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EPIDEMIOLOGICAL STUDIES IN THE WORK OF YOUNG SCIENTISTS: GOOD PUBLICATION PRACTICES

BADANIA EPIDEMIOLOGICZNE W PRACACH MŁODYCH NAUKOWCÓW: ZASADY DOBREJ PRAKTYKI PUBLIKACYJNEJ

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A – przygotowanie projektu badania | study design, **B –** zbieranie danych | data collection, **C –** analiza statystyczna | statistical analysis, **D –** interpretacja danych | interpretation of data, **E –** przygotowanie maszynopisu | manuscript preparation, **F –** opracowanie piśmiennictwa | literature review, **G –** pozyskanie funduszy | sourcing of funding

SUMMARY

Epidemiological studies hold a significant position in the research conducted by young scientists. One of the key aims of establishing the epidemiology of non-communicable diseases is studying the incidence of features of states and events connected with health in specified populations. This in turn is closely connected with the assessment of factors affecting health, which is the basis of information used by health care providers and other institutions. Apart from planning and conducting studies, a young scientist has to describe and publish their results. Only a full publication in a peer-reviewed journal represents the highest scientific value. This paper presents epidemiology as a science and methodology by using definitions, classifications and main goals. The short depiction presents epidemiology as a tool for assessing the health of a society and describes the main good practices for publishing the results of epidemiological studies.

KEYWORDS: epidemiological studies, young scientists, publishing results

STRESZCZENIE

Badania epidemiologiczne zajmują ważną pozycję w pracach młodych naukowców. Jednym z najważniejszych celów epidemiologii chorób niezakaźnych jest badanie występowania cech stanów, zdarzeń związanych ze zdrowiem w określonych populacjach. To z kolei jest ściśle związane z oceną czynników wpływających na stan zdrowia, których znajomość jest podstawą informacji do wykorzystywania przez służbę zdrowia i inne instytucje. Młody naukowiec oprócz planowania i wykonywania badań musi opisywać ich wyniki oraz publikować w czasopismach. Tylko pełna publikacja w recenzowanym czasopiśmie ma największą wartość naukową. Artykuł przedstawia epidemiologię jako naukę i metodologię poprzez definicje, klasyfikacje i główne cele. W skrócie przedstawiono epidemiologię jako narzędzie dla oceny sytuacji zdrowotnej społeczeństwa i omówiono ważniejsze zasady dobrej praktyki publikacyjnej wyników badań epidemiologicznych.

SŁOWA KLUCZOWE: badania epidemiologiczne, młodzi naukowcy, publikacja wyników

Definition of Epidemiology and Epidemiological Studies in Modern Science

Epidemiological studies allow the researchers to obtain credible data [1]. In 1988 John Last defined epidemiology as "the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems" [2]. The term "epidemiology" is usually associated with communicable diseases and measures aimed at preventing their incidence and spread. Most of the severe communicable diseases were gradually contained and in some cases their incidence

was completely eliminated, which allowed the second half of the 20th century to be devoted to establishing the incidence and causes of non-communicable diseases, i.e. civilisation diseases. Thus, J. Zejda offers the following definition: "[e]pidemiology is a study of the incidence and determinants of various health-related states in specified populations and a system of actions utilising the obtained data to resolve health problems of a population". The second part of the definition, concerning application, refers to promoting health, preventing diseases, and to medical protocols based on scientific evidence [3].

One of the most important aims of the epidemiology of pathological phenomena is studying the incidence of features of health-related states and events in specified populations, combined with an assessment of health-affecting factors, which can lead to using the knowledge to control health problems [4,5]. For example, in a sphere important for people: calculating the level of prevalence of a disease, i.e. incidence and distribution of a pathology in a specified human population, and explaining the rules for establishing the causes of diseases, especially modifiable environmental factors [6,7]. The number of causal factors may vary for different diseases and medical conditions. Some are necessary for the disease or condition to occur, some only increase the risk of occurrence. Dedicated epidemiological and statistical methods are used to study these correlations and their impact.

To sum up, it can be stated that epidemiological studies constituted an explanation of the incidence and determinants of health-related phenomena in specified human populations and a system of actions utilising the obtained data to reduce the established health problems in a population.

Classification of Epidemiological Studies

General epidemiology concentrates on general, universal features governing the incidence and spread of diseases and on the methods (research tools) used in order to explore the scope of the subject. Detailed epidemiology concentrates on specific, well-defined health problems.

