OFFICIAL JOURNAL OF THE ITALIAN SOCIETY OF PSYCHOPATHOLOGY

Journal of PSYCHOPATHOLOGY

Editor-in-chief: Alessandro Rossi

VOL. 27 - 2021
NUMBER 3

Cited in: EMBASE - Excerpta Medica Database ▪ Index Copernicus ▪ PsycINFO ▪ SCOPUS ▪ Google Scholar ▪ Emerging Sources Citation Index (ESCI), a new edition of Web of Science

PACINI EDITORE MEDICINA

www.jpsychopathol.it

OFFICIAL JOURNAL OF THE ITALIAN SOCIETY OF PSYCHOPATHOLOGY

Journal of PSYCHOPATHOLOGY

Publisher: Pacini Editore Srl, Via Gherardesca 1, 56121 Pisa • www.pacinimedicina.it

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:125-134
DOI: 10.36148/2284-0249-406

Original article

The selected psychosocial risk factors in the development of personality disorders in a group of Polish young adults

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SUMMARY

Objectives

In literature, several groups of risk factors for psychiatric disorders are usually found, among them individual experiences, cultural influences, social relationships and social resources. Our considerations focus on a number of selected family conditions relevant to the process of formation of personality disorders.

Methods

A group 387 students revealing the traits of personality disorders participated in our study. The researchers took advantage of the following research techniques: self-constructed questionnaire, Retrospective Evaluation of Parental Attitudes Questionnaire [1] and a Structured Clinical Interview for investigating personality disorders SCID-II [2].

Results

Four types of family relations were distinguished which may either have an impact on the development of healthy personality (tolerant parents) or imply the appearance of personality disorders (intolerant, passive, uninvolved and incoherent parents). People with abnormalities in their personality development significantly more frequently assessed the atmosphere in their families of origin as abnormal. Three types of disorders were significantly more common in men than in women. These were the histrionic ($p < 0.038$), narcissistic ($p < 0.004$) and antisocial personality ($p < 0.001$) disorders.

Conclusions

Our research confirmed a vital significance of the specificity of parental influence on the development of personality disorders.

Key words: personality disorders, parental attitudes, young adults, personality development

Received: April 21, 2021
Accepted: August 4, 2021

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How to cite this article: Ochojska D, Pasternak J. The selected psychosocial risk factors in the development of personality disorders in a group of Polish young adults. Journal of Psychopathology2021;27:125-134.https://doi.org/10.36148/2284-0249-406

Introduction

Early adulthood is a very demanding period in most people's life. This is when young adults try to become materially and emotionally independent from their families of origin and take full responsibility for their own lives. As individuals choose their own ways of self-realization they encounter many different psychological, social and physical challenges. The main developmental tasks of young adults usually involve establishing a family, and is linked with choosing a partner, bringing up children, meeting one's obligations associated to household duties, and also taking on new professional roles.

The intense cultural and civilizational transformations of our times result in a growing number of tasks which young people must be equipped to perform. This makes them evade adulthood as expressed in avoiding marriage or postponing the decision to have children, even though taking responsibility for another person still remains an indicator of individual's maturity. Unfortunately, more and more people suffer from various mental problems, which is why it has become necessary to take action aimed at preventing mental

health disorders and looking for effective forms of therapy if only because personality disorders are at the very source of mental illness and psychiatric disorders.

The determinants of personality disorders

Personality disorders are associated with certain fixed, rigid patterns of behaviour that deviate from the behaviour typical for a given culture. People with personality disorders reveal difficulties in psychosocial functioning and adapting to various situations. Adaptive problems, inability to meet certain needs and inadequate response patterns lead to aggravating disorders, difficulties in daily functioning or establishing proper relationships with other people.

The current classification of mental disorders DSM-5 [3] distinguishes ten types of personality disorders. The DSM-5 classification provides the results of studies that indicate that the prevalence of personality disorders in the population varies between 0.2 and 7.9%.

A higher proportion of individuals with personality disorders has been demonstrated in some other studies. In the well-known research conducted by Hasin et al. [4], 14.79% of adults in America were diagnosed with at least one personality disorder. Research by Xu, Liu, Yuan and Feng [5] identified 28.31% of individuals with personality disorders, including people with some traits of personality disorders (17.07%) and personality disorders (11.24%).

Both biological and psychosocial factors are at the source of personality disorders. Research confirms that in case of borderline personality disorder the significance of genetic component is considerable, particularly when it comes to the temperamental characteristics (dysregulation, hypersensitivity and impulsiveness). Similarly, research on anxiety and personality disorders that are characterized by high level anxiety demonstrates that there is a higher risk of its occurrence in people whose immediate relatives suffer from these disorders [6]. The symptoms occurred even more frequently in children of mothers who suffered from anxiety disorder [7]. An essential role of neurotransmitters, i.e. dopamine, serotonin as well as the opioid system was also emphasized in the development of personality disorders [8]. In the analysis of psychosocial determinants, particular emphasis was placed on family factors, mainly parental influences [9]. The strength of the association between personality disorders and the occurrence of abnormalities in parental influences is difficult to measure as many factors that are usually involved are juxtaposed in the system. In fact, the functioning of a family as a system is particularly significant here. In psychodynamic mechanisms, such as identification with a parent, but also through continuous patterns of interactions resulting from the overlapping of various factors, positive and negative events (such as work problems, achieving success, illness of a family member, divorce) a child takes over some moods, styles of coping with difficulties, acquiring specific roles, which overlaps with individual characteristics also determined by genetic factors, which altogether create a system of specific attitudes and behaviours in various situations. There are, however, difficulties in establishing unequivocally what type of traumatic events, their duration or severity might cause personality changes. Case studies are certainly useful in this context as are qualitative analysis taking into consideration the frequency and severity of specific behaviours in a group or community.

There are many studies available with regards to the relationship between personality disorders and retrospectively evaluated parental attitudes. Strong influence of environmental factors (including parental influences) were noted in the aetiology of borderline personality disorder [10]. Adolescents whose mothers were diagnosed with borderline personality disorders saw their mothers' attitudes as rejecting. Such adolescents were most frequently diagnosed with avoidant personality disorder [11]. The mothers were also demanding and reversing roles in the mother-child relationship [12], excessively protective, rejecting [13], and inappropriate in all dimensions investigated [14]. Children of borderline mothers may develop borderline personality traits, such as emotional dysregulation, insecure attachment, depression, internalising and externalising problems and interpersonal problems [15-17].

An interesting study on the effects of early maladaptive patterns, temperament and parental attitudes on the development of borderline and avoidance personality traits was conducted by Mącik [18]. In the case of borderline features, the most appropriate model includes the following schemas: abandonment, defectiveness, self-sacrifice, pessimism and parental attitudes: overdemandingness, autonomy, overprotection on the father's part and autonomy and inconsistency of the mother. For avoidant traits temperament has been shown to be more important than parental attitudes; among the significant factors are social isolation, vulnerability to harm, subjugation, self-sacrifice, emotional inhibition, pessimism, and temperamental traits including emotional reactivity and activity.

Early childhood traumas as well as traumatic events and perceived attitudes of rejection and excessive protection [19] are often responsible for the development of the narcissistic personality disorder. Empirical studies demonstrate that personality disorders (antisocial, avoidant, borderline, depressive, paranoid, schizoid and schizotypal) mostly emerge in the situation of rejection and low protection [20]. The parental attitude retrospectively perceived as excessively demanding is linked with the emergence of avoidant personality disorder [21]. Also rejection and excessive demands are linked with this disorder [22]. A study involving Japanese students revealed that insecure attachment

style, along with the perception of parental attitudes as rejecting were a predictor of mental problems in men (including personality disorders) whereas in case of women it was rejection, excessive protection and anxiety that predicted the occurrence of these kinds of problems [23].

Method

Objectives

The aim of the study was to screen for psychosocial risk factors leading to personality disorders and also to analyze the perception of the impact the family of origin has had on students with certain features of personality disorders.

The following research questions were posed in the course of our research:

- what are the correlations between the specific features of personality disorders in the students' group and the retrospective evaluation of their mothers' parental attitudes?
- what are the correlations between the specific features of personality disorders in the students' group and the retrospective evaluation of their fathers' parental attitudes?
- is there a correlation between a specific nature of marital bond of the students' parents and the students's personality traits?

Participants

The study involved 387 students, including 274 women and 113 men. Our sample consisted of the students of Rzeszow University and Rzeszow University of Technology. The respondents were studying at various technical and humanities faculties. The selection of participants was random. The mean age of the sample was 22. 83 (SD = 1.93), ranging from 19-26 years. The researchers administersed the assessment tools to thestudents mainly before or after their lectures. The inclusion criteria to the group of people showing the features of personality disorders took place through categorized interview based on The Structured Clinical Interview for DSM-IV Personality Disorder Research SCID II. The students answered a number of questions which described their behaviours, beliefs and the way they experience emotions. The necessary condition to be included into the group of people of risk of development of personality disorders was to reveal a minimal number of behaviours or traits complied with DSM-IV personality disorders diagnostic criteria. The exclusion criteria referred to the participants who showed few or any symptoms of personality disorders. Some of the people in the sample displayed more than one characteristic of personality disorder. Table 3 presents the figures in relation to the number of persons revealing the traits of each personality disorder investigated.

Materials

The following techniques have been used to assess the risk factors:

1. The Structured Clinical Interview for DSM-IV Personality Disorder Research SCID II developed by First, Gibbon, Spitzer., Williams, Benjamin [2]. The questionnaire consists of questions relating to the criteria of all personality disorders and conduct disorder, whose occurrence in adolescence is a prerequisite for the diagnosis of antisocial personality disorder in adults, specified in DSM-5 The participants were asked to give their subjective responses to the statements of the scale. Several items relating to the assessment of the respondents' behaviour based on the interviewer's observations were omitted. The questionaire of written interview referring to the traits of personality disorders contains 94 main questions. The participants answer yes or no. The questions adress an enduring pattern of inner experience and behaviour that deviates markedly from the expectations of the individual's culture, is pervasive and inflexible, is stable over time and leads to distress or impairment, This pattern is manifested in at least two of the following areas: cognition (i.e., ways of perceiving and interpreting self, other people, and events), affectivity (i.e., the range, intensity, lability, and appopriateness of emotional response), interpersonal functioning and impulse control. To some main questions, the specific questions are attached. For example, to the the main question: 'Before the age of 15 did you?; twelve detailed questions are added (i.e. Did you often initiate physical fights?; Did you use a weapon that cause serious physical harm to others, like a bat, brick, broken bottle, knife, gun?). The participants answer yes or no for all these detailed questions. Each individual was treated as showing the features of specific type of personality disorder when a certain number of questions was appropriately answered which meant that a sufficient number of diagnostic DSM-IV criteria was fulfilled. Taking into account these criteria allowed to distinguish the styles of dysfunctional functioning which could be both: the features of personality disorder and real personality disorder. The research didn't intend to differentiate between them.
2. The Questionnaire for Retrospective Parental Attitudes (KPR-Roc) adapted by Plopa [1] which consists of two versions of 50 statements each (separately for the assessment of maternal and paternal attitudes). The task of a tested adult is to retrospectively assess their parents' attitudes. The participants respond to each statement on a five-point scale. The scale is characterized by high theoretical relevance in the structural aspect and the reliability index of the measurements

ranging from 0.84 to 0.93 (Cronbach's alpha). It measures the intensity of attitudes: acceptance/rejection, demands, autonomy, inconsistency, and protection. Acceptance is the expression of positive feelings towards a child, creating an atmosphere of security and of a free emotional exchange. An overly demanding attitude is expressed in having high expectations of a child. It is linked with the need to respect certain rules and prohibitions without taking into the account the capacity and needs of a child. The main method of enforcing commands is the use of punishment. The attitude of allowing autonomy involves giving children freedom, increasingly so as they grow up. Parents demonstrate to their child the different ways of solving problems and give them choices. Inconsistent attitude is expressed in changeable parental behaviour, depending on the parent's mood. Such behaviour often becomes excessive and a child can be awarded or punished for the same thing, depending on a situation or the way the carer feels. This lack of stability on the parent's side results in a child becoming distant, losing the feeling of security and becoming reluctant to act as there is no link between action and the subsequent enforcements. Excessive protection consists in providing continuous care without giving a child an opportunity to test different situations.

3. A self-made questionnaire including the basic information on the persons examined that involved questions about their psychosocial situation, taking into the account the family situation and environmental factors.

