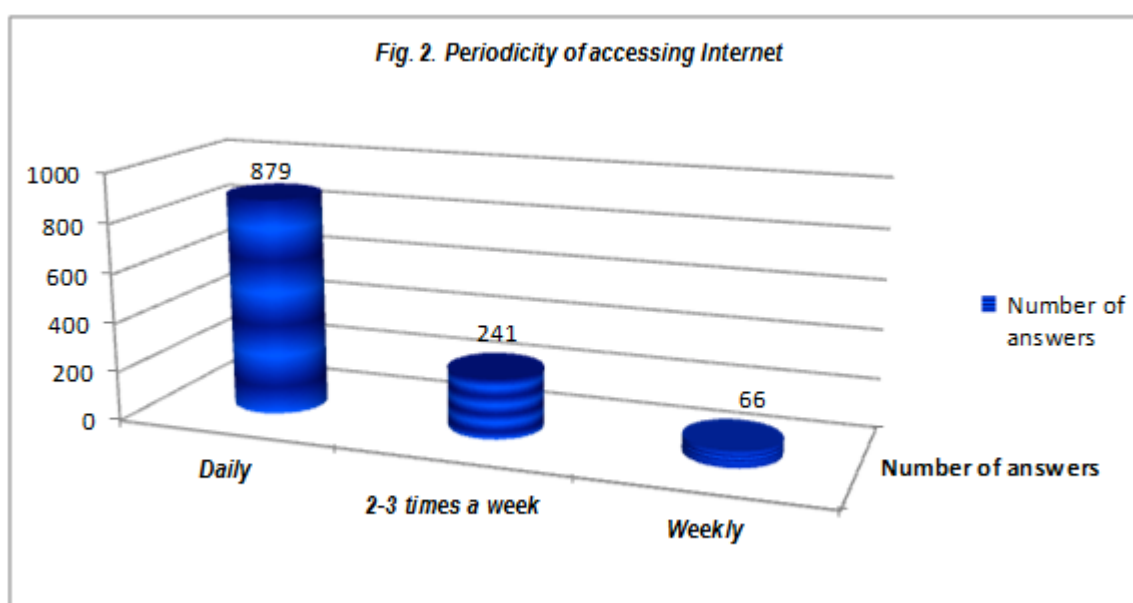


Figure 2. Periodicity of accessing Internet

We observed some differences between groups of students and staff concerning the answers of the question about the application of Internet sources for professional goals. Results are presented on Table 4. Figure 3 refers to the familiarity of respondents (staff and students) with the usage of mobile learning and e-learning platforms:

Table 4. Which of the following e-tools you apply for professional goals?

	STUDENTS	STAFF
Chat	100 %	46 %
Audio- and Video-conference	100 %	58 %
Forum	100 %	46 %
E-mail groups	100 %	88 %
Mobile Internet / Mobile learning	100 %	62 %

