CLINICAL PATHWAYS - RETROSPECTIVE VIEW ON THEIR APPLICATION AS A FINANCIAL TOOL IN BULGARIAN HOSPITALS

Lyubomira Koeva-Dimitrova, Elka Atanasova

*Department of Health Economics and Management, Faculty of Public Health,
Medical University of Varna*

ABSTRACT

INTRODUCTION: During the period 2000-2001, clinical pathways were developed and implemented as a temporary solution for financing the hospitals in Bulgaria. The aim of this article is to study and trace the application of clinical pathways as a tool for hospital funding in Bulgaria.

MATERIALS AND METHODS: In order to examine the implementation and the progress of CPs in Bulgarian hospitals we have studied Bulgarian and foreign publications. In addition to this, we have also included official reports published by the Ministry of Health, Ministry of Finance, National Health Insurance Fund (NHIF), the National Center of Public Health and Analyses (NCPHA) and others.

RESULTS AND DISCUSSION: CPs were negotiated and included for the first time in the National Framework Contract in 2001. Gradually, the number of CPs increased and reached more than 300 in 2015. The introduction of CPs as a tool for financing hospital care is related to the need of fixing the prices of the respective CPs. Initially, the NHIF and the Bulgarian Medical Association developed a common methodology for fixing the prices of CPs. From 2011, an amendment to the Health Insurance Act stipulates that the procedures for valuation and payment of activities by NHIF are defined by specific methodologies. We have found that not all hospitals submit information to the specialized software for hospitals which is the only tool for analyzing the costs structure in the health care establishments at present.

CONCLUSION: The clinical pathways are not accepted as a sufficient effective mechanism for hospital funding in Bulgaria. Moreover, the lack of accurate and comparable information makes the analyses incomplete and vulnerable.

Keywords: *clinical pathways, hospitals, financing, cost, pricing, Bulgaria*

Address for correspondence:
Lyubomira Koeva-Dimitrova
Medical University of Varna
55 Marin Drinov Str.,
Varna, 9000
e-mail: liubomira.koeva@mu-varna.bg

Received: March 9, 2016

Accepted: April 5, 2016

INTRODUCTION

Clinical pathways (CPs) are introduced in health care in the early 1980s in the United States. For the first time, the CPs were used systematically between 1985 and 1987 in the New England Medical Center in Boston (USA) in response to the introduction of Diagnosis-Related Groups (DRG) in 1983. In the early 1990s CPs were introduced in the United Kingdom. Currently, CPs are used world-

wide as a complex intervention (1). The widespread use of CPs presumes the presence of different definitions of their nature. The European Pathway Association define a CP as: "A complex intervention for the mutual decision-making and organization of predictable care for a well-defined group of patients during a well-defined period" (1). According to other authors "The clinical pathway coordinates the expected care and treatment, provided by a multidisciplinary team of specialists, towards a patient in certain condition or in a group of similar conditions, in generally agreed time frame in order to achieve certain results. Any deviation from the plan is defined as "variation". Its study helps for reconsidering the current practice" (2). Bulgarian experts added and specified that "a clinical pathway is a structured multidisciplinary plan which aims to achieve clearly defined clinical purposes and describes in details the basic steps in providing care for a patient with a specific medical problem" (3). Other experts perceive the CP as an "organizational, diagnostic and therapeutic algorithm which resolves the growing conflict between the clinical freedom and the health care management through the balance between the medical and economic feasibility" (4).

The introduction of the social health insurance model in Bulgaria is associated with many discussions and intentions to introduce DRG as a method for financing hospitals (5). Despite the thorough research on international experience and the experimental application of case mix approach and DRG in Bulgaria, the CPs were developed and implemented in 2000-2001. Initially they were perceived as a temporary solution for financing hospitals since it is considered that they are a preferred mechanism for quality control and are not appropriate as a funding method (6).

The aim of this article is to study and trace the application of clinical pathways as a tool for hospital funding in Bulgaria.

