

Prospects of Telemedicine in Developing Countries: A Case Study in Greece

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ABSTRACT: *This pilot research examines the motives, the obstacles and the expected outcomes of telemedicine from a medical practitioner's viewpoint. It is a qualitative study based on interviews of 60 practitioners, all from general hospitals of the metropolitan area of Thessaloniki, Central Macedonia, Northern Greece. The study shows that the vast majority of them disagree with the motives provided for the promotion of telemedicine practices in their health units, they differ from the IT experts' opinion of what the obstacles are leading to the low diffusion of telemedicine and show very low expectations of the benefits yield by its application. The main conclusion is that more work is needed to communicate the positive points of medicine especially to the people mostly related and to be involved with this practice.*

Keywords: Telemedicine, E-health, Technology

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1. Introduction

It goes without saying that one of the most important roles of the advent of information and communication technologies in modern day societies is its impact in the health system and the ways it is reshaping its functionality. Recommendations of IT usage to improve the provided services lead to serious discussions about several aspects of e-Health, including the privacy and security issues related to the implementation of a global system of electronic health record of patients [1], the availability of e-Health Kiosk for the everyday needs of the patients similar to online libraries and bank ATMs [2] and even the use of geographic information system to evaluate the distribution of the various medical facilities available to the patients in an effort to take corrective actions for the benefit of the patients [3]. Together with those the new term of telemedicine was introduced i.e. the broad use of health services from a distance in an effort to provide accessibility, quality and low cost medical care to people who cannot reach the health units easily [4].

This development has lead the professionals in the field, the academics and the managers related to e-Health and whole societies to one more hype like the one faced some years ago with e-Commerce. Even as long back as in the late 90s, though experts and decision makers were having high expectations for the success of all the different aspects of e-Health, but the diffusion of telemedicine was still at very low levels [4]. The main problems with the diffusion of telemedicine in the health care units of different types were identified as early as 1998 when various research studies took place and showed that the major obstacle was, at the time, the lack of will and effectiveness of older health organizations to implement necessary changes that would promote telemedicine and the low level of the knowledge and skills related to IT that would be necessary for the health units' medical personnel to utilize the new idea [5].

Governments are spending loads of money to achieve successful levels of health services to their citizens quite a big part of which goes to e-Health services and to telemedicine, without significant results. This is especially so in the case of the jewelry of the British public sector, which is the health system were such attempts failed either because it is inoperable with the traditional system or at least from an economic viewpoint [6]. On the other hand, all indications point to the suggestion that telemedicine has failed regardless of the effort and money spent for it. There seems to be not enough planning of how the information technology could be used for the health system to really benefit from it [7].

There is a need for deeper studies of the issues behind the concept of telemedicine just to make sure it is clearly understood not only from a technological point if there are the tools available to make it work but also from a medical practitioners' viewpoint if they are comfortable with its current attempt of deployment. In other words:

- What is the medical practitioners' perception of the suggested incentives but also the possible barriers related with the progress of telemedicine?
- What are the expected outcomes of the application of telemedicine in the health system given proper infrastructure is available?
- Is the appropriate infrastructure of such a task available to the medical practitioners?

2. Aims and Objectives

The aim of this pilot study is to investigate the current situation of telemedicine in developing countries and more specifically in Greece. The study must satisfy the objectives below:

- Examine whether the suggested incentives to promote telemedicine happen to be accepted by the medical practitioners community or not,
- Identify the real obstacles behind the, so far, low diffusion of the idea in everyday health care,
- Discuss with the Medical Doctors (M.Ds from now on) the possible outcomes of the successful application of telemedicine,
- Investigate through interviews whether the necessary infrastructure for this challenge is available to the medical practitioners.

3. Methodology

This is a qualitative investigative pilot study in which the author sought medical practitioners' viewpoints on some of the major issues related to the pros and cons of the diffusion of telemedicine in their health units and their expectations of it. The author arranged 60 interviews with M.Ds of the general metropolitan area of Thessaloniki, Central Macedonia, Northern Greece. The discussion was based on a structured very specific set of 4 questions, main qualitative in nature, with several options as answers for each that the interviewees were asked to state whether they agreed upon or not. (The personal details of years of experience and usage of the Internet were also asked during this discussion). The interviews took place during a period of 6 weeks. The scope of this study was the country of Greece and more specifically Northern Greece but the authors believe that the people, issues and mentality are applicable at least to all Greek residents and, quite possibly, to other populations especially of the developing countries as well.

In question 3 a number of possible incentives were suggested to the medical practitioners to find their perception of whether they had a positive reaction towards them or not. The interviewees were given the freedom to express their thoughts on the subject and justify why they would agree or not with the proposed motives. In question 4 they were asked to explain what issues they believe would block the application of telemedicine in their health unit. In question 5 they would identify possible outcomes of the successful implementation of the idea. In both questions 4 and 5 they were discussing the various options provided but at the end the answers would boil down to a simple agree or disagree. Finally, in question 6 they were asked to provide their opinions on whether they find the available infrastructure appropriate and sufficient for the task or not.

4. Findings

4.1 Perceived incentives

The charts of figures 1 and 1a do not leave much room for assumptions and speculations. They clearly lead to the conclusion

Figure 1. Inclusive to medical personnel to follow telemedicine procedures (based on M. D's years of experience)

