MODERN TEACHING TECHNOLOGIES

СУЧАСНІ ПЕДАГОГІЧНІ ТЕХНОЛОГІЇ

EFFICIENCY ESTIMATION OF SCIENTIFIC RESEARCH CONDUCTED BY MASTERS' OF NURSING BY MEANS OF MODERN SCIENTOMETRIC TECHNOLOGIES

O. V. Voznyuk*, V. V. Svyrydyuk**

Nursing is an important link in health care, providing a wide range of medical care that includes caring, first aid, prevention, rehabilitation, etc. The integration of Ukraine into the international labor market creates new requirements for health insurance. Scientific research in the sphere of nursing is an integral part of the professional training of the nurses. Masters' of Nursing are involved in the formation of unique scientific knowledge that promotes nursing practices that distinguishes nursing from other professions. One of the important tasks of professional training for Masters' students are forming a scientific communicative competence in order to improve not only their scientific research but also creating favorable conditions for representing the scientific research results with the help of innovative scientometric technologies. As such, the purpose of the article is to analyze the utilization of innovative approaches for assessing the validity of the results of Masters' scientific research by means of modern scientometric technologies. The research methods are as follows: to reach the objectives the cross-correlation analysis is used. The research results are as follows: For 9 years, from 2010 to 2018, Masters created 1037 intellectual property documents. The obtained cross-correlation analysis data establishes a direct relationship between such scientometric indicators as: the total number of publications, the Hirsch index, the number of publications included in the international scientometric database, the number of publications in foreign journals, the number of publications included in the list of scientific professional editions of Ukraine. The analysis enables the

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formulation of scientific criteria for evaluating the significance of scientific research conducted by Master's of Nursing. This consists of the ability of the Masters to create intellectual property documents, to disseminate their research to the international scientific community. According to the scientific criteria, the following indicators are proposed: the number of presentations at the international level; the number of certificates confirming scientific development and its presentation at international scientific forums; the quantity and quality of the intellectual property documents; the number of publications included in international scientometric database; the number of publications in foreign languages; the number of publications included in the list of scientific professional editions of Ukraine; the presence of ORCID; the presence of citations by other researchers; presence and value of the Hirsch Index.

Key words: *nursing, scientific research of Masters' of Nursing, scientometric database.*

ОЦІНКА ЕФЕКТИВНОСТІ НАУКОВИХ ДОСЛІДЖЕНЬ МАГІСТРІВ МЕДСЕСТРИНСТВА ЗАСОБАМИ СУЧАСНИХ НАУКОМЕТРИЧНИХ ТЕХНОЛОГІЙ

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Сестринська справа є важливою ланкою охорони здоров'я, представники якої надають широкий спектр медичної допомоги (догляд, перша допомога, профілактика, реабілітація тощо). Інтеграція України до міжнародного ринку праці пропонує нові вимоги до медичного страхування. Наукові дослідження в області медсестринства є невід'ємною складовою професійної підготовки медичних сестер. Магістри у галузі сестринської справи беруть участь у формуванні унікальних наукових знань, які відрізняють медсестринство від інших професій, що сприяє підвищенню сестринської практики. Одним з важливих завдань підготовки магістрів в галузі сестринської справи є формування в них наукової комунікативної компетентності для вдосконалення не тільки наукових досліджень, але й для поліпшення репрезентації результатів за допомогою інноваційних наукометричних технологій. Завдання статті: аналіз можливостей використання інноваційних підходів для оцінки вагомості результатів наукових досліджень магістрів засобами сучасних наукометричних технологій. Методи дослідження. Використовується крос-кореляційний аналіз. Протягом 9-х років, з 2010 по 2018 рр. магістри створили 1037 об'єктів інтелектуальної власності. Отримані дані крос-кореляційного аналізу встановлюють пряму залежність між такими наукометричними показниками, як: загальна кількість публікацій, індекс Гірша, кількість публікацій, що входять в міжнародні наукометричні бази, кількість публікацій у зарубіжних виданнях, кількість публікацій у професійних виданнях, включеним до списку, затвердженого атестацією науково-педагогічних кадрів Департаменту освіти і науки України. Проведений аналіз дозволив сформулювати наукометричні критерії оцінки значущості наукових досліджень магістрів сестринської справи, які полягають у здатності магістрів створювати об'єкти інтелектуальної власності, репрезентувати їх міжнародному науковому товариству та забезпечувати їх просування на ринок інтелектуальної власності. До наукометричних критеріїв пропонується приймати такі показники: кількість презентацій на міжнародному рівні; кількість дипломів за кращу наукову розробку та її презентацію на міжнародних наукових форумах; кількість і якість об'єктів інтелектуальної власності (монографії, підручники, посібники, патенти, статті, дисертації тощо); кількість публікацій, що потрапили до інформаційних фондів міжнародних наукометричних баз; кількість публікацій іноземними мовами; кількість публікацій у виданнях, які входять до переліку наукових фахових видань України; наявність ORCID; наявність цитування іншими дослідниками; наявність і розмір індексу Гірша.

