IMPLEMENTING QUALITY INDICATORS FOR DIABETES AND HYPERTENSION IN FAMILY MEDICINE IN SLOVENIA

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ABSTRACT

Introduction. A new form of family practices was introduced in 2011 through a pilot project introducing nurse practitioners as members of team and determining a set of quality indicators. The aim of this article was to assess the quality of diabetes and hypertension management.

Methods. We included all family medicine practices that were participating in the project in December 2015 (N=584). The following data were extracted from automatic electronic reports on quality indicators: gender and specialisation of the family physician, status (public servant/self-contracted), duration of participation in the project, region of Slovenia, the number of inhabitants covered by a family medicine practice, the name of IT provider, and levels of selected quality indicators.

Results. Out of 584 family medicine practices that were included in this project at the end of 2015, 568 (97.3%) had complete data and could be included in this analysis. The highest values were observed for structure quality indicator (list of diabetics) and the lowest for process and outcome quality indicators. The values of the selected quality indicators were independently associated with the duration of participation in the project, some regions of Slovenia where practices were located, and some IT providers of the practices.

Conclusion. First, the analysis of data on quality indicators for diabetes and hypertension in this primary care project pointed out the problems which are currently preventing higher quality of chronic patient management at the primary health care level.

INTRODUÇÃO

Uso de um novo modelo de unidades de família introduzido em 2011 através de um projeto piloto introduzindo os enfermeiros práticos como membros da equipe e determinando um conjunto de indicadores de qualidade. O objetivo deste artigo era avaliar a qualidade de gestão de pacientes com diabetes e hipertensão.

Métodos. Incluímos todas as unidades de família medicina que estavam participando do projeto no final do mês de dezembro de 2015 (N=584). Foram extraídos e analisados os seguintes dados de relatórios eletrônicos automáticos de indicadores de qualidade: gênero e especialização do médico de família, status (servidor público/contrato não-governamental), duração da participação no projeto, região da Slovenia, número de moradores cobertos por uma unidade de medicina familiar, nome de fornecedor de TI, e níveis de indicadores de qualidade selecionados.

Resultados. Dos 584 serviços de medicina familiar incluídos neste projeto no final de 2015, 568 (97.3%) possuíam dados completos e foram incluídos nesta análise. Os valores mais altos foram observados para o indicador de qualidade estrutural (lista de diabéticos) e os menores para os indicadores de processo e resultado. Os valores dos indicadores de qualidade selecionados foram independentemente associados com a duração de participação no projeto, algumas regiões da Slovenia onde os serviços estavam localizados, e alguns provedores de TI dos serviços.

Conclusão. Primeiro, a análise de dados de indicadores de qualidade para diabetes e hipertensão neste projeto de cuidado primário apontou os problemas que atualmente impedem uma melhor qualidade de gestão de pacientes crônicos no nível de cuidado primário.
1 INTRODUCTION

Assessing quality of care with quality indicators is paramount (1) and has already become a standard for working in family practice in several countries (2-5). Various quality indicators are being used (6) and in some countries performance-related-pay based on quality indicators has been introduced (7-9).

In Slovenia, quality assurance at the primary health care level is formally a priority, but the legislation that would ensure quality in this area is proceeding very slowly. External quality assessment and inspections commissioned by the Ministry of Health are rarely used. Supervision of quality in primary care is fragmented and poorly coordinated. Family physicians (FPs) are more involved in unofficial and ad hoc forms of quality improvement than in formalised procedures. There are formal instruments for assessing quality, such as attestation of physicians, voluntary certification and accreditation, and mandatory licensing of physicians or nurses, but quality of primary health care has not yet been systematically assessed by quality indicators (10), despite the fact that a set of quality indicators was developed for cardiovascular prevention (11, 12) and that there is ample scientific evidence in this field in the literature (1, 5-7, 13-17).

In 2011, an ongoing pilot project at the primary care level in Slovenia was launched with the support of the Ministry of Health. It introduced a new model of family medicine practice where the family physicians' working team (consisting of one FP and one nurse with a baccalaureate degree – a practice nurse) was extended by a nurse practitioner working four hours a day or 0.5 full-time equivalents. The nurse practitioner is responsible for preventive activities (screening for and counselling on cardiovascular risk factors, diabetes, depression, chronic obstructive pulmonary disease (COPD), hypertension, and smoking and management of smoking and risky alcohol consumption) and routine management of patients with stable chronic diseases (COPD, asthma, hypertension, diabetes, benign enlargement of prostate, depression, osteoporosis and coronary heart disease) (18, 19). Preventive activities can also be carried out by physicians in terms of a comprehensive approach to the patients, but in this model of family medicine practice they are mainly performed by the nurse practitioners.

