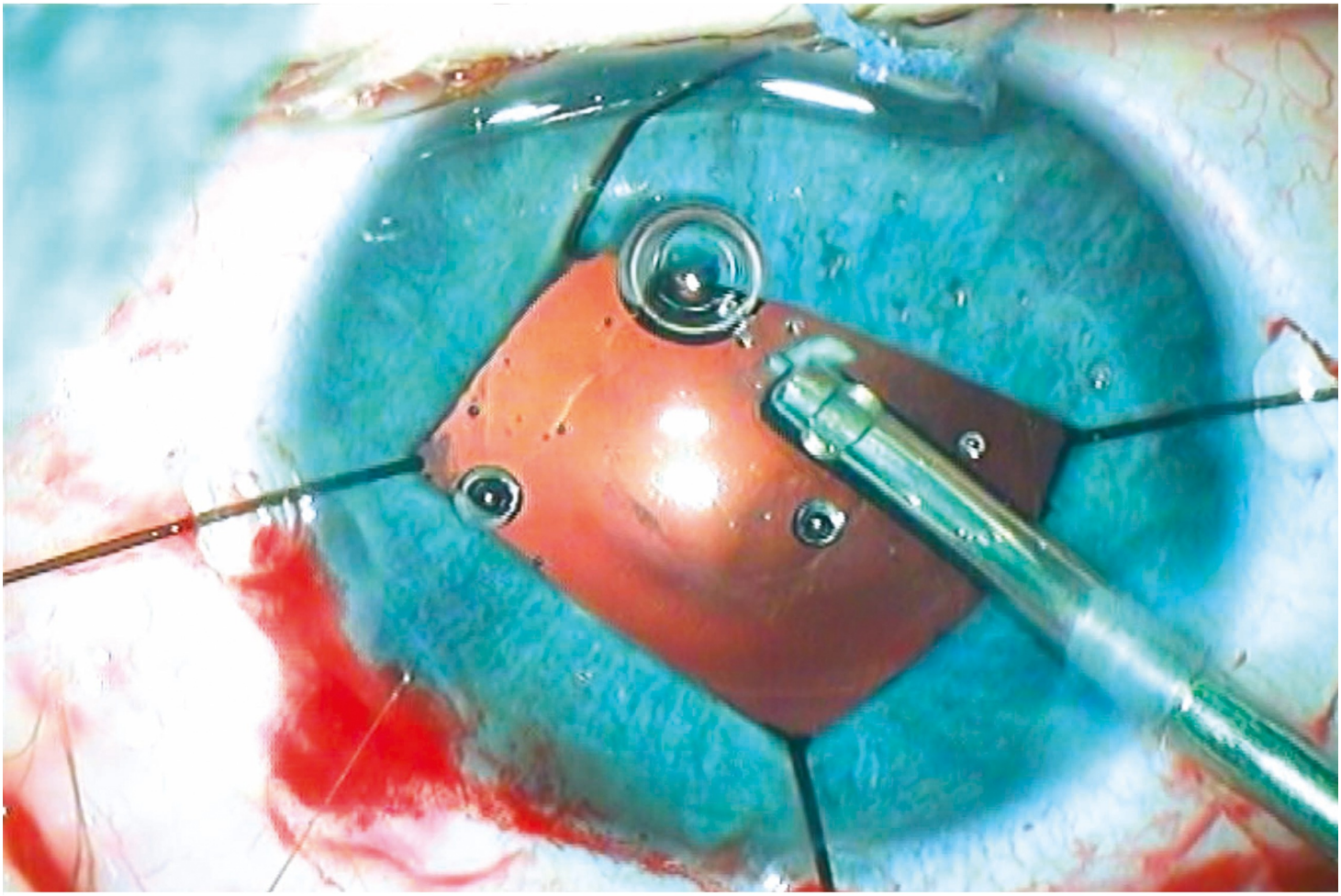
ISNN 0030-0675

Journal of Ophthalmology

(Ukraine)

№ 3 2021



Odesa

Organization of Ophthalmic Care

Psychosemantic analysis of eye care workers' percepts of creative abilities

N. V. Rodina [1], B. V. Biron, V. O. Suslova [1], A. V. Kernas [2], O. S. Grytsenko [1]

[1] Odesa Mechnikov National University
Odesa (Ukraine)