Statistical analysis

Statistical analyses were computed on anonymous data using IBM SPSS 26. The profile of the research group was performed on the grounds of analysis of percentage curve of the frequency of occurence of qualitative data. Homogeneousness of the research groups was verified using chi-square. The effect of interaction between the specificity of personality pattern and parental attitudes was tested using Pearsons-r correlation. The verging level of error of the first kind was presupposed (zero hypotheis was rejected so there were no statistically significant differences, $p < 0.05$). The assumptions were tested with two-sided degree of relevance.

To evaluate of parental behaviour in the marital dyad which may have an impact on personality disorder applied cluster analysis using the mean k method (Quick Cluster). Calculations were made on the basis of standardized results Z. The comparisons between the groups of participants were conducted using Pearson's chi square (asympoptic relevance).

Our research objective was to analyse a correlation between specific personality traits and and family influences, mainly, retrospective parental attitudes that become risk factors for personality disorders. Furthermore, based on the analysis of parental attitudes and using cluster analysis, the authors identified a few types of family relations which imply developing a healthy personality and personality disorder.

However, the results of our study do not constitute a nosological diagnosis as individual evaluation should be based on observation and detailed conversation with the person in question. In fact, our analyses served the purpose of identifying individuals with the features of personality disorders and determining a correlation between the occurrence of dysfunctional characteristics patterns and certain risk factors.

Results

The questionnaire revealed that more than 30% of our students' parents were educated to the secondary level and almost 25% of all mothers and 40% of fathers completed vocational education; 25% of all mothers and 15% of fathers held university diplomas whereas 4.4% of mothers and 5.9% of fathers completed only primary education.

Our analyses of the differences in the incidence of personality disorders in men and women found that three types of disorders were statistically significantly more common in men than in women (Fischer test): histrionic personality ($p < 0.038$), narcissistic personality ($p < 0.004$) and antisocial personality ($p < 0.001$).

The analysis of the evaluations of maternal attitudes made by our young respondents with severe traits of personality disorder found significant correlations that indicated the importance of mother-child interactions (Tab. I).

In the case of subjects with schizotypal, borderline, narcissistic and conduct disorders, maternal behavior was more frequently described as inconsistent ($p < 0.01$). A lesser correlation was found between the assessment of mothers as inconsistent ($p < 0.01$) and the features of paranoid and antisocial personality. A lesser correlation ($r = 0.2$) also occurred between unaccepting maternal attitudes and dominant features of avoidant ($p < 0.01$), paranoid ($p < 0.01$), borderline ($p < 0.01$) and conduct disorders ($p < 0.01$). On the other hand, people with paranoid, narcissistic, antisocial and conduct disorders more often described their mothers as excessively demanding ($p < 0.01$). The borderline persons in our sample more often stressed that mothers limited their autonomy ($p < 0.01$).

As demonstrated by the results presented in Table II our research showed the essential correlation between fathers' attitudes and the emergence of particular personality traits. Students with strong features of narcissistic, borderline, paranoid personality and conduct disorders spoke of their fathers as inconsistent ($p < 0.01$). Our respondents who displayed the traits of avoidant personality disorder significantly more often evaluated their fathers as unaccepting ($p < 0.01$) and restricting their autonomy ($p < 0.01$). Students whose personality was predomi-

TABLE I. *Personality traits and mother's parental attitudes (Pearson's r).*

Severity of traits indicating personality disorders	Mother-acceptance	Mother-demands	Mother-autonomy	Mother-inconsistence	Mother-protection
Avoidant	-.244**	.097	-.169**	.066	.010
Dependent	-.119*	.139**	-.181**	.111*	.061
Anankastic	-.171**	.133*	-.164**	.147**	.053
Paranoid	-.205**	.205**	-.164**	.230**	.062
Schizotypal	-.197**	.141**	-.134*	.247**	.025
Schizoid	-.152**	.025	-.074	.080	-.046
Historionic	-.053	.140**	-.087	.156**	.060
Narcissistic	-.169**	.211**	-.177**	.252**	.081
Borderline	-.227**	.194**	-.229**	.251**	.090
Conduct disorder	-.240**	.216**	-.190**	.283**	-.036
Antisocial	-.185**	.214**	-.168**	.233**	-.020

*Note. *p < .05; **p < .01*

nantly paranoid significantly more frequently defined their fathers as inconsistent ($p < 0.01$), restricting their autonomy ($p < 0.01$) and usually unaccepting ($p < 0.01$). When comparing the fathers' and mother's attitudes more paternal than maternal influence was found in case of avoidant personality as fathers were more frequently defined as unaccepting. Similarly, students who displayed paranoid traits more often evaluated their fathers as inconsistent, unaccepting and restricting their autonomy. People with features of borderline personality disorder more often defined both their mothers and fathers as inconsistent.

Four types of families were distinguished on the basis of the results in the Plopa scales by means of cluster analysis using the mean k method (Quick Cluster). The numbers of individuals in each cluster were: cluster 1: N = 77; cluster 2: N = 114; cluster 3: N = 102; cluster 4: N = 59; cluster total: N = 352; missing data: N = 35.
Based on the analysis of parental attitudes and using cluster analysis, the researchers identified four types of family relations (Fig. 1) which may have an impact on the formation of a healthy (cluster 2) or features of personality disorders (clusters 1, 2 and 4):

TABLE II. *Personality traits and father's parental attitudes (Pearson's r).*

Severity of traits indicating dysfunctional personality	Father-acceptance	Father-demands	Father-autonomy	Father-inconsistence	Father-protection
Avoidant	-.270**	.065	-.235**	.122*	-.142**
Dependent	-.139**	.176**	-.137**	.183**	.044
Anankastic	-.184**	.183**	-.171**	.242**	.001
Paranoid	-.310**	.191**	-.266**	.332**	-.075
Schizotypal	-.217**	.142**	-.179**	.225**	-.006
Schizoid	-.134*	.052	-.066	.149**	-.037
Historionic	.021	.124*	-.022	.089	.094
Narcissistic	-.197**	.196**	-.153**	.275**	-.007
Borderline	-.234**	.186**	-.208**	.302**	-.011
Conduct disorder	-.113*	.217**	-.115*	.290**	.054
Antisocial	-.112*	.157**	-.094	.227**	.060

*Note.*p < .05; **p < .01*

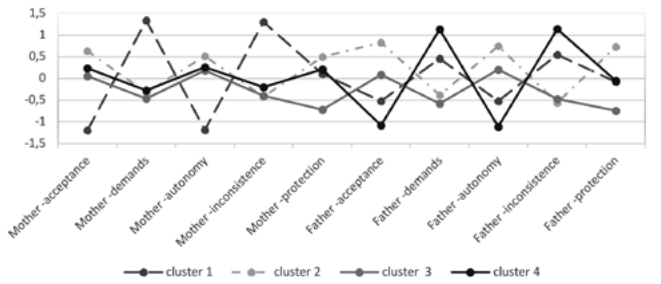

FIGURE 1. *A graphic presentation of clusters regarding the specific character of parental impact in the marital dyad.*

1. **Intolerant parents who realize their own needs in the upbringing of their children, with inappropriate behaviour predominantly on the mother's part** (cluster 1). In this case characteristic is the lack of acceptance especially on the mother's part but also low acceptance by the father while big demands and lack of autonomy are notable mainly in case of mothers, as is their inconsistent behaviour towards the child.
2. **Tolerant parents – open to the individual development of the child** (cluster 2) characterized by positive attitudes towards the child, relatively high level of acceptance at relatively low demands allowing a lot of freedom in the child's activity.
3. **Passive parents, not quite involved in providing support in their child's development** (cluster 3). Parents who have little time for the child, hardly ever express approval of the child's activity; relatively low demands are placed by fathers and average demands by mothers; in general both parents follow a specific set of rules.
4. **Parents who are inconsistent/incoherent in their parental interventions (disharmonious marriage)** (cluster 3). Overall acceptance on the mother's part; mother relatively consistent and moderately demanding; rejecting father - unaccepting, not allowing autonomy while highly demanding and inconsistent.

These four types of family relations were analysed with the use of Pearson's chi-square test.

Our research demonstrates (Tab. IV) the existence of correlations between the specific functioning of parents as the marital dyad and their children's personality traits. These were significant in case of avoidant, anankastic, paranoid personality ($p < 0.001$), in which cases our respondents defined their parents primarily as inconsistent and also, to a lesser extent, intolerant. Similar correlations obtained in the case of students whose personalities were predominantly narcissistic, in which case a considerable percentage of respondents focused on the lack of tolerance in the behaviour of both parents who were mostly focused on their own needs ($p < 0.001$). Students who displayed impaired behaviours, typical for borderline personality disorder more significantly ($p < 0.001$) assessed their parents as intolerant or incoherent. In the group of participants with histrionic personality we encountered statistically significant appearance of extreme opinions ($p < 0.01$), meaning that some students saw their parents as tolerant and others as intolerant. We found no statistically significant differences in the evaluation of parents by people with schizoid and dependent personalities.

Our analysis of correlations between the formal family structure and irregularities that led to personality disorder revealed a statistically significant correlation in case of people with predominantly narcissistic characteristics (chi sq. = 6.456; df-2; $p < 0.05$). Among these students 7% came from reconstructed families of origin (3% in case of other students in our sample). Fewer students with narcissistic personality traits were brought up in incomplete families (4%) although 13% of students with other personality disorders grew up in such families. As far these differences are concerned a clear trend ($p < 0.057$) was also observed in case of borderline personality (chi sq. = 5.732; df-2; $p < 0.057$). In this group 9% of students in our sample were brought up in reconstructed families whereas the equivalent figure for other respondents was 2.8%. 13% of students with borderline characteristics and 11% of other respondents lost one of the parents early in their lives (incomplete family).

Within this research we also analysed the correlations between students' evaluation of the atmosphere in their families and the severity of irregular personality traits. Our respondents were asked to evaluate the atmosphere in their family home on the five-step scale, from bad, inadequate, average to good and very good. The analyses showed that compared to other students with prevalent traits of avoidant personality more often and statistically significantly (chi sq.= 20,100; df-4; $p < 0.001$) assessed the situation in their families as inappropriate, including 4% who said it was bad, 5% inadequate, 16% as average, 44% as good and 31% as very good whereas among other students in the sample the percentages were respectively as follows: 0; 5; 9; 38 and 49%. Similar results obtained in terms of obsessive-compulsive personality (chi sq.= 17.082; df-4; $p < 0.002$). Approximately 3% of these students assessed the atmosphere in their family as bad, 8% as inadequate, 14% as average, 41% as good and 35% as very good whereas none of the other respondents thought the situation in their family of origin was bad, 4% said it was inadequate, 8% average, 39% good and 50% very good. Our research also confirmed that students with paranoid personality significantly frequently perceived irregularities in their family relations (chi sq. = 25.521; df-4; $p < 0.000$). Among the respondents in this group, 4% rated the atmosphere as bad, 7% as inadequate, 16% as average, 46% as good, and 28% as very good, while among others it

TABLE III. *Severity of features of dysfunctional personality vs. specific interventions of the parental subsystem (a cross table – Pearson's chi square).*

Personality disorders (severity)	S 1 Intolerant parents	S 2 Tolerant parents	S 3 Passive parents	S 4 Inconsistent parents	Total	Pearson's chi square (asymptotic relevance)	Df	P
Avoidant								
Population	n = 29	n = 27	n = 22	n = 29	n = 107	17.916	3	< .001
%	37.7	23.7	21.6	49.2	30.4	Likelihood ratio = 17.438		
Adjusted residual	1.6	-1.9	-2.3	3.4		Linear correlation test = 0,749	3	.001
Dependent								
Population	n = 12	n = 6	n = 11	n = 9	n = 38	6.675	3	.083
%	15.6	5.3	10.8	15.3	10.8	Likelihood ratio = 7.110		
Adjusted residual	1.5	-2.3	0	1.2		Linear correlation test = 0.71	3	.068
Anankastic								
Population	n = 42	n = 38	n = 31	n = 40	n = 151	29.966	3	< .001
%	54.5	33.3	30.4	67.8	42.9	Likelihood ratio = 30.180		
Adjusted residual	2.3	-2.5	-3.0	4.2		Linear correlation test = .669	3	.0
Paranoid								
Population	n = 33	n = 12	n = 21	n = 30	n = 96	44.337	3	< .001
%	42.9	10.5	20.6	50.8	27.3	Likelihood ratio = 45.124		
Adjusted residual	3.5	-4.9	-1.8	4.5		Linear correlation test = 1.141	3	.0
Schizotypal								
Population	n = 9	n = 2	n = 2	n = 6	n = 19	13.921	3	< .003
%	11.7	1.8	2,0	10.2	5.4	Likelihood ratio = 13.72		
Adjusted residual	2.8	-2.1	-1.8	1.8		Linear correlation test = .04	3	.003
Schizoid								
Population	n = 8	n = 7	n = 9	n = 6	n = 30	1.391	3	.708
%	10.4	6.1	8.8	10.2	8.5	Likelihood ratio = 1.442		
Adjusted residual	.7	-1.1	.1	.5		Linear correlation test = .024	3	.696
Historionic								
Population	n = 26	n = 23	n = 14	n = 11	n = 74	11.053	3	< .011
%	33.8%	20.2%	13.7%	18.6%	21,0%	Likelihood ratio = 1.564		