As part of this project, a list of quality indicators was introduced in order to monitor the work of family medicine practices participating in the project. The list included 35 quality indicators, of which nine were structure quality indicators, 23 were process quality indicators, and three were outcome quality indicators (1, 20).
Table 1. Quality indicators for diabetes and hypertension.

| Quality indicator                                      | Calculation formula                                                                                                                                                                                                 | Type of quality indicator | Quality standard | Mean value (SD) | Median |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|-----------------|--------|
| List of patients with diabetes                         | Number of diabetic patients/ (Number of registered patients * 0.061) * 100                                                                                                                                          | Structure                 | 0                | 84.2 (53.6)     | 84.0   |
| Percentage of patients with diabetes with measured HbA1C once a year | Number of patients with diabetes with measured HbA1C at least once a year/number of registered diabetic patients * 100                                                                                       | Process                    | 80               | 25.6 (22.3)     | 21.2   |
| Percentage of patients with hypertension with a systolic blood pressure 140/90 mmHg or lower | Number of patients with hypertension with blood pressure 140/90 mmHg or lower/number of registered patients with hypertension * 100                                                                                     | Outcome                    | 50               | 18.2 (16.3)     | 14.3   |

1Prevalence of diabetes in Slovenia which is 6% (21)
2The expression “registered” describes the number of patients with diabetes/hypertension on the patient list of each family medicine practice

Statistical analysis was carried out using IBM SPSS Statistics version 22.0 (Armonk, NY: IBM Corp.). We performed multivariate analysis with general linear models. We set p<0.05 as the limit for statistical significance.

We used the observed outcome variables and explanatory factors in the analyses. The observed outcome variables were: 1) the value of the quality indicator “List of patients with diabetes”; 2) the value of the quality indicator “Percentage of patients with diabetes with measured HbA1C once a year” (continuous variable); and 3) the value of the quality indicator “Percentage of patients with hypertension with a systolic blood pressure 140/90 mmHg or lower” (continuous variable). Higher levels of observed outcome variables indicated a higher quality of work.

The explanatory factors were: 1) gender (nominal variable: male/female); 2) specialisation of family physician (nominal variable: has specialisation in family/general medicine/does not have specialisation in family/general medicine); 3) status of family medicine practice (nominal variable: public servant/self-contracted); 4) duration of participation in the project (continuous variable); 5) region of Slovenia (nominal variable: Celje, Koper, Krsko, Kranj, Ljubljana, Maribor, Murska Sobota, Nova Gorica, Novo Mesto, Ravne na Koroškem); 6) area covered by the practice (nominal variable: urban/rural); and 7) name of IT provider (nominal variable: IT No. 1, IT No. 2, IT No. 3, IT No. 4, IT No. 5). The variable “Urban/rural area” was determined according to the definition of rural areas in Slovenia provided by the Statistical Office of Slovenia, which defines rural areas as those with less than 5,000 inhabitants.

The dummy variables created for the multivariate analyses were gender (reference category: male gender), the region of Slovenia (reference category: Ravne na Koroškem), the IT provider (reference category: IT provider No. 5), specialisation (reference category: no specialisation), area (reference category: urban), and status (reference category: public servant) and were created by a simple coding.

3 RESULTS

3.1 Sample Description

Out of 584 family medicine practices that were included in this project at the end of 2015, 568 (97.3%) had complete data and could be included in this analysis (Table 2). The mean duration of participation in the project was 28.7±18.7 months, with a median of 33.0 months. The mean age of the family physicians was 51.4±9.0 years, median 53.0.
Table 2. Characteristics of family medicine practices included in the project.

