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RELIGIOUSNESS, ANXIETY AND DEPRESSION IN PATIENTS WITH GLAUCOMA, AGE-RELATED MACULAR DEGENERATION AND DIABETIC RETINOPATHY

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SUMMARY

Background: *Many chronic medical conditions such as glaucoma, senile macular degeneration and diabetic retinopathy are further complicated by emotional and psychological disorders. Religiousness represents a part of a social culture and has a significant role in the prevention of mental difficulties of the patients, especially those belonging to older population. The aim of this study was to investigate the connection between religiousness, anxiety, and depression in patients with glaucoma, age-related macular degeneration and diabetic retinopathy and to test their connection related to different diagnosis.*

Subjects and methods: *This cross-sectional study included 163 patients divided into three groups (glaucoma group, senile macular degeneration group and diabetic retinopathy group). Respondents voluntarily agreed to participate in the study and with assistance they fully completed the Scale of Religiousness, Hospital Anxiety and Depression Scale, General Health Questionnaire and demographic information (age, gender, education, employment and marital status).*

Results: *The results showed noticeable religiosity of the respondents (M=18.31, SD=5.28), but also the presence of anxiety (M=7.55, SD=3.73), especially in patients with glaucoma, as well as impaired mental health in AMD patients (M=19.56, SD=4.14). No differences were found in the severity of anxiety, depression, general health and religiosity between groups, but the presence of depression in subjects with age-related macular degeneration significantly affects the level of religiosity (p=0.032).*

Conclusion: *These results unequivocally point to the need for further research and raising awareness of all health professionals about the importance of a holistic approach to the patient regardless of his diagnosis in order to identify the possible effective ways to deal with chronic disease considering all levels of patient's needs.*

Key words: *glaucoma - age-related macular degeneration - diabetic retinopathy - religion, anxiety - depression*

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INTRODUCTION

Vision is a sense that receives the greatest number of stimuli from the environment and therefore any damage or loss of this sense seriously affects each individual and his community (Kim et al. 2020). World Health Organization (WHO) has recognized the importance of ocular diseases and has adopted the global action plan on eye health and the prevention of ocular diseases (WHO 2013). Furthermore, in its reports WHO confirms the increase in number of blind people which is directly linked to a longer life span and chronic diseases, whereas glaucoma, age-related macular degeneration (AMD) and diabetic retinopathy (DR), due to their incidences, are considered to be priority diseases in the area of ophthalmology.

Glaucoma is a chronic neurodegenerative disorder of the optic nerve (Waisbourd et al. 2015). It is the second most frequent cause of blindness and it represents a significant public health problem in the world as well as in Croatia (Pelčić 2011). AMD is a type of maculopathy that results in irreversible visual impairment among older population (Salimiaghdam et al. 2020) and it is one of the most common causes of the vision loss and blindness in developed countries (Mrak et al. 2011). DR is the most common chronic complication of diabetes (Galetović et al. 2015). The incidence and prevalence of diabetes in Croatia follows and even exceeds the rates of diabetes in developed countries (Gverovic Antunica et al. 2019).

Many chronic medical conditions are complicated by emotional and psychological disorders. However, the emotional dimensions of such chronic medical conditions are often overlooked when medical care is considered (Balajee et al. 2017). Although clinical practice shows the presence of comorbidity in patients is more of a rule than an exception, a holistic approach to the patients is still lacking (Babić et al. 2019). A patient is

most commonly approached from a doctor's specialization point of view and in doing so the fact that a patient is a complex entity with his somatic and psychological characteristics is completely neglected (Babić et al. 2019). The proportion of psychological stress is higher in subjects with chronic diseases (Balajee, et al. 2017). The most common manifestations of psychological distress are anxiety and depression (Zhang et al. 2017), particularly when the disease impairs patients' function (Casten et al. 2002, Lucchetti et al. 2012).