TABLE III. *continues*

Personality disorders (severity)	S 1 Intolerant parents	S 2 Tolerant parents	S 3 Passive parents	S 4 Inconsistent parents	Total	Pearson's chi square (asymptotic relevance)	Df	P
Adjusted residual	3.1	-.3	-2.1	-.5		Linear correlation test = 6.774	3	.014
Narcissistic								
Population	n = 30	n = 14	n = 13	n = 16	n = 73	25.942	3	< .001
%	39.0	12.3	12.7	27.1	20.7	Likelihood ratio = 24.695		
Adjusted residual	4.5	-2.7	-2.4	1.3		Linear correlation test = 3.651	3	0
Borderline								
Population	n = 19	n = 7	n = 8	n = 15	n = 49	22.851	3	< .001
%	24.7	6.1	7.8	24.4	13.9	Likelihood ratio =		
Adjusted residual	3.1	-2.9	-2.1	2.8		Linear correlation test =	3	0

Note. SCID II: severity of features of personality disorders, specific interventions of the parental subsystem – cluster analysis

was 0; 5; 9; 37 and 50%. Similar correlations were related to schizoid personality (statistically significant differences: Chi sq. = 12.12; df-4; $p < 0.01$). Among the surveyed students in this group 3% defined the atmosphere as bad, no one pointed to the situation as inadequate, 27% considered it as average, 32% good and 38% very good; in the group of people who did not display such traits the corresponding figures were 1; 6; 9; 40 and 44% respectively. Narcissistic individuals also rated the family atmosphere as worse (statistically significant differences: chi sq. = 9.55; df-4; $p < 0.05$). Among the people primarily focused on themselves 4% rated the atmosphere in their family of origin as bad, 5% as inadequate, 14% as average, 40% as good, and 37% as very good (the non-narcissistic perceptions were slightly different at 0, 5, 10, 40, and 45%, respectively). The study also revealed that people with high borderline scores were significantly more likely to negatively assess their family relations: approximately 4% assessed their family atmosphere as bad, 5% as inadequate, 30% as average, 42% as good and 18% as very good. Other respondents, on the other hand, most often evaluated the atmosphere in their families as very good (48%) and good (39%).

The study did not show statistically significant differences in family atmosphere scores for students with irregularities towards the dependent (chi sq.= 2.573; df-4; $p < 0.63$), schizotypal (chi sq.= 6.815; $p < 0.146$) and histrionic (chi sq.= 0.074; df-4; $p < 0.999$) personalities.

Discussion

Our research showed that people with the prevalent features of avoidant, obsessive-compulsive, paranoid, schizoid, narcissistic and borderline personality statistically significantly more often assessed the atmosphere in the family as abnormal. However, there no relationship has been found between the specificity of the assessment of family atmosphere and schizotypal or histrionic personality.

Taking into account the differences in the incidence of personality dysfunctions in men and women, it was demonstrated that three types of disorders were significantly more common in men than in women. These were the histrionic ($p < 0.038$), narcissistic ($p < 0.004$) and antisocial personality ($p < 0.001$) disorders. The prevalence of histrionic personality disorder in men was not confirmed by other studies [3,24]. These differences in results may be due to oversensitivity of the screening instruments to the occurrence of personality disorders, inadequate number of respondents and inequality as far as the gender of respondents is concerned but also specificity of the group of students in the sample studied or the trends emerging in the Polish society or, more specifically, among students in the second decade of the twenty-first century. A significantly higher incidence of histrionic personality disorder in men can result from psychosocial transformations due to changes in traditional male and female roles, as well as a unification in the expression of personality traits, such as greater social acceptance for young men expressing emotions or attracting other peo-

ple's attention. As suggested by Bakkevig and Karterud [25] two distinct bundles can be distinguished in the diagnostic criteria of the histrionic personality: the exhibitionistic features and seeking attention of others and focusing on impressions. Perhaps one of these bundles is more common in men as it thus influences the research results for the whole category of histrionic personality. Our research confirmed the significance of parental attitudes in the formation of personality disorders. It is only in case of the schizoid and dependent personality that the clear influence of maternal and paternal influences was not confirmed, which suggests a stronger role of biological factors in the development of these type of disorders. It is also important to realize the relevance of interactions between parents and children, i.e. certain behaviours on the part of children could provoke certain parental responses. In fact parents' own personality disorders are an essential element of their children developing a dysfunctional personality, both in terms of the transmission of genetic susceptibility and in the development of stressful, abnormal patterns of behaviour or relationships in the child's immediate environment [26]. Studies by other authors confirm that mothers with the borderline personality disorder are more likely to be insensitive, highly intrusive and have difficulty identifying their children's emotional states [27]. They also engage in deviant interactions with their children characterized by low sensitivity, excessive protection and hostility [13]. Parental neglect may be related to the transgenerational influence of the mother on the development of personality disorder in their teenage daughters [28].

The four types of parental interventions identified in the study, one of which implies the development of healthy personality and three of personality disorders (tolerant vs intolerant, passive and inconsistent parents) are conceptualized a little differently in the research conducted by other authors. For example it was confirmed that the perceived parental affectionless control of both parents, particularly by a child's mother, is a predictor of the development of all kinds of personality disorders [29] while the carers' criticism was an important feature of the child-parents relationship in the perception of patients with the borderline personality disorder [30]. The study by Musser et al. [31], shows that the following negative parental attitudes of invalidating children are predictive of the development of borderline disorders: emotional inaccuracy, misattribution of children's emotional states or emotional expression to their negative traits, discouraging children from expressing negative emotions and oversimplification of child-related problem solving. The importance of the parent-child relationship in the development of borderline personality disorder was presented by Boucher et al. [32]. Low parental care, high overprotection and parental inconsistency were the predictors of this disorder. In turn, the parental interventions based on considerable permissiveness correlated positively with the histrionic, narcissistic and antisocial personality disorders of their children [33]. Because of the existence of complex correlations between the occurrence personality disorders and mental disorders, it is necessary to undertake preventive interventions to inhibit the development of interpersonal difficulties. Students and adolescents should be particularly involved in various psychological interventions, aimed at the development of social competences. In some justified cases it is also necessary to undertake long-term individual and systemic psychotherapy.

This study is not without of its limitations. First, we have only assessed the students from one region of Poland and it could be difficult to predict whether the research in other areas of the country would yield similar results. Second, the number of women who took part in our study was twice as high as the number of men so the strength of conclusions may be limited. To overcome these limitations, further studies could be undertaken in other regions of Poland and with more equal number of women and men. The next issue, which could be questionable is the matter of retrospective analysis of parental attitudes. To what extend the recollections from the perspective of a child or adolescent can be reliable source of knowledge. Some other authors [34] assume that subjective concept of parental attitudes seems more valid than that declared by parents. We also supposed that. We realize we have considered only some psychosocial predictors of developing specific personality traits. We remember about some biological and systemic factors but they weren't the subject of our study. Thus, the research doesn't allow to understand a causality direction between risk factors and results.

The authors hope that the results of this research will prove useful to psychologists, psychiatrists, pedagogues, social workers and all those who have the situation of young adults very much at heart.

Ethical consideration

Komisja Bioetyczna Rzeszowskiego (Ethical Committee University of Rzeszow) nr 20/03/18.

Acknowledgement

We are very grateful to the students who took part in the research.

Funding

No grants or other financial support have been involved.

Conflict of interest

The Authors have no conflict of interest to declare

Author contributions

Author Contributions DO and JP involved in conceptualization, resources, original draft preparation, statistical analysis, presenting results, discussion, review and editing. Both Authors have read and agreed to the published version of the manuscript.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:135-139
DOI: 10.36148/2284-0249-408

Original article

How the Italian women perceived distress from their puerperal conditions during the COVID-19 outbreak

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SUMMARY

Background

The COVID-19 pandemic strongly influenced the habits of the puerperal in the usual management of the birth event. The present study aimed to evaluate how post-traumatic stress in puerperia varied during the COVID-19 pandemic. Specifically, it assessed any differences in the distress perception by considering some socio-demographic variables related to the birth event, as: the weeks of gestation of the birth, the partum typology and the breastfeeding typology.

Methods

An online questionnaire was administered to women who complete their pregnancies during the pandemic. The questionnaire included items relating to the characteristics of childbirth and the Impact of Event Scale-Revised.

Results

156 puerperal women were recruited, 36.54% of the participants registered a posttraumatic stress disorder (PTSD), 8.97% outlined a probable diagnosis of PTSD, 28.85% highlighted the presence of some symptoms related to PTSD and 25.64% were fine.

Conclusions

PTSD among puerperal women was intensely evident in the avoidance dimension, especially in participants who have given a pre-term birth, though the caesarean surgery and who had artificially breastfed their own unborn child in the puerperium.

Key words: disease outbreak, postpartum period, posttraumatic stress disorder

Received: January 15, 2021
Accepted: May 5, 2021

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How to cite this article: Vitale E. How the Italian women perceived distress from their puerperal conditions during the COVID-19 outbreak. Journal of Psychopathology 2021;27:135-139. https://doi.org/10.36148/2284-0249-408

Introduction

The SARS-CoV-2 infection, known as Coronavirus Disease 2019 started in Wuhan, China, in December 2019 and quickly spread around the world, becoming a global pandemic from March 2020 [1]. This condition has strongly influenced the living conditions of the entire general population and workers, particularly healthcare professionals [2,3], students [4] and patients [5-7], especially pregnant [8,9] and puerperal [10] women. In this regard, literature reported a worsening in physiological conditions in puerperal women during the COVID-19 pandemic [11,12], as the pandemic determined particular emphasis on the isolation condition dictated by the high contagiousness of the infection itself [13]. This circumstance had therefore strongly influenced the puerperal habits in their usual management of the birth event, also connected to the ever increasing restrictions of the obstetrics wards regarding the visits of family members, including new fathers, to avoid any further source of contagion [14,15]. All of this resulted in a further worsening of the mental health condition of the puerperal during the COVID-19 era [16,17].

Aim

The present study aimed to evaluate how post-traumatic stress in puerperia varied during the COVID-19 pandemic. Specifically, it assessed any differences in the distress perception by considering some socio-demographic variables related to the birth event, as: the weeks of gestation of the birth, the partum typology and the breastfeeding typology.

Materials and methods

Strategy conception

Assuming that the pandemic condition was a particular stress-perceived condition for the whole general population, especially for puerperal women, who might cope further stressful circumstances, such as: the pregnancy, the birth event and the puerperium, the present study purposed to assess the existence of post traumatic stress disorder (PTSD), since literature reported that PTSD was the development of characteristic symptoms after exposure to one or more traumatic events. The presentation might include fear-based re-experiencing, emotional and behavioral changes, dysphoric moods, or negative cognitions [18]. Moreover, PTSD might include several factors in adapting to a disaster, such as: an increased sense of insecurity and vulnerability; a loss of sense of control and predictability; a need to reaffirm familiar relationships, attachments and routines; and to remain independent.

At the same time, the present study assessed the PTSD according to some socio-demographic variables both related to the birth event and the puerperium status, as:

- the number gestation weeks of the childbirth: whether the birth occurred at term (between the 37th and 41st week of gestation), pre-term (before the 37th week of gestation) or post-term (between 41st and 42nd week of gestation);
- if the birth took place in physiological conditions or in a surgical caesarean section;
- if during the puerperium the woman had breast-fed the unborn child naturally or using some artificial preparations.

The questionnaire

The questionnaire created ad hoc for this study was administered online through some web pages, such as: Facebook and Instagram internet pages. The questionnaire consisted of two parts. In the first part, some socio-demographic information were collected, as:

- age of puerperal women, dividing them into several age groups, as: up to 20 years, from 21 to 30 years, from 31 to 40 years and over 41 years;
- the instruction level, as: elementary or lower secondary school, diploma or degree;
- the weeks of gestation to childbirth, as: pre-term, term, or post term;
- the birth typology, as: natural or surgical caesarean;
- the breastfeeding typology, as: natural or artificial.