Ключові слова: *медсестринство, наукові дослідження магістрів у галузі медсестринтства, наукометричні бази даних.*

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Introduction. Nursing is an important part of health care, providing a wide range of medical care. Integrating Ukraine into the international labor market sets new requirements for nursing. This is due to the fact that the main link in the functioning of health care, both in developed and developing countries, were and remains nurses [6; 5]

Nursing graduates – the Masters' of Nursing are leading specialists in the management of nursing services in health care institutions, as well as an integral part of higher medical (nursing) education and the main driving force of scientific research in the sphere of nursing.

Scientific research in the field of medicine is an integral part of the professional training of nurses with higher education. Masters' of Nursing participate in the formation of unique scientific knowledge that distinguishes nursing among other medical professions and promotes improving the quality of nursing practice, specifically the pedagogical aspects of nurses' activities in the course of preventive work among the population for spreading a healthy lifestyle.

It should be noted that long before the adoption of the aforementioned concept of nursing activities at the legislative level, domestic and foreign researchers had elaborated in detail the main principles and outlined prospective approaches to improving the quality of higher education (the magistracy) by combining education with science and production. However, the following questions still remain: 1) the quantitative measurement by means of *scientometrics* of the results of conducted research; 2) the proper presentation of these results at the international level with the use of modern means of scientific communication; 3) the protection of intellectual property rights for the research created by the Masters.

The main trend in the contemporary development of science as a form of social consciousness is the intensive implementation of information and computer scientometric technologies. These technologies, which relate to the study of measuring and analyzing science, technology and innovation, also assess the impact of research, journals and institutes, the understanding of scientific citations, mapping scientific fields and the production of indicators for use in policy and management contexts.

Derek John de Solla Price, an American scientist who is one of the founders of scientometrics wrote that, unfortunately, when evaluating scientific productivity, one cannot measure what one would like, but only that which is possible [2].

Scientific research, in addition to researching various aspects of communication in science, deals with the quantitative measurement of the significance of scientific results and the development of new approaches to quantitative assessment of the value of a scientific component in higher professional education. Therefore, one of the problems of the Masters' professional training lies in ensuring that they form scientific communicative competence, thus increasing not only the quality of scientific research, but also improving the presentation of the results by means of innovative scientometrics technologies [1–4; 9; 10].

Other researchers have expanded on the work of D. Price, in particulure, Y. Hartfield. They obtained scientific substantiation of the scientometric indicators of evaluating scientists' activities by the citation indices as the best approximation to their objective characteristics in the form of numerical values of quantitative measurement [1].

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Furthermore, according to two recent UNESCO expert reports on this subject, the use of scientometric citation indicators for assessing the significance of scientific research results has become world-wide recognized [7; 8].

Improving the quality of higher education and modernizing the structure, content and organization of education on the basis of the competence approach are among the key directions of the National Strategy for the Development of Education in Ukraine for 2012 – 2021.

Ukraine started training Masters' of Nursing in 2008, when institutions of higher nursing education were established in Ukraine. These included Zhytomyr Institute of Nursing (now Zhytomyr Medical Institute of Zhytomyr Regional Council) and Nursing Education and Research Institute of Ternopil State Medical University. During this time, the first scientific research of the students for the Masters' degree in the field of nursing took place in Ukraine [6].

The results of scientific activities in any field are assessed using quantitative and qualitative scientometric indicators, allowing researchers to obtain important information about the relevance of a particular scientific subject in numerical dimension. Currently, the criteria of scientometric statistics, advanced text analysis (text mining) and scientometric indices (Hirsch index, index H^{10}, etc.), and indices of the theory of fractals (Hurst index, Hausdorff-Bezikovich's dimension, etc.) are used to assess the importance of the results of scientific studies in the field of natural sciences and the humanities [10].

The problem of assessing the effectiveness of the scientific research conducted by Masters' of Nursing with the help of modern scientometric technologies is not yet sufficiently studied, therefore, the aim of the article is to analyze the possibilities of using innovative approaches to assess the significance of Masters' results in scientific research with the help of modern scientometric technologies.