The connection between glaucoma and both anxiety and depression demands attention from ophthalmologists and primary care providers (Zhang et al. 2018). Patients with AMD also may face difficulties in relation to many basic activities of daily life (Inan et al., 2019), while patients with DR (Fenwick et al. 2017) can also develop mental disorders which cause a lower general health status such as depression and anxiety (Inan et al. 2019).

It is well known that religiousness, representing a part of social culture (Safara & Bhatia 2008, Stewart et al. 2010) has a significant role in the prevention or reduction of mental difficulties (Safara & Bhatia 2008), especially among older people (Lerman et al. 2018) who are most frequently affected by afore-mentioned diseases. Religion is a private manifestation of spirituality and it is the fourth aspect of health, along with physical, mental and social aspects (Osadchuk et al. 2019). Previous research suggests that religion is an important factor which impacts the quality of life and the occurrence of anxiety and depression (Safara & Bhatia 2008, Lucchetti, et al. 2012, Salgado 2014) and also facing the consequences of a disease (Stewart et al. 2010, Vitorino et al. 2018). Patients who pray and practice faith tend to have a more positive attitude towards their situation (McIntosh 2018). Likewise, research results indicate that religiosity is widely spread in Croatia and despite social changes it remains a significant feature of the Croatian population (Glavaš et al. 2017, Nikodem & Zrinščak 2019). Faith provides hope in positive outcomes to the believers, it contributes to their perception of contentment and happiness, gives them a certain feeling of comfort and a sense of community and ensures consolation during difficult times in life. Such perception can provide a sense of safety and confidence, encourage optimism and positive psychological states and thereby ensure better psychological health of the patients (Ančić & Jerolimov 2011).

Considering the incidence of glaucoma, AMD and DR and the occurrence of anxiety and depression with these chronic diseases (Zhang et al. 2017, Jeong et al. 2016, Gverovic Antunica et al. 2019), our research aims to investigate the connection between religiousness, anxiety and depression in patients with glaucoma, AMD and DR and to test their interaction related to different diagnosis. There may be a connection between religiousness, general psychological health and negative health outcomes such as anxiety and depression depending on the diagnosis of ocular disease.

SUBJECTS AND METHODS

A cross-sectional study was performed on chronic ophthalmic patients in February 2020. The medical records of 275 patients with AMD, glaucoma and DR scheduled for ophthalmologist examination were checked. We excluded the participants with other ophthalmological diagnosis, patients who had other associated eye diseases in addition to the above diagnoses, patients with malignant disease, chemotherapy or other severe chronic and psychiatric diseases.

After the analysis of medical records, we excluded the scheduled respondents (n=56) whom are confirmed by a psychiatrist to be suffering from mental disorders and the ones to be suffering from mild to moderate form of depression or anxiety disorder, regardless if they are taking or not taking any therapy. After a control examination in an ophthalmology specialist clinic respondents that met inclusion criteria (n=219) were informed about the study by the authors. Written consent was given by 163 patients before participation in study. In a separate room where peace and privacy were ensured, the authors personally read the questions from the questionnaires to each respondent individually and noted down the obtained answers on the questionnaires. After collecting data, participants were divided into three groups: glaucoma group (95 patients), AMD group (32 patients) and DR group (36 patients) regardless of vision level.

The ethical committee of Zadar General Hospital approved the study at their regular meeting (IRB approval number: 02-2025/20-3/20). The research is in compliance with ethical standards of the Declaration of Helsinki. All participants were informed of the aim of the study and other study details, and voluntarily agreed to participate. Participants were able to stop participating at any time without any consequences. Anonymity of the participants during and after the study was guaranteed.

Questionnaires

For the purposes of sociodemographic analysis data on gender, age, education, marital and working status were collected. The religiosity, anxiety, depression and current mental health data were collected by questionnaires.

Scale of Religiousness

Scale (Bezinović et al. 2005) was developed to measure the level of religiousness. It contained 5 items and item 6 was subsequently added at the authors' recommendation. The assessment of prevalence of these

cognitions was done on a five-point scale. The internal consistency coefficient of the entire scale Cronbach alfa equals α=0.88.