In the second part of the questionnaire the Impact of Event Scale-Revised (IES-R) was administered to assess the symptoms of PTSD. The IES-R contained 22 items, that each of them was associated to a Likert scale value ranging from 0, as “not at all”, to 4 as “extremely”. The sum of the scores of the 22 items provided a total value of the IES-R that identified a different level of the PTDS condition. Specifically, for values less than 23 any clinically relevant post-traumatic condition was identified, for values between 24 and 32, a PTDS condition with some mild symptoms was diagnosed, for values varied from 33 to 36, a clinical condition of PTDS was identified, and finally, for values higher than 37, a PTSD status was certainly diagnosed.

Furthermore, the 22 items were divided into the 3 sub-dimensions which explored:

- items no.1,2,3,6,9,14,16,20 the “Intrusion” dimension, as: intrusive thoughts, nightmares, intrusive feelings and imagery, dissociative-like re-experiencing;
- items no. 5,7,8,11,12,13,17,22, the “Avoidance” dimension, as: numbing of responsiveness, avoidance of feelings, situations, and ideas;
- items no. 4,10,15,18,19,21 explore the “Hyperousal” dimension, as: anger, irritability, hypervigilance, difficulty concentrating, heightened startle.

Participants

All women who gave birth in the Italian territory in the period between February 2020 and May 2020 could be voluntarily involved in this research. All women who did not answered the questionnaire in all its parts were excluded.

Ethical considerations

The study was evaluated and approved by the Ethics Committee of the University Hospital of the Policlinic of Bari (no.6492/2020). All the data reported in the questionnaires were handled independently. No form of return of the data provided was envisaged.

Data analysis

Data were collected in an Excel data sheet and then elaborated thanks to the Statistical Package for the Social Sciences (SPSS) version 20. Socio-demographic variables were considered as categorical and elaborated as frequencies and percentages, while the total IES-R values and their related sub dimensions’ scores were presented as means and standard deviations. The Independent Samples t-test was performed to evaluate sampling differences according to socio-demographic variables collected. All values < 0.05 were considered as statistically significant.

Results

A total 156 puerperal women were enrolled in this survey (Tab. I). 36.54% of the participants reported a PTSD condition, while 25.64% were well.

By considering IES-R total scores, a significant difference ($p = .046$) was reported between "pre-term" and "complete" puerperal women, as "pre-term" women recorded higher IES-R total scores (38.50 ± 13.80) than "complete" ones (33.08 ± 14.30), respectively. As regards the IES-R intrusion sub dimension, any significant differences were recorded according to all sampling characteristics considered. On the other hand, concerning the Avoidance sub dimension, significantly differences were registered between "pre-term" and "complete" puerperal women ($p = .022$), as "pre-term women registered higher IES-R-scores (15.50 ± 4.23) than "complete" women (13.22 ± 5.40), respectively. Also, by considering the typology of partum, women who performed a caesarean section reported significantly ($p = .004$) higher IES-R values in the Avoidance sub dimension (14.95 ± 4.86) than women who delivered physiologically (12.51 ± 5.44). Finally, by considering the breastfeeding typology, a significant difference was reported ($p = .016$), as women who naturally breastfed (13.10 ± 5.14) recorded lower scores than women who artificially breastfed (15.33 ± 5.36) their newborns (Tab. II).

Discussion

The present study aimed to evaluate how post-traumatic stress in puerperia varied during the COVID-19 pandemic. Specifically, it assessed any differences in the distress perception by considering some socio-demographic variables related to the birth event, as: the weeks of gestation of the birth, the partum typology and the breastfeeding typology. Data highlighted the presence of the PTSD among puerperal women, especially in the avoidance sub dimension. Moreover, as regards the other two sub dimensions, there was no statistically significant difference between the IES-R values in relation to the characteristics of childbirth and breastfeeding. Current literature had already evaluated the anxious and depressive conditions [19,20] in pregnant women during the COVID-19 pandemic. For example, in the Saccone et al. [21] study the psychological impact of the COVID-19 pandemic in pregnant women was assessed also by using the Italian version of the IES-R. However, data referred only to the pandemic period, such as from March 2020 to April 2020, differentiating the IES-R scores according to pregnancy. In any case, the study reported high IES-R scores also linked to the high demand of cesarean surgery. The high IES-R scores in the pregnant woman reflected then in the puerperia with as

TABLE I. *Sampling characteristics (n = 156).*

Variables	N	%
Age:		
Under 20 years	18	11.5
21-30 years	62	39.7
31-40 years	64	41
> 41 years	12	7.7
Instruction level:		
Lower middle school	19	12.2
Diploma	51	32.7
Graduation	86	55.1
Weeks of gestation at the time of partum:		
Pre term	120	76.9
Complete	36	23.1
Post term	0	0
Type of partum		
Physiological	74	47.4
Caesarean section	81	51.9
Type of breastfeeding:		
Natural	111	71.2
Artificial	45	28.8
IES-R scores		
Values < 23	40	25.64
Values 24-32	45	28.85
Values 33-36	14	8.97
Values > 37	57	36.54

TABLE II. *Differences in PTSD in relation to of childbirth characteristics.*

	Means	Standard deviation	P-value
IES-R total	34.33	14.32	
Weeks of gestation at the time of partum:			
Pre term	38.50	13.80	0.046*
Complete	33.08	14.30	
Type of partum			
Physiological	33.72	14.39	0.569
Caesarean section	35.04	14.36	
Type of breastfeeding:			
Natural	34.35	14.21	0.980
Artificial	34.29	14.77	
IES-R intrusion	11.67	6.81	
Weeks of gestation at the time of partum:			
Pre term	12.89	7.35	0.224
Complete	11.31	6.64	
Type of partum			
Physiological	12.22	6.72	0.356
Caesarean section	11.20	6.95	
Type of breastfeeding:			
Breast	12.31	6.64	0.068
Artificial	10.11	7.08	
IES-R avoidance	13.74	5.28	
Weeks of gestation at the time of partum:			
Pre term	15.50	4.23	0.022*
Complete	13.22	5.40	
Type of partum			
Physiological	12.51	5.44	0.004*
Caesarean section	14.95	4.86	
Type of breastfeeding:			
Natural	13.10	5.14	0.016*
Artificial	15.33	5.36	
IES-R hyperarousal	8.92	5.01	
Weeks of gestation at the time of partum:			
Pre term	10.11	4.93	0.103
Complete	8.56	5.00	
Type of partum			
Physiological	8.99	4.83	0.904
Caesarean section	8.89	5.22	
Type of breastfeeding:			
Breast	8.95	5.06	0.980
Artificial	8.84	4.92	

**p < 0.05 is statistically significant.*

many high IES-R values, especially in the avoidance sub dimension as also demonstrated in this study. Certainly in the literature several studies were available by considering the pregnancy period, as pregnant periodically checked to routine clinical analysis so it was easier in recruiting in research studies [22-24].

The present findings showed a worsening of the PTSD condition during the COVID-19 pandemic and therefore appeared to be in agreement with the data reported in the literature which underlined a psychological condition both for pregnant and puerperal women not very encouraging during the pandemic. However, the present study

included a sufficient number of participants compared to that recruited in other studies on puerperal subjects as it was not easy to recruit in this particular historical period in which puerperal avoided to had contact with the world, but it was important to describe and know their psychological conditions to implement the network of psychological services, already available to them to improve their psychological well-being in a particular period of their life made even more difficult by the pandemic condition in which the whole world is currently pouring.

Conclusions

PTSD among puerperal women was intensely evident in the avoidance dimension, especially in participants who have given a pre-term birth, though the caesarean surgery and who had artificially breastfed their own unborn child in the puerperium. Further studies were desirable to better investigate the avoidance sub-dimension, perhaps correlating it with other evaluation scales such as the Edinburg Depression Scale [25] and perhaps gather an even more representative group of participants.

Ethical consideration

None.

Acknowledgement

We thank all the participants.

Funding

None.

Conflict of interest

The Author declares to have no conflict of interest.

Author contributions

None.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:140-147
DOI: 10.36148/2284-0249-426

Original article

Comparison of happiness training based on Islamic concepts and Qigong exercises effectiveness on happiness of mothers with handicapped children

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SUMMARY

Background

A child with a disability causes many psychological problems for the family members, especially for the mother. Considering the importance of maternal happiness in the family and society, the aim of the present study was to compare happiness training based on Islamic concepts and Qigong exercises effectiveness on happiness of mothers with handicapped children.

Methods

A Semi-experimental design was conducted (pre-test and post-test) with two experimental and one control groups. 45 mothers with handicapped children Welfare of Tabriz (Iran) who had lower scores in the Oxford Happiness Questionnaire by Argyle (1990), were selected by convenience sampling and randomly divided into two experimental groups (15 people in each group) and one control group (15 people). For the first group, Happiness training based on Islamic concepts (8 sessions; a week 2 sessions in one hour) and for the second group, Qigong exercises (8 sessions; week 2 sessions, 30 to 40 minutes) was applied and the control group did not receive any training. Prior and after the training, the subjects completed Argyle Oxford Happiness Questionnaire (1990). Univariate analysis of covariance (ANCOVA) was used to analyze the data.

Results

The results showed that the mean scores of happiness of mothers with handicapped children increased significantly in the group of Happiness training based on Islamic concepts comparison to Qigong exercises group and in the Qigong exercises group comparison to the control group in the post-test ($p < 0.05$).

Conclusions

The results showed that happiness training based on Islamic concepts is more effective in increasing happiness in mothers with handicapped children than Qigong exercises.

Key words: happiness, qigong, mothers, physically disabled

Received: April 30, 2021
Accepted: June 9, 2021

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How to cite this article: Salehiam MH, Sarvari S, Ghanati P. Comparison of happiness training based on Islamic concepts and Qigong exercises effectiveness on happiness of mothers with handicapped children. Journal of Psychopathology 2021;27:140-147. https://doi.org/10.36148/2284-0249-426

Introduction

The birth of a child is one of the most pleasant and enjoyable events for a family. But if the child is not born with the desired mental and physical health and is so-called disabled, this pleasant event becomes an unpleasant event [1]. Physical disability is one of the major disabilities of children in many countries [2]. The World Health Organization uses disability as a general term for injuries, functional and participatory limitations that lead to dysfunction of the body and deprive the individual of participation in daily personal and social activities [3]. The presence of a disabled child makes important changes in the normal life cycle of families [4].

Meanwhile, mothers often experience more stress than fathers due to their special role in the birth and care of a disabled child. Fathers usually do not express their feelings as much as mothers, while mothers show a wide range of emotions such as anger, sadness, crying and grief [5]. Studies have shown that mothers with handicapped children have lower levels of general health (physical symptoms, depression [6], anxiety and social dysfunction) [7] and less happiness [8], lower quality of life and psychological capital [9] compared to mothers of healthy children. Have lower levels of life satisfaction [10] and higher levels of stress and lower psychological well-being [11]. Happiness is the repeated experience of pleasant emotions, the relative absence of unpleasant feelings, and the general feeling of life satisfaction [12].

According to figures released by the World Health Organization, there are 650 people with handicapped living in the world, of which nearly 70% are in developing countries. In Iranian society, according to the Welfare Organization, about 7% of the population suffers from some kind of disability and annually about 25,000 handicapped children are born in the country with severe physical and motor disorders [13]. People are of special importance. Researchers believe that happiness education based on Islamic concepts [14,15] and Qigong exercises [16] are among the interventions that can play a significant role in reducing depression, anxiety and happiness in stressful life situations. Happiness based on positive psychology is a feeling that is characterized by happiness, satisfaction, joy and pleasure and has existed in the world since ancient times and the goal of every human being is to achieve it [17].

Today's world is full of anxieties, including mental anxieties and psychological tensions, and full of serious human problems in the age of technology and communication, which has led to a decrease in his sense of happiness. In fact, one of the basic human needs is to live happily, in the light of which a person can pay attention to his spiritual balance and the dimension of his society. One of the issues that psychologists have been studying for the last two decades is happiness and well-being and its influential and related factors [18]. Given that we live in a religious country and religious beliefs and practices based on religious teachings are of particular importance in our culture, one of the factors influencing happiness is religiosity [19].

This is the mission of Islam and in this regard, there are many emphases for a person to live happily and be cheerful. Since Islam is the religion of happiness, vivacity and mobility. The believer, in terms of living happily, does his work well and achieves more success in his physical, mental and intellectual endeavors, as well as in social communication and interaction with people in the community and work environment. Who helps his fellow man and has a good presence [20]. Accordingly true happiness and the Islamic model of happiness is a cognition that arises from the level of human perfection and is associated with an infinite server, which has stability and stability [21].