To achieve this stated aim, a correlation analysis is used. The results of 150 Masters' (graduates of the Zhytomyr Medical Institute in 2010–2018) scientific research for 112 formal indicators are put into the cells of an Excel spreadsheet. The formalization is carried out by the quantitative gradation of measurable indicators. This is the case, first of all, of intellectual property documents created by the Masters on the basis of the research carried out, including Masters' theses. As a result, an array of data is obtained consisting of 16,800 numerical values that characterize the objects of intellectual property.

Results. The mentioned 112 indicators are streamed into 7 groups which are shown in Table 1. The indicators of the general characteristics of the Masters' theses are introduced: the year of theses defense; the relationship between the scientific specialties of the theses' scientific leaders and their scientific degrees, depending on the subject chosen by the magistracy students; the number of defended Masters' theses depending on the year of defense, etc. It should be noted that the number of defended Masters' theses varied greatly depending on the year of defense. This is directly related to the number of students who began studying in magistracy. During 10 years of observation among the magistracy students, there were no students who failed to prepare and defend their Master's thesis.

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Table 1

The main groups of indicators that characterize the objects of intellectual property created by Masters' of Nursing

№	The name of groups' indicators	The number of the indicators
1	General characteristics of Masters' theses	6
2	Research strategies and scientific directions	14
3	Content analysis of Masters' theses	30
4	Number and quality of scientific results' presentations (approbation)	10
5	Publications, other objects of intellectual property and their scientometric indices	14
6	Typical mistakes in Masters' theses	35
7	The number of questions and correct answers at defense proceedings as well as the estimation of Masters' theses	3
8	Total:	112

The relationship between the scientific specialties of the Masters' theses supervisor and their scientific degrees depended on the scientific research subject being chosen by the students. In accordance with the chosen subject, the academic council approved a thesis supervisor who was a specialist in the subject chosen by the student. The majority of chosen thesis supervisors were Doctors' of Medical Sciences (58,5 %), followed by Candidates of Pedagogical Sciences (28,4 %), Candidates of Biological Sciences (9,5 %), and Candidates of Medical Sciences (6,6 %). Candidates of Philosophical Sciences were thesis supervisors of only one Master's thesis (0.7 %).

The research strategies and research subjects have been ranked in 15 indicators in a group named "Research Strategies and Scientific Directions." Table 2 shows the scientific directions in which magistracy students conducted their research.

The largest proportion of scientific research was devoted to the role of a nurse in preventing common, socially significant diseases, such as coronary heart disease, arterial hypertension, diabetes mellitus, breast cancer, etc. Medical aspects of prevention, as well as the possibility of using medical nurses' pedagogical approaches to preventing diseases through promoting a healthy lifestyle, were also investigated. The share of scientific research in this direction was 22.7 %.

The second direction (13.3 %) was the study of various aspects of the standardization of the nursing process, specifically, the optimization of the load on nurses and the introduction of European and international standards for nursing interventions in the health care institutions of Ukraine. 10.0 % of the Masters' scientific research was devoted to the substantiation of new approaches to forming the health-preserving competence in prospective nurses. A significant proportion (8.0 %) of research concerned the problem aspects of management in nursing.

In general, the proportion of research carried out in the medical sphere reached 71.9 %. The research conducted on pedagogical, philosophical, psychological, ecological and other subjects made up 28,1 %.

Despite the availability of thesis supervisors from a wide-range of academic specialties, the magistrate students prefer to conduct research within the field of medicine.

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Table 2

Scientific directions of nursing magistrate students' research

Scientific directions	The proportion	
	Abs. N	M±m, %
Prevention of common socially significant diseases	34	22,7±3,4
Standardization of the nursing process	20	13,3±2,7
Forming health-saving competence	15	10,0±2,4
Management in nursing	12	8,0±2,2
Rehabilitation of common socially significant diseases	10	6,7±2,2
Nursing education	9	6,0±1,9
Forming safe hospital space	8	5,3±1,8
Palliative care	7	4,7±1,8
Forming professional competence	6	4,0±1,6
Forming communicative competence	5	3,3±1,4
Counteracting HIV and AIDS	5	3,3±1,4
Counteracting the formation of emotional burnout syndrome	4	2,7±1,4
Forming information competence	4	2,7±1,4
Conflictology	4	2,7±1,4
Family medicine	3	2,0±1,1
Forming sociological competence	2	1,3±0,8
Forming multicultural competence	1	0,7±0,7
Emergency Medicine	1	0,7±0,7
Total:	150	100,0±0,0

The research methods used by the students of the magistracy are put into three research strategies: the strategy of comparison (93 Masters' theses – 62,0 ± 4,0 %), the experiment strategy (36 Masters' theses – 24,0 ± 3,5 %) and the strategy of series of dynamics analysis (21 Masters' theses – 14.0 ± 2.8 %).