| Characteristic          | Number (%) |
|-------------------------|------------|
| **Region**              |            |
| Celje                   | 71 (12.5)  |
| Koper                   | 34 (6.0)   |
| Krsko                   | 20 (3.5)   |
| Kranj                   | 63 (11.1)  |
| Ljubljana               | 148 (26.1) |
| Maribor                 | 84 (14.8)  |
| Murska Sobota           | 37 (6.5)   |
| Nova Gorica             | 44 (7.7)   |
| Novo Mesto              | 37 (6.5)   |
| Ravne na Koroškem      | 30 (5.3)   |
| **Gender of the physician** |           |
| Male                    | 132 (23.2) |
| Female                  | 436 (76.8) |
| **Specialisation of the physician** |         |
| General medicine        | 313 (55.1) |
| Family medicine         | 195 (34.3) |
| Other specialities      | 1 (0.2)    |
| No specialisation       | 59 (10.4)  |
| **Status**              |            |
| Public servant          | 426 (75.0) |
| Self-contractor         | 142 (25.0) |
| **IT provider**         |            |
| No. 1                   | 159 (28.0) |
| No. 2                   | 6 (1.1)    |
| No. 3                   | 210 (37.0) |
| No. 4                   | 90 (15.8)  |
| No. 5                   | 97 (17.1)  |
| **Area**                |            |
| Urban                   | 459 (80.8) |
| Rural                   | 109 (19.2) |

3.2 Quality Indicator ‘List of Patients with Diabetes’

The mean value of this quality indicator was 84.2±53.6, with a median of 84.0 (Table 1).

The results of a multivariate analysis showed that the variables ‘IT provider No. 1 and 4’ and ‘Duration of participation in the project’ were significantly correlated with a higher value of this quality indicator, and ‘Working in the Maribor region’ was significantly correlated with a lower value of this quality indicator (Table 3).

For continuous variables regression coefficients indicate the change of the observed variable with each increasing unit of explanatory variable.

For categorical variables regression coefficients indicate the changes of the observed variable in comparison to a reference category.

3.4 Quality Indicator “Percentage of Patients with Diabetes with Measured HbA1C Once a Year”

The mean value of this quality indicator was 25.6±22.3, with a median of 21.2.

The results of a multivariate analysis showed that the variable ‘Duration of participation in the project’ was significantly correlated with a higher value of this quality indicator, and ‘IT provider No. 3 and 4’ were significantly correlated with a lower value of this quality indicator (Table 4).

Table 3. Characteristics of family medicine practices included in the project.

| Explanatory variables | Regression coefficient | Standard Error | Upper and lower 95% confidence Interval | p       |
|-----------------------|------------------------|----------------|----------------------------------------|---------|
| **Gender**            |                        |                |                                        |         |
| Female                | 0.17                   | 4.66           | -8.97, 9.30                            | 0.972   |
| Male                  | reference              |                |                                        |         |
| **Status**            |                        |                |                                        |         |
| Self-contractor       | 6.47                   | 5.22           | -3.76, 16.70                           | 0.215   |
| Public servant        | reference              |                |                                        |         |
| **IT provider**       |                        |                |                                        |         |
| No. 1                 | 19.03                  | 8.13           | 3.10, 34.96                            | 0.019   |
| No. 2                 | 12.18                  | 19.57          | -26.18, 50.55                          | 0.534   |
| No. 3                 | 8.88                   | 6.53           | -3.92, 21.67                           | 0.174   |
| No. 4                 | 21.85                  | 7.79           | 6.57, 37.12                            | 0.005   |
| No. 5                 | reference              |                |                                        |         |
### Table 4. Multivariate analysis for higher value of the quality indicator 'Measured HbA1C in patients with diabetes at least once a year'.

| Explanatory variables | Regression coefficient | Standard Error | Upper and lower 95% confidence Interval | p   |
|-----------------------|------------------------|----------------|----------------------------------------|-----|
| Area                  |                        |                |                                        |     |
| Rural                 | -2.61                  | 5.17           | -12.74, 7.52                           | 0.614|
| Urban                 | reference              |                |                                        |     |
| Specialisation        |                        |                |                                        |     |
| General Practice      | -2.92                  | 6.99           | -16.62, 10.78                          | 0.676|
| Family Medicine       | -0.46                  | 7.00           | -14.17, 13.26                          | 0.948|
| No specialisation     | reference              |                |                                        |     |
| Region                |                        |                |                                        |     |
| Celje                 | -8.32                  | 11.03          | -29.94, 13.31                          | 0.451|
| Koper                 | -1.99                  | 11.92          | -25.36, 21.38                          | 0.868|
| Krsko                 | 11.18                  | 14.45          | -17.14, 39.49                          | 0.439|
| Kranj                 | 4.02                   | 10.70          | -16.95, 24.99                          | 0.707|
| Ljubljana             | -4.58                  | 9.42           | -23.05, 13.88                          | 0.627|
| Maribor               | -35.92                 | 10.97          | -57.42, -14.42                         | 0.001|
| Murska Sobota         | -17.34                 | 11.32          | -39.52, 4.85                           | 0.126|
| Nova Gorica           | -0.40                  | 11.00          | -21.95, 21.15                          | 0.971|
| Novo Mesto            | 0.37                   | 11.45          | -22.07, 22.80                          | 0.975|
| Ravne na Konoljem     | Reference              |                |                                        |     |
| Age (years)           | -0.17                  | 0.22           | -0.61, 0.26                            | 0.435|
| Duration of participation in the project | 1.47 | 0.11 | 1.24, 1.69 | < 0.001 |
For continuous variables regression coefficients indicate the change of the observed variable with each increasing unit of explanatory variable.