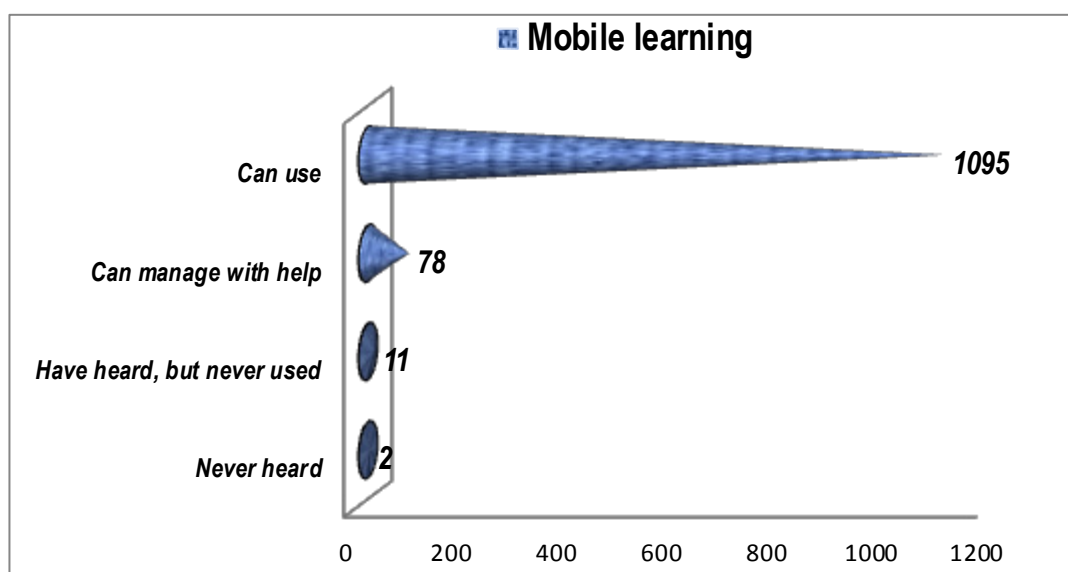


Figure 3. Capacity of respondents to use mobile learning

All students from the target group (100%) and an important part of the staff (62%) have positive answers to the questions „Are you interested in mobile learning?“ and „Are you interested in e-learning?“.

The next question „What language would you prefer for the course information?“ received two types of answers: practically all the working staff (656 or 97.04 %) prefer e-learning in the native (Bulgarian) language. All students and a part of the working staff (43 %) would like education in English and in native language.

We observed biggest interest to certain types of procedures, especially to mobilizations and manipulations (fig. 4). Only a few respondents are interested in functional evaluation, most of medical doctors are interested to manual diagnostics.

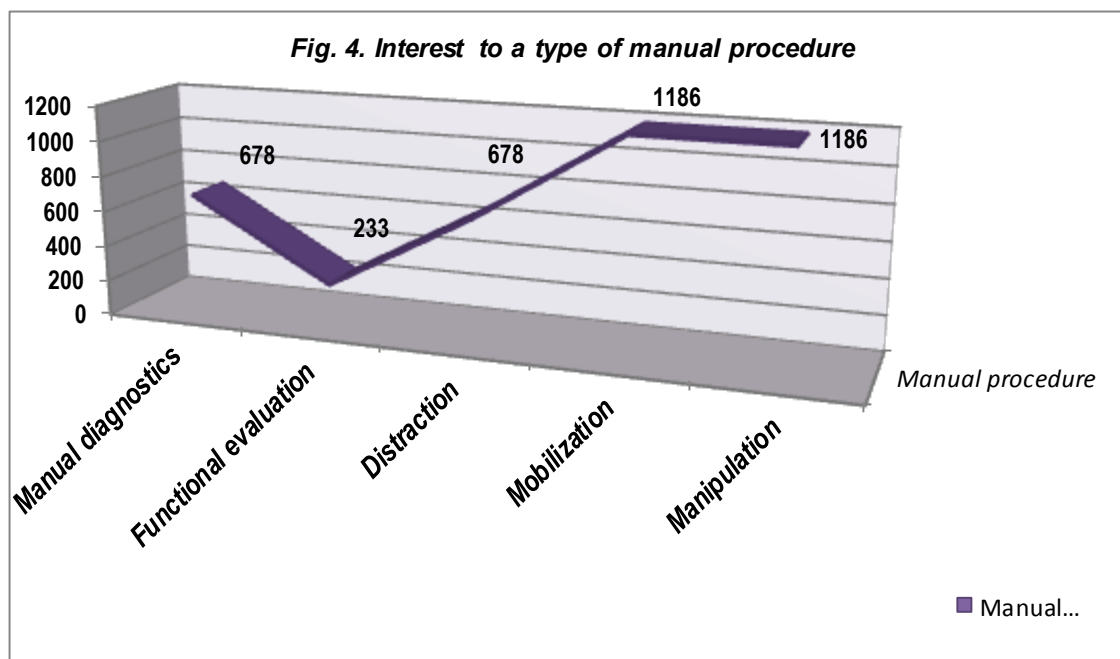


Figure 4. Type of preferred manual procedure

Figure 5 presents the results of the question about the preferred localization of the manual procedure. More than one answer is permitted. The interest is elevated to procedures of the spine, hip and knee

joints, and sacro-iliac joint. Some respondents are interested of shoulder joints. Only a few respondents mentioned other localizations.