The students of the magistracy sufficiently utilized both theoretical (biblical semantic, statistical, simulation, scientometric, trending, etc.) and empirical methods (anthropometry, timekeeping, experiment, etc.).

An important scientometric criterion is the number and quality of publications (the objects of intellectual property) created by the Masters. Table 3 presents the results of the statistical analysis of such publications.

In general, for the 9 years between 2010 and 2018, 1037 intellectual property documents were created by the Masters: on average, 6.9 ± 0.5 units per Master. Furthermore, there have been no Masters who have not produced a publication. The number of publications varied widely from 2 to 56. Most publications consisted of articles and abstracts in various scientific journals which included prestigious foreign professional journals, leading international scientometric databases of Web of Science, Scopus, Google scholar, and domestic collections of scientific works that do not have electronic versions on the Internet with the corresponding English-language attributes. It should be noted that the majority of publications produced by Masters during their time at higher education institutes were in the form of abstracts, whereas post-graduation, publications were more frequently in the form of articles published in specialized journals, and begin to include other objects of intellectual property such as monographs, textbooks, manuals, etc.

The Masters published articles and abstracts mostly independently. Only

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some have produced their own monographs, usually those who have gone on to prepared and defended a doctoral dissertation. Those Masters have articles in scientific journal.

Table 3

Analysis of the objects of intellectual property created by the Masters' of Nursing of Zhytomyr Medical Institute

Name of intellectual property documents	Number of intellectual property **documents** created by the **Masters' of Nursing**					
	While studying in a magistracy		After graduation		Total	
	Abs. N	M±m, %	Abs. N	M±m, %	Abs. N	M±m, %
Articles, total: including	72	6,9±0,8	209	20,2±1,2	281	27,1±1,5
in foreign publications	0	0,0±0,0	12	1,2±0,3	12	1,2±0,3
in the journals included in the funds of international scientometric databases	0	0,0±0,0	5	0,5±0,2	5	0,5±0,2
in domestic professional editions included in the list of scientific professional editions of Ukraine	0	0,0±0,0	21	2,0±0,4	21	2,0±0,4
in other editions	72	6,9±0,8	171	16,5±1,1	243	23,4±1,2
Abstracts	352	33,9±1,5	378	35,2±1,4	730	72,3±1,5
Monographs and sections of the monographs	0	0,0±0,0	19	1,8±0,4	19	1,8±0,4
Textbooks, manuals and their sections	0	0,0±0,0	7	0,7±0,3	7	0,7±0,3
Total (articles, abstracts, monographs, textbooks and manuals):	424	40,9±1,5	613	59,1±1,5	1037	100,0±0,0

Masters also published articles in foreign editions and in the editions included in international scientometric databases, including the following national journals: "Zhytomyr Ivan Franko State University Journal", "Ukraine. Health of the Nation", "The Master of Nursing", "Social Medicine and Health Care Organizations Journal", "East European Medical Journal", "Family Medicine", etc. The vast majority of the Masters' publications include articles and abstracts published in Zhytomyr Institute of Nursing Journal, the annual conference proceedings "Higher education in nursing: problems and perspectives", the collections of the materials of the annual International Congress of the Students and Young Scientists of Ternopil State Medical University, and the collections of the materials of the annual International Medical and Pharmaceutical Conference of the Students and Young Scientists "Current issues of medicine and pharmacy BIMKO" of Bukovina State Medical University.

The share of Masters with the index of citation is 4.7 %. 24 persons have ORCID (16.0 %), mostly from Zhytomyr Medical Institute lectures with Masters' degree. 1.3 % of the Masters have the Hirsch index.

To determine the most significant scientometric criteria, a correlation analysis was carried out utilizing a formalized Excel table for 36 indicators, a list of which is given in Table 4.
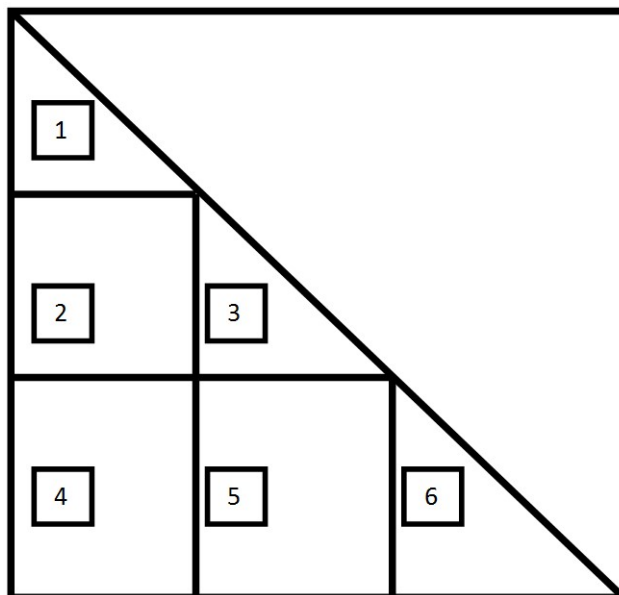
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Table 4