For categorical variables regression coefficients indicate the changes of the observed variable in comparison to a reference category.

### 3.3 Quality Indicator ‘Percentage of Patients with Hypertension with a Systolic Blood Pressure 140/90 mmHg or Lower’

The mean value of this quality indicator was $18.2 \pm 14.3$, with a median of 16.3 (Table 1).

The results of a multivariate analysis showed that the variables ‘Duration of participation in the project,’ ‘Female gender,’ ‘Self-contractor,’ ‘Working in the Maribor region’ and ‘Having IT No. 2’ were significantly correlated with a higher value of this quality indicator. Variables ‘IT provider No. 3’ and ‘IT provider No. 4’ were significantly correlated with lower values of this quality indicator (Table 5).

#### Table 5. Multivariate analysis for higher value of the quality indicator ‘Percentage of patients with hypertension with a systolic blood pressure 140/90 mmHg or lower.’

| Explanatory variables | Regression coefficient | Standard Error | Upper and lower 95% confidence Interval | p       |
|-----------------------|------------------------|----------------|-----------------------------------------|---------|
| **Gender**            |                        |                |                                         |         |
| Female                | 3.36                   | 1.48           | 0.47, 6.25                              | 0.023   |
| Male                  | Reference              |                |                                         |         |
| **Status**            |                        |                |                                         |         |
| Self-contractor       | 3.44                   | 1.65           | 0.20, 6.68                              | 0.037   |
| Public servant        | Reference              |                |                                         |         |
| **IT provider**       |                        |                |                                         |         |
| No. 1                 | -0.77                  | 2.57           | -5.82, 4.27                             | 0.764   |
| No. 2                 | 17.59                  | 6.20           | 5.45, 29.74                             | < 0.001 |
| No. 3                 | -6.64                  | 2.07           | -10.69, -2.58                           | 0.001   |
| No. 4                 | -10.58                 | 2.47           | -15.42, -5.74                           | < 0.001 |
| No. 5                 | Reference              |                |                                         |         |
For continuous variables regression coefficients indicate the change of the observed variable with each increasing unit of explanatory variable.

For categorical variables regression coefficients indicate the changes of the observed variable in comparison to a reference category.

4 DISCUSSION

This study showed that the structure quality indicator was achieved for diabetes (list of diabetic patients). However, it also showed that the values of the process and outcome indicators were low, which indicates that the quality of management of patients with diabetes and hypertension could be improved. The levels of the selected quality indicators were associated with several features, most commonly with the duration of participation in the project, the region of Slovenia where the practice was located, and the IT provider used by the practice.

4.1 The Assessment of Quality of the Management of Patients with Diabetes and Hypertension

High values of structure quality indicators are an important sign that the conditions for measuring quality have been established. On the other hand, lower levels of process quality indicators were found and could be attributed to several reasons. The lack of continuous quality control with feedback could be one of them; the project continued without continuous data analysis, feedback to practices on the quality of their work, or benchmarking (22), and no staff were employed to carry out these tasks.