[2] Odessa National Maritime University
Odesa (Ukraine)

E-mail: nvrodinaod@gmail.com

Background: *This article puts the emphasis on the notion of "creative abilities" in the context of its interpretation by eye care workers. Creative potential is essential for the general and professional culture of physicians, and personal creativity takes on a new meaning in the age of digitalization and dominance of artificial intelligence in routine medical practice.*

Purpose: *To investigate eye care workers' percepts of creative abilities by conducting a psychosemantic analysis and considering these percepts as a source of health care workers' job satisfaction.*

Material and Methods: *The study sample was composed of the eye care workers from the Filatov Institute of Eye Diseases. Two hundred and eleven eye care workers were requested to take part in the study, and the response rate was 85.8% (181/211). The 181 responders included 99 nursing staff members and 82 physicians (ophthalmologists). The study was conducted with the use of Hughes and Powell's Guiding Principles for Life (GPL) Questionnaire (adapted by Semeniuk), the Kim, Leong, and Lee's Job Satisfaction Scale (JSS) (adapted by Semeniuk) and the Lüscher 8-color test.*

Results: *Eye care workers rated "Creativity" low among the 22 "Guiding Principles for Life". In physicians, such guiding principles as "Creativity", "Devout", and "Material wealth" were associated with each other, which indicates that the achievement of material wealth was associated with such a virtue as devout, and this achievement requires creativity. It was demonstrated that creativity as a guiding principle was more important for physicians than for the nursing staff, and in male physicians it was associated with unconscious satisfaction with working environment.*

Keywords:
psychosemantic analysis, percept, creativity, job satisfaction, ophthalmologists

Introduction

The importance of creative abilities in the activities of medical professionals is increasingly topical and highlighted in a number of studies. Most of these studies are devoted to the development of creative abilities in medical students [1-4], particularly those studying ophthalmology [5]. The articles on medicine of the future stress that, in the 21st century, medical professionals will be required to demonstrate creative abilities in developing novel promising treatments and show creative imagination in diagnostics [6].

Attitudes to the role of creative abilities in the activities of medical professionals have been studied among the healthcare workers involved in various medical specialties like family medicine, therapy, obstetrics and gynecology, pediatrics, psychiatry, surgery [7] and nursing care [8]. Although there have been several reports on creative solutions to problems in eye health care [9-11], the lack of studies on the attitudes of eye care workers to creative abilities is what makes the current study important.

Therefore, **the purpose** of this study was to investigate eye care workers' percepts of creative abilities by conducting a psychosemantic analysis and considering these percepts as a source of health care workers' job satisfaction.

Material and Methods

The study sample was composed of the eye care workers from the Filatov Institute. Two hundred and eleven eye care workers were requested to take part in the study, and the response rate was 85.8% (181/211). The 181 responders included 99 nursing staff members and 82 physicians (ophthalmologists). All nursing staff members were women, i.e., the subsample of nursing staff was composed of women only. Of 82 physicians, 38 (46.3%) and 44 (53.7%) were men and women, respectively.

The Hughes and Powell's Guiding Principles for Life (GPL) Questionnaire was used to study the attitudes of responders to the role of creative abilities in their life [12]. Twenty-two guiding principles for life (A world at peace, Honest, Friendship, Equality, Social justice, Politeness, Protecting the environment, Freedom, Meaning in life, Enjoying life, National Security, Wisdom, Broad-minded, Cleanliness, Helpful, Successful, Creativity, Exciting life, Social recognition, Spiritual life, Devout, and Material wealth) were listed, and the respondents were asked to rate them according to their importance. The principle ranked as most important was scored 22, and the least important was scored 1. We believed that the prevalence of creativity as a leading guiding principle for life among the above principles will indicate a positive attitude of respondents to the role of creative abilities in their personal life and recognition of the importance of creative abilities in professional and other activities.