**Scientometric indicators according to which a correlation analysis of
intellectual property created by the Masters' of Nursing was carried out**

№	Indicator
1	Number of surveyed patients and questioned respondents
2	Number of comparison groups
3	Total number of pages in Master's thesis
4	Number of sections in the Master's thesis
5	Number of introductions' pages in the Master's thesis
6	The number of first section pages in the Master's thesis
7	The number of the divisions in the first section in the Master's thesis
8	The number of second section pages in the Master's thesis
9	The number of second section divisions in the Master's thesis
10	The number of third section pages in the Master's thesis
11	The number of third section divisions in the Master's thesis
12	The number of fourth section pages in the Master's thesis
13	The number of fourth section divisions in the Master's thesis
14	The number of conclusions' pages in the Master's thesis
15	The number of the points in the conclusions in the Master's thesis
16	The number of pages of practical recommendations in the Master's thesis
17	The number of points in practical recommendations in the Master's thesis
18	The number of pages of the abstract in the Master's thesis
19	The number of keywords in the annotation in the Master's thesis
20	The number of literary sources used in the Master's thesis
21	The number of literary sources in Cyrillic in the Master's thesis
22	The number of literary sources in Latin in the Master's thesis
23	The number of tables in the Master's thesis
24	The number of illustrations (charts, graphs, photos, etc.) in the Master's thesis
25	Total number of presentations (reports) on the results of scientific research in the Master's thesis
26	The number of reports at the international level
27	The number of reports at the national level
28	The number of reports at regional level scientific forums
29	The number of honors (diplomas) for the best report
30	Total number of publications
31	The number of publications in the editions included in international scientometric database
32	The number of publications in foreign editions
33	The number of publications included in the list of scientific professional editions of Ukraine
34	Presence of ORCID
35	The value of the Hirsch index
36	The mark obtained during the defense of the Master's thesis

The form in which the Excel program outputs the value of the correlation coefficients (36 lines per 36 columns) does not allow it to be placed on a standard sheet A4, so Table 5 is presented in the form of 6 fragments according to Figure 1.

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Picture 1. The form of dividing the table 5 into fragments

Table 5 (first fragment)

The values of the coefficients of linear correlation of the scientometric indicators from 1 to 12 inclusive

№	1	2	3	4	5	6	7	8	9	10	11	12
1	1											
2	0,34	1										
3	0,33	0,24	1									
4	0,06	0,12	0,25	1								
5	0,15	0,19	0,28	0,16	1							
6	0,16	-0,01	0,33	-0,10	-0,08	1						
7	0,05	0,35	0,19	0,18	0,25	0,17	1					
8	0,06	-0,20	0,14	-0,43	-0,18	0,11	-0,38	1				
9	0,02	-0,08	0,09	-0,22	-0,27	-0,02	-0,34	0,75	1			
10	0,30	0,41	0,42	-0,15	0,40	-0,03	0,34	-0,19	-0,28	1		
11	0,13	0,48	0,17	0,18	0,40	-0,11	0,43	-0,28	-0,18	0,43	1	
12	0,02	0,06	0,42	0,55	0,08	0,12	0,28	-0,32	-0,25	-0,09	-0,04	1

In the first fragment of Table 5 horizontally and vertically appear:

- **Number 1**: the number of the surveyed (questioned) persons;

- **Number 2**: the number of groups of comparison (match);

- **Number 3**: the total number of the pages in the Master's thesis;

- **Number 4**: the number of the sections in the Master's thesis;

- **Number 5**: the number of pages of the introduction;

- **Number 6**: the number of pages of section 1;

- **Number 7**: the number of divisions in section 1;

- **Number 8**: the number of pages of section 2;

- **Number 9**: the number of divisions in section 2;

- **Number 10**: the number of pages of section 3;

- **Number 11**: the number of divisions in section 3;

- **Number 12**: the number of pages in section 4.

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Table 5 shows a gray background where the correlation of the average degree took place, and the dark background is a correlation of strong degree (close correlation).