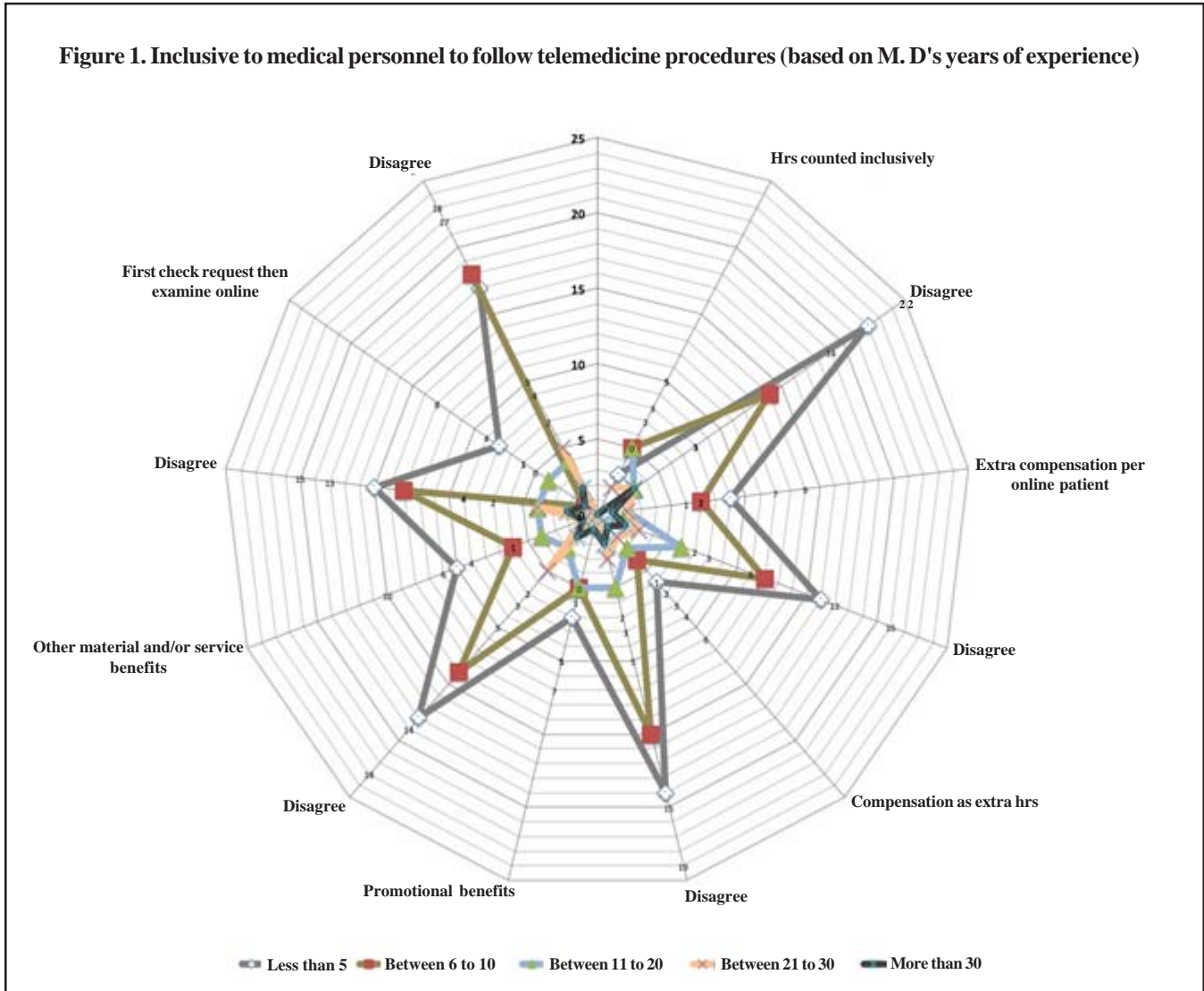


Figure 1. Incentives to medical personnel

that the predominant perception from the medical personnel’s viewpoint, as to the suggested incentives from the part of the IT specialist and the health unit managers, is that they disagree these are good motives to follow telemedicine practices. Indeed, of the 60 M.Ds interviewed on average only 18 (30%) of the participants agreed that any of the incentives suggested to them was a reason good enough to follow telemedicine practices during the duties. The remaining 42 individuals (70%) refused any of the motives given to them. Furthermore, the pattern more or less is the same and suggests that there is a common mentality against the idea. This pattern only shifts just a little towards more positive reactions if the practitioners have more years of experience. However, this shift is by far not enough to allow for optimism unless serious modifications to the suggestions are made.

More specifically 15 (25%) agreed that counting hours of advising patients online inclusive with the rest of their duty hours is worth the thought of following telemedicine practices whereas the rest 45 of them (75%) rejected the idea. This is especially so for medical practitioners with less than 5 years of actual experience in hospitals or health centers in which case (5% of the interviewees) they find the idea interesting whereas the vast majority (36.7% of the sample) refuse it. The situation gets a little more in favor of accepting this incentive for the M.Ds with 6 to 10 years of experience (8.3%) and for those with 11 to 20 years in the profession (8.3%) in which case the disagreement drops significantly to 23.3% and seriously to 5% respectively.

The results were very similar when the interviewees were asked if being offered extra compensation per hour of following online

patients would help promote the practice of telemedicine, i.e. 3rd incentive. Things were just a little better in the case of being suggested to practice it with promotional benefits (4th incentive) agreed in advance but the change was insignificant. The same negative pattern of rejection resulted when offered the opportunity to first check the requests for online patients and only if they approved the cases to deal with them online.

The answers of the interviewees were a little more positive than the average negative patterns when asked if they would find it interesting if extra compensated for each online patient the results were just a little positive (2nd incentive). About 35% of them (21/60) would be willing to accept this incentive when 65% would still be negative (39/60). The research also exhibited very similar views as to possible other material and/or services offered to them as incentives. Experience seems to have once again similar effect like in the previous cases.

The basic explanation of the aforementioned is that either the suggested incentives are not correct at all or if they are their outcome is not satisfactory in quantitative terms or at least not enough so to attract the practitioners to invest time and effort on it.