Factors affecting the creation and increase of components of Islamic happiness include patience, recognizing the reality of hardships, having skills to deal with stress, sugar, material and spiritual vitality. In general, the teachings of patience and gratitude create happiness by changing the mind and cognition in human beings, but in the areas of material and spiritual vitality, it is necessary to perform behaviors in order to complete happiness in the individual. Physical factors (appearance, play, recreation, proper nutrition, sleep and bathing), economic (work and contentment) and social (marriage and uterine reconciliation) as enhancing material vitality and moral factors (good mood, humor, anger management, Forgiveness, piety, social support of others, self-discipline, proper planning in life and wise words) and emotional-spiritual factors (remembrance of God, prayer and supplication) cause spiritual vitality [15]. Lyubomirsky et al. [21] believe that in general, happy people respond to situations and events in a more positive and adaptive manner and have lower stress levels and a stronger and more creative immune system than unhappy people [22].

Aghaei [22] showed spirituality training in promoting happiness in postmenopausal women is affectiveness [23]. Shokoohi Yekta et al. [23] in a quasi-experimental study on mothers with mentally disabled children, concluded that anger management training reduces anger intensity in anger-provoking situations and increases the use of control strategies and improve parent-child relationships [23]. Zarrin Kolah [24] showed that humorous styles play a significant mediating role for psychological well-being and happiness [24].

In recent years, people have increasingly used mind and body exercises (such as qigong, taichi, and yoga) as complementary and alternative therapies to control stress, depression, and anxiety [26]. Mental exercise is a type of exercise that focuses on self-awareness and interpersonal and mental alignment, along with low and moderate muscle activity and meditation [27]. Qigong as a mental exercise is an ancient Chinese exercise for health, vitality and longevity with a history of several thousand years. Today, about 60 million people do it daily in China. The three main teachings of qigong are mind regulation, body regulation and breathing regulation; all of which are designed to enhance Chi function, that is, by using natural forces to optimize and balance energy within, through deep attainment of concentration and relaxation [28].

An overview of the domestic Qigong research literature provides more than a dozen forms that have been

studied for their effects on health outcomes, including Guo-lin, Chun-do-Sun-bap, -Do-Sun-Bup), Vitality, Bu Zheng Qigong, Eight Brocade, and Medical Qigong [29]. Qigong is rooted in the concepts of traditional Chinese medicine (TCM) and its emphasis on qi (vital energy) and yi (power of intention), which is considered as an effective intervention to manage moods and increase the well-being of body and mind. It distinguishes other treatments [30]. In fact, when people practice Qigong regularly, their minds gradually reach peace and tranquility, and they generally feel that their existence has become more balanced.

However, the most important effect of regular Qigong training is to discover the inner world of their body energy. By touching, feeling and receiving their inner experiences, they enter a new stage of mental cognition in addition to their physical cognition. This can be very effective in helping people, especially mothers with handicapped children, and help them deal with life-threatening and confusing life. Qigong general exercises reduce the mental stress that is common in the community helps those who are not balanced. Qigong balances internal energy and can cure many diseases. In addition, it helps people overcome depression and fear and achieve true peace, tranquility, happiness and bliss [31].

It has been shown to treat depression, improve quality of life and increase physical and mental well-being [32], reduce adrenocorticotropic hormone, cortisol and aldosterone levels, norepinephrine and epinephrine and improve mood [33] and strengthen the immune system [34]. Accordingly, Tsang et al. [35] examined the effect of the Qigong exercise program on 82 depressed seniors in Hong Kong and concluded that 16 weeks of regular Qigong exercise can relieve depression and improve self-efficacy. Welfare in the elderly is depressed and has a chronic physical illness [35]. Oh et al. [36] stated that qigong plays an important role in the treatment of depression as a physical-mental exercise. The results of a systematic and meta-analysis of Wang et al. [37] show that Qigong has a positive effect on psychological well-being and reduces depression and anxiety.

Since mothers mothers with handicapped children face a lot of stress, problems and difficulties in life and also they play an important role in creating and maintaining the balance of the relationship system in the family and according to studies, it seems that happiness education is based on Islamic concepts and Qigongi exercises are very important as basic skills to promote mothers' happiness. Due to the importance of this issue, research gap and lack of empirical research in comparing the effect of these trainings on increasing parents' happiness with disabled children, especially mothers with physically and mentally handicapped children, this study aims to compare the effect of happiness training based on Islamic concepts and exercises on happiness of mothers with physical handicapped children.

Materials and methods

The method of the present study was quasi-experimental (pre-test-post-test) using two experimental groups and one control group.

Statistical society

The statistical population included all mothers of children with physical and mental disabilities, covered by the welfare of Tabriz (Iran) in 2020-2021. The sample consisted of 45 mothers with handicapped children and welfare in Tabriz who had lower scores in the Oxford Argyle (1990) Happiness Questionnaire. They were divided into three groups as Qigong exercises (15 people), happiness training based on Islamic concepts (15 people) and one control group (15 people).

Data collection tools

The following tools have been used to collect information: Oxford Happiness Questionnaire: The instrument of the present study is the Oxford Happiness Questionnaire developed by Argyle in 1990. This questionnaire has 29 four-choice items that are scored from 0 to 3, respectively. Strongly disagree (0), disagree (1), agree (2), strongly agree (3). So the higher the scores, the happier people will be. The minimum score of each subject is 0 and the maximum is 87 [40]. The validity of the Oxford Happiness Questionnaire has been confirmed in various studies and the Cronbach's alpha coefficient for evaluating the reliability of this tool has been calculated between 87-93% in studies [38].

Intervention methods

Happiness training based on Islamic concepts: For the first group, happiness training based on Islamic concepts was taught in 8 sessions and each session lasted for one hour. This treatment method has been developed by Hosseinpour Najjar et al. [40] and its effectiveness on depression, anxiety and happiness has been confirmed.

Qigong exercises

The total duration of the exercises was 10 sessions, two sessions per week and each session lasted 30 to 40 minutes. Traditional Chinese qigong is all about the coordination of body, breath and mind through a series of movements and has been shown to have mental benefits (reducing anxiety and stress) and physical health (lowering blood pressure, better sleep, increasing endurance, improving kidney function). Is the relief of low back pain).[25] These Qigong exercises are part of the Qigong movements that affect mental happiness, health, and stress reduction, adapted from Yang's book Health

and Martial Arts, and can be seen in Figure 1 (left to right, respectively).

How to collect information

After receiving permission from Tabriz University, coordination with the officials of the General Department of Welfare of East Azerbaijan Province and obtaining informed consent from mothers with handicapped children, it was decided that the selected mothers at the appointed time in the amphitheater of Tabriz University, which had the necessary facilities, including computers, video projectors, etc., to be present. In the introductory meeting, after establishing the researcher with the participants, the mothers' questions were answered and the questionnaires were completed. After performing the pre-test (Oxford Argyle Happiness Questionnaire, 1990), agreement was reached on the date of the next sessions and 45 mothers with handicapped children who met the inclusion criteria were randomly divided into 2 experimental groups of 15 (Group 1: Happiness Training). Basis of Islamic Concepts and group 2: Qigong exercises and a group of 15 witnesses were divided.

After selecting the test groups, in the introductory session of the experimental groups, a summary of the goals and methods of happiness training based on Islamic concepts and Qigong exercises for the experimental groups was given and the experimental groups were asked not to talk about the content of the sessions with other mothers. Mothers were assured that they would not be under any other educational or medical program. Experiment 1 students in groups in sessions, happiness education based on Islamic concepts (8 sessions; 2 weeks, one and a half hour sessions) and experimental group 2 students, Qigong exercises training (8 sessions: two sessions of 30 to 40 minutes per week) One group received and the control group did not receive training. All educational materials in the Happiness Education group were presented based on Islamic concepts in powerpoints format and with pictures. At the end of the training sessions, post-test (Oxford Argyle Happiness Questionnaire, 1990) was measured in all 3 groups (2 experimental groups and one control group). It should be noted that in order to comply with the ethical principles of the research, after all three post-test groups (Oxford Argyle Happiness Questionnaire, 1990), the mentioned trainings were performed for the control group.

FIGURE 1. *Qigong movements performed in the training protocol.*

Data analysis

Finally, the data were analyzed using SPSS-20 statistical software. In the description section,mean and standard deviation and in the inferential section, univariate analysis of covariance with assumptions of normal distribution of scores through Shapiro-Wilk test, assumption of homogeneity of regression slope using group interaction * Pre-test and Levin test for homogeneity and error of dependent variable was used in the groups.

Results

According to the Table I, it is concluded that happiness training based on Islamic concepts have a significant positive effect on increasing happiness of mothers with handicapped children.

According to the Table II, it is concluded that Qigong exercises have a significant positive effect on increasing happiness of mothers with handicapped children.

According to the Table III, it is concluded that the effect of happiness training based on Islamic concepts on increasing happiness of mothers with handicapped children is significantly greater than the effect of Qigong exercises.

Discussion

The aim of this study was to compare the effect of happiness education based on Islamic concepts and Qigong exercises on happiness of mothers with children with physical disabilities. The results of univariate analysis of covariance showed that happiness scores of mothers with handicapped children in education According to Islamic concepts it has increased significantly compared to the Qigong training group compared to the control group in the post-test. There is no report in the research literature on comparing the effectiveness of these trainings on increasing the happiness of mothers with handicapped children; but the result obtained with the results of studies of Ekrami et al. [14], Hosseinpour Najjar et al. [40] Jafari and Bagheri [20]. Cognitive-behavioral and Islamic happiness education has a great effect on increasing happiness, positivity, psychological well-being, improving quality of life and stress tolerance. Religion plays a significant role in increasing happiness in the face of stress.

TABLE I. *Results of differences between happiness of mothers with handicapped children in post-test of control and happiness training based on Islamic concepts.*

Source of change	Sum of squares	df	Average squares	F	P	Eta
The effect of pre-test	442.15	1	442.15	1489.1	0.001	0.988
Group effect	315.21	1	315.21	1319.4	0.001	0.768
Error	7.372	27	0.362			
Total	5213	30				

TABLE II. *Results of differences of happiness training based on Islamic concepts in the post-test between the two control groups and Qigong exercises.*

Source of change	Sum of squares	df	Average squares	F	P	Eta
The effect of pre-test	547.16	1	547.16	1581.6	0.001	0.982
Group effect	123.24	1	123.24	392.5	0.001	0.762
Error	8.347	27	0.381			
Total	5431	30				

TABLE III. *Results of differences in happiness of mothers with handicapped children in the post-test between happiness training based on Islamic concepts and Qigong exercises groups.*

Source of change	Sum of squares	df	Average squares	F	P	Eta
The effect of pre-test	474.25	1	474.25	2743.1	0.001	0.967
Group effect	78.42	1	78.42	412.3	0.001	0.545
Error	5.12	27	0.145			
Total	6345	30				

It is also consistent with the findings of Zarrin Kolah [24] that religiosity, religion, and humorous styles (one of the components of Islamic happiness education) play a significant role in mental health (reducing stress, depression, and anxiety) and happiness. In addition, this research finding is in line with the results of studies by Tsang et al. [35], Oh et al. [36], Chow et al. [34] and Wang et al. [37] that Qigong has a positive effect on psychological well-being, quality of life and reducing negative emotions (depression, anxiety and stress).

Explaining this research finding, it can be stated that families with disabled children are under more stress than families with healthy children. In addition, the first person who has direct contact with the child is the mother. While constant maintenance and the need to provide special conditions for growth and exposure to pressures such as, stereotyped behaviors and lack of self-care skills in these children weaken the normal functioning of the mother and also mothers react negatively to their child's behaviors. Factors cause high levels of stress and marital conflicts, separation, divorce, low self-esteem, decreased happiness and life satisfaction in mothers with handicapped children [10]. Evidence suggests that feelings of happiness produce energy, passion, vitality, movement and dynamism, and as a shield can protect a person against stress and problems and ensure mental health. There are many factors that can affect happiness, including wealth, health, education, gender, religious status, age, leisure activities, cognitive processes, and personality traits [25].

In religious societies, including Iran, religious elements are mixed with cultural elements and culture not only takes on a religious form but also has religious content and criteria. Elements of Islamic culture can protect society from the harms and tensions of life. Prevention and treatment of mental disorders helped. It is necessary to localize therapeutic methods today because there are significant differences in behavior between individuals and groups that grow in different ecological and cultural conditions and behavioral similarities between those that are in similar environmental and cultural conditions attract attention [19]. In fact, happiness based on Islam-

ic concepts is a kind of psychological activity and a positive emotional state that arises after seeking divine pleasure, achieving goals, real success, the absence of negative emotions and general satisfaction with human life and strengthens faith, expands social relationships. Good information processing, life expectancy, dynamism and more effort make a person happy [21].