Hughes and Powell believed that most people affirm a wide range of values, but particular people draw more heavily on certain sets of values than others. The original version of the questionnaire was for the first time used in the Australian Community Survey. The four different value orientations (domains) found by the study included Order, Social Well-being, Spirituality and Self-enhancement. However, the principles for life these domains are composed of have been not specified in the original version of the questionnaire. Semeniuk [13] aimed to identify the structure of these domains, translated the original version of the questionnaire into Ukrainian and customized it to the social and cultural realities of our nation. Particularly, since the methodology involved value ranking in order of importance, exploratory factor analysis was carried out and the non-factorability of the matrix was demonstrated, with a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.076. Consequently, the researcher proposed to consider any guiding principle for life as an individual index (individual factor) reflecting a particular life orientation of eye care workers. There were 22 of such factors. The criterion validity of the adapted questionnaire was assessed and confirmed [13] by comparing the results obtained with the questionnaire with those obtained with social and demographic parameters, organizational environment factors and parameters of the psychological methodologies aimed at assessment of the positive personality features, stress reactions, work-life balance, burnout, etc.

Two methodologies, the Kim, Leong, and Lee's Job Satisfaction Scale (JSS) (adapted by Semeniuk [13]) and the Lüscher 8-color test have been used to study respondents' job and organizational satisfaction. A two-level approach to the study of job and organizational satisfaction was applied, with the JCC used for the assessment of conscious job and organizational satisfaction, and the Lüscher test (an indicator of the proximity to the autogenous norm) used for the assessment of unconscious job and organizational satisfaction. This two-level approach was required because verbal methods of psychodiagnostics are susceptible to conscious and unconscious distortion. That is, this methodological approach provides a comprehensive perception about eye care workers' psychological well-being.

The JSS [14] consists of 5 items describing a subjective assessment of individual's job, and responders check a box for each item using a 5-point Likert-type scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The original JSS was found to have a Cronbach's α of 0.849. The adapted JCC demonstrated high construct validity for a general sample of medical staff, subsample of nursing staff and subsample of physician staff, as reflected by Cronbach's α values of 0.908, 0.906, and 0.971, respectively. In addition, it showed a high criterion validity, which was confirmed by comparing total scores as assessed by JSS and the Stress Reaction Inventory (SRI) for eye care workers [15].

The Lüscher color test is used to assess the person's subjective status and allows measuring persistent and situational psychoemotional statuses, current tendencies, anxiety and the ways for their compensation. This test has a long form and a short form [16]. We used the short Lüscher color test adapted by Sobchik [17] which is made up of eight colors: grey (0), blue (1), green (2), red (3), yellow (4), violet (5), brown (6) and black (7).

The test procedure is as follows. The eight color cards are arranged in front of the person taking the test, and the person is asked to rank-order them in order of preference. The test is performed under natural illumination, with light rays not falling directly on the color cards. The examinee is asked to try not to relate these colors to anything else.

The original instruction has been somewhat changed to reflect the examinee's unconscious job and organizational satisfaction: "Please, look at these cards attentively. Imagine that you are at your working place. Try to select the most preferable among these color cards without relating these to clothes, wall-paper, cars, etc." After the most preferable color card is selected, it is removed from the examinee's field of vision, and the s/he is instructed in the following way: "OK, not, please, select the most preferable among the remaining color cards". The above step is repeated until the examinee has only one color card in front of him/her. This suggested version of the procedure is performed two times without pause. The examiner writes the results of the test using conventional numbers of the colors.

In this study, we used such characteristic as the average proximity to the autogenous norm, which is based on the concept of the autogenous norm of color preferences. The norm was obtained by Wallneffer in a study including psychotherapy sessions for a representative group of psychiatry clinic patients, with the Schultz autogenous training used as the major correction method. Wallneffer found that, on recovery (at discharge), most patients selected a sequence of preferred colors coded as 3-4-2-5-1-6-0-7. This selection has been accepted by Lüscher as a norm for color preferences and is a reference corresponding to psychic well-being. The selection of a color sequence conforming to the autogenous norm by the examinee will mean that s/he is a vigorous, active (with no signs of fatigue), self-reliant, emotionally stable and balanced person, who looks positively to the future and has no serious personality problems or conflicts. The closer the examinee's profile to the autogenous norm, the closer is the examinee to the reference norm of psychic well-being. The larger the deviation, the more apparent are tension, uneasiness, non-stability, fatigue, prevalence of negative and asthenic feelings, etc [16].