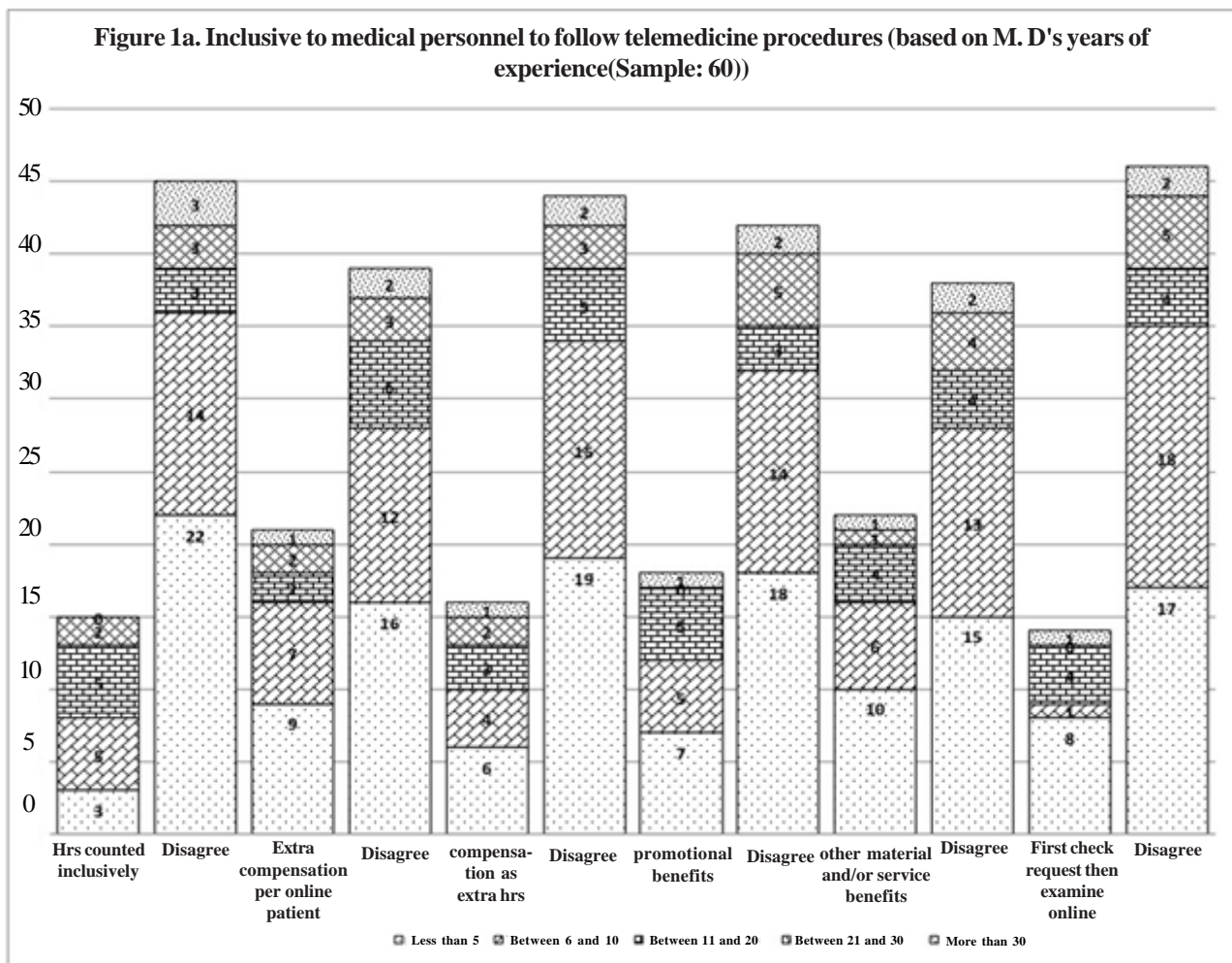


Figure 1a. Incentives to medical personnel

4.2 Obstacles

In order to pass through the second research phase, the interviewees were asked to identify possible obstacles towards the promotion of telemedicine practices. The results further stressed that not only they didn't find the incentives provided to them significant enough but the majority of them also disagreed with the IT and managerial suggestions of the reasons blocking progress on this idea. It must be noted, however, that their opinions have some variety interesting enough to describe in the current section (figure 2 and 2a).