MATERIALS AND METHODS

To review the implementation and the progress of CPs in Bulgarian hospitals we have studied Bulgarian and foreign publications. In addition to this, we have also included official reports published by the Ministry of Health, the Ministry of Finance, the National Health Insurance Fund (NHIF), the Na-

tional Center of Public Health and Analyses (NC-PHA) and others.

RESULTS AND DISCUSSION

The transformation of the tax-based health care system into a social health insurance system imposed a different approach in the generation and distribution of funds for the different levels of the health care system. Furthermore, the key feature of the new system is the negotiation between the professional associations of physicians and dentists and the NHIF as the only responsible organization for the payment of contracted services. The relationships between the NHIF and health care providers are based on the National Framework Contract (NFC). CPs are negotiated and included in NFC for the first time in 2001 as NHIF paid for only 21 CPs. Gradually, the number of CPs increased to 30 in 2002, 81 in the years 2003-2004, and to 120 in 2005 (7). For the treatment of patients with diagnoses that are not included in the CPs, hospitals receive funding from the Ministry of Health which is based on a budget. Since 2006, inpatient hospital services have been financed mainly by the NHIF. As of 2015, the number of CPs has increased to more than 300 (currently 311) (8). One of the main principles of the changes in the scope of CPs is grouping together of diagnoses and procedures which require similar resources. The expectations of this distribution are that patients with the same degree of complexity of a disease and similar levels of required resources will fall into the same CP. A crucial aspect in the development of the CPs is the multidisciplinary approach with consensual solutions in order to achieve common agreement between groups of experts.

The introduction of CPs as a tool for financing hospital care is related to the need of fixing the prices of the respective CPs. For this purpose, the Bulgarian Medical Association and the NHIF developed a common methodology for fixing the prices of CPs. A calculation of weighted average cost approach was applied - the total amount of the individual costs of the patients gathered in the respective CP, is divided by the total number of patients for this CP. The average cost of CPs is calculated at the level of municipal, regional, and university hospitals, while the actual calculation for different types of hospitals applies:

- ❖ trimming of costs - a process in which extremely high and unrealistically low reported costs are not included in the calculation, thus it is not allowing interference over the normal distribution of costs incurred in hospitals;
- ❖ the estimated average costs by CPs for the different types of hospitals are weighed by the number of reported cases, thus defining a price at national level;
- ❖ defined prices for CPs at national level are increased by percentage, which reflects the dynamics of the cost of reported cases by adding the expected rate of inflation;

The application of this methodology reveals a problem, which relates to the practice of negotiating the CPs prices between the professional organizations of physicians and the NHIF. This in turn led to a lack of connection between the reported CP costs by hospitals (according to the cited methodology) and the price which NHIF pays.

According to the experts, financing the CPs in accordance with the above-mentioned method sets a number of limitations. Thus, financing requires implementation of additional tools to restrict the hospital costs - namely hospital budgets (global budgets) (9). In the light of these two tools (CPs and hospital budgets), reimbursement rates and methods of valuation and payment of medical services have been designed - "which aim at a fairer redistribution of public funds" (9). As of 2011, an amendment to the Health Insurance Act stipulates that the procedures for valuation and payment of activities by NHIF are defined by specific methodologies. These methodologies are developed by NHIF and are sent to the Minister of Finance and the Minister of Health for opinion. The Minister of Health submits the approved methodologies for adoption to the Council of Ministers. This way, the approved methodologies become regulations, therefore, mandatory for all participants in the health insurance system (10). The methodologies are developed by all types of activities and are comprised of two components - methodology for payment and methodology for valuation of the activities. The payment methodology includes specific rules according to which the health care establishments should carry out and report the medical activities, while the valuation methodology comprises rules (incl. mathemat-

ical ones) which determine the prices which NHIF pays to the health care establishments (10).