The average proximity to the autogenous norm was calculated as the average value of proximities to the autogenous norm for the first and second choices. Proximity to the autogenous norm was calculated as the difference between the maximum possible deviation from the autogenous norm (32 points) and the deviation value for a particular subject. That is, greater proximity to the autogenous norm indicates greater psychological well being. According to a study by Semeniuk [13], the internal consistency reliability of the average proximity to the autogenous norm for the Luscher color test was rather high (Cronbach's $\alpha = 0.799$). With regard to the criterion validity of this measure, it showed no significant correlations with characteristics of anxiety questionnaires [18, 19] and subjective well-being questionnaire [13]. This can be is explained by the fact that these questionnaires are focused on conscious personality level, whereas the Luscher color test, on the unconscious personality level. The deviation from the autogenous norm, however, did show significant correlations with social and demographic parameters [18].

Therefore, the three psychological methodologies showed adequate validity for subsequent empirical study, psychosemantic analysis of eye care workers' percepts of creative abilities. Statistical analysis was performed and results were graphically presented using IBM SPSS statistics 22.0.0 software.

Results

At the first phase of the study, we fulfilled the task of finding the place of creativity among the guiding principles for life.

Table 1 presents descriptive analysis with the estimates of the mean (M) and standard deviation (SD) for each of the Hughes and Powell's 22 guiding principles for life. The mean values ranged from 8.227 points (for Creativity) to 16.580 points (for Honesty). The data in the table demonstrate that "Creativity" was given the lowest place among the guiding principles for life. That is, eye care workers appeared to have indifferent attitudes towards creative abilities.

Our psychosemantic analysis of eye care workers' percepts of creative abilities was based on the understanding of psychosemantics as a science of the language of thought, which was initially formulated by Fodor [20]. Fodor believed that the language of thought is a way of thought which is specific and innate for the human being and which the latter uses unconsciously. Semantics for the language of thought is assigned by the postulates of meanings which do not depend on lexicon and are articulated according to the logic of mental representations (percepts, beliefs, desires, etc.). Our attempt to consider the logic of the structure of percepts of creative abilities is based on the investigation of multidimensional relationships between the parameters of the Guiding Principles for Life Questionnaire; this investigation is considered below. The relationships were assessed using the statistical procedure of multidimensional scaling. Multidimensional scaling graphically represents stumuli (of objects) as points in a space of the lowest possible dimensionality [21].

The Minkowski distance is a generalisation of the ordinary Euclidean distance and the Manhattan distance [22] and we used it as a similarity measure for multidimensional scaling. The Minkowski distance is a more promising solution for building space models than other distance metrics [23]. The space model built through multidimensional scaling was assessed using the following criteria: Normalized Raw Stress (NRS), Dispersion Accounted For (DAF), and Tucker's Coefficient of Congruence (TCC) [24].

Fig. 1 shows a two-dimensional graphical representation of the structure of the relationships between percepts of creative abilities and the guiding principles for life. The values of model fit indices were found to be adequate (NRS = 0.030; DAF = 0.970; TCC = 0.985), which allowed making conclusions on the basis of this model.

The plot demonstrates that, in the psychosemantic space of eye care workers, creative abilities are associated with such guiding principles for life as Spiritual life, Cleanliness, Successful, Social recognition, Meaning in life, and Broad-minded, and thus form a separate set of mental representations.

At the second phase of the statistical analysis, we investigated the effects of the 22 guiding principles for life on job and organizational satisfaction. Since the parameters of the GPL instrument were ordinal numbers, we believed it reasonable to use the regression models which are resistant to non-normal distribution and do not depend on the type of measure scale. Correspondingly, we used categorical regression with optimal scaling. We used CATREG Version 3.0 (Leiden SPSS Group, Leiden University, the Netherlands) as an optimal scaling

algorithm. This approach to non-linear regression allows stabilizing the estimates of regression coefficients and obtaining an optimal transformation of the variables [25].

Each categorical regression model included one independent variable, control variables, and one dependent variable. A guiding principle for life was used as an independent variable, social and demographic parameters like gender (female and male categories) and position (physicians and nursing staff categories) were used as control variables, and a job and organizational satisfaction characteristic was used as a dependent variable.