Lyubomirsky et al. [21] believe that people with religious affiliations are more likely to consider them very happy. During training sessions, by teaching patience, which is familiarity with the true meaning of patience, the importance of its necessity in life and ways to gain patience in the face of various situations, mothers can be helped not only not to give up but also to try to solve it; because people in the face of stress and life crises need to learn how to cope with problems to be able to maintain their mental health [19]. The results of the study by Lashani et al. [43] showed that the application of gratitude strategies has a significant effect on the development of positive emotions and happiness, as it is related to awareness of the blessings of life, possessions or acquisitions [43]. Things that may always happen to us, but we look at them as very ordinary things and do not take their role and place seriously or ignore them. In the wake of such awareness and positive attention, we also pay attention to the source of this matter, a source which we may have so far, more limited, or less, viewed from this perspective. During the next sessions in this study, the factors of spiritual and material vitality in mothers were studied. Accordingly, one of the most important ways to live happily is to be active. Planning for enjoyable activities such as games, outings, attending friendly gatherings, engaging in moral and spiritual matters can enhance our activities. Pleasant activities are among the most effective ways to reduce negative emotions and increase happiness [14].

People who have a sense of humor (one of the spiritual and moral issues) also deal with problems in a more fun way, experience less stress, thus improving their well-being and mental health, and have lower levels of happiness [25]. Also, the research of Paster et al. [44] showed that social support as a source of coping plays a very important role in predicting the mental well-being of parents in the face of stressful events such as the birth of exceptional children. In fact, people feel happier when they know they are being supported by family, friends, and loved ones, and they act more logically and effectively in the face of adversity. Obviously, all human beings need the support of those around them and their friends in times of trouble to feel safe. In fact, the more social support others have, the more hope they have [46].

In the final sessions, anger management training as well as remembrance, prayer and supplication were taught. Anger management is a negative emotion that if one becomes accustomed to expressing oneself over time, one will lose happiness. In this regard, Imam Ali (AS) says: "Anger destroys its owner and reveals ugliness. Therefore, what God advises is to control anger and consider it as a characteristic of the pious who have been promised paradise and forgiveness [41]. Accordingly, the results of Salehian et al. [46] showed that anger management training can change the psychological characteristics of individuals including self-esteem and happiness [44]. Also, believing that there is a God who controls situations and oversees the servants greatly reduces situation-related anxiety; as most believers believe, the effect of uncontrollable situations can be controlled through reliance and recourse to God through remembrance, prayer and supplication. Also, people who are at a higher level in terms of religion, solve their problems in a problem-solving manner and with social support [48].

In fact, happiness education based on Islamic concepts, which includes a positive view of life and gratitude, as well as resilience and effort against life problems and material and spiritual vitality can increase happiness in the lives of mothers with handicapped children. On the other hand, one of the most important, simplest and least expensive therapeutic approaches is physical activity and exercise. Qigong exercise is a form of complementary medicine and as a non-pharmacological and uncomplicated treatment that does not require special equipment; Along with other common therapies, it is used to reduce stress [49]. Studies have shown that mothers with disabled children have lower levels of happiness than mothers of healthy children [18]. Happiness, on the other hand, strengthens the immune system through the secretion of the hormone oxytocin [49].

However, having a child with a physical disability is a source of stress for parents, especially mothers [51] and stress or tension is a phenomenon that can affect almost all neurological and endocrine activities, so that the effects of stress-induced changes can Disrupts the balance of homeostasis and leads to disorders in the immune system. The effects of stress on the sympathetic nerves and the hypothalamic nerve branch stimulate the pituitary gland and increase the secretion of glucocorticosteroid hormones. These hormones play an important role in reducing the immune system's responses [51].

Accordingly, previous studies have shown that qigong may have beneficial effects on society in a wide range of psychological well-being, including mood, anxiety, depression, general stress management, quality of life, and athletic self-efficacy. Qigong movements are relatively easy compared to other traditional mind-body techniques. Hence, people practice qigong for various reasons, including sports, recreation, well-being, happiness, maintaining health, meditation, cultivating martial arts [38]. Psychological benefits of qigong practice

include relaxation, movement demonstration, desensitization, automatic movement enhancement, and breathing. Researchers speculate that regulating breathing and structural movements during qigong exercise leads to long, deep diaphragmatic, rhythmic breathing that can affect the autonomic nervous system (ANS) and endocrine system, stabilize mood, and increase mood. Control and restore the homeostatic state, cardiac output, oxygen consumption, exhalation of carbon dioxide and the flexibility of the autonomic nervous system [52]. Researchers have also proposed three psychological pathways (monoamine neurotransmitters in the brain, hypothalamic-pituitary-adrenal axis, and brain-derived neurotropic agents) to explain the effects of qigong exercise on maternal stress and depression [28].

Therefore, in the present study, by examining the effect of Qigong exercises and happiness education based on Islamic concepts, in fact, the physical and psychological dimensions of affecting the happiness of mothers with handicapped children are combined as the strength of this research. One of the limitations of the present study is that it is unisexual and it is not possible to implement follow-up programs in order to pursue effectiveness over time.

Besides, as the present study is a quasi-experimental study with limited participants care should be taken in predicting the results in general.

Conclusions

In general, it can be concluded that happiness education based on Islamic concepts is more effective in increasing the happiness of mothers with handicapped children than Qigong exercises. According to the results of this study and its confirmation through previous studies, the use of happiness education based on Islamic concepts along with Qigong exercises is suggested as an effective program to increase the happiness of parents with disabled children, especially mothers with handicapped children. A move by all welfare centers, counseling and treatment in the country with the aim of guiding and helping the parents of exceptional children for better and faster adjustment and increasing the mental health of parents should be considered by the authorities.

Ethical consideration

This research has been conducted in compliance with ethical standards and participants' satisfaction.

Acknowledgement

Researchers appreciate all the participants in this study.

Funding

It is worth mentioning that the present study was conducted without any financial support.

Conflict of interest

There is no conflict of interest for the Authors of this article.

Author contributions

Both Authors had a common share.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:148-155
DOI: 10.36148/2284-0249-425

Original article

Mapping potential risk factors in developing burnout syndrome between physicians and registered nurses suffering from an aggression in Italian Emergency departments

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SUMMARY

Background

Violence in the workplace is a problem that affects countries around the world. The present study aimed to evaluate potential risk factors in the development of burnout syndrome in physicians and registered nurses belonging to the Italian Emergency Medicine Departments.

Methods

An online survey was conducted from August to February 2021, that explored: workplace safety job satisfaction and burnout levels in: emotional exhaustion (E.E.), depersonalization (D.) and personal accomplishment (P.A.) sub dimensions, in nurses and physicians belonging to Italian Emergency Departments.

Findings

222 healthcare workers were recruited among physicians and registered nurses. Of these, 191(86%) suffered from an aggression and 83(37.4%) perceived their own work environments as unsafe. Burnout levels indicated that: more healthcare workers were in E.E. (36.9%), in severe D. (52.3%) and P.A. (40.5%) conditions. Sex for E.E. (p = .034), shift work for P.A. (p = .012), suffered aggression for both D. (p = .029) and P.A. (p = .043) and job satisfaction both for D. (p = .004) and P.A. (p = .002) might be considered as potential risk factors in developing burnout syndrome.

Key words: aggression, burnout, emergency department, physician, registered nurse, risk factor

Received: May 24, 2021
Accepted: June 21, 2021

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How to cite this article: Vitale E, Lupo R, Calabrò A, et al. Mapping potential risk factors in developing burnout syndrome between physicians and registered nurses suffering from an aggression in Italian Emergency departments. Journal of Psychopathology 2021;27:148-155. https://doi.org/10.36148/2284-0249-425

Background

Violence in the workplace is a problem that affects countries around the world. The true extent of the problem is not known, but the data collected is believed to be only the tip of the iceberg. The National Institute for Occupational Safety and Health (NIOSH) defined violence as: "any physical assault, threatening behavior or verbal abuse suffered while in the workplace" [1]. Episodes of violence against healthcare workers were considered adverse events of particular gravity, as they were potentially avoidable events, capable of causing serious harm or even death of the patient and/or operator. Although the phenomenon of violence in the workplace was substantially distributed across all work contexts and the health

sector remained the most involved, especially the emergency and urgent departments. First aid, characterized by a large number of daily accesses and by situations in which operators might move while maintaining the difficult balance between the need to assign priority to their interventions, to act quickly under the diagnostic-therapeutic-assistance profile and to guarantee in any case a quality healthcare response, always keeping the humanization profile of care high, represented the care settings most at risk of violence [2]. Several studies highlighted the worrying dimensions of this phenomenon. For example, a recent study by Sharma et al. (2019), documented that about 54% of investigated healthcare workers suffered from violence in the emergency department exposing them to physical, verbal and psychological violence [3]. However, violence at workplace still remained underestimated due to the low propensity to report, or shame [4,5], or because the aggressions were experienced as an integral part of the work [6], or even due to a lack of satisfaction in the answers provided by the administration[7]. In addition, several studies investigated the psychophysical consequences to violence, showing how fear, anguish, low mood, decrease in the quality of one's work, were among physicians and nurses belonged to the Emergency Departments (ED) often leading to removal from their workplaces [8,9]. The Ministry of Health defined acted of violence to healthcare workers as "sentinel events" and adopted recommendations on this matter [10] aiming to prevent and adopt initiatives to protect healthcare workers and victims of violence. In this direction, healthcare workers might be involved in a virtuous process, purposed at recognizing not only the empowerment of healthcare personnel, but also a more transparent and healthier work environment, both for the staff themselves and patients, in order to fully support efforts to improve the health and safety of health personnel [11,12]. Nurses who were victims of violence could develop psycho-somatic disorders related to the adverse event, as burnout syndrome, as shown by another study carried out in Italy [13] on a sample of 630 workers, specifically 522 nurses and 108 healthcare support workers, from which a directly correlation was evidenced between professional exhaustion and, in particular, verbal violence suffered in the workplace. In Slovenia, 3756 nurses were interviewed and of these, 61.6% suffered from verbal violence and 10.9% from physical one in the last year and only 6.5% reported the incident in writing form [14]. The main reason for the overwhelming majority of healthcare workers who did not report violence was the belief that the report might not change anything, followed by fear of losing their jobs. Although this phenomenon was substantially distributed over all healthcare work environments, so episodes of violence against healthcare workers underwent a worrying growth. To date, data available in this regard were lacking, even less a precise evaluation of it, also due to the lack of systematically research activities and homogeneous procedures carried out [15].

Aim

The present study aimed to evaluate potential risk factors in the development of burnout syndrome associated to socio-demographic variables collected, general assessment in safety perception level of one's work environment and job satisfaction levels in physicians and registered nurses belonged to the Italian Emergency Medicine Departments.

Materials and methods

Data collection

The questionnaire was presented to the "Italian Triage Training group" which accepted it, as well as authorized and subsequently widespread it through online distribution channels.

The questionnaire

The questionnaire contained a first part of socio-demographic data:

- sex, as female and male;
- healthcare role, as physician or registered nurse;
- years of work experience in Emergency Department (ED), divided into four subgroups, as: from 1 to 10 years, from 11 to 20 year, from 21 to 30 years and over 31 years;
- intensity area of the ED, as: < 25.000 inhabitants assigned, between 25.000 and 50.000 inhabitants, between 50.000-75.000 inhabitants, between 75.000-100.000 inhabitants and over 100.000 inhabitants;
- shift work, as interviewees worked only during the morning hours (h12), or both the morning and the night hours (h24);
- if the interviewer suffered from violence;
- for who suffered from violence, if it was verbal or physical;
- when violence occurred, as: during the morning and the afternoon or the night;
- if the victim of violence reported the event;
- worker safety perception, by indicating own perception among three levels, as: weak, moderate or strong;
- job satisfaction levels, by indicating own satisfaction among three levels, as: weak, moderate or strong;
- burnout levels, by answering to the Maslach Burnout Inventory (MBI) questionnaire, describing it as a three-dimensional aspects as Emotional Exhaustion (E.E.), as a result of continuous interactions required between the worker and the users of the service; Depersonalization (D) or the presence of cynical attitudes

and responses to clients; and a the sensation of poor Personal Achievement (P.A.) or the lack of confidence and negative self-esteem resulting from meetings with unrewarding situations. The MBI scale contained 22 items, specifically items no. 1,2,3,6,8,13,14,16,20 explored for the E.E. sub dimension, items no. 5,10, 11,15,22 for D. and items no. 4,7,9,12,17,18,19,21 for P.A. Each question was associated to a 6-point Linkert-scale varying from 0(never) to 6 (always). By summing answer values for each sub dimension it obtained, for the E.E. dimension all values lower than 14 identified a weak level, for values ranged from 15 to 23 a moderate level and for values over 24 a strong level. By considering the D. sub dimension, values less than 3 indicated a weak level, values between 4 and 8 indicated a moderate level, values more than 9 indicated a strong level. Finally, as regards the P.A. sub dimension, values more than 37 identified a weak level, values included from 30 to 36 indicated a moderate level and values less than 29 indicated a strong level.