One of the main problems regarding the valuation of medical services is the reliability of the reported information. This issue is related to the lack of identical methodology for reporting the costs and costs calculation at the level of the patient (11,12). Thus, a gap in the reporting of the various types of costs in the various hospitals is observed. This probably is one of the reasons which explain the serious variations in the presented data upon the analysis of the experts. This fact in turn emphasizes the need of quality accounting information and usefulness of its subsequent analysis and interpretation. Another reason for the incorrect calculation of the CP cost is the amount of unaccounted costs in hospital accounting. Such costs, for example, are the costs for food that are fully paid by the patients, the costs for medicines, consumables and others that the patients buy themselves, in some cases, expenses for sheets and others. This in turn leads to incomplete and insufficiently precise calculation of the treatment of a sick person who has used the pathway. Thus, it is impossible to calculate the total cost of treatment and, hence, to define the price which would be formed based on the cost of the service. According to the health care managers in Bulgarian hospitals such costs have to be made due to the lack of funds and the insufficient financing of the health care system in general. The unaccounted and unregistered payments are a serious problem in Bulgaria as well (13).

This makes it difficult to provide accurate, reliable and comparable information for the sake of activities valuation in hospital care. On the other hand, the price of some CPs does not include certain costs, for example costs for consumables, medicines, overheads, staff, food, etc.

Table 1 presents the data from the analyses of Ministry of Health and NCPHA, NHIF, Ministry of Finance regarding the average reimbursement prices and the average cost per case for the period 2007 - 2014.

When we summarize and compare the data in Table 1, we observe the great deviation in the average values for reimbursement prices of CPs for the period 2010-2012. According to the NHIF and the Ministry of Finance, the weighted average price of CPs was

Table 1. Average reimbursement prices of the clinical pathways and the average cost per case for the period January, 2007 – December, 2014.

Years	Average reimbursement price	Total	Average cost per case				
			University hospitals	Regional hospitals	Municipal hospitals	Private hospitals	Others*
2007	583	589	916	494	427	n/a	n/a
2008	706	717	1117	589	465	n/a	n/a
2009	766	792	1238	618	472	n/a	n/a
2010 (January-April)	716 (NHIF, MF(9))	759	1072	583	464	n/a	n/a
2010	1152 (NCPHA (14))						
2011	1163	n/a	1181	762	569	n/a	n/a
2012	648 (NCPHA (12))	1066	1146	652	487	897	1897
2012 (January-September)	1295 (NCPHA (14))						
2013	656	890	1456	687	462	921	1032
2014	671	843	1249	698	510	860	1016

Source: For the period January, 2007- April, 2010, NHIF and Ministry of Finance (9)

For the entire 2010, NCPHA (14)

For 2011, NCPHA and Ministry of Health (18)

For the period 2012-2014, NCPHA and Ministry of Health (12,14)

*Others, including: former dispensaries, state-owned hospitals, specialized rehabilitation hospitals, diagnostic-consultative centres and medical centres performing hospital services.

BGN 716 in 2010, covering only the first four months of the respective year, while according to NCPHA the average price of the CPs was BGN 1152 for the entire 2010. Despite the inconsistency of the reported periods, there is significant variation in the values. A double difference in data for the average reimbursement price for 2012 is notable. It is an interesting fact that the same lead authors of the studied problems indicate different average values of the CPs in their publications. This misleads the consumers of the information and raises doubts about the validity of the presented data.

Table 1 shows significant variations in the average cost per case for the different types of hospitals. The average costs in university hospitals exceed 1.60 times the reimbursement levels for 2009 and 2010. Meanwhile, the average costs in the regional hospi-

tals are around 80% of the reimbursement cost while in municipal hospitals these costs reach 60-65% of the reimbursement price. Thorough analyses also suggest that part of the CPs are “undervalued” and another part “overvalued” as the value of CPs is not bound to the disease severity, accompanying diseases, and the quality of treatment (8). Furthermore, the study shows that there is a lack of accessible information regarding the costs of private hospitals in the period 2007-2011.

The survey conducted by NCPHA with regard to assessing the efficiency of the CPs in the period 2010-2012, used data from hospitals participating in the voluntary submission of information to the NCPHA through specialized software for hospitals (14). Based on the aggregated data from hospitals which submitted information to the specialized software

Table 2. Average cost per case, average reimbursement prices of the clinical pathways and the relative share of underfunding of the clinical pathways at national level for the period 2012-2014.