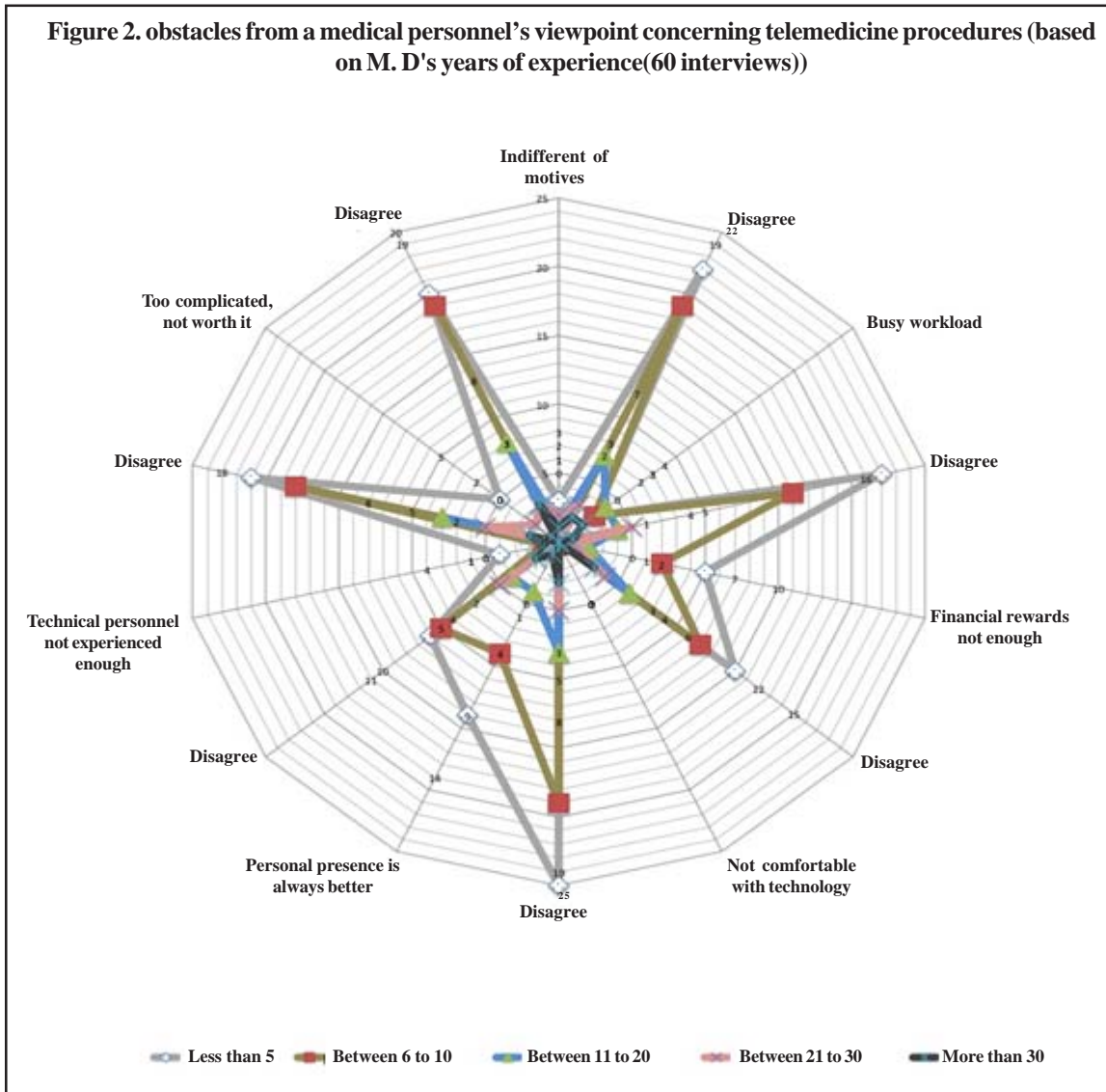


Figure 2. Obstacles from M.Ds viewpoint

First, the number of those negative to the practice of telemedicine regardless of the motives is very small, just 11.7% (7/60 in all), whereas the absolute majority attributed the lack of real progress in telemedicine in the country to other factors and disagree they are indifferent of motives (53/60 interviewees; 88.3%). Specifically, those with less than 5 years of medical practice i.e. 36.7% (22/60) are not indifferent of motives but just don't agree with the ones offered. Quite similar is the case with those with between 6 and 10 years of experience who would also prefer other motives to apply the plan (31.7%, 19/60 interviewees). This could easily and basically be interpreted as suggesting that M.Ds believe motives to the medical practitioners and the nursing personnel are important but the ones proposed and given are not attractive enough for them. There is probably a need for more discussion on what exactly would motivate them before any other actions in that regard are taken.

Second, only 20% of the participants (12/60 interviewees) complained their busy workload is a serious obstacle for the lack of progress towards this goal. The rest of them (80%), 48 out of 60 medical practitioners, don't believe so especially those with up to 5 or between 6 to 10 years of medicine experience. For those between 11 to 30 years of experience there is no percentage influence in the final outcome. Interestingly, though low numbered, the medical practitioners with over 30 years of experience point to their busy workload in their case as a serious obstacle.

Third, when asked about their opinion on financial rewards over telemedicine progress they did show a clear pattern to disagree

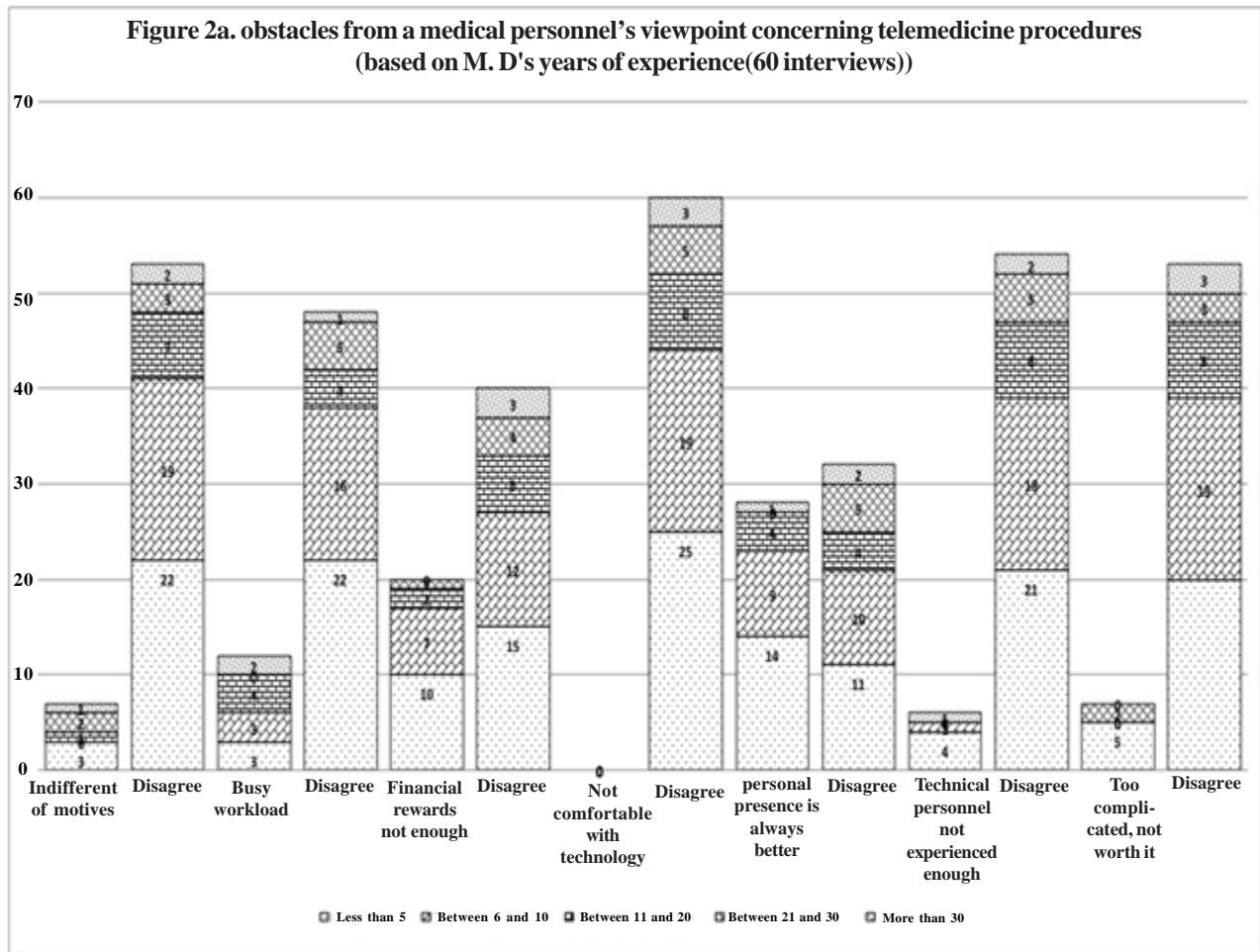


Figure 2a.Obstacles from M.Ds viewpoint

that the financial rewards are a problem as they are not sufficient. According to this research, over 66.7% of them (40 out of 60) believe that lack of serious financial rewards are not an obstacle towards telemedicine practice as in the same research 20 out of 60 (33.3%) answered in the exact opposite direction which should not be ignored at all. It is noteworthy that, as the years of medical experience increase the value of the financial rewards seems to be undermined. Indeed, while 10 out of 25 medical practitioners with less than 5 years of work experience see the positive affect of financial rewards, their fellow practitioners with over than 30 years experience do not see it at all (0 out of 3) despite the fact that the data in the latter case is very small and cannot provide a safe conclusion. A suggested explanation of the aforementioned is that although the financial rewards are important but whether they are sufficient and/or satisfactory or not does not seem to be a serious obstacle blocking the progress towards telemedicine practices.