Data analysis

All data were collected in an Excel data sheet and subsequently processed thanks to the Statistical Package for the Social Sciences (SPSS) version 20. All data were grouped according to socio-demographic variables in frequencies and percentages. Subsequently, data were further analyzed for the risks in burnout syndrome by performing multivariate logistic regression analyses. All p values < .05 were considered as statistically significant and potential risk factors in developing burnout syndrome. So, for all the potential factor identified we analyzed data in order to better underline which characteristics were more at risk in developing burnout syndrome in each sub dimensions.

Validity and reliability

In this study it was adopted a homogenous instrument to assess burnout levels among Italian nurses as the MBI, which contained 22 items that well measured burnout level and its consistency among responses of multiple users was validated from other previous studies [16].

Results

As shown in the Table I, 222 healthcare workers were recruited among physicians and registered nurses, who worked in the Italian Emergency Departments (EDs). Of these, 191(86%) suffered from an aggression, and 83(37.4%) perceived their own work environments as unsafe, 101(45.5%) as moderately safe and only 38(17.1%) among them as safe. Moreover, burnout levels underlined more healthcare workers both in severe E.E. (36.9%), D. (52.3%) and P.A. (40.5%) conditions.
Analyzing the sampling characteristics as a function of

TABLE I. *Sampling characteristics (n = 222).*

Socio-demographic characteristics	n;%
Gender	
Female	127(57.2%)
Male	95(42.8%)
Healthcare role:	
Physician	47(21.2%)
Nurse	175(78.8%)
Years of work experience in ED:	
1-10 years	154(69.4%)
11-20 years	47(21.2%)
21-30 years	12(5.4%)
> 31 years	9(4.1%)
Emergency department:	
< 25.000 patients	42(18.9%)
25.000-50.000 patients	98(44.1%)
50.000-75.000 patients	41(18.5%)
75.000-100.000 patients	25(11.3%)
> 100.000 patients	16(7.2%)
Shift work:	
H12	37(16.7%)
H24	185(83.3%)
Suffered aggression:	
No	31(14%)
Yes	191(86%)
Typology of aggression:	
Physical	66(29.73%)
Verbal	125(56.31%)
When aggression occurred:	
Morning/afternoon	146(65.76%)
Night	45(20.27%)
Report of the aggression:	
No	64(28.83%)
Yes	127(57.2%)
Safety perception:	
Weak	83(37.4%)
Moderate	101(45.5%)
Strong	38(17.1%)
Job satisfaction:	
Weak	45(20.3%)
Moderate	58(26.1%)
Strong	119(53.6%)
Burnout levels	
E.E.:	
Weak	75(33.8%)
Moderate	65(29.3%)
Strong	82(36.9%)
D.:	
Weak	62(27.9%)
Moderate	44(19.8%)
Strong	116(52.3%)
P.A.:	
Weak	69(31.1%)
Moderate	63(28.4%)
Strong	90(40.5%)

TABLE II. *Multivariate analysis of the potential risks according to socio-demographic characteristics.*

Socio-demographic characteristics	Burnout sub-dimensions	F	P-value
Sex	E.E.	4.582	.034*
	D.	1.778	.184
	P.A.	.426	.515
Healthcare role	E.E.	.178	.674
	D.	.025	.874
	P.A.	.313	.577
Years of work experience in ED	E.E.	.929	.428
	D.	1.139	.335
	P.A.	.972	.407
Emergency department	E.E.	1.699	.153
	D.	1.504	.203
	P.A.	.442	.778
Shift Work	E.E.	3.441	.065
	D.	1.445	.231
	P.A.	6.392	.012*
Suffered aggression	E.E.	1.175	280
	D.	4.875	.029*
	P.A.	4.150	.043*
Typology of aggression	E.E.	.244	.622
	D.	.115	.734
	P.A.	.000	.999
When aggression occurred	E.E.	.410	.746
	D.	.181	.909
	P.A.	1.731	.163
Report of the aggression	E.E.	.246	.620
	D.	3.194	.076
	P.A.	.023	.880
Safety perception	E.E.	.806	.449
	D.	.127	.881
	P.A.	1.439	.240
Job satisfaction	E.E.	2.807	.063
	D.	5.743	.004*
	P.A.	6.781	.002*

**p < .05 is statistically significant.*

the variables identified as potential risk factors in the development of Burnout syndrome, it could be noted that for the sub-dimension of E.E. females were more at risk than males. As regards the sub dimension of the D., suffering from an aggression and job satisfaction played an important role, as healthcare workers who suffered from an aggression and registered higher job satisfaction levels reported severe D. levels, too. Finally, as regards the P.A. sub-dimension, those who also worked during the night shift and already suffered from an aggression in their work environments, and also reported high levels of job satisfaction were most at risk (Tab. III).

Discussion

The present study aimed to evaluate potential risk factors in the development of Burnout syndrome in relation to socio-demographic variables collected, in addition to the general assessment of both the perception of the safety level of one's work environment and the level of job satisfaction, among physicians and registered nurses belonging to the Italian Departments of Emergency. The sample included 222 participants between nurses and physicians. Of these, 127(57.2%) suffered from an aggression during their work activities. Also literature recorded higher frequencies in healthcare workers who suffered from aggressions. For example, Cannavò et al. study [17] reported that 69.4% (n = 154) of interview-

TABLE III. *Sampling characteristics of the potential risk factors associated.*

Sampling characteristics	Burnout sub dimensions	Burnout level		
		Weak	Moderate	Strong
Sex	**E.E.**			
Female		45(20.27%)	31(13.96%)	51(22.97%)
Male		30(13.51%)	34(15.31%)	31(13.96%)
Shift work	**P.A.**			
H12		7(3.15%)	8(3.60%)	22(9.91%)
H24		62(27.93%)	55(24.77%)	68(30.63%)
Suffered aggression	**P.A.**			
No		14(6.31%)	7(3.15%)	10(4.50%)
Yes		55(24.77%)	56(25.22%)	80(36.04%)
Job satisfaction				
Weak	**D.**	6(2.70%)	7(3.15%)	32(14.41%)
Moderate		13(5.85%)	9(4.09%)	36(16.22%)
Strong		43(19.37%)	28(12.61%)	48(21.62%)
	P.A.			
Weak		8(3.60%)	6(2.70%)	31(13.96%)
Moderate		9(4.09%)	16(7.21%)	33(14.86%)
Strong		52(23.42%)	41(18.47%)	26(11.71%)

ers worked in the EDs for at least 10 years, mostly in a 24-hour shift and 44.1% (n = 98) indicated a number of annual accesses between 25.000 and 50.000 patients and violence in their work environments was considered as a widespread problem [18] and also concomitant cause emerging from the literature [19], as in the last 12 months, 29.73% (n = 66) suffered from physical aggressions and 56.31% (n = 125) to verbal ones. The prevalence of verbal violence could be found in numerous other studies [20-27]. In most cases (61.3%) the perpetrator was a patient, while family members or caregivers were responsible in 21.6% of cases. These episodes were more frequent during the morning and the afternoon shift (n = 146; 65.76%). Also in the Cannavò et al. study [17] aggressions during the night shift (20.27%; n = 45) were less frequent than the morning and the afternoon shifts. On the other hand, Ferri et al. [28] recorded higher prevalence during the night shift, especially in the waiting room. In this regard our data showed that violent episodes were recorded more during the h24 shift (86%) than the 12h (14%). Moreover, our findings recorded that 28.83% (n = 64) of participants did not report the aggression as an adverse event. At this regard our data were in agreement to a study conducted in Slovenia [29], on a sample of 3756 nurses, in which only 5% (n = 6) reported the incident in writing, compared to 10.9% of nurses who suffered physical violence. The main reason for the overwhelming majority of workers not reporting violence was the belief that reporting could not change anything, followed by the fear of losing their jobs. All these aspects produced demotivation and a consequently reduction in confidence in one's own skills. In line with these results of other studies [30,31], there was the reason to believe that the phenomenon of aggression suffered by healthcare workers in their workplace, although it emerged clearly, has been under-represented, also due to cultural reasons that hinder the recording of episodes. Literature recorded positively correlations between healthcare workers and burnout [32,33], also in the EDs [34-36]. Our data recorded that females were more exposed than males. Also, as regards the depersonalization sub dimension, healthcare workers who worked during the night shift and who had already suffered an aggression, recorded a strong level of depersonalization. This condition emerged also in the literature [34-36], and yet being present in every clinical setting, as it was more widespread in services where patient care and critical issues were more intense and there was a high workload and a greater risk of death [37,38]. The feeling of continuous fear was also reported in other studies in which most of nurses felt themselves in a continuous anguish of being victims of violence again [39-41] and clearly demonstrated how even simple training days' lead to a greater sense of security in dealing with situations of hostile behavior and also to an increase in confidence in the organizational structure and in the number of cases of aggression reported. In some studies [42,43], a change in the internal physical structures was proposed, such as the adoption of internal video cameras and the increase in the fixed presence of security agents. Work safety was related to the work environment [44], so the emergency room became

an environment in which those who work might manage relationships characterized by strong emotions and stress, both in patient and family. Which might explode in a violent reaction. Additionally, literature suggested as work-related stress unfavorably influenced on the adaptive ability of the person, as: failure in the adaptation process represented the basis for the development of the burnout syndrome, as shown in several studies [45-47] basing on the MBI test, highlighting burnout levels in healthcare workers and a greater prevalence of violent episodes in EDs. Moreover, burnout might influence the entire well-being condition of the healthcare worker, who might develop musculoskeletal disorders, insomnia and depression disorders and a consequent reduction in the quality of care delivered [11,33,48,49]. However, there are still few works that have explored the prevention of the psychological consequences of violence.

Study limitations

Data were collected throughout all the Italian Emergency Departments, however the sample collected comprised on smaller group than all nurses and physicians working in emergency medical departments throughout the Italian territory.

Furthermore, data were collected on-line and there was no form of iteration with the participants.

Conclusions

The present study explored areas and dynamics in violence occurred in the EDs and related psycho-physical consequences. Almost all of the healthcare workers studied came into contact at least once with any type of violence in their career, especially verbal. It will be important to stimulate the awareness since during the University training [50,51] and then, in the company management that in order to prevent episodes of violence, and above all to reduce the consequences and costs related thanks to concrete interventions in psychological support which will be prevent a chronic adaptation to traumatic conditions. It will be necessary to implement further studies, with a larger sample, considering the effects of the law of 14 August 2020, n.113 containing "Provisions on safety for health and social health professions exercising their functions" probably still today too early to be tangible [52]. In this period, more than ever, we could realize the importance of healthcare personnel within a society that will be oriented to function. Attacking a nurse or a physician might put the system in difficulty: not only the person is harmed but, indirectly, also the user, aggravating the problems that already existed.

Ethical consideration

The study was conducted according to the Declaration of Helsinki principles.

This study was approved from the ethic commission from the Italian "Triage Training Group" in the 20th August 2020.

Acknowledgement

All Authors thank the nurses who participated in this survey.

Funding

None.

Conflict of interest

The authors declare no conflict of interest, financial or otherwise.

Author contributions

All Authors equally contributed to the compilation of this research article.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:156-162
DOI: 10.36148/2284-0249-432

Original article

Examination of aggression profiles of athletes and sedanter individuals

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SUMMARY

Objective

The aim of this research is to examine the aggression profiles of athletes and sedentary individuals. In the research, scanning model was used to determine the current situation.

Methods

The population of the research consists of individuals who live in Yozgat, do sports and do not. The sample of the study consists of 191 individuals randomly selected. As data collection tools in the research, the "Personal Information Form" created by the researcher and the "aggression scale" developed by Buss and Perry were translated into Turkish by H Andaç Demirtaş in 2012, a reliability study was carried out. In the analysis of the data, the frequency and percentage distributions describing the personal characteristics of the participants were extracted, the arithmetic averages and standard deviations of the answers given to the scales were calculated, and the distributions regarding the violence tendencies and aggression levels were determined. With independent variables related to sub-problems; Violence tendency and aggression levels were tested with parametric tests, t-test was used for pairwise comparisons and One-Way Analysis of Variance (ANOVA) was used for comparisons of three or more groups. The level of significance in the analysis was taken as "p < 0.05".