A close direct correlation between the number of pages in the section 2 of the Master's thesis (column N 8) and the number of divisions of section 2 (line N 9) was found: R = 0.75 ± 0.04.

The second fragment of table 5

Correlation between indicators 1-12 and 13-24

№	1	2	3	4	5	6	7	8	9	10	11	12
13	0,03	0,06	0,19	0,52	0,37	-0,05	0,25	-0,23	-0,11	-0,14	0,23	0,48
14	0,02	0,07	0,30	-0,19	0,13	0,13	0,03	0,09	0,03	0,27	0,10	-0,08
15	0,17	0,37	0,41	0,05	0,18	0,07	0,22	-0,11	-0,10	0,49	0,29	0,06
16	0,18	0,20	-0,09	0,08	0,14	-0,01	0,08	-0,31	-0,33	0,25	0,13	-0,08
17	0,31	0,41	0,13	0,02	0,23	0,01	0,26	-0,23	-0,26	0,50	0,28	-0,04
18	-0,01	0,12	0,01	0,07	-0,13	0,03	-0,12	0,03	0,09	0,02	-0,13	0,06
19	-0,01	0,08	-0,06	0,06	-0,18	0,02	-0,17	0,05	0,12	-0,04	-0,14	-0,01
20	-0,09	0,07	0,23	0,02	0,05	0,21	0,05	0,10	-0,06	0,10	0,06	0,07
21	-0,15	-0,08	0,18	-0,06	-0,01	0,18	-0,06	0,26	0,10	-0,05	-0,02	0,04
22	0,11	0,17	0,17	0,11	0,19	0,09	0,14	-0,15	-0,13	0,25	0,08	0,01
23	0,04	0,27	0,58	0,21	0,16	-0,04	0,19	-0,06	-0,09	0,50	0,26	0,23
24	0,28	0,38	0,44	0,30	0,23	0,04	0,39	-0,24	-0,30	0,43	0,29	0,35

In the second fragment of Table 5 horizontally, the numbers 1 to 12 include the same values as in the first fragment, and vertically under the numbers from 13 to 24 inclusive, the following indicators are represented:

- **Number 13**: the number of units in section 4;

- **Number 14**: the number of pages in the conclusions;

- **Number 15**: the number of points in the conclusions;

- **Number 16**: the number of pages in practical recommendations;

- **Number 17**: the number of points in practical recommendations;

- **Number 18**: the number of pages in the abstract;

- **Number 19**: the number of keywords in the abstract;

- **Number 20**: the number of used literary sources;

- **Number 21**: the number of literary sources in Cyrillic;

- **Number 22:** the number of literary sources in Latin;

- **Number 23**: the number of tables;

- **Number 24**: the number of illustrations (diagrams, graphs, photos, etc.).

No case of close direct or inverse correlation in this fragment of Table 5 was found.

In the third fragment of Table 5 horizontally, the numbers 1 to 12 include the same values as in the first fragment, and vertically under the numbers from 25 to 36 inclusive, the following indicators are represented:

- **Number 25**: the total number of presentations (reports);

- **Number 26**: the number of reports at the international level;

- **Number 27**: the number of reports at the national level;

- **Number 28**: number of reports at scientific forums at the regional level;

- **Number 29**: the number of diplomas (marks) for the best report;

- **Number 30**: the number of publications;

- **Number 31**: the number of publications in the publications included into international scientometric databases;

- **Number 32**: the number of publications in foreign editions;

- **Number 33**: the number of publications included in the list of

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scientific professional editions of Ukraine;

- **Number 34**: the presence of ORCID;

- **Number 35**: the value of the Hirsch index;

- **Number 36**: the mark obtained during the defense of the Master's thesis.

The third fragment of Table 5

Correlation between indicators 1-12 and 25-36

№	1	2	3	4	5	6	7	8	9	10	11	12
25	0,15	0,15	0,17	0,06	-0,06	0,06	0,02	0,07	0,03	0,14	0,09	-0,20
26	0,11	0,17	0,17	0,02	-0,09	0,03	-0,01	0,02	0,08	0,13	0,04	-0,01
27	0,02	0,08	-0,01	0,15	-0,13	-0,11	0,04	0,02	0,03	0,01	0,04	-0,17
28	0,21	0,09	0,14	0,10	-0,06	0,21	-0,01	0,06	0,12	-0,01	0,07	-0,06
29	0,06	0,01	0,02	-0,11	-0,08	0,06	-0,05	-0,01	-0,08	0,11	-0,07	-0,15
30	0,09	-0,03	0,08	-0,12	-0,01	0,10	-0,03	0,12	0,07	0,01	-0,01	-0,11
31	0,05	-0,04	0,06	-0,08	-0,10	0,17	0,05	0,05	0,08	0,01	-0,01	-0,11
32	0,07	0,01	-0,01	-0,09	-0,07	0,13	-0,01	0,05	0,05	-0,03	0,01	-0,10
33	0,03	-0,04	0,01	-0,14	0,03	0,05	-0,01	0,01	-0,01	0,02	-0,01	-0,08
34	-0,01	0,02	0,03	0,09	-0,27	-0,15	-0,02	0,03	0,11	-0,03	-0,06	-0,01
35	-0,04	-0,13	-0,01	-0,18	-0,05	0,06	0,06	0,09	0,08	-0,07	-0,12	-0,14
36	0,24	0,04	0,25	0,07	-0,04	0,16	0,17	0,01	0,02	0,07	-0,01	0,04