Tables 2 and 3 present categorical regression results. Standardized regression coefficients (β), standard errors of regression coefficients (SE) and statistical significance (p) of regression coefficients for guiding principles for life (model predictors) were calculated.

Table 2 shows that the attitude to creative abilities is not a predictor that can exert its influence on eye care workers' conscious job and organizational satisfaction. However, the following guiding principles for life were found to be statistically significant predictors: "Spiritual life", "Helpful", "Cleanliness", "Politeness", "Equality", "National Security", "Wisdom", "Honest" (a positive effect), and "Material wealth", "Social justice", "Successful", "Exciting life", and "Enjoying life" (a negative effect).

Table 3 shows that the attitude to creative abilities is an additional statistically significant predictor that can exert its influence on eye care workers' unconscious job and organizational satisfaction. "National security", "Spiritual life", and "Social recognition" were the guiding principles for life found to be the statistically significant predictors exerting an additional effect. Such guiding principles for life as "True friendship", "Meaning in life", "Social justice", "Protecting the environment", "Enjoying life" and "A world at peace" had a negative effect on eye care workers' unconscious job and organizational satisfaction.

Discussion

Ophthalmology is a profession recognized for its creativity and innovation [11]; particularly, ophthalmic practice has changed significantly during the last 30 years, and "sparks of innovation and a spirit of creativity have fueled the transformation" of this field [26]. Creativity in the medical profession is generally associated with readiness to state and solve problems on one's own, creatively reflect upon this experience and utilize it in new professional situations [1].

Nevertheless, the descriptive statistics of GPL parameters in the current study demonstrated that eye care workers considered creativity the least important of the 22 guiding principles for life. These findings are to a certain extent in agreement with those of a study by Duffy and Richard [7] who examined the relation of 18 critical work-related factors to job satisfaction in a random sample of 763 physicians of six major specialties. Although creativity was one of the 18 factors, it was not included by responders to the list of the five most important factors for their personal job satisfaction. Dissimilar to the self-report, the regression analyses showed that creativity was among the five most significant predictors of job satisfaction.

Such an indifferent attitude towards creativity as an important component of the ophthalmologist's professional activity has been associated in the foreign literature with the traits of the academic process in medical schools of universities which, in the opinion of British researcher Sparrow [5], does not promote the development of a creative professional. However, Horpinich, a Ukrainian researcher, believes [1] that the Ukrainian medical academic education system is inferior to the UK and US with regard to the development of creative abilities, because most medical academic institutions in the country employ an information-oriented model of education, with students encouraged to conceive and process information, as well as to demonstrate how well this information is learned. This model contributes to the adoption of a passive role by the student and promotion of the need to avoid failure motive. In addition, it puts the emphasis on gaining the required knowledge, but gives little attention to making students ready to professional activity and developing their creative abilities and creative professional thought. We considered the psychosemantic space of the mental representations that form a unified semantic field with the percept of creative abilities, namely, "Spiritual life", "Cleanliness", "Successful", "Social recognition", "Meaning in life", and "Broad-minded". It was demonstrated that they describe the existential-and-spiritual dimension of the eye care worker. It is believed that it is important for health care workers not only to be creative and capable of generating principally new ideas, but also to be capable of negotiating the contradictions of the existence of the contemporary human being, making an existential choice that is not at odds with human values and professional normative values [27].

Finally, while discussing the results of categorical regression, it is noteworthy, that, although eye care workers appeared to have indifferent attitudes towards creative abilities, such a guiding principle for life as "Creativity" was found to be a statistically significant predictor that can exert its influence on eye care workers' unconscious job and organizational satisfaction. Out study concurs with that of Duffy and Richard [7] who, in a sample of American physicians of some specialties (such as surgery, family medicine and gynecology), found that, it was creativity that determined physician job satisfaction in general, work satisfaction and environment satisfaction, although the responders believed that creativity was not among the five most important "critical factors" for their personal job satisfaction. It is noteworthy that, in a study by Duffy and Richard [7], physician job satisfaction was assessed by a two-item scale (i.e., actually, they used a semantic differential for this purpose). A semantic differential allows detecting not only conscious percepts, but also unconscious percepts [28]. Duffy and Richard [7] do not explain the above finding in their report. However, application of a

two-level approach for obtaining a comprehensive eye care workers' perception of psychological well-being allows us to formulate the following statement: a positive attitude of eye care workers to creative abilities is an incompletely conscious mental representation which determines mostly unconscious job satisfaction.