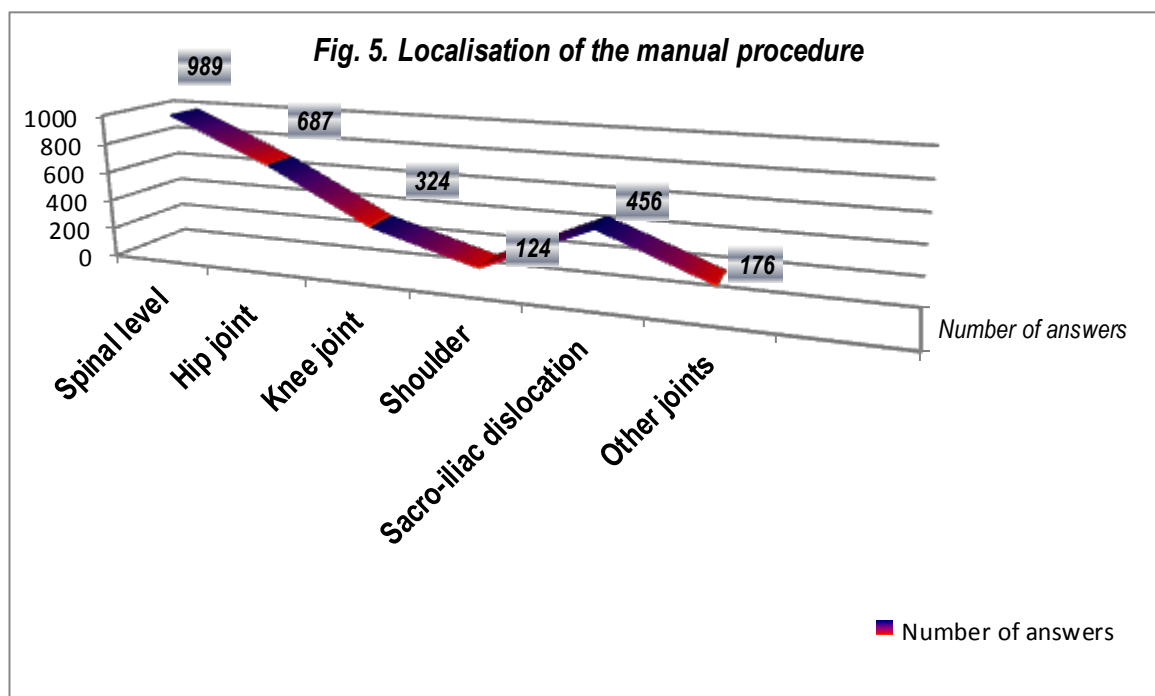


Figure 5. Preferred localization of the manual procedure

Figure 6 presents the answers of the next question, concerning combination of manual therapy with other types of rehabilitation procedures. More than 1 answer is permitted. The biggest interest is demonstrated towards the combination of manual diagnostics and manual therapy with kinesitherapy and hydro-/ balneo-kinesitherapy, and ergotherapy (occupational therapy). The interest is lower towards pre-formed modalities and the therapeutic massage, and towards the photo-therapy. About 20 % of respondents are answered with interest to 'all the above' (fig.8).