Epidemiological studies can be observational, i.e. not interfering with the natural course of events, when the researcher collects data and does not interfere, and experimental, requiring active participation of the researchers in changing the factors determining the disease, such as exposure or behaviours, or changes in the development of the disease, which through treatment and their schema are similar to experiments [8].

In the first type of studies, descriptive epidemiology is the most easily applied and most commonly used. The aim of such studies is characterising the incidence of a health-related event or a different parameter connected with a health-related event in a population. For young scientists, this type of epidemiological studies is usually the first stage of research, based on available data, which allows the analysis of cause and effect relations and observe whether the incidence of a given event is increasing or decreasing (has a tendency to increase or decrease).

However, it is analytical epidemiology that provides concrete evidence for the causes of an event. Using analytical epidemiology we assess the determinants of health problems, establish connections between the studied phenomena and environmental factors, interpret the observed connections in terms of cause and effect, which allows us to apply the study results in practice. Other types of observational studies provide interpretation of the correlations in the cause and effect category, analyse the connections between health and risk factors. The aims of different types of experimental studies are: assessing the state of health in a population and its dynamics, studying the connections between a disease and exposition to risk factors, studying the connections between a disease and its complications and treatment methods, establishing the effectiveness and costs of treatment methods, studying the effects of the incidence of a disease, developing guidelines for strategies fighting a disease, monitoring the effectiveness of health care strategy, assessing the effectiveness of the cost of introducing health care strategy.

Therefore, in order for epidemiological studies to have effect on the proper implementation of a prophylactic programme, they should cover significant subjects, which require studying for the benefits of the society. In some specialist areas, such as environmental and occupational medicine epidemiology, special care is placed on studying populations subject to risk factors and a specified type of environmental exposition [9].

Good Publication Practices and Disseminating the Results of Epidemiological Studies

Being a scientist is different from any other profession in one key aspect: apart from conducting studies and other types of research work, a scientist has to write about their results. Everything becomes clear once we have the knowhow and writing scientific publications is no exception [10].

Some of the reasons for publishing are:

1. We have study results we have to share with others
2. We are trying to enter the scientific circles of a given specialty and thus raise both our own prestige, and that of our research site
3. An academic paper is aimed not only at effective dissemination of knowledge, it also increases our scientific background and helps us increase our personal factors (the Hirsch index)

4. We improve our CV and our chances for obtaining a grant
5. We become better authors

What do we need to write an academic paper? The easiest formula is: *scriptio = scientia + ars + labor*.

These are the key basic features of good publication practices and general guidelines and tips, helping to prepare a paper with results of epidemiological studies (a so-called original paper). A paper ready for publication has to show its authors have good knowledge of the described topic, good research skills and interesting observations, with potentially significant implications. A good paper provides new information or new context for existing information [11]. Papers presenting results of epidemiological studies have an existing uniform format, known as IMRAD, which is an acronym composed of the first letters of the elements of a paper: Introduction, Methods, Results, and Discussion [12] with added Conclusions.

The title is very often the thing that encourages potential audience to read the paper (the title does not need to be final, it can change during the course of writing a paper). It should be precise and concise. It is a good practice to read the types of titles which usually appear in the journal we want to submit our paper to.

Original research articles are typically structured in this basic order [13]: Introduction: What did you/others do? Why did you do it? Methods: How did you do it? Results: What did you find? And Discussion: What does it all mean? This order is recommended by most English-language publications and one we are used to as authors and readers. A clear and concise style of the paper increases its chances of being read by a large number of interested readers. Elements such as elaborate language, complex comparisons, idiomatic expressions, metaphors and jokes render the reception of the results of the study less clear. Science is a serious subject, which requires clear means of delivery [14,15].

The style of a paper becomes a bigger challenge when we write in a foreign language. In such cases it is best to forgo translating even the best version of the manuscript and instead write in the target language from the start [16,17].

Writing a paper should commence from recalling the working hypothesis and preparing three key chapters, i.e. Introduction, Methods, and Results.

Introduction should contain the rationale for exploring a given subject and present the aim of the paper. We present the available knowledge and point out previously unknown items [18]. Furthermore, we should describe the used methods, which play a significant role in epidemiological studies. A well-prepared statistical analysis can greatly increase the chances for a paper to be published. The Results chapter should present the main conclusion of the paper without digressing to other subjects. We should organise the data into a logical construction, presenting the course of the study and the results [19].