Hospital Anxiety and Depression Scale, Croatian version

Scale (Milanović 2017) is a questionnaire used to detect the symptoms of depression and anxiety in medical institutions. It contains 14 items altogether, 7 related to depression and 7 related to anxiety. The intensity of each statement is assessed on a four-point scale. The results less than 7 for the individual subscale indicate a normal result on anxiety or depression scale (Burns et al. 2014, Vitulić 2017). Reliability of a part of the scale concerning depression equals α=0.81, while the reliability of a part of the scale concerning anxiety equals α=0 .76 (Milanović 2017).

General Health Questionnaire

Questionnaire (GHQ 12) was initially devised by Goldberg (1987) to screen for psychiatric illnesses in the primary care setting (Goldberg & Bridges 1987). The GHQ 12 version having 12 items was validated by the World Health Organization (Goldberg et al. 1997). The GHQ 12 was used to assess the current mental health of the participants and it focused on the inability to carry out normal activities and the appearance of new and distressing incidents (Balajee et al. 2017). Each item of the GHQ 12 was rated on a four-point scale. Score higher than 12 was considered as an evidence of psychological distress (Balajee et al. 2017).

Statistical analysis

General information of the respondents, gender, education level, employment and marital status are shown in percentages. Arithmetic means and standard deviations was used for numerical data. The Chi-square test was used to analyze the differences between categorical variables.

The connection between the results related to depression, anxiety, general psychological health and religiousness has been verified by the Pearson correlation coefficient.

The connection between the results concerning depression, anxiety and general psychological health and the results related to different diagnosis were validated by a moderation analysis. The results related to religiousness were modeled as a dependent variable whereas the results concerning depression, anxiety and general psychological health were modeled as independent variables. Independent variables were centered. The bootstrap method was used with 5000 generated subsamples. The Huber-White robust standard errors were calculated.

There were no data gaps. The used alpha value equaled 5%. The bifurcated tests were carried out. Statistical data processing was performed by a computer program SPSS 26.0.

RESULTS

Socio-demographic data and the level of anxiety, depression, general health and religiosity

More than half participants were women (N=91; 55.8%) and 44.2% were men (N=72). The participants mostly had secondary education (39.9%), and were retired (51.5%). The average age of all participants was 68.3 years. The AMD respondents were somewhat older (M=74.09, SD=10.99) than the patients with glaucoma (M=65.51, SD=14.12) and DR (M=70.66, SD=12.44) and they were mostly retired and widowed (Table 1).

On average, the respondents attained bordering results of anxiety (M=7.55, SD=3.73) and normal results on depression scale (M=6.29, SD=4.63). The average value of general psychological health was close to the mean value 18 (M=18.62, SD=3.92). Respondents were notably religious (M=18.31, SD=5.25). In relation to other groups, the respondents with glaucoma showed a slightly higher level of anxiety that approached the level of significance (M=8.08, SD=4.62, p=0.088). No statistically significant difference was found between the groups of respondents regarding the level of religiousness, anxiety, depression and general mental health (Table 1).

Anxiety, depression, general health and religiousness

The highest scores regarding anxiety were obtained by those respondents who answered the question: "If somebody asked you about your attitude towards religion where would you put yourself?" by "I am not religious, I oppose to religion" (M=9.67, SD=3.06), and the lowest scores were obtained by those who answered to the same question by "I think about it a lot, but I'm not sure whether I believe or not" (M=5.25, SD=4.27). On the depression scale, the highest scores were also achieved by those respondents who answered "I am not religious, I oppose to religion" (M=8.67, SD=5.51), and the lowest results were obtained by those who answered "Although I am not religious I have nothing against religion" (M=3.56, SD=3.36). The highest results in GHQ were obtained by those respondents who answered by "Although I am not religious I have nothing against religion" (M=19.67, SD=4.97), and the lowest scores were obtained by those answering "I am not religious, I oppose to religion" (M=17.67, SD=5.69). The results are shown in Table 2.