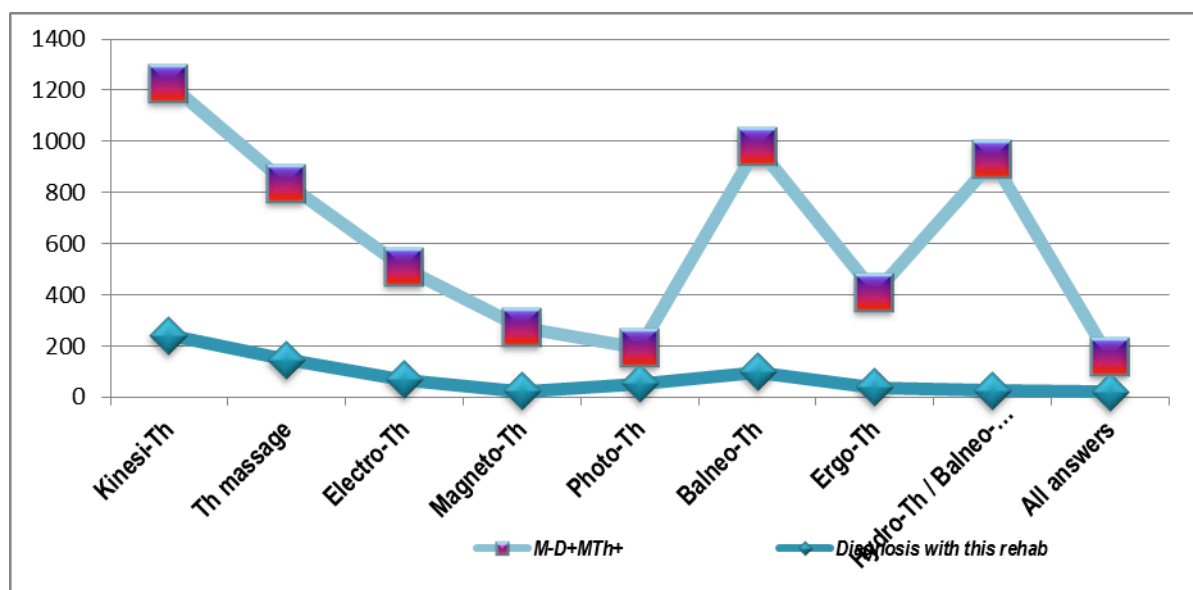


Figure 6. Combination of Manual diagnostics and manual therapy with other rehabilitation procedures

5 DISCUSSION

The results of our investigation proved that rehabilitation staff and students in Bulgaria have the potential to accept an electronic educational platform on „Manual medicine“. Most of them are familiar with Internet and e-learning. An important part of respondents prefer a bilingual education (in native language and in English).

The areas of biggest interest are manual mobilizations and manipulations. Preferred ization of the manual therapy is the spine, after that – the hip, the knee and the sacro-iliac joint.

Most of respondents would like to receive detailed information about combination of manual therapy with other types of kinesitherapy, hydro and balneo-therapy and balneo-kinesitherapy. All of them are interested in e-learning on manual medicine.

We prepared an e-learning platform on manual therapy with the goal to ameliorate the level of vocational competence of all these types of medical staff and students. After the analysis of the actual level of competences of the user, the educational programme offers a list of diagnostic and therapeutic procedures; including theoretical bases and practical skills (tips and trips), including presentation of clinical cases. After the education the student (university student or LLL student) must accomplish a series of tests designated to analyze the efficacy of the educational process.

In future publications we will present the results of the evaluation of competences in the field of diagnostic and therapeutic manual procedures.

6 CONCLUSION

Bulgarian rehabilitation staff and students are interested by electronic education (e-platforms and training) and they appreciate its positive characteristics, as follows: access to interactive multi-media materials, results of investigations in a lot of scientific applications and information sources form all the world, possibility of information exchange, potential of knowledge and application of international standards of education and qualification [5,6]. They consider the importance of introduction of this type of education in Bulgarian manual therapy school – with the objective of amelioration of the quality of care and the quality of life of Bulgarian patients [1,7].

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