As to the lack of technology literacy as an obstacle towards the goals of telemedicine no medical practitioner agreed that there is a lack of technology literacy among them. On the contrary, when asked if they fill not comfortable with technology everyone rushed to answer otherwise (60 out of 60).

The interviewees were offered with the suggestion that personal presence is always better when comes to medical practice. In this case the participants' opinions were a little vague. They were rather divided and the research basically illustrated that personal presence of the medicine practitioner is not clearly considered as needed from M.Ds. To be more precise, 46.7% of M.Ds stated that their personal presence is always better when comes to providing improved medical services to patients. On the other hand, the 53.3% of the respondents disagreed. Once again those with many years of experience seem to be friendlier towards the use of Information and Communication Technologies developments even if someone would expect to be the other

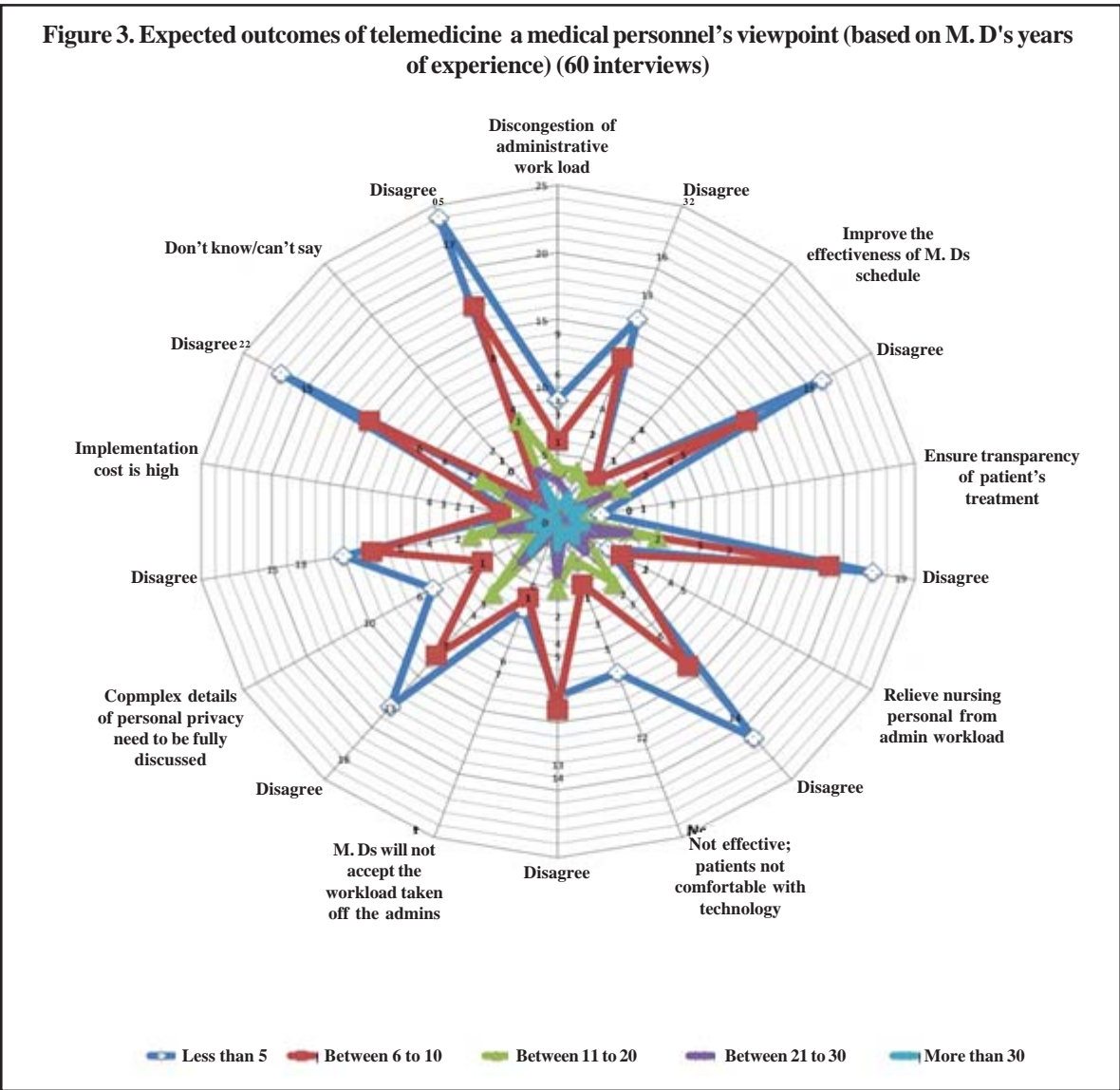


Figure 3. Expected outcomes of telemedicine

way around. So 5 out of 5 M.Ds having 11 to 30 years of experience and 2 out of 3 with more than 30 years of medicine practice believe even more in the possible success of telemedicine.

Concerning the technical personnel's experience and the affect that it might have in the progress towards telemedicine, i.e. the sixth option, it does not seem to be thought of as a real problem as the vast majority of the participants (54/60; 90%) disagreed that the personnel is not experienced enough to support such a task at least in the health units they are serving. Likewise high was the percentage (53/60; 89%) of those that noted it is not correct to say that the whole concept of telemedicine is rather complicated to be applied and is a reason for the lack of progress towards the goal. Figure 2a clearly illustrates this pattern.