Given a wide variation of the results, it should be mentioned that the study has some limitations. First, the tool used for assessing the guiding principles for life included 22 items, and each guiding principle for life was measured by a single item, thus limiting the reliability of this tool in assessing the principles. Second, the position and gender were the only social and demographic variables taken into account. Nevertheless, findings of the current study are a substantial contribution to knowledge with regard to creative abilities in the professional activity of eye care workers. Given the findings of the study, it is important to stimulate implementation of creativity by health care workers in order to avoid job dissatisfaction and burnout. In addition, the obtained data will help medical school teachers to transform the academic curriculum to a model encouraging the development of student's creativity.

References

1. Horpinich TI. [Development of creative abilities of medical students in universities of Great Britain and the USA]. Naukovi zapysky Ternopil′s′koho natsional′noho pedahohichnoho universytetu imeni Volodymyra Hnatyuka. Ser. Pedahohika. 2015; 3: 131–138. Ukrainian.
2. Tan'ko YeV. [Experience in organizing self-guided work of students of higher educational institutions in Great Britain]. Pedahohika ta psykholohiia. 2013; 44: 157-166. Ukrainian.
3. Tkachenko LM. Development of intellectual and creative abilities of gifted youth in US universities. Dissertation for the degree of candidate of pedagogical sciences, specialty 13.00.01 - general pedagogics, history of pedagogics. Cherkasy, B. Khmelnytsky Cherkasy National University; 2012. Ukrainian.
4. Ness RB. Commentary: Teaching Creativity and Innovative Thinking in Medicine and the Health Sciences. Acad Med. 2011 Oct;86(10):1201-3. doi: 10.1097/ACM.0b013e31822bbb9f.
5. Sparrow JM. British academic ophthalmology in crisis. Br J Ophthalmol. 2006 Apr;90(4):404-5. doi: 10.1136/bjo.2005.088062.
6. Larson EB, Fihn SD, Kirk LM, Levinson W, Loge RV, Reynolds E, Williams M The future of general internal medicine. J Gen Intern Med. 2004 Jan;19(1):69-77. doi: 10.1111/j.1525-1497.2004.31337.x.
7. Duffy RD, Richard GV. Physician job satisfaction across six major specialties. J Vocat Behav. 2006 Jun; 68(3): 548-559.
8. Ma X, Yang Y, Wang X, Zang Y. An integrative review: Developing and measuring creativity in nursing. Nurse Educ Today. 2018 Mar; 62: 1-8. doi: 10.1016/j.nedt.2017.12.011.
9. Morse AR. Telemedicine in ophthalmology: promise and pitfalls. Ophthalmology. 2014 Apr;121(4):809-11. doi: 10.1016/j.ophtha.2013.10.033.
10. Praeger DL Innovations and creativity in contemporary ophthalmology: preliminary experience with the phakic myopic intraocular lens. Ann Ophthalmol. 1988 Dec;20(12):456-62.
11. Quillen DA, Harper RA, Haik BG. Medical student education in ophthalmology: crisis and opportunity. Ophthalmology. 2005 Nov;112(11):1867-8. doi: 10.1016/j.ophtha.2005.05.005.
12. Hughes P, Powell R. Community Values Australian Communities Survey. [Internet] 1998. [Last accessed on 2021 Mar 20]. Available from: http://ncls.org.au/default.aspx?sitemapid=3025.
13. Semeniuk NS. [Psychological Peculiarities of Life Orientations (on the Example of Ophthalmological Medics)]. Dissertation for the degree of candidate of psychological sciences, specialty 19.00.01 - general psychology, history of psychology. Odesa, Mechnikov Odesa national university; 2018. Ukrainian.
14. Kim WG, Leong JK, Lee YK. Effect of service orientation on job satisfaction, organizational commitment, and intention of leaving in a casual dining chain restaurant. Hospitality Management. 2005; 24: 171-193.
15. Tsekhmister IV, Daniliuk IV, Rodina NV, Biron BV, Semeniuk NS. Developing a stress reaction inventory for eye care workers. Journal of Ophthalmology (Ukraine). 2019;1(486):39-45.
16. Luscher M. The four color person. New York, NY: Simon & Schuster; 1983.
17. Sobchik LN. [The method of color choices, a modification of the eight-color Luscher test. A practical guide]. St. Petersburg: Rech; 2006. Russian.
18. Vardi H, Statsenko YeA, Charykova IA., Tsvirko DN, Lyatina IM, Chumakova AA, Kulagin AS. [Comparative analysis of anxiety assessment methods in athletes]. Sportivnaya meditsina: nauka i praktika. 2018; 8(1), 63-69. Russian.
19. Shcherbatykh YuV. [To what extent does Luscher's color choice method measure the autonomic component of anxiety]. Prikladnyye informatsionnyye aspekty meditsiny. 2002; 5 (1-2): 117-122. Russian
20. Fodor J. In Critical Condition. Cambridge, MA: MIT Press; 2000.
21. Terekhina AYu Multidimensional scaling in psychology. Psikhologicheskiy zhurnal. 1983; 4(1): 76-88. Russian.
22. Haggett P, Cliff AD, Frey A. Locational Analysis in Human Geography. London: Edward Arnold; 1977.
23. Shahid R, Bertazzon S, Knudtson ML, Ghali WA. Comparison of distance measures in spatial analytical modeling for health service planning. BMC Health Serv Res. 2009 Nov 6;9:200. doi: 10.1186/1472-6963-9-200.
24. Borg I, Groenen PJF. Modern Multidimensional Scaling Theory and Applications. New York, NY: Springer; 2005.
25. van der Kooij AJ. Prediction accuracy and stability of regression with optimal scaling transformations. Doctoral Thesis Child & Family Studies and Data Theory (AGP-D), Department of Education and Child Studies, Faculty of Social and Behavioural Sciences, Leiden University; 2007.
26. Higginbotham EJ, Upadhyay A, Egbuonu-Davis L. The new patent law may accelerate innovation in ophthalmology. JAMA Ophthalmol. 2014 Feb;132(2):137-8. doi: 10.1001/jamaophthalmol.2013.5645.
27. Zhdan VM, Dvornyk VM, Starchenko II, Bieliaieva OM. [Medicus nihil aliud est, quam animi consolatio: communicative competence of a doctor as one of the main criteria of his professionalism]. Aktual′ni pytannia linhvistyky, profesiynoi linhvodydaktyky, psykholohii ta pedahohiky vyshchoi shkoly: zbirnyk statei V Mizhnarodnoi naukovo-praktychnoi konferentsii., m. Poltava, 19–20 lystopada, 2020 r. 2020; 3–13.Ukrainian.