Comparison with regard to diagnosis in relation to attitude towards religion

As shown in Table 3. the conducted analysis of the variance did not detect statistically significant differences in the occurrence of anxiety (F(2, 160) = 2.468,

Table 1. Descriptive characteristics of the subjects and the scales used for different diagnoses (n=163)

Variable	Glaucoma (n, %)	DR (n, %)	AMD (n, %)	Total (n, %)	p*
Gender					0.038
Male	40 (42.10)	22 (61.11)	10 (31.25)	72 (44.17)	
Female	55 (57.89)	14 (38.88)	22 (68.75)	91 (55.82)	
Education					0.108
Without education	16 (16.84)	3 (8.33)	9 (28.12)	28 (17.7)	
Elementary school	35 (36.84)	16 (44.44)	6 (18.75)	57 (34.96)	
High school	34 (35.78)	15 (41.66)	16 (50.00)	65 (39.87)	
University education	10 (10.52)	2 (5.55)	1 (3.12)	13 (7.97)	
Employment					0.023
Yes	27 (28.42)	5 (13.88)	3 (9.37)	35 (21.47)	
No	18 (18.94)	4 (11.11)	3 (9.37)	25 (15.33)	
Retired	50 (52.63)	27 (75.00)	26 (81.25)	103 63.19)	
Marriage status					0.052
Unmarried	6 (6.31)	4 (11.11)	1 (3.12)	11 (6.7)	
Married	60 (63.15)	14 (38.88)	12 (37.50)	86 (52.76)	
Divorced	6 (6.31)	3 (8.33)	4 (12.50)	13 (7.9)	
Widow	23 (24.21)	15 (41.66)	15 (46.87)	53 (32.51)	
	M (SD)	M (SD)	M (SD)	M (SD)	
Age	65.51 (14.12)	70.66 (12.44)	74.09 (10.99)	68.3 (13.59)	0.004
Anxiety	8.08 (4.62)	6.61 (4.11)	7.03 (3.36)	7.55 (3.73)	0.088
Depression	6.58 (4.62)	6.00 (4.96)	5.78 (4.38)	6.29 (4.63)	0.641
GHQ	18.71 (4.17)	17.56 (2.69)	19.56 (4.14)	18.62 (3.92)	0.102
Religiosity	18.87 (4.95)	16.61 (5.38)	18.56 (5.87)	18.31 (5.28)	0.087

Legenda: n- number of participants; M – arithmetic mean; SD – standard deviation; GHQ - general health questionnaire; DR - diabetic retinopaty; AMD - age-related macular degeneration; * Chi-square test

Table 2. Descriptive data on depression, anxiety and general psychological health to answer the question "If someone asked you about your attitude towards religion, where would you rank?" (n=163)

Diagnosis	Anxiety M (SD)	Depression M (SD)	GHQ M (SD)
I am not religious, I am an opponent of religion (n=3)	9.67 (3.06)	8.67(5.51)	17.67 (5.69)
I am not religious even though I have nothing against religion (n=9)	6.22 (2.77)	3.56 (3.36)	19.67 (4.97)
I am indifferent to religion (n=16)	7.88 (4.15)	5.75 (4.55)	19.06 (3.75)
I think a lot about religion but I'm not clear believe it or not (n=4)	5.25 (4.27)	5.00 (4.69)	17.75 (2.75)
I am religious even though I do not accept everything my faith teaches (n=42)*	7.10 (3.97)	5.26 (4.05)	18.17 (3.64)
I am a convinced believer, I accept everything my faith teaches (n=89)*	7.88 (3.60)	7.13 (4.85)	18.72 (4.02)

Legenda: GHQ - general health questionnaire; M - arithmetic mean; SD - standard deviation, n - number of participants
* Answers involved in t-test processing

Table 3. Results of analysis of variance comparing attitudes towards religion and t-tests comparing different diagnoses according to the expression of results on the scales used (n=163)