The above point to a couple of conclusions quite likely to be true. First, although it is certain that there are some obstacles not allowing progress towards telemedicine but it is also mostly true that these obstacles are not related to lack of experience either from the part of the medical practitioners of all types, including nursing, from the part of the technical personnel in the various health centers. Second, a more thorough and deep discussion should take place with all interested parties as to what are the real reasons behind the problem of sloe progress towards the goal.

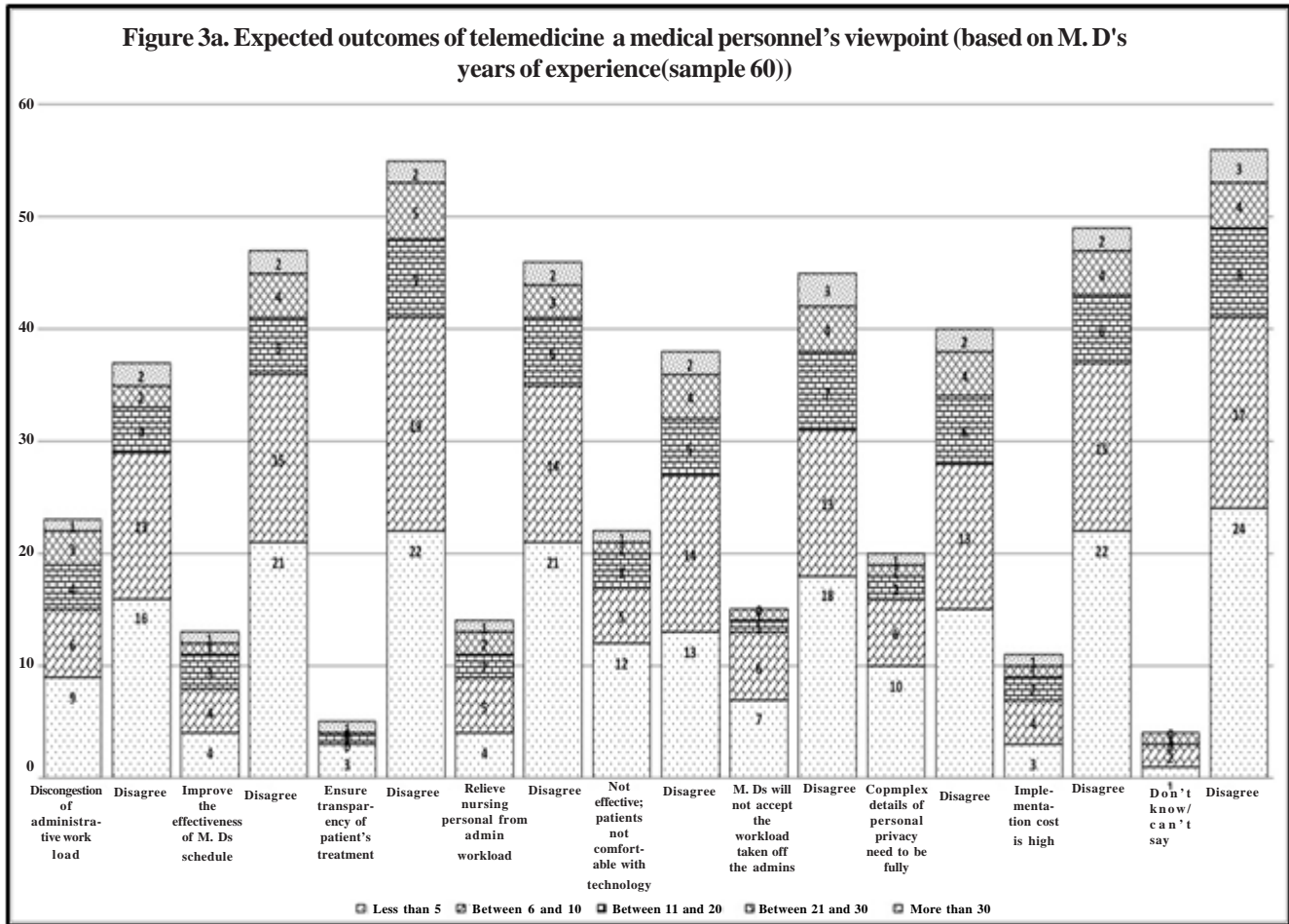


Figure 3a. Expected outcomes of telemedicine

4.3 Expected outcomes

Next the research focused on revealing the expected outcomes of telemedicine practice from M.Ds' point of view and the evaluation of the extent they have been met. The results of this part of the study are illustrated, from different viewpoints, in the charts of figures 3 and 3a.

The first result of this question was related to the possible decongestion of administrative workload in the various health units with most of the M.Ds disagreeing with this suggestion as a good possibility. The majority of them (67.7%; 37/60) were completely negative to such a possibility while the rest (32.3; 23/60) detecting a clearly positive impact of telemedicine on their administrative workload. It is interesting to note that, once again, the years of experience only slightly affect their views towards the negative reactions to the suggestion.

Continuing their evaluation, based on the percentage of those practitioners opposing the suggestion that telemedicine improves the effectiveness of their schedule, the study shows only few participants (13 out of 60; 21.7%) believe to the positive effectiveness of telemedicine over their schedule whereas the rest (47/60; 78.3%) just don't see it. In this case all experience categories revealed more or less the same pattern of opinions. They mostly disagree and, thus, reject the possibility of improving their schedule by practicing telemedicine.

Then, the participants were asked for their point of view over telemedicine practice outcomes. It was found that they definitely think patient's treatment transparency is not ensured through telemedicine practices. In the relevant question 55 out of 60 (91.7%) disagreed leaving only a small percentage of up to 8.3% (5/60) of those that believe otherwise. They also completely disagree that telemedicine can really relieve nursing personnel from administration workload. Only the 23.3% of them think that this is possible (14/60 interviewees).