28. Althouse RH. A Semantic Differential investigation of sexually symbolic concepts: Freud and Jung. J Proj Tech Pers Assess. 1970 Dec;34(6):507-12. doi: 10.1080/0091651X.1970.10380296.

Conflict of Interest Statement:
The authors declare no conflict of interest which could influence their opinions on the subject or the materials presented in the manuscript.

Table 1. Descriptive statistics of characteristics of guiding principles for life in eye care workers

Guiding principles for life	M	SD
A world at peace	16.453	8.032
Honest	16.580	5.142
Friendship	13.762	5.771
Equality	9.558	5.648
Social justice	13.569	6.219
Politeness	12.116	5.222
Protecting the environment	10.215	6.597
Freedom	13.436	6.067
Meaning in life	8.862	6.134
Enjoying life	10.834	6.574
National Security	10.785	6.713
Wisdom	13.961	4.539
Broad-minded	9.287	4.640
Cleanliness	10.039	6.046
Helpful	13.265	5.147
Successful	10.425	5.472
Creativity	8.227	5.169
Exciting life	9.713	5.689
Social recognition	8.619	5.843
Spiritual life	11.635	6.374
Devout	12.044	5.719
Material wealth	10.702	6.468

Table 2. Parameters of categorical regression models contributing to the total score as assessed by the Job Satisfaction Scale (JSS)