It is also possible that adherence to the guidelines was low. A recent study from Slovenia showed that the introduction of this different model of chronic patient management in family medicine improved the process of quality of care, but the desired level of quality has not yet been achieved (23), which probably points to low adherence to the guidelines. Other studies have also shown that primary care physicians’ adherence to hypertension and diabetes guidelines is low (24-27). For example, adherence to hypertension guidelines was found to be between 10 and 50% (24, 25). On the other hand, another study showed that HbA1C was measured in almost all the patients (26). It is also possible that the selection and development of the quality indicators themselves was not optimal. The development of quality indicators must be based on a systematic evidence-based approach, and expert consensus and guidelines should be considered. The indicators should be acceptable, feasible, reliable, sensitive to change, and valid (16). The quality indicators in our project have not yet been evaluated according to these features, and therefore it could be possible that the low levels of quality indicators are associated with their suboptimal nature.
4.2 Associations between Quality Indicators and Characteristics of Providers

The most important variable that was shown to be associated with higher levels of quality indicators was the duration of participation in the project. This indicates that the practical introduction of quality indicators in the everyday work of practices might be associated with some problems that could influence the quality. These problems are yet to be recognised. The region of practices was also recognised as important. Some previous data from Slovenia indicate that there are differences between regions in terms of quality (10). Which factors contribute to that is unknown and a subject for further studies. In addition, IT providers proved important in our research. Ensuring quality of data during electronic data capture is always a problem, and several ways of reducing errors must be applied (28, 29). There are no reports about the quality of data gathering in this project, and it therefore seems that there are some problems which still need to be recognised and addressed.

The quality indicator ‘List of patients with diabetes’ indicates the prevalence of diabetes in registered patients of family medicine practices in Slovenia. It should be mentioned here that its value could also be affected by the actual prevalence of diabetes in the region of Slovenia (30), and does not only depend on the quality of work. Other factors can also contribute to the quality management of chronic patients and were not included in this study. These might include systemic factors, reimbursement, service organisation and capacity, cultural factors, disease epidemiology, practice systems in terms of incentives, practice information capacity, access, the use of teams in quality policy, detection of quality and safety problems, staff and patient safety, inclusion of patients’ perspectives, and the length of consultations (31-34). These factors should be considered when studying this topic further.

4.3 Limitations of the Study

We chose only a few quality indicators because we focused on the management of chronic diseases and not on their prevention. This was done to ensure the clarity and focus of the study. It could, however, be possible that by excluding some quality indicators we overlooked some other differences.

The other problem is the quality of the data, as the electronic database was only established in 2015; our analysis was carried out at the end of 2015, and we can, therefore, anticipate that some technical problems had not yet been resolved. Therefore, the reliability of the data might not be as good as if we had done the research later.

Our study did not include other factors that could influence the quality of management of chronic diseases, especially the characteristics of other team members, particularly nurse practitioners. Since nurse practitioners are very involved in the management of chronic patients, the inclusion of their characteristics could have helped us to build a more comprehensive view of this matter, and produced more reliable statistical models. Other limitations are the exclusion of patient data, and the cross-sectional nature of this study, which prevents us from detecting causality. This would further increase the comprehensibility of the results.

In our study, we did not analyse the characteristics of those family medicine practices that did not participate in the project. Therefore, we do not know if they differ significantly from those included in the study.

4.4 Theoretical and Practical Implications of the Study

The study showed that the quality assessment was a challenge, because the values of the quality indicators were set empirically while preparing the new model of family medicine practices in Slovenia. The quality indicators should be re-evaluated and changed if necessary according to the established methodology (16). It was also recognised that expert supervision at the location is necessary to assess the process of work of the family medicine team at different levels (e.g. following protocols, regularly measuring the parameters of chronic diseases, recording them in the electronic database, and their reporting and analysis), and to discuss the obstacles directly with care providers. Continuous quality control and benchmarking should be established in order to improve the quality of chronic patient management in Slovenian family medicine practices. The study also indicated the need for collaboration between different professionals (e.g. IT specialists and health care providers) to adopt the IT system to fully support patient management. The quality indicators should be a basis for financing the practices according to quality standards. It may also be important to inform each team about their quality results every month, and ask for their feedback.

4.5 Suggestions for Future Research in the Field

The regional differences in quality which emerged from our analysis should be further explored. Other possible factors that could contribute to quality should be studied. The quality indicators should be reviewed each year, which would allow a comparison of indicators between two points in time in the same practice, or between practices using the new approach and those using the classical approach, and to observe the trend of change according to the existing circumstances.
5 CONCLUSION

The first analysis of data on quality indicators for diabetes and hypertension in this primary care project pointed out the problems which are currently preventing higher quality of chronic patient management at the primary health care level. There are problems with the quality of data, especially with the IT support, which should be recognised and eliminated.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

Ethical approval was not sought as no patients were involved in the study. The values of quality indicators were extracted from the whole pool of data and other data were gathered from the project database. The data on providers were anonymous.

