

# Trends in the Use of Physical Medicine and Rehabilitation in Croatia between 1995 and 2012

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## ABSTRACT

*Until now, there have been no published researches evaluating referrals from family doctors (FDs) or utilizations of physical medicine and rehabilitation (PMR) in Croatia. The main study aim was of determining the referral trend and the trends in the number of PMR consultations. The data were collected from the Croatian Health Statistics Yearbook, 1995–2012. The results of this study pointed out to the large number of FDs referrals as well as the large number of consultations performed in PMR: about 11% of all specialists' consultations, or the first rank in 2012. While the number of referrals decreased until 2008, the number PNR consultations continuously increased. In the same time the number of the musculoskeletal diagnosed registered by FDs also increased. The geographical variations were observed too. The new researches are needed to get deeper inside in the problem of PMR utilization.*

**Key words:** *physical medicine and rehabilitation, referrals, utilization, specialists' consultations, Croatia*

## Introduction

Within the Croatian health care system, primary care physicians such as family doctors (FD) and pediatrician's have a gate-keeping role; referring patients to specialist consultations, including physical medicine and rehabilitation (PMR)<sup>1</sup>. However, in addition to decisions based on professional knowledge and experience, the referral system is influenced by many factors related to both health services and patients<sup>2–5</sup>.

Physical medicine and rehabilitation in Croatia is organized mainly as either out-patient, part of hospital service, or private service. To be available for the publicly insured patients, the services have to be under contract with the Croatian Health Insurance Fund (CHIF). The PMR interventions can be performed on out-patients, or at a patient's home. Physical therapy (PT) at home is usually performed by a private home care service<sup>6</sup>. It is not enough to have a referral from FD or a recommendation from a PMR specialist to perform the PT at home, so it should be approved by the doctor-supervisor appointed by the CHIF<sup>7</sup>. In order to make specialists' consultations rational, a specific number of inhabitants per one specialist contracting with CHIF were defined by Croatian

Standards and Norms of Health Care Rights, introduced in 2002. For PMR, 30,000 inhabitants per one FMR team was defined as the standard, than it was changed to 25,000, and in 2004 it was changed again to 35,000 inhabitants per one FMR team. For PT at home, the number of inhabitants was set to 15,000<sup>8,9</sup>. Reimbursement of specialist consultations, including PMR, has always been based on the fees for services using complex calculations, converting them into points and the points into payment sums<sup>10</sup>. In 2009, changes in the regulations to obtain orthopedic devices were introduced. PMR specialists were obliged to prescribe aids that were beforehand only used in the exclusive domain of orthopedic doctors and/or surgeons<sup>11</sup>. Furthermore, patients seeking expertise in the realization of rights that are based on disability, such as retirement, are very common in PMR.

Along with all the changes that have been occurring within the health care system, there has been an increase in public awareness of the importance of physical activity for general good health and for disease prevention. Physical activity has become an important commercial activ-

ity, and participation in organized physical activities has become a lifestyle, even a kind of fashion<sup>12,13</sup>.

In addition to PMR under the CHIF contract, called public in this paper, there are private PMR practices where patients pay directly for medical interventions.

Until now, there have been no published researches evaluating referrals from FDs or utilizations of PMR<sup>14</sup>. Therefore, this study was undertaken with the main aim of determining the trend in the number of PMR consultations in Croatia in between 1995 and 2012, and estimating if this trend could be related to the abovementioned health care changes.

## Methods

The study is observational and longitudinal, based on routinely collected data. From the Croatian Health Statistics Yearbook, published by the Croatian Institute of Public Health, data related to referrals from PHC and related to the utilization of a specialist's service were collected for the period of 1995–2012<sup>15</sup>. Data were collected for Croatia and for Counties, separately, and for each of the years of study. A proportion of consultations performed by PMR as a fraction of total specialists' consultations were calculated. The trends in the number of PMR consultations were obtained for the period 1995–2012 in total numbers and by age. In order to assess the possible relationship, PMR consultations and morbidity from musculoskeletal diseases recorded in primary health care (PHC) were obtained (ICD-X, M diagnoses). Data for private PMR practices were collected only for the period 2009–2012 since they were not available in the Yearbooks prior to 2008.

Although one of the aims of this study was to investigate the relationship between the referral and the use of PMR, we assumed that the information would be made available on the CIHF web-page. However, these data are not publicly available yet, and could not be obtained. The only available data were those related to the number of contracted outpatients and private PMR teams for the years 2010–2012<sup>16</sup>.