Guiding principles for life	β	SE	P
A world at peace	0.210	0.110	0.028
Honest	0.347	0.071	<0.001
Friendship	-0.180	0.160	0.282
Equality	0.301	0.120	<0.001
Social justice	-0.354	0.091	<0.001
Politeness	0.292	0.073	<0.001
Protecting the environment	0.084	0.185	0.893
Freedom	-0.214	0.146	0.097
Meaning in life	0.159	0.168	0.490
Enjoying life	-0.233	0.094	<0.001
National Security	0.304	0.079	<0.001
Wisdom	0.330	0.129	<0.001
Broad-minded	-0.277	0.200	0.110
Cleanliness	0.272	0.059	<0.001
Helpful	0.261	0.082	<0.001
Successful	-0.333	0.065	<0.001
Creativity	-0.137	0.196	0.483
Exciting life	-0.296	0.062	<0.001
Social recognition	-0.191	0.137	0.106
Spiritual life	0.206	0.124	0.030
Devout	0.163	0.200	0.616
Material wealth	-0.385	0.067	<0.001

Table 3. Parameters of categorical regression models which determine the proximity to the autogenous norm

Guiding principles for life	β	SE	P
A world at peace	-0.200	0.070	<0.001
Honest	0.182	0.196	0.461
Friendship	-0.267	0.084	<0.001
Equality	0.204	0.150	0.106
Social justice	-0.230	0.143	0.037
Politeness	-0.172	0.121	0.080
Protecting the environment	-0.220	0.117	0.009
Freedom	-0.121	0.176	0.627
Meaning in life	-0.232	0.096	<0.001
Enjoying life	-0.207	0.071	<0.001
National Security	0.247	0.117	0.013
Wisdom	-0.130	0.196	0.782
Broad-minded	0.207	0.170	0.229
Cleanliness	0.192	0.165	0.247
Helpful	0.187	0.190	0.423
Successful	0.153	0.181	0.584
Creativity	0.209	0.097	0.001
Exciting life	0.145	0.194	0.762
Social recognition	0.273	0.065	<0.001
Spiritual life	0.270	0.079	<0.001
Devout	0.115	0.221	0.846
Material wealth	0.070	0.179	0.928

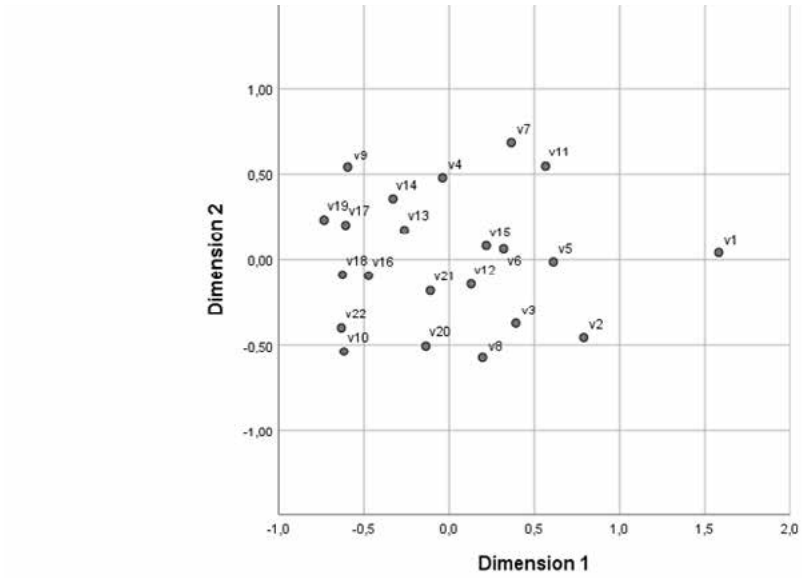


Fig. 1. Two-dimensional graphical representation of the structure of the relationships between percepts of creative abilities and the guiding principles for life

Note: v1, A world at peace; v2, Honest; v3, Friendship; v4, Equality; v5, Social justice; v6, Politeness; v7, Protecting the environment; v8, Freedom; v9, Meaning in life; v10, Enjoying life; v11, National Security; v12, Wisdom; v13, Broad-minded; v14, Cleanliness; v15, Helpful; v16, Successful; v17, Creativity; v18, Exciting life; v19, Social recognition; v20, Spiritual life; v21, Devout; v22, Material wealth.