In the third fragment of Table 5, no cases of close, direct or inverse correlation between the investigated parameters were detected.

The fourth fragment of table 5

Correlation between indicators 13-24

№	13	14	15	16	17	18	19	20	21	22	23	24
13	1											
14	-0,03	1										
15	0,09	0,56	1									
16	0,04	0,05	0,13	1								
17	-0,01	0,16	0,32	0,79	1							
18	-0,04	0,02	0,04	0,16	0,19	1						
19	-0,06	0,01	-0,03	0,18	0,17	0,87	1					
20	0,02	0,23	0,28	-0,04	0,01	0,01	0,01	1				
21	-0,01	0,01	0,08	-0,23	-0,28	-0,16	-0,11	0,79	1			
22	0,03	0,34	0,24	0,31	0,48	0,33	0,21	0,08	-0,45	1		
23	0,02	0,30	0,48	0,01	0,24	0,07	0,03	0,28	0,15	0,25	1	
24	0,18	0,10	0,33	0,21	0,41	0,04	-0,02	0,04	-0,09	0,21	0,31	1

In the fourth fragment of Table 5, from numbers 13 to 24 inclusively, horizontally and vertically, there are such indicators as in the second fragment vertically.

A close direct correlation between the number of pages of practical recommendations (column N 16) and the number of points in practical recommendations (line N 17) was found: R = 0.79 ± 0.03.

A close direct correlation is found between the number of abstract pages (column N 18) and the number of keywords in the abstract (line N 19): R = 0.87 ± 0.03.

A close direct correlation between the total number of used literary sources

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(column N 20) and the number of literary sources in Cyrillic (line N 21) was found: R = 0.79 ± 0.03.

In the fifth fragment of Table 5, from numbers 13 to 24 inclusively, the same indicators appear horizontally in the fourth fragment, and vertically from number 25, to and including 36, the same indicators appear as in the third fragment vertically.

Fifth fragment of table 5

Correlation between indicators 13-24 and 25-36

№	13	14	15	16	17	18	19	20	21	22	23	24
25	-0,11	0,12	0,09	-0,01	0,04	-0,16	-0,15	0,16	0,04	0,14	0,23	0,08
26	-0,01	0,08	0,09	0,01	0,06	0,32	0,34	0,07	-0,03	0,14	0,21	0,07
27	-0,11	-0,02	-0,05	-0,05	-0,01	-0,34	-0,31	0,09	0,05	0,06	0,06	0,04
28	-0,05	0,11	0,12	-0,05	-0,06	-0,14	-0,10	0,07	0,05	0,02	0,13	0,02
29	-0,12	0,14	0,19	-0,01	-0,01	0,12	0,16	0,06	-0,01	0,05	0,02	-0,02
30	-0,09	0,06	0,09	0,01	-0,07	-0,16	-0,16	0,05	0,10	-0,13	0,03	-0,14
31	-0,09	0,02	0,09	-0,04	-0,08	-0,07	-0,08	0,07	0,06	-0,06	0,01	-0,10
32	-0,04	-0,02	0,09	-0,01	-0,05	-0,07	-0,07	0,03	0,04	-0,10	-0,04	-0,18
33	-0,06	0,04	0,06	0,07	-0,04	-0,09	-0,08	0,04	0,06	-0,11	-0,03	-0,13
34	-0,08	-0,04	0,03	-0,03	-0,02	-0,04	0,02	-0,02	-0,03	0,02	0,21	-0,01
35	-0,09	0,04	-0,02	0,01	-0,07	-0,07	-0,06	0,02	0,07	-0,11	-0,09	-0,15
36	0,08	0,15	0,07	-0,04	0,07	-0,01	-0,01	0,03	-0,05	0,18	0,15	0,20

No case of close, direct or inverse correlation between the indicators in the fifth fragment of Table 5 was detected.