Figure 4. Infrastructure availability for the development of telemedicine from the medical personnel's viewpoint (based on M. D's years of experience) (Sample : 60)

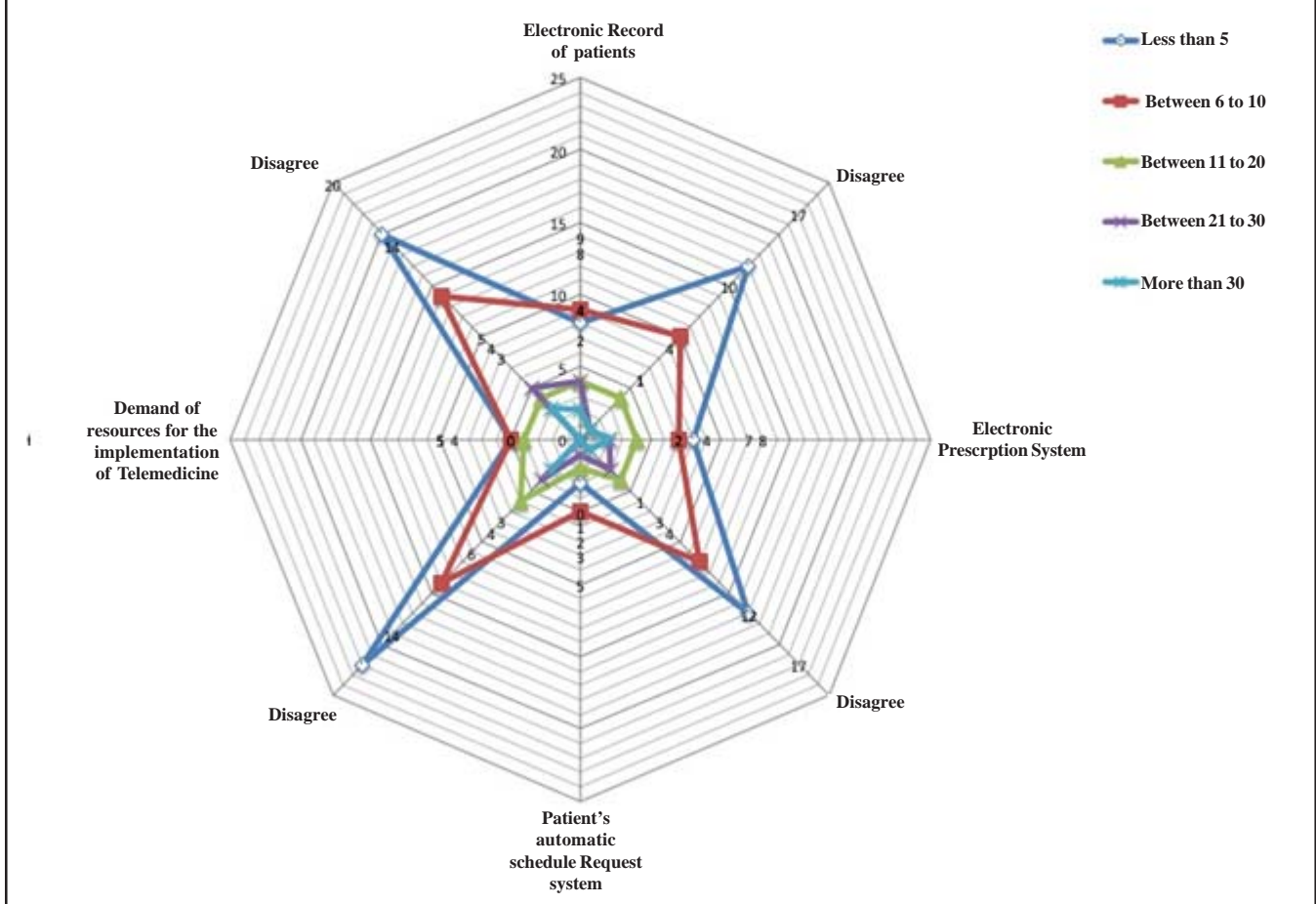


Figure 4. Infrastructure availability for the development of telemedicine

The fifth point asked was whether patients feel comfortable or not with those technology assisted health systems. A significant percentage of 36.7% of M.Ds answered that patients are not feeling comfortable with telemedicine practice technology but most of them (38 out of 60; 63.3%) think they are. M.Ds with less than 5 years of experience are not illustrating a clear opinion. Almost half of them (13 out of 25) supported the opinion of patients being comfortable with technology, which is compatible with the majority of the rest of the M.Ds opinions that have more than 5 years of experience.

At this point the research shifted to opposite side asking M.Ds whether they accepted or not the workload taken from administration in the telemedicine practice. The result was clearly in favor of those accepting the administration workload. Only 15 out of 60 M.Ds answered that they would not accept any such workload.

The participants were also asked whether they believe personal privacy concern could be a serious issue affecting in a negative way the progress towards telemedicine. The pattern once again was present with the M.Ds not feeling unsafe as to privacy issues since only a third of them (33.3%) believe that there must be an extra caution on technology privacy issues while the rest of the interviewees' population of M.Ds disagreed (66.7%). About the operating cost of telemedicine the M.Ds clearly disagreed with the statement that wants it to be a high cost investment. More specifically, 49 out of 60, which is an 81.7% cut, feel like disagreeing with those (18.3%) that support the high cost last outcome statement of this research.

4.4 Infrastructure availability

It is generally accepted that there are a few prerequisites for the development and the success of telemedicine. During the study