In order to investigate whether the number of PMR teams is in accordance with the Standard, the average numbers of inhabitants per one contracted PMR team, both outpatient and home, were calculated<sup>16</sup>. Since physical therapy at home (PT) is most often used by older patients, we calculated the average number of residents over 65 years of age per one PT team.

The collected data were analyzed using the Microsoft Excel. The results are displayed as a table of frequencies and percentages, and the trends as line charts.

## Results

The results are presented in three parts. In the first part, the trends in the number of referrals and the total number of specialist consultations, with an emphasis on PMR consultations, are presented. In the second part,

the results concerning the organization and function of PMR in 2012 are presented. In the third part, the trends in the use of private PMR services are displayed.

### Referrals and consultations in public PMR

The number of referrals from primary care physicians, family doctors and pediatricians showed an upward trend until 2007, after which there was a slight decline. The trend in the total number of specialist consultations increased until 2010, after which there was a sudden decrease in 2011, followed by a sharp increase in 2012. The number of specialist consultations has always been greater than the number of referrals, with an average of 1.3 specialist consultations per one referral (Figure 1).

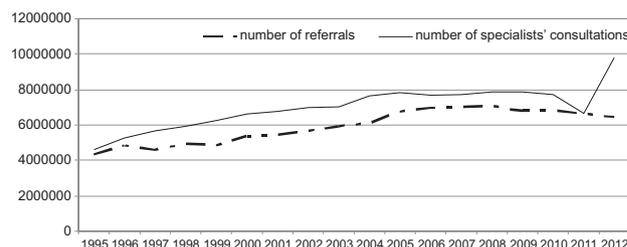


Fig. 1. Trend in the number of referrals and the total number of specialist consultations in Croatia, 1995–2012.

Of the total number of specialist consultations, PMR consultations accounted for 9–11% with an upward trend, especially in 2012 (Figure 2).

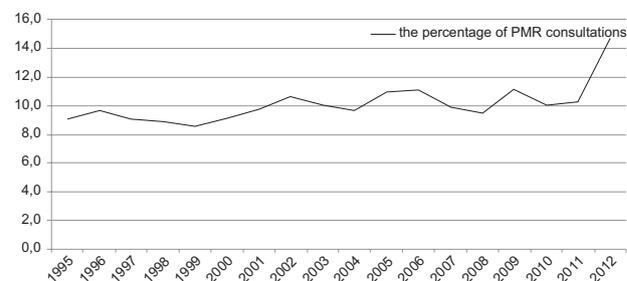


Fig. 2. Trend in the percentage of PMR consultations in relation to the overall specialist consultations in Croatia, 1995–2012.

The 20–64 age-group accounted for the highest number of PMR consultations because this is the largest contingent of the population (about 65% of the population). However, the percentage of consultations among this group of patients has been declining, from 76.9% in 1995 to 66.3% in 2012. Patients older than 65 accounted for the relatively largest number of PMR consultations, and their percentage steadily grew from 16 to 25%, which is higher than their percentage in the total population (around 16.5%). The age group 0–18 years accounts for less than 10% of PMR consultations (Figure 3).

When the total number of PMR consultations is calculated among the number of inhabitants in Croatia in a particular year, there is an observed trend of steady growth, with 0.14 consultation per person in 1995, to 0.28 in 2006, and 0.44 in 2012.

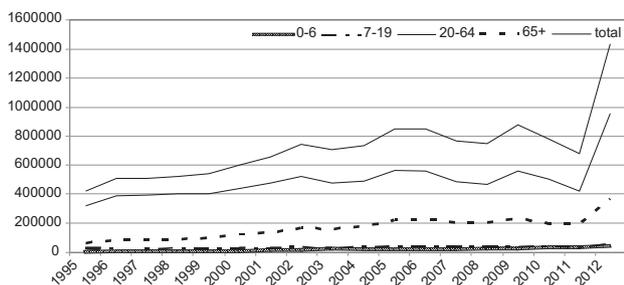


Fig. 3. Trend in the total number of PMR consultations in relation to the patients' ages in Croatia, 1995–2012.

For comparison, the trend in musculoskeletal diseases (M diagnosis, ICD-X) was explored as well, since these are often treated with physical therapy. The number of diagnoses of musculoskeletal diseases recorded in PHC follows the trend in the number of PMR consultations, but the absolute number of diagnoses is slightly less than the number of visits. The distribution curves by age are identical as well (Figure 4).