Comparisons of diagnoses	F (df = 2; 160)	p	ω^2
Anxiety	2.468	0.088	0.018
Depression	0.445	0.641	0.000
General psychological health	2.312	0.102	0.016
Religiosity	2.482	0.087	0.018
Comparisons of relation towards religion	t (df = 129)	p	d
Anxiety	1.120	0.265	0.206
Depression	2.169	0.032	0.419
General psychological health	0.756	0.451	0.144

Legenda: F – F- ratio of analysis of variance; t – Student's t-test result; df – degrees of freedom; p – statistical significance; d – magnitude of the effect expressed through Cohen's d; ω2 – magnitude of the effect expressed through squared omega

p=0.088), depression (F(2, 160)=0.445, p=0.641), general psychological health (F (2,160) = 2.312, p=0.102) and religiousness (F (2,160) = 2.482, p=0.087) between the patients with AMD, glaucoma and DR, T-tests did not find statistically significant differences in the expression of anxiety (t (129) = 1.120, p=0.265) and general psychological health (t (129) =0.756, p=0.451) with regard to the respondents' attitude towards religion. Those respondents who answered that "they are religious although they do not accept all religious teachings" (M=5.26, SD=4.05) had significantly less prominent depression (t (129) =2.169, p=0.032) in relation to those respondent who answered they were "devout believers who accept all teachings of their religion"(M=7.13, SD=4.85). The effect is poorly expressed (d=0.419).

The connection between depression, anxiety, GHQ and religiousness

The results of depression are statistically significant and strongly connected to the results of anxiety (r=0.567, p<0.001). With the increase of results regarding depression (r= -0.450, p<0.001) and anxiety (r= -0.494, p<0.001) there is a statistically significant moderately prominent fall of results regarding psychological health. The results related to religiousness are not significantly connected to the results concerning anxiety (r=0.007, p=0.925), depression (r=0.088, p=0.265) and general psychological health (r=0.063, p=0.422) for the entire sample.

The results of anxiety in relation to a diagnosis do not significantly contribute to the explained variation of the results regarding religiousness (F (5,157) = 1.580, p=0.169). Accordingly, the moderating effect is not present as shown in Table 5.

The results concerning depression in relation to a diagnosis have a statistically significant contribution to the explained variation of the results regarding religiousness (F (5,157) = 2.814, p=0.018). The total of 6.4% of the variance is explained. The moderating effect is also statistically significant (F (2,157) = 3.294, p=0.040), and it explains the additional 2.8% of the variance from the model with the results regarding depression and various diagnoses without interaction (which is not shown).

As far as AMD diagnosis is concerned, with every point gained on the scale of depression there is a statistically significant increase of about half a point on the scale of religiousness (b=0.505, SE=0.172, p=0.004), while such growth is not present in glaucoma diagnosis (b=-0.017, SE=0.113, p=0.881) and in DR (b=0.062, SE=0.186, p=0.740). Table 5.

The results concerning general psychological health and a diagnosis do not have a statistically significant contribution to the explained variation of the results regarding religiousness (F (5,157) = 1.589, p=0.166). Accordingly, the moderating effect is not present which is also shown in table 5.

Table 4. Pearson correlation coefficients between the scales used (n=163)

		Anxiety	Depression	GHQ
Depression	*r*	0.567	-	
	p	<0.001	-	
GHQ	*r*	-0.450	-0.494	-
	p	<0.001	<0.001	-
Religiosity	*r*	0.007	0.088	0.063
	p	0.925	0.265	0.422

Legenda: r – Pearson correlation coefficient; p - statistical significance; n - number of participants

Table 5. Results of a moderation analysis of differences in the relationship between anxiety, depression, GHQ and religiosity for different diagnoses (n=163)