REFERENCES

1. Mairnz J. Defining and classifying clinical indicators for quality improvement. Int J Qual Health Care 2003; 15: 523-30.
2. Kringos D, Boerma W, Bourguet Y, Cartier T, Dedou T, Hasvold T et al. The strength of primary care in Europe: an international comparative study. Br J Gen Pract 2013; 63: e742-e50.
3. Reid RO, Friedberg MW, Adams JL, McGlynn EA, Mehrrota A. Associations between physician characteristics and quality of care. Arch Intern Med 2010; 170: 1442-9.
4. Rushforth B, Stokes T, Andrews E, Willis TA, McElchan R, Faulkner S et al. Developing ‘high impact’ guideline-based quality indicators for UK primary care: a multi-stage consensus process. BMC Fam Pract 2015; 16: 156.
5. Seddon ME, Marshall MN, Campbell SM, Roland MO. Systematic review of studies of quality of clinical care in general practice in the UK, Australia and New Zealand. Qual Health Care 2001; 10: 152-8.
6. Simou E, Platitska P, Koukogeorgou E, Roumeliotou A. Quality indicators for primary health care: a systematic literature review. J Public Health Manag Pract 2015; 21: E8-16.
7. Campbell S, Reeves D, Kontopantelis E, Middleton E, Sibbald B, Roland M. Quality of primary care in England with the introduction of pay for performance. N Engl J Med 2007; 357: 181-90.
8. Buetow S. Pay-for-performance in New Zealand primary health care. J Health Organ Manag 2008; 22: 36-47.
9. Van Herck P, De Snedt D, Annemans L, Remmen R, Rosenthal MB, Sermeus W. Systematic review: effects, design choices, and context of pay-for-performance in health care. BMC Health Serv Res 2010; 10: 247.
10. Boerma W, Kringos D, Verschurem M, Pellny M, Bulc M. Primary care quality management in Slovenia. Copenhagen: WHO, 2008.
11. Petek D, Campbell S, Serec M, Kersnik J. Quality indicators of cardiovascular disease prevention for primary care in Slovenia. Zdrav Vestn 2012; 81: 687-98.
12. Petek D, Kersnik J. Management of cardiovascular risk factors in high risk patients: correlates of quality of care. Zdrav Vest 2013; 52: 263-74.
13. Pavlic DR, Sever M, Klemenc-Kets-Z, Sibav I. Process quality indicators in family medicine: results of an international comparison. BMC Fam Pract 2015; 16: 172.
14. Schafer WL, Boerma WG, Kringos DS, De Maeseneer J, Gress S, Heinenmann S et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. BMC Fam Pract 2011; 12: 115.
15. Marshall MN, Shekelle PG, McGlynn EA, Campbell S, Brook RH, Roland MO. Can health care quality indicators be transferred between countries? Qual Saf Health Care 2003; 12: 8-12.
16. Campbell SM, Braspenninck J, Hutchinson A, Marshall MN. Research methods used in developing and applying quality indicators in primary care. BMJ 2003; 326: 816-9.
17. Campbell SM, Harn M, Hacker J, Burns C, Oliver D, Thapar A et al. Identifying predictors of high quality care in English general practice: observational study. BMJ 2001; 321: 784-7.
18. Poplas-Sasic T, Sibav I, Kersnik J. The project of model practices in family medicine in Slovenia. Zdrav Vestn 2013; 82: 635-47.
19. Klemenc-Kets-Z, Kravos A, Poplas-Sasic T, Sibav I, Kersnik J. New tool for patient evaluation of nurse practitioner in primary care settings. J Clin Nurs 2014; 23: 1323-31.
20. Anon. Poročilo o kazalnikih kakovosti. Ljubljana: AZ, 2015.
21. Nerat T, Kos M. Burden of type 2 diabetes from the healthcare payer perspective in Slovenia. Zdrav Vest 2013; 52: 162-80.
22. Ettrorchi-Tardy A, Levit M, Michel P. Benchmarking: a method for continuous quality improvement in health. Healthc Policy 2012; 7: e010-19.
23. Petek D, Makar M. Quality of care for patients with diabetes mellitus type 2. In “model practices” in Slovenia - first results. Zdrav Vest 2016; 55: 179-84.