The Discussion chapter differs from the Introduction: it begins with describing the results and then moves on to explain their significance in the broader context of the studied area. The main subject of the Discussion are own results. A well-executed discussion should focus on the key observations, circumventing the problematic findings, especially if they are not significant for the study hypothesis. At the end we should ask about the importance of our findings. What do they bring? Do they disperse doubts? Do they question the current knowledge? In the Conlcusions chapter we recap the results and present the final conclusion, e.g. the effect on future studies.

Final Remarks

Epidemiological studies are necessary to understand the way diseases and pathological events spread in a society. They increase the awareness of the current situation and the need to monitor it. They are also a source of analysis and data on the scope and scale of health problems in a population. By establishing and describing risk factors and assessing the situation, they allow to draw conclusions from past and potential future events. The epidemiological approach helps in making decisions regarding health-related policy and actions based on evidence, indicating prophylactic goals. All of that contributes to designing studies, and collecting and analysing data, and disseminating results via good publication practices. We have to remember that only a full publication in a peer-reviewed journal represents the highest scientific value. Clear reports from epidemiological studies should be accompanied by promoting such studies, which helps make the peer-review process, which is a part of promoting the study, more clear.

References

1. Budyńko Ł, Waszak P. Pomysł – badanie – publikacja. Poradnik naukowy dla studentów kierunków medycznych. Gdańsk: Gdański Uniwersytet Medyczny; 2015.
2. Lappe M, Last JM. Ethics and public health, Maxcy-Rosenau's public health and preventive medicine. 12th ed. Norwalk: CTAppleton-Century-Crofts; 1986: 1867–1877.
3. Duława J. Vademecum medycyny. Wydawnictwo Lekarskie PZWL; 2015: 34–46.
4. Porta M. Dictionary of Epidemiology. Oxford: International Epidemiological Association – Oxford University Press; 2008.
5. Beaglehole R, Bonita R, Kjellstrom T. Podstawy epidemiologii. Łódź: Instytut Medycyny Pracy; 2002.
6. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. STROBE Initiative The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)

statement: guidelines for reporting observational studies. Prev Med 2007; Oct; 45(4): 247–251.
7. Brozek G, Lawson J, Shpakou A, Fedortsiv O, Hryshchuk L, Rennie D, et al. Childhood asthma prevalence and risk factors in three Eastern European countries - the Belarus, Ukraine, Poland Asthma Study (BUPAS): an international prevalence study. BMC Pulmonary Medicine 2016; 16: 11.
8. Jędrychowski W. Zasady planowania i prowadzenia badań naukowych w medycynie. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego; 2004.
9. Kurpas D, Ratajczak-Olszewska B, Libera A, Mroczek B, Szpakow A, Halski T, red. Jak pisać prace naukowe i gdzie je publikować? Opole: Państwowa Medyczna Wyższa Szkoła Zawodowa; 2014.
10. Ryś P, Władysiuk M, Skrzekowska-Baran I, Małecki M. Review articles, systematic reviews and metaanalyses: which can be trusted? Pol Arch Med Wewn 2009; 119(3): 148–156.
11. McConnel S. How to Write a Good Technical Article. From the Editor. IEEE Software [online] 2002 Sep/Oct [cyt. 20.02.2017]. Available from URL: http://www.construx.com/stevemcc/
12. Albert T. Writing for journals: a paradigm lost? J Epidemiol Community Health 2000; 54: 642–643.
13. George M. Hall How To Write a Paper. 5th Edition. BMJ Books; 2012.
14. Ludbrook J. Writing intelligible English prose for biomedical journals. J Clin Exp Pharmacol Physiol 2007; 34(5–6): 508–514.
15. Liśkiewicz T, Liśkiewicz G. Wprowadzenie do efektywnego publikowania naukowego. Jak przygotować, wysłać i promować artykuł naukowy. Łódź: Amber Editing; 2014.
16. Nicolaides A, Thornton E. The process of writing a scientific paper. Int Angiol 2000; 19: 184–190.
17. Sun H, Linton J. Structuring papers for success: Making your paper more like a high impact publication. Technovation 2014; 34(10): 571–573.
18. Shah J. Some rules for writing medical articles for peer-reviewed journals. Ann R Coll Surg Engl 2015 May; 97(4):252–254.
19. Weiner J. Technika pisania i prezentowania przyrodniczych prac naukowych – przewodnik praktyczny. Warszawa: Wydawnictwo Naukowe PWN; 2012.

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