In the sixth fragment of Table 5, from numbers 25 to 36 inclusively, horizontally and vertically, there are corresponding figures as in the third fragment vertically.

Sixth fragment of table 5

Correlation between indicators 25-36

№	25	26	27	28	29	30	31	32	33	34	35	36
25	1											
26	0,58	1										
27	0,69	0,06	1									
28	0,52	0,07	0,29	1								
29	0,25	0,39	0,02	0,02	1							
30	0,29	0,15	0,14	0,27	0,38	1						
31	0,27	0,29	0,04	0,20	0,43	0,79	1					
32	0,23	0,30	-0,01	0,14	0,40	0,73	0,91	1				
33	0,14	0,13	-0,02	0,14	0,38	0,90	0,75	0,65	1			
34	0,29	0,17	0,31	0,14	0,17	0,29	0,34	0,32	0,19	1		
35	0,13	0,17	-0,01	0,07	0,41	0,72	0,72	0,66	0,76	0,20	1	
36	0,19	0,15	0,13	0,13	0,35	0,21	0,21	0,17	0,16	0,18	0,11	1

A close direct correlation between the total number of approbation and presentations (column N 25) and the number of presentations (reports) at all-Ukrainian scientific forums was found (line N 27): R = 0.69 ± 0.04.

A close direct correlation was found between the total number of publications (column N 30) and the number of publications included in international scientometric databases (line N 31): R = 0.79 ± 0.03.

A close direct correlation was found between the total number of publications (column N 30) and the

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number of publications in foreign editions (line N 32): R = 0.73 ± 0.01.

A close direct correlation was found between the number of publications included in the international scientometric databases (column N 31) and the number of publications in foreign editions (line N 32): R = 0.91 ± 0.03.

A close direct correlation was found between the total number of publications (column N 30) and the number of publications included in the list of scientific professional editions of Ukraine (line N 33): R = 0.90 ± 0.01.

A close direct correlation was found between the number of publications in the editions included in the international scientometric databases (column N 31) and the number of publications included in the list of scientific professional editions of Ukraine (line N 33): R = 0.75 ± 0.04.

A close direct correlation was found between the number of publications in foreign editions (column N 32) and the number of publications included in the list of scientific professional editions of Ukraine (line N 33): R = 0.65 ± 0.05.

A close direct correlation was found between the total number of publications (column N 30) and the presence of the Hirsch index (line N 35): R = 0.72 ± 0.04.

The close direct correlation was found between the number of publications in the editions included in the international scientometric databases (column N 31) and the presence of the Hirsch index (line N 35): R = 0.72 ± 0.04.

The close direct correlation was found between the number of publications in foreign editions (column N 32) and the presence of the Hirsch index (line N 35): R = 0.66 ± 0.05.

A close direct correlation was found between the number of publications included in the list of scientific professional editions of Ukraine (column N 33) and presence of the

Hirsch index (line N 35): R = 0.76 ± 0.04.

Thus, according to the correlation analysis, it can be concluded that between such scientometric indicators as the total number of publications, the Hirsch index, the number of publications included in international scientometric databases, the number of publications in foreign editions, the number of publications included in the list of scientific professional editions of Ukraine, there is a close direct correlation.

The conducted analysis enables the formulation of scientific criteria for assessing the significance of scientific research of the Masters' of Nursing, which includes the ability of the Masters to create intellectual property documents, to present them to international scientific community and ensure their promotion in the intellectual property market.

According to the scientific criteria, the following indicators are proposed:

- the number of presentations at national and international levels;
- the number of diplomas for the best scientific development and its presentation at all-Ukrainian and international scientific forums;
- the quantity and quality of intellectual property documents: monographs, textbooks, manuals, patents, articles, abstracts, etc.;
- the number of publications included in information funds of international scientometric databases;
- the number of publications in the international scientific language;
- the number of publications in the included in the list of scientific professional editions of Ukraine;
- the presence of ORCID;
- the presence of the quotes by other researchers;
- the presence and value of the Hirsch index**.**

Conclusions. 1. Conducted content analysis of Masters' theses and an

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analysis of the quantity and quality of intellectual property documents enables the formulation of scientometric criteria for assessing the significance of scientific research of Masters. This consists of their ability to create intellectual property documents and to present them to the international scientific community by means of scientometric web-network, which in turn provides their promotion on the market of intellectual property.

2. According to the correlation analysis, the closest direct correlation is between such scientometric indicators as the total number of publications, the Hirsch index, the number of publications included in international scientometric databases, the number of publications in foreign editions, and the number of publications included in the list of scientific professional editions of Ukraine.

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