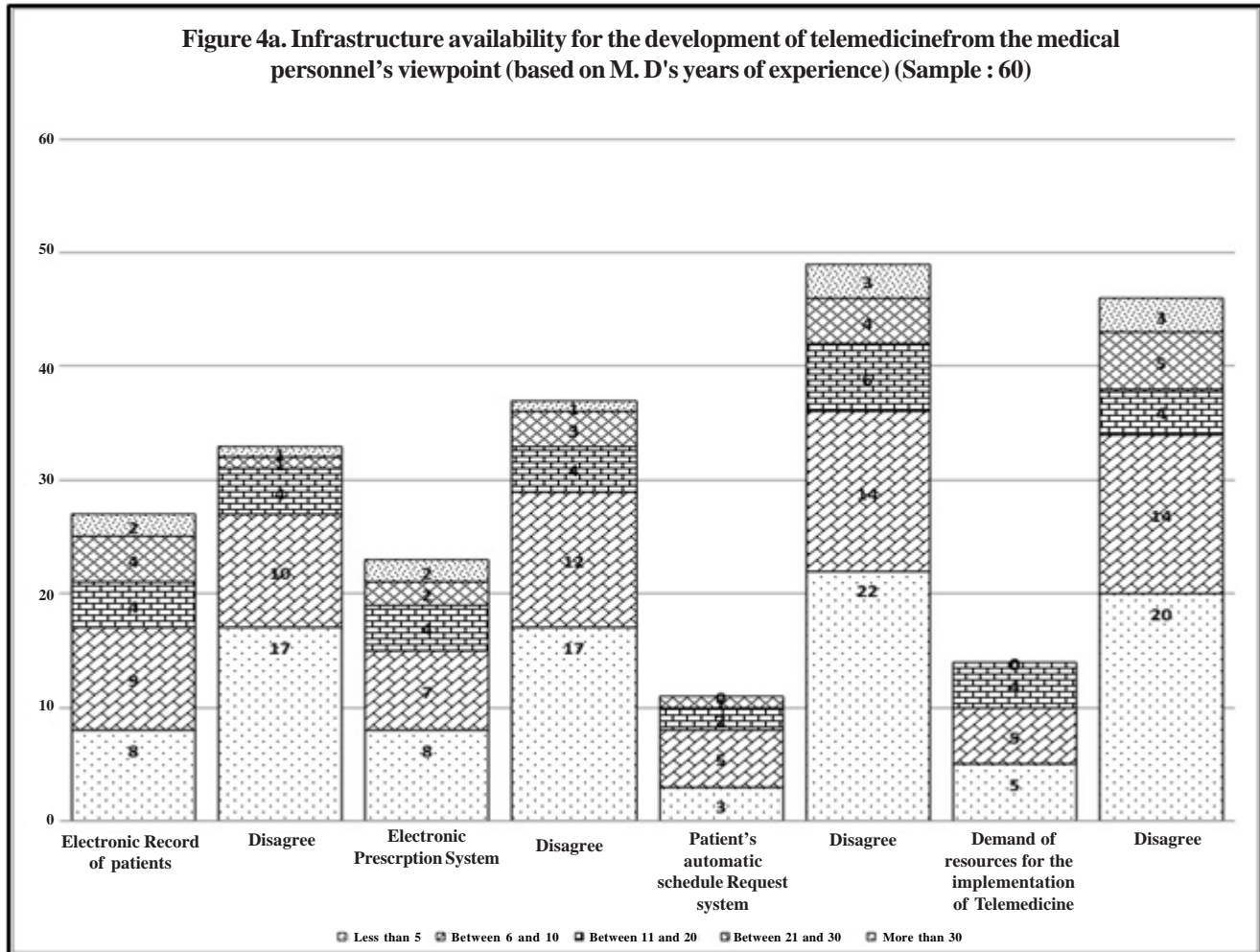


Figure 4a. Infrastructure availability for the development of telemedicine

the author asked the participants' opinion on four of what are considered some of the important ones and their availability in the health centers they serve. The results of this question 6 are illustrated in figures 4 and 4a.

Quite likely the most important infrastructure that needs to be available for the plan to succeed is the electronic health record of the patient. The M.Ds' responses were divided between those who suggested such records are available in their health units and those who disagreed. The only major change in the patterns was that the medical practitioners with up to 5 years of experience noted lack of availability of the specific ICT infrastructure at a percentage of 28.8% (17/60) with less than half of them (8/60; 13.3%) having no problems with the matter. Thus, it seems that whether in electronic form or not the patient's health record is not a problem for the development and progress of telemedicine since it is somehow available to the medical personnel. Almost the same pattern seems to be dominant in the case of the availability of the electronic prescription system to both M.Ds and patients. Indeed, the only variation is that there seems to be a slight shift towards the lack of availability especially for those participants of the study with experience up to 10 years.

The other two requirements, much less important than the previous two, i.e. the automated scheduling system for the patient and the technology requested are found to be unavailable and, hence, the quick conclusion is that there is work to be done to change this before one seriously hopes to progress towards the goal of telemedicine. Once again figures 4 and 4a clearly illustrate this as a fact.

5. Conclusions

Modern communities in developed countries began to exploit gradually Information and Communication Technologies' given

abilities and relevant innovations to address medical service needs. For example the Radboud University Nijmegen Medical Center of Holland is such a case where patients have the opportunity to communicate online with the hospital and make an online appointment with the doctors of their preference and accept a first level medical care or talk with other patients or hospital staff [8].

Remote access and service availabilities in sectors like Health, promote the quality of life for all citizens, which conforms with all Government policies for equal access [9]. Especially the injured or impaired or disabled people can gain a lot from the implementation of those remote access health services [10]. Telemedicine practice can surely play the part of promoting general public health but only when stakeholders like M.Ds have creative positive reactions to its implementation procedure.

In the case of Greece and their M.Ds there seems to be a lack of full acceptance of telemedicine practice. In the first phase of this research, most of the M.Ds claimed that the suggested incentives to accept telemedicine were not so appropriate or stimulus enough. Even though there were few exceptions of medical practitioners that agreeing with the motives presented, they are surely outnumbered by the disagreeing ones.

It is strange to observe in the results that they are not indifferent of given motives but they substantially reject the suggested ones. The author's opinion on this finding is that this behavior of M.Ds stresses the opinions of those who believe that Greek M.Ds are not yet ready for technology changes. Not because they do not have the technological ability to practice telemedicine, or because they have busy schedule but because they are not convinced that telemedicine could replace their physical presence near the patient which they appreciate it as a catalytic factor of patient's good health. Financial issues remain a strong motivation factor for a significant number of M.Ds as they would be satisfied with higher rewards but not in the form of a compensation over every remotely carried patient or every extra teleworking hour.

Undoubtedly, there could be in the future a widely usage of Information and Communication Technologies in all levels of healthcare. With no doubt improving healthcare remote access can build a much stronger confidence healthcare system and in the long run increase the life expectancy due to lower cost health services provision in a shorter time and covering all health needs of possible patients. All these under the condition that more work will be done from the part of information and communication specialists to convince the healthcare professionals of all types that technology is not only useful in their profession but also rather, if not absolutely, safe and secure as far as their professional but also their patients' privacy rights.

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