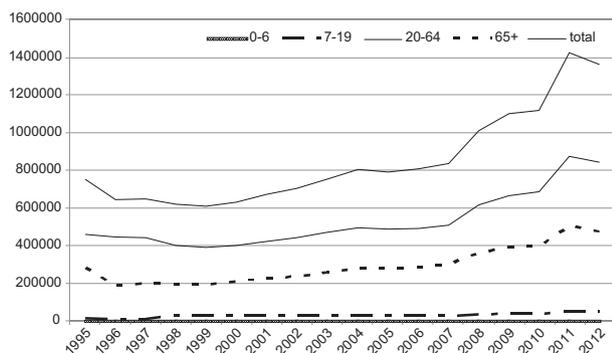


Fig. 4. Trend in the number of diagnoses of musculoskeletal diseases recorded in PHC (ICD-X, M diagnoses) according to patients' age groups in Croatia, 1995–2012.

### Organisation and function of public PMR in Croatia and counties in 2010

In 2010, there were a total of 291.3 public PMR teams under the CHIF contract, with an average population size of 14,724 inhabitants per team. Among them, 178.3 were PMR out-patient teams, with an average population size of 24,032 inhabitants per team, and 113 home physical therapy teams, with an average population size of 37,919 inhabitants per team.

However, large differences were recorded among the numbers of inhabitants per PMR teams in the counties. The largest average numbers of inhabitants per one PMR team were recorded in Koprivničko-križevačka (46,233 inhabitants) and Požeško-slavonska County (41,071 inhabitants). The smallest average numbers of inhabitants per one PMR team were recorded in Krapinsko-zagorska (11,556 inhabitants) and Varaždinska (17,420.9 inhabitants) County.

There are even greater differences in home physical therapy. The largest number of inhabitants per one team was found in Bjelovarsko-bilogorska (59,882 inhabitants)

and Koprivničko-križevačka County (57,792), and the smallest number in Primorsko-goranska (22,784 inhabitants) and Dubrovačko-neretvanska County (24,514 inhabitants). However, when it comes to older people, for whom home PT is usually intended, then these differences are markedly larger and vary from 6,453 inhabitants per one home PT team in Dubrovačko-neretvanska County to 40,711 inhabitants in Karlovačka County.

The average number of consultations per one PMR team varies considerably among counties. Dubrovačko-neretvanska (1,089 consultations) and Splitsko-dalmatinska Counties (1,121 consultations) are those with the lowest average numbers, while Karlovačka (16,632 consultations) and Varaždinska Counties (14,597 consultations) have higher average numbers of consultations per PMR team.

### The use of PMR in private practice

The total number of consultations in private specialists' practices has been reported only since 2009, and has decreased until 2012. PMR consultations account for about 10% of the total number of consultations (from 8.2% in 2010 to 13.6% in 2011). Women were almost twice as likely as men to use private PMR services (Figure 5).

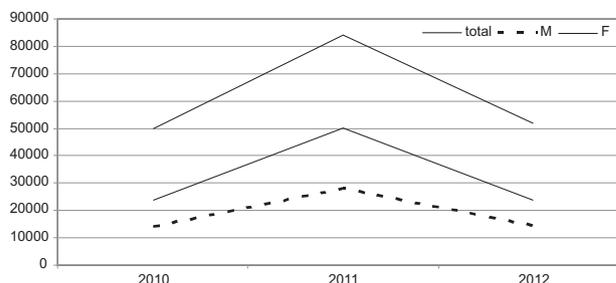


Fig. 5. The trend in the number of consultations in private PMR practices in relation to the patients' genders in Croatia from 2009–2012 (since 2008 data were not available).

Looking at the absolute numbers, private PMR offices were more frequently visited by patients in the 20–64 age-group. However, relatively more frequent users were patients older than 65 years of age, whose percentage ranged from 28.0 to 32.4, which is significantly higher than their proportion in the general population (16%). A negligible number of users were schoolchildren (Figure 6).

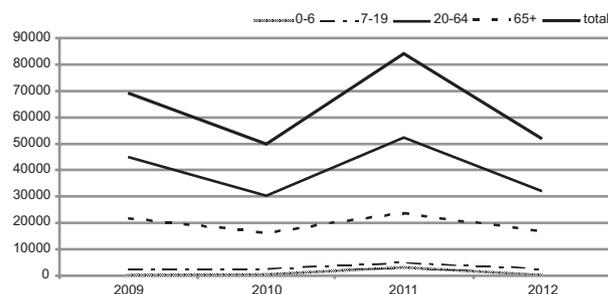


Fig. 6. The trend of the number of consultations in private PMR practices in relation to the patients' ages in Croatia from 2009–2012 (since 2008 data were not available).