24. Heneghan C, Perera R, Mant D, Glasziou P. Hypertension guideline recommendations in general practice: awareness, agreement, adoption, and adherence. Br J Gen Pract 2007; 57: 948-52.
25. Midlov P, Ekebo R, Johansson L, Gerward S, Persson K, Nerbrand C et al. Barriers to adherence to hypertension guidelines among GPs in southern Sweden: a survey. Scand J Prim Health Care 2008; 26: 154-9.
26. Rao DT, Sunio LK, Lo YJ, Gossain VV. Comparison of the adherence to the American Diabetes Association guidelines of diabetes care in primary care and subspecialty clinics. J Diabetes Metab Disord 2015; 14: 35.
27. Seidu S, Khunti K. Non-adherence to diabetes guidelines in primary care - the enemy of evidence-based practice. Diabetes Res Clin Pract 2012; 95: 907-12.
28. Ohmann C, Kuchinke W, Canham S, Lauritzen J, Salas N, Schade-Brottier C et al. Standard requirements for GCQ-compliant data management in multinational clinical trials. Trials 2011; 12: 85.
29. Kumar AA, Naik B, Guddeman DK, Bhat P, Wilson N, Sreenivas AN et al. Efficient, quality-assured data capture in operational research through innovative use of open-access technology. Public Health Action 2013; 3: 60-2.
30. Jelić J, Drinovec J, Mrhar A. Burden of type 2 diabetes. Farm Vestn 2006; 60-2.
31. Smith PC. Measuring health system performance. Eur J Health Econ 2002; 57: 315-24.
32. Ettorchi-Tardy A, Levit M, Michel P. Continuous quality improvement in health. Health Policy 2012; 7: e010-19.
33. Petek D, Makar M. Quality of care for patients with diabetes mellitus type 2. In “model practices” in Slovenia - first results. Zdrav Vest 2016; 55: 179-84.
34. Heneghan C, Perera R, Mant D, Glasziou P. Hypertension guideline recommendations in general practice: awareness, agreement, adoption, and adherence. Br J Gen Pract 2007; 57: 948-52.
35. Midlov P, Ekesbo R, Johansson L, Gerward S, Persson K, Nerbrand C et al. Barriers to adherence to hypertension guidelines among GPs in southern Sweden: a survey. Scand J Prim Health Care 2008; 26: 154-9.
36. Rao DT, Sunio LK, Lo YJ, Gossain VV. Comparison of the adherence to the American Diabetes Association guidelines of diabetes care in primary care and subspecialty clinics. J Diabetes Metab Disord 2015; 14: 35.
37. Seidu S, Khunti K. Non-adherence to diabetes guidelines in primary care - the enemy of evidence-based practice. Diabetes Res Clin Pract 2012; 95: 907-12.
38. Ohmann C, Kuchinke W, Canham S, Lauritzen J, Salas N, Schade-Brottier C et al. Standard requirements for GCQ-compliant data management in multinational clinical trials. Trials 2011; 12: 85.
39. Kumar AA, Naik B, Guddeman DK, Bhat P, Wilson N, Sreenivas AN et al. Efficient, quality-assured data capture in operational research through innovative use of open-access technology. Public Health Action 2013; 3: 60-2.
40. Jelić J, Drinovec J, Mrhar A. Burden of type 2 diabetes. Farm Vestn 2006; 60-2.
41. Smith PC. Measuring health system performance. Eur J Health Econ 2002; 57: 315-24.
42. Ettorchi-Tardy A, Levit M, Michel P. Continuous quality improvement in health. Health Policy 2012; 7: e010-19.
43. Petek D, Makar M. Quality of care for patients with diabetes mellitus type 2. In “model practices” in Slovenia - first results. Zdrav Vest 2016; 55: 179-84.
44. Heneghan C, Perera R, Mant D, Glasziou P. Hypertension guideline recommendations in general practice: awareness, agreement, adoption, and adherence. Br J Gen Pract 2007; 57: 948-52.
45. Midlov P, Ekesbo R, Johansson L, Gerward S, Persson K, Nerbrand C et al. Barriers to adherence to hypertension guidelines among GPs in southern Sweden: a survey. Scand J Prim Health Care 2008; 26: 154-9.
46. Rao DT, Sunio LK, Lo YJ, Gossain VV. Comparison of the adherence to the American Diabetes Association guidelines of diabetes care in primary care and subspecialty clinics. J Diabetes Metab Disord 2015; 14: 35.