Years	Average cost per case	Average reimbursement prices	Relative share of underfunding (%)
2012	1066.11	648.22**	39.20%
2013	890.24	656.03**	26.31%
2014	842.82	671.47**	20.33%

Source: NCPHA and Ministry of Health (12); **Todorova R. Analysis of the stability of the health insurance model - the risks and challenges for the NHIF.

for hospitals, the average prices of CPs have been calculated and they were BGN 1152 in 2010, BGN 1163 in 2011, and BGN 1295 for the first nine months of 2012, respectively. Hence, this trend shows an increase in the average cost of CPs. In the period 2010-2011, the number of paths with low hospitalization (less than 20 patients a year) was 16 and 17, respectively. There were also two of them where no patient was admitted. For the first nine months of 2012, 23 CPs were with patient admission below the number of 20 and 4 of them have zero admissions. According to experts of NCPHA, the low utilization of these pathways means that the same have resource planning within the year, which is a hidden reserve for the reallocation in excess of other pathways (14).

Bulgarian researchers, again, analyzed the available data for costs distribution by hospital types and CPs for the period 2012 - 2014, based on data from specialized software for hospitals (12). They reported a gradual decrease in the number of hospitals that submit data to NCPHA. Moreover, this study provides data for private hospitals. However, the relative share of cases with financial information decreases significantly, especially for these health care establishments. Table 2 presents the comparison between the average cost per case and the average cost of CP, as well as the relative share of the underfunding of CPs at national level.

Overall, the data in Table 2 suggest that the average cost of CPs does not cover the costs generated by the patients. Moreover, the relative share of the underfinancing of CPs showed an almost twofold decrease between 2012 and 2014. The experts explain this phenomenon with the execution of the necessary activities concerning the clinical pathways only and an improvement of the management of patient care (12).

As of April 2014, a new methodology for valuation of activities in hospital care is in force. According to it a new way for calculation of the uniform reimbursement prices of CPs is introduced through:

1. Summarizing the information from the in-patient health care establishments concerning the actual costs made by the different types of hospitals.
2. Calculation of the new uniform reimbursement prices by nonlinear transformation so that when relatively large overvaluation/undervaluation of the CP is present, it approximates the new price to the actual cost.
3. Calculation of the necessary funds at national level based on the new uniform reimbursement prices and forecasts for the number of patients on CPs (15).

In 2015, the results of the analysis on CPs and health care establishments (in terms of the new methodology - the first 3 months, the first 6 months and 11 months) show that the inhomogeneity of CPs still persists. 155 CPs maintain the position overvalued/undervalued, and the number of those which change their position is 134, as 63 from the overvalued CPs pass into undervalued position. According to Salchev, cost structure by types of hospitals and CPs is different and these differences should be taken into account in the future (16). The conclusions and recommendations of the recent analysis of NCPHA regarding the hospitals funding are related to the design of a complex indicator that reflects not only the activity but also the movement of patients, the severity of the cases, etc.

Presented by us financial data are results, derived from analyses and reports of the NHIF, the Ministry of Health, the NCPHA, and the Ministry of Finance which are the main institutions which dis-

pense information from health care establishments in different sections. As mentioned above, currently, specialized software for hospitals is the only tool for analyzing the costs and their structure in the health care establishments. We have found that not all hospitals submit information to the specialized software for hospitals. Overall, the number of health care establishments which submit financial and economic data diminishes, which is a precondition for distortion of information at a national level. This way, the average cost per patient will always be undervalued or overvalued compared to the average price of the CPs. As already mentioned, the prices of the CPs are determined according to methodologies adopted by a Government decree. A summary of the data from hospitals for actual costs incurred is necessary in order to calculate uniform reimbursement prices of the particular pathways. Davidov reasonably raises the questions: which are the hospitals that the information on the “actual costs” is collected from and what is the applied methodology for the calculation of these costs? He presents other important issues as well. What is the underfinancing of the clinical pathways due to? Are these irrational costs made by the hospitals or problems with the development of their pricing by the NHIF? (17).