	Anxiety				Depression				GHQ			
Model	*F*	*df 1/2*	R^2	*p*	*F*	*df 1/2*	R^2	*p*	*F*	*df 1/2*	R^2	*p*
Total	1.580	5|157	0.042	0.169	2.814	5|157	0.064	0.018	1.589	5|157	0.049	0.166
Interaction	0.940	2|157	0.012	0.393	3.294	2|157	0.028	0.040	0.857	2|157	0.017	0.427
Diagnosis	*b*	*SE*	*t*	*p*	*B*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*
AMD	0.246	0.316	0.778	0.438	0.505	0.172	2.942	0.004	-0.245	0.326	-0.751	0.454
Glaucom	-1.156	0.130	-1.202	0.231	-0.017	0.113	-0.150	0.881	0.175	0.126	1.388	0.167
DR	0.084	0.228	0.367	0.714	0.062	0.186	0.332	0.740	-0.084	0.376	0.223	0.823

Legenda: b – nonstandardized centered regression coefficient; SE – standard error of the b coefficient; t – t-value; p – statistical significance; F – F-ratio; df – degrees of freedom; R^2 – coefficient of determination; GHQ - general health questionnaire; AMD - age-related macular degeneration: DR - diabetic retinopathy

DISCUSSION

Our research aimed to test the level of religiousness, general psychological health, anxiety and depression in patients with glaucoma, AMD and DR. Furthermore, it aimed to test the connection and possible differences between the results of depression, anxiety, general psychological health and religiousness. The results of our research point to a prominent religiousness of the respondents, the presence of psychological distress, a bordering level of anxiety and a normal level of depression.

The highest levels on anxiety scale and depression scale were noted in patients with glaucoma. The similar results were obtained by other studies. A research named Psychological Aspects of Glaucoma states that the proofs of a connection between glaucoma, anxiety and depression are mixed up because some researchers indicate a significantly higher prevalence of anxiety and depression in relation to healthy population, whereas the others state that after the phase of adjustment there are no differences (Jeong et al. 2016). However, the results of the latest research testing well-being of the patients with glaucoma are compliant with our results because they point to a presence of anxiety and depression symptoms in patients with chronic ophthalmological diseases (Zhang et al. 2017, Musch et al. 2019).

General psychological state is the most impaired in patients with AMD. In our research those are the oldest respondents (M=74.09, SD=10.99). The mentioned result can be the consequence of older age and expected overall decline in respondents' psychophysical competences (Strong et al. 2015). The research that included 200 patients with AMD also shows that older patients with visual impairment have more prominent difficulties in the independent living and put much more effort in performing everyday activities which entails a feeling of fatigue (Inan et al. 2019). AMD compromises the quality of life (Singh et al. 2017) which increases throughout the duration of a disease or with age (Inan et al. 2019). The results of the research done by Balajee at al. (2020) support this. They compared the psychological distress and its associated factors between the chronic patients and healthy subjects and stated that chronic patients have more psychological stress which increases with age (Balajee et al. 2017). Similar results were published by a study conducted in China (Fenwick et al. 2017). Motl & McAuley (2010) also point to the fact that aging in combination with a chronic disease primarily correlates with the quality of life (Motl & McAuley 2010).

Considering the respondents' attitude towards religion, the highest level of anxiety and depression, as well as a lower rate of general psychological health was shown by the respondents in our research who are not religious and oppose to religion. Such results support other researches pointing to the importance of religion in facing hardships of life (Glavas et al. 2017) and chronic diseases (Balajee et al. 2017; da Silva et al. 2018). Salgado (2014) in his review paper indicates religiosity as a significant protective factor not only regarding health, but human life in general (Salgado 2014). He points out that religion contributes to a better physical and psychological health, faster recovery and facing consequences and reduces depression, anxiety and stress (Salgado 2014). Taking into account the confirmation of the mentioned research on the role of religion, our results are expected and in compliance with earlier research which additionally confirms the importance and the role of religiosity in facing difficulties caused by chronic diseases and their consequences.

No significant differences were found in the occurrence anxiety, depression, general psychological health and religiosity among the respondents according to their diagnosis. This points to the fact that these are chronic and incurable diseases that have similar effects on the patients. Fenwick et al. (2017) in their research which included 3353 respondents with visual impairment and chronic ophthalmological diseases stated that such conditions lead to significant reduction of the emotional well-being and increased the risk of anxiety and depression development even in medical conditions that were not characterized by a significant loss of vision (Fenwick et al. 2017).