**TABLE 1**  
NUMBER OF PUBLIC PMR AND HOME PHYSICAL THERAPY TEAMS IN RELATION TO THE AVERAGE NUMBER  
OF INHABITANTS OLDER THAN 65 YEARS OF AGE IN CROATIA AND COUNTIES IN 2010

Counties	Total inhabitants	PMR Teams*	Inhabitants / team	Home PT**	Inhabitants / home PT	>65 g / home FT
Croatia	4,284,889	178.3	24,031.9	113	37,919.3	9,759.8
Bjelovarsko-bilogorska	119,764	3.1	38,633.5	2	59,882.0	16,092.5
Brodsko-posavska	158,575	6.3	25,117.6	5	31,715.0	8,094.8
Dubrovačko-neretvanska	122,568	5.9	20,777.2	5	24,513.8	6,453.0
Istarska	208,055	6.5	32,008.5	7	29,722.1	7,801.4
Karlovačka	128,899	5.4	23,870.2	2	46,449.5	40,711.0
Koprivničko-križevačka	115,584	2.5	46,233.6	2	57,792.0	14,839.0
Krapinsko-zagorska	132,892	11.5	11,555.8	3	44,297.3	11,337.3
Ličko-senjska	50,927	2.0	25,463.5	1	50,927.0	18,800.0
Međimurska	113,804	3.0	37,934.7	2	56,902.0	12,757.5
Osječko-baranjska	305,032	8.8	34,662.7	12	25,419.3	6,169.2
Požeško-slavonska	78,034	1.9	41,070.5	2	39,517.0	10,155.0
Primorsko-goranska	296,195	12.8	23,140.2	13	22,784.2	6,295.8
Sisačko-moslavačka	172,439	8.8	19,595.3	3	57,479.7	16,421.7
Splitsko-dalmatinska	454,798	18.5	24,583.7	12	37,899.8	9,232.5
Šibensko-kninska	109,375	6.0	18,229.2	3	36,458.3	11,892.7
Varaždinska	175,951	10.1	17,420.9	4	43,987.6	10,662.7
Virovitičko-podravaska	84,836	4.5	18,852.4	3	28,238.7	7,044.7
Vukovarsko-srijemska	179,521	6.4	28,050.2	4	44,880.2	11,072.5
Zadararska	170,017	6.0	28,336.2	2	85,008.5	22,914.0
Grad Zagreb and Zagrebačka	790,017	48.3	22,932.1	26	42,600.9	10,339.7

\* Physical Medicine and Rehabilitation Teams; \*\* Home Physical Therapy Teams

## Discussion

The results of this study pointed out several important facts relevant to the planning of health care delivery, and they indicate the need for further research. The first is the relatively large number of consultations performed in PMR: about 11% of all specialists' consultations. The number of consultations is also continuously growing, with an increase of over 300% during the study period, particularly in the year 2012. While other specialties have also seen a growing number of consultations, for PMR this increase is much higher. For example, according to research by Sorić and associates, PMR was at fourth place from 1995 to 2004, but moved to third place over the next several years before reaching first place in 2012<sup>18</sup>. It's hard to explain what led to such a large increase over these eighteen years, even more so because referrals for PMR consultations were not even among the top ten most common in 1990, similar to other European countries, where the same survey was conducted<sup>19,20</sup>. However, the increase in PMR referrals was already reported in 2009<sup>21</sup>. Large numbers of consultations might also be relevant due to the administrative obligations of PMR, such as prescribing home physical therapy, mostly without even seeing patients, as well as prescribing orthopedic devices and evaluating work disabilities<sup>7,12</sup>.

As could be expected, the trends in the number of PMR consultations followed the morbidity trends of musculoskeletal diseases. During the study period, the morbidity of musculoskeletal diseases was continuously growing, but to a greater degree than was observed in the literature<sup>22</sup>. Particularly strong growth of about 25% was recorded in 2010. It could be questioned whether the growth of musculoskeletal diseases is really the cause of the high utilization of PMR services. Or, to reverse the situation, could the increasing demand for PMR services lead to greater demands for musculoskeletal disease diagnoses?

It is also known that the rate of use of specialist consultations is in relation to availability<sup>23</sup>. In this study, the increased availability is due to a large number of public PMR teams in relation to the populations they serve. In the year 2010, a significantly larger number of PMR teams were contracted than the number of teams required by the accepted national standards. On average, one team was contracted per 24,032 inhabitants, much higher than the standards set for 35,000 inhabitants<sup>8-10</sup>. There were also significant regional differences. This could be due to the fact that these counties have spas and special rehabilitation centers regularly used by patients from other counties. However, it is not clear why the number of contracted PMR teams was significantly high-

er than the standards in counties that do not have such spas. This phenomenon should be further studied, especially because Croatia, when compared to other European countries, has relatively more PMR specialists and is currently in second place when comparing the ratio of specialists to people<sup>24</sup>.