CONCLUSION

The accepted clinical pathways are not a sufficiently effective mechanism for hospital funding in Bulgaria. When we observe only the data presented in the tables, this conclusion is evident. Behind the aggregate figures, however, lies a vast amount of data obtained by the various health care establishments (costs by type, costs by supplementary activities, revenues, etc.). Unfortunately, most researches do not have access to this information. Therefore, interpretation of the financial and economic data must be performed very carefully, pointing out the limitations of the initial information and the applied statistical approaches and analyses. The lack of unified national information system covering all registered health care establishments means lack of accurate and comparable information that makes the analyses incomplete and vulnerable.

REFERENCES

1. Vanhaecht K, Panella M, van Zelm R, Sermeus W. An overview on the history and concept of care pathways as complex interventions. *International Journal of Care Pathways*, 2010; 14: 117-123
2. Johnson S. The development and implementation of pathways in an acute setting. In Wilson J (Ed) *Integrated Care Management: The Path to Success?* Oxford. Butterworth Heinemann. 1997
3. Hinkov H, Zahariev B. Twisted Clinical Pathways, Newspaper “Capital”. Available at: http://www.capital.bg/politika_i_ikonomika/bulgaria/2011/07/15/1123923_krivite_klinichni_puteki (Access on 25 February 2011)
4. Vekov T, Grigorov M, Dzhabazov S. Clinical Pathways - quality standard of medical activity or tool for financing the hospital care and barrier to accessibility. *Medical Review*, 2009; vol. XLV (1): 82-84.
5. Ministry of Health. National Conference on Health Reform in Bulgaria. Verbatim report. Sofia. 1998.
6. Ministry of Finance. Financing and Health Care Management. Theoretical bases, models, problems and trends. Report. Sofia. Available at: <http://www.minfin.bg/document/2891:1> (Access on 25 February 2016).
7. Ganova-Iolovska M, Geraedts M. Clinical pathways – the Bulgarian approach. *Journal of Public Health*. 2009; 17(3): 225-230.
8. National Health Insurance Fund. National Framework Contract for 2015. 2015; Sofia. NHIF.
9. Ministry of Finance. Analysis of forecast volumes, prices and methodologies for valuation of activities and services in hospital care. Report. Sofia. Available at: http://rlkpd.com/pdf/analiz_prognozni_obemi_bolnichna_pomosht.pdf (Access on 25 February 2016).
10. Radeva M. Methodology for valuation and payment for medical activities. Available at: <http://mariaradeva.com/03-2015/HPД-2015/методики-за-остойносттаване> (Access on 20 January 2016).
11. Koeva-Dimitrova L. Problems in reporting the activities of Health Care Establishments. PhD Thesis. University of Economics-Varna. 2013.
12. Salchev P, Atanasov P, Dimitrova-Savova T. Cost structure of hospitals for period 2012-2014. *Economic Thought*. 2015; 6: 47-64.
13. Open Society Institute. Informal payments in the health care system. Report. Sofia. OSI. 2008.

14. Salchev P, Atanasov P, Dimitrova-Savova T, Griva Chr. Economic analysis and evaluation of the effectiveness of hospital care services in Bulgaria by using the Data Envelopment Analysis for the period 2010-2012. *Bulgarian Journal of Public Health*. 2013; Vol V (2): 96-128.
15. State Gazette. Decree № 94 as of April 24, 2014 for the adoption of methodologies for valuation and payment for medical care. Issue 37 as of April 29, 2014.
16. Salchev P. Analysis of the relative weights and carrying case mix index of clinical pathways. 2016; DOI:10.1314/RG.2.1.3539.8162
17. Davidov B. Clinical pathways, Hospitals, National health insurance fund. Republic BG. 2015; Available at: <http://republica.bg/posts/view/klinichnite-pyteki-bolnicite-kasata-52> (Access on 23 January 2016).
18. Griva Chr, Salchev P, Atanasov P, Kundurdjiev T, Dikova K. Analysis of the state and problems of the functioning of the municipal hospitals and the reasons for their closure. Available at: http://ncphp.government.bg/files/Doklad_Rab_grupa-v1_29_08-article-PA.pdf (Access on 11 February 2016)