Concerning the respondents' attitude towards religion, no significant differences were found between anxiety and general psychological health while statistically much less significant depression was present in respondents belonging to the category of believers who do not accept all teachings of their faith as opposed to those accepting all religious teachings. Mahdanian (2018) in his review paper, where he depicts 23 different research papers describing religion and depression, states that Nelson (2002) considers that the most useful aspects of religion for the patient relate to spiritual prosperity and not exclusively religious practices (Mahdanian 2018). Furthermore, we assume that the respondents belonging to the category of believers who accept all religious teachings put a challenging task in front of themselves which surely causes additional pressure. A recent research that aimed to test the relation between spirituality, religiosity and mental health clearly emphasized the difference between spirituality and religiosity and underlined the components of spirituality as more significant (Vitorino et al. 2018).

As expected and following our research so far, there is a significant relation between anxiety and

depression as confirmed in the earlier research (Lucchetti et al. 2012, Burns et al. 2014; Inan et al. 2019). The presence of anxiety and depression in our respondents significantly influences their general psychological health in such way that the increase of anxiety and depression leads to the relapse in general psychological health. Moreover, our data do not show the correlation between religion and depression, anxiety and general psychological health of the respondents. Such results can be attributed to the fact that our respondents are traditionally religious, that is, they adopted their religious point of view at the young age from their family (Glavas et al. 2017, Nikodem & Zrinščak 2019), and not later in life due to the consequences of their disease. Ahrenfeld et al. (2017) in their longitudinal study describe two forms of religiosity, one of them is restful religiousness where we can classify our respondents and the other one is crisis religiousness such as disease crisis (the religious coping mobilization effect) which is associated with poor health (Ahrenfeldt et al. 2017).

Anxiety in our respondents combined with a medical diagnosis does not contribute to religiousness as shown by the results of the study testing religiosity of dialysis patients in Brazil (Lucchetti et al. 2012). The author states that aspects of religiousness are not linked to the symptoms of anxiety but rather to the symptoms of depression and the quality of life (Lucchetti et al. 2012). Contrary to these results, the presence of AMD and depression significantly increases religiousness while such effect is not present among the respondents diagnosed with glaucoma and DR. Since patients diagnosed with AMD in our sample belong to the oldest group of respondents, it is possible that it is precisely their age (Zimmer et al. 2016) and the specific features of a disease whose duration leads to progressive loss of vision (Evans et al. 2007) in combination with depression which is also associated to religiosity, that gives such results.

This study also has several limiting factors, which may limit the generalization of results. This is a cross-sectional study, which cannot identify a causal relationship and the testing was done face to face which could influence the answers and sincerity of the respondents. A low number of respondents in subgroups could influence the strength of statistical results. Moreover, our research includes a quantitative approach and if paired with a qualitative approach it would give deeper insight into this research topic. Future research should include more participants from different hospitals and qualitative methods which would provide interviews that would describe religiosity, anxiety and depression in more detail and its specifics and direct and indirect causes during illness. A study like this would provide more objective and comprehensive results.

CONCLUSION

This study examined religiousness, general psychological health, anxiety and depression in chronic ophthalmic patients with glaucoma, AMD and DR. Prominent religiousness of the respondents was noted, as well as the presence of anxiety especially in those patients diagnosed with glaucoma and impaired mental health in AMD patients. No differences were found between the occurrence of anxiety, depression, general health and religiousness between the patients diagnosed with glaucoma, AMD and DR. The presence of depression in patients diagnosed with AMD significantly influences the level of religiosity.

These results point to the need of further research and raising awareness of all health professionals about the importance of holistic approach to the patients regardless of their diagnosis in order to recognize possible effective ways of facing the chronic diseases considering all levels of patients' needs.

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Contribution of individual authors:

All authors reviewed and discussed the manuscript draft and contributed to the final manuscript and all authors give final approval of the version to be submitted.

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