The potential reason for increased numbers of PMR consultations might be the fees for service reimbursement in Croatia<sup>11,25</sup>. Each PMR team in Croatia has performed an average of 6,558 consultations per year. If we index the number of visits along with the number of working days, it appears that every day each PMR specialist consulted approximately 26.2 patients. However, there are major differences among the counties, from 1,089 to 16,632 consultations per one PMR specialist per year. It is hard to say if these differences were solely a consequence of reimbursements; it is more likely to be associated with local conditions, such as habits and traditions in seeking PMR services<sup>26</sup>. Certainly, the large number of consultations casts doubt on their quality. It also reduces access to PMR services due to long waiting times, which could possibly direct patients to private PMR practices<sup>27</sup>.

If the public PMR consultations were added to those in private PMR practices, almost every eighth resident in Croatia was seen by a PMR specialist in 2012. We could assume that a fraction of these visits are repeat visits from the same patients, but this is still a large number. It is likely that increased awareness of the value of physical activity in health maintenance has led to the phenomenon in which »young people go to the gym and older people go to physical therapy«<sup>28,29</sup>.

The strength of the research partially comes from the fact that it is the first following-up for a longer period the utilization of the PMR service in Croatia. The research is based on the official statistics data, usually used in planning at national level. In addition, data were collected in the same way during the follow-up period, which made it possible to track trends over a long period of time. The follow-up period of eighteen years is long enough to show that the trends are long-term, not the fluctuations. Although the data is suitable for studying trends, they are not sufficient for deeper analysis. The study limitation comes also from the fact that some data were missing (e.g., patients' genders). Because of this there is a need

for improving data registration and collection. However, the most significant limitation is the lack of referral data which are supervised by CHIF and are not publicly available. It would be best to have this data made publicly available because this information usually serves as the basis for important decisions.

Despite the limitations, these results might help in decision-making at various levels of health care planning and delivery. Primarily, PHC doctors could once again reconsider the necessity of referrals to PMR. They also might take other more effective measures for the patients on their lists. Many European countries demonstrate that physical therapy is a part of everyday FDs scope of work, with physiotherapists as an integral part of the teams and with offices that are equipped to carry out simple treatments<sup>30,31</sup>. With the heavy workload experienced by PMR specialists, any measures that would reduce their workloads would obviously be welcomed. However, planners and financiers of health care should also consider the existing standards, especially those for home physical therapy. Actions to reduce regional disparities in Croatia should also be considered; these disparities have already been reported in other studies<sup>32</sup>.

## Conclusions

The results indicated a high number of PMR consultations, especially when the numbers were continuously increasing. Despite the fact that the number of contracted PMR teams was over the defined standard in 2012, a huge workload was observed. The large number of visits per day makes this specialty less accessible to patients, especially in certain counties. Since this study is based on routinely collected data and only trends can be clearly detected, further researches are necessary to explore the phenomenon of PMR utilization more thoroughly.

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## UPUĆIVANJE I TRENDOVI KORIŠTENJA FIZIKALNE MEDICINE I REHABILITACIJE U RH U PERIODU OD 1995.–2012. GODINE

### SAŽETAK

Malobrojna su istraživanja o upućivanju iz obiteljske medicine na specijalističke konzultacije, a osobito su malobrojna o korištenju fizikalne medicine i rehabilitacije (FMiR). Cilj je bio istražiti trendove upućivanja vanja i korištenja FMiR u Hrvatskoj u periodu od 1995. do 2012. godine. Podaci su prikupljeni iz Hrvatskih zdravstveno-statističkih godišnjaka za taj period. Rezultati su pokazali da je upućivanje i korištenje FMiR relativno veliko. Dok se broj upućivanja smanjuje, korištenje FMiR se povećava, tako da je oko 11% svih pregleda u specijalističkim ordinacijama napravljeno u FMiR, po čemu je u 2012. godini bila na prvom mjestu po broju pregleda u Hrvatskoj. Istovremeno je i broj muskuloskeletnih bolesti registriranih u obiteljskoj medicini rastao. Uočene su varijacije po županijama u korištenju FMiR. Budući da su rezultati istraživanja upućivali na trendove korištenja, potrebna su dodatna istraživanja o stvarnim razlozima tako čestog korištenja FMiR.