Results

According to the research results; it was determined that there was a significant difference between the variables of gender, licensed sports, nationality status and aggression level, and there was no significant difference between the level of aggression, income level, sports age and aggression level.

Conclusions

In the literature, it is thought that there is a study that supports and does not support the results obtained from the study.

Key word: sports, aggression, sedanter

Received: May 2, 2021
Accepted: June 14, 2021

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How to cite this article: Gümüşdağ H, Aydoğan M. Examination of aggression profiles of athletes and sedanter individuals. Journal of Psychopathology 2021;27:156-162. https://doi.org/10.36148/2284-0249-432

Introduction

Sports are of great importance for individuals to make use of their time, to create an environment of fun and competition in a peaceful environment [1]. Today, sport, which shows a rapid development and spread, affects individuals with emotions such as excitement, sadness, love and stress. Individuals (referee, trainer, athlete, press, spectator, manager, etc.) who take charge in different positions in sports can exhibit different behaviors depending on the events they experience during sports. Events such as defeat and wrong decision during and after sports can cause unwanted events and violence during and after sports [2].

Violence is a concept that has taken its place as a quality and identity in every period of humanity. Violence has taken its place in the history of humanity as a tool that sometimes causes social destruction and sometimes a psychological trauma that damages the personality [3].

While the increase in the changes in the society has been a solution to the economic and physical problems of the individuals, it causes the rapid proliferation of psychological problems. One of the most important factors affecting the health of the individual is violence. Violence is a health and human rights problem that is seen in almost every aspect of an individual's life and is growing with an increase all over the World [4].

Although there is aggressive behavior at the source of violence, there are many individual and social reasons behind the tendency to violence. However, throughout history, people with a different mentality have seen themselves as justified when they display violent behavior and have argued that their violent behavior is right and appropriate. Individuals who have this thought will not be tolerant towards individuals who do not think like themselves [5].

According to Tiryaki [6], aggression is a form of hostile, damaging, oppressive, painful and painful behavior in order to win against an opponent, to try to direct him, to spoil a job, to make it futile. It is emphasized that aggressive behaviors are purpose-oriented behaviors and may be directed towards a person, group or society, and that people who encounter such behaviors will either act in the form of avoidance or opposition.

In the light of this information, the aim of this study is; The aim of this study is to examine the aggression levels of individuals who do and do not do sports in terms of different variables.

Methods

Participants

The study group of this research consists of 191 individuals who do or do not do sports, randomly selected.

Procedures

In this study, the screening model was applied because it was aimed to determine the aggression levels of individuals who do and do not do sports. This model can be defined as "research models aiming to determine the existence and/or degree of change together between two or more variables". The research has a descriptive nature as it will be done due diligence.

The aggression level questionnaire was applied to the research group. The survey consists of two parts. In the first part, the Personal Information Form, in the second part; Developed by Buss and Perry [7] and translated into Turkish by H Andaç Demirtaş [8] in 2012, reliability study was carried out and "aggression scale" was used. The questionnaire is a 5-point Likert-type scale, which includes "Not at all suitable for my character", "Very suitable", "Slightly appropriate", "Very appropriate" and "Exactly". It aims to measure these sub-dimensions of four different aggressions: Physical aggression, Verbal aggression, Anger and Hostility. Physical aggression sub-dimension is expressed with 9 questions (items 13,8,2,11,25,16,29,22 and 5) that physically measure harming others. Verbal aggression sub-dimension includes 5 questions (27,6,21,14 and 4th items) that relate and measure hurting others verbally. The anger sub-dimension was expressed with 7 questions (items 19,28,1,18,9,23 and 12) aiming to measure the dimension of aggression emotionally. The hostility sub-dimension includes these 8 questions (20,24,3,26,10,15,7th and 17th items) that aim to measure the cognitive dimension of aggression [8].

The data collected for the problems whose answers are sought within the framework of the purpose of the research were first processed into the data coding form. All of the data were included in the research. Then, statistical analyzes were applied on the data transferred to the computer on the SPSS 22.0 program. T-test was used for comparing differences between two groups, and one-way ANOVA followed by Tukey's HSD test for comparing differences between multiple groups. Differences were considered significant at $p < 0.05$. The results of the personal information of the candidates, scale and inventory total scores, factor scores, frequency and percentage values were analyzed. The normal distribution of the scores, their curves, and the values of the skewness and kurtosis coefficients were examined. When the skewness coefficients were examined, it was determined that the scores were in the range of ± 2. While Cooper-Cutting explains that the skewness and kurtosis values are in the range of ± 2, it is a suitable situation in terms of normality, while Büyüköztürk interprets that these values are in the range of ±1 as no deviation from normality.

Since the skewness and kurtosis values of the scores

TABLE I. *Normality distributions of the data.*

	N	Skewness	Kurtosis
Physical aggression	190	1.425	1.589
Verbal aggression	190	0.502	-0.103
Anger	190	0.563	0.123

TABLE II. *T Test results between the genders and aggression levels of the individuals participating in the study.*

		N	x̄ ± SD	T	P
Physical aggression	**Man**	100	2.21 ± 0.81	3.130	0.02
	Female	90	1.90 ± 0.56		
Verbal aggression	**Man**	100	2.73 ± 0.73	3.049	0.03
	Female	90	2,42 ± 0,67		
Anger	**Man**	100	2.57 ± 0.71	-0.023	0.92
	Female	90	2.56 ± 0.53		

p < 0.05

were not at extreme levels in the study, they were in the range of ± 2 and there were no extreme deviations in the normal distribution curves, it was decided to use the T test in 2-variable analyzes from parametric techniques, and the One Way Anova test in analyzes with 3 or more variables.

Results

Is there a significant difference between the gender of the individuals participating in the research and aggression?

In the registered examination subsection in Table II, male practices are 2.21 ± 0.81, femininity examination is 1.90 ± 0.56, male dimensions are 2.73 ± 0.73 in dictionary sub-dimensions, standard practices are 2.42 in femininity model. In the anger sub-dimensions, the mean scores of men were found to be ± 0.67 and 2.56 ± 0.53.

In terms of statistical analyzes within the scope of the research, there was a significant difference in aggression and verbal aggression sub-units with p < 05, while there was a significant difference between alpha classes.

Is there a significant difference between the active sports status of the individuals participating in the research and aggression?

When Table III is examined, it is seen that the mean of the individuals participating in the research in the physical aggression sub-dimension who do sports is 2.21 ± 0.76, the individuals who do not do sports are 2.02 ± 0.69, and the mean of the individuals who participate in the verbal aggression sub-dimension is 2.68 ± 0.71, 2.52 ± 0.72 for the individuals who do not do sports, 2.48 ± 0.62 for the individuals who participate in the anger sub-dimension, and 2.62 ± 0.64 for the individuals who do not do sports.

As a result of the statistical analyzes made within the scope of the research, no significant difference was found between the physical aggression, verbal aggression and anger sub-dimensions at p < 0.05 alpha level between the individuals who do sports and those who do not.

Is there a significant difference between licensed sports and aggression?

When Table IV is examined, it is seen that the mean of licensed individuals participating in the study in the physical aggression sub-dimension is 2.37 ± 0.86, while the average of unlicensed individuals is 2.01 ± 0.67, while the mean of licensed individuals is 2.85 ± 0.81 and unlicensed individuals are 2 in the anger sub-dimension,

TABLE III. *T-Test results of the individuals participating in the study between their sporting status and aggression levels.*

		N	x̄ ± SD	T	P
Physical aggression	**Yes**	80	2.21 ± 0.76	1.067	0.28
	No	110	2.02 ± 0.69		
Verbal aggression	**Yes**	80	2.68 ± 0.71	1.559	0.12
	No	110	2.52 ± 0.72		
Anger	**Yes**	80	2.48 ± 0.62	-1.485	0.13
	No	110	2.62 ± 0.64		

p < 0.05

TABLE IV. *T Test results between the licensed sports status and aggression levels of the individuals participating in the study.*

		N	x̄ ± SD	T	P
Physical aggression	**Licences**	27	2.37 ± 0.86	2.054	0.043
	Unlicensed	53	2.01 ± 0.67		
Verbal aggression	**Licences**	27	2.85 ± 0.81	1.458	0.152
	Unlicensed	53	2.59 ± 0.65		
Anger	**Licences**	27	2.75 ± 0.65	2.926	0.004
	Unlicensed	53	2.34 ± 0.56		

p < 0.05

it was determined that the mean of licensed individuals was 2.75 ± 0.65, and the mean of unlicensed individuals was 2.34 ± 0.56.
As a result of the statistical analyzes made within the scope of the research, it was determined that there was a significant difference between the licensed sports status and aggression in the sub-dimensions of physical aggression and anger at p < 0.05 alpha, and there was no significant difference in the verbal aggression sub-dimension.

Is there a significant difference between the nationality status of the athletes and aggression?

When Table V is examined, the average of the national athletes participating in the study in the physical aggression sub-dimension is 2.56 ± 0.90, and the non-national athletes are 2.00 ± 0.66, while the averages of the national athletes participating in the verbal aggression sub-dimension are 2.95 ± 0.75, in the anger sub-dimension, the mean of non-national athletes was 2.60 ± 0.69, the mean of national athletes was 2.79 ± 0.54, and the mean of non-national athletes was 2.39 ± 0.62.
As a result of the statistical analyzes made within the scope of the research, it was determined that there was a significant difference between the national and non-national athletes at p < 0.05 alpha level in physical aggression and anger sub-dimensions, but no significant difference was found in the verbal aggression sub-dimension.

Is there a significant difference between the average income and aggression levels of the athletes?

When Table VI is examined, it is seen that in the physical aggression sub-dimension, the average of those with an income of 1000 TL or less is 2.06±0.41, those with 1001-2000 TL income is 2.17 ± 0.81, those with 2001-3000 TL income are 1.92 ± 0.77, 3001 it was determined that those with TL and above were 2.07 ± 0.72.
In the verbal aggression sub-dimension, those with an income of 1000 TL or less mean 2.80 ± 0.84, those with 1001-2000 TL average 2.75 ± 0.47, those with 2001-3000 TL income 2.42 ± 0.89, 3001 TL and above It was determined that those with the highest score were 2.58 ± 0.71.
In the anger sub-dimension, the mean of those with 1000 TL or less income is 2.39 ± 0.43, those with 1001-2000 TL are 2.72 ± 0.61, those with 2001-3000 TL are 2.53 ± 0.48, those with 3001 TL and above and it was found to be 2.56 ± 0.66.

Is there a significant difference between sports age and aggression levels of athletes?

Looking at Table VII, in the physical aggression sub-dimension, the mean of those with a sports age of less than 1 year was 1.92 ± 0.57, those with 1-2 years of age

TABLE V. *T Test results between the nationality status of the individuals participating in the study and their aggression levels.*

		N	x̄ ± SD	T	P
Physical aggression	**National**	18	2.56 ± 0.90	2.424	0.024
	Non-national	62	2.00 ± 0.66		
Verbal aggression	**National**	18	2.95 ± 0.75	1.846	0.069
	Non-national	62	2.60 ± 0.69		
Anger	**National**	18	2.79 ± 0.54	2.471	0.016
	Non-national	62	2.39 ± 0.62		

p < 0.05

TABLE VI. *The results of the Anova Test between the income status and aggression levels of the individuals participating in the research.*

		N	x ± SD	F	P Tukey HSD
Physical aggression	**1000 TL and under**	8	2.06 ± 0.41	0.359	0.78
	1001-2000 TL	13	2.17 ± 0.81		
	2001-3000 TL	20	1.92 ± 0.77		
	3001 TL and above	149	2.07 ± 0.72		
Verbal aggression	**1000 TL and under**	8	2.80 ± 0.84	0.814	0.48
	1001-2000 TL	13	2.75 ± 0.47		
	2001-3000 TL	20	2.42 ± 0.89		
	3001 TL and above	149	2.58 ± 0.71		
Anger	**1000 TL and under**	8	2.39 ± 0.43	0.480	0.69
	1001-2000 TL	13	2.72 ± 0.61		
	2001-3000 TL	20	2.53 ± 0.48		
	3001 TL and above	149	2.56 ± 0.66		

p < 0.05

TABLE VII. *Anova Test results between the sports age and aggression levels of the individuals participating in the research.*

		N	x ± SD	F	P Tukey HSD
Physical aggression	**Less than 1 year**	14	1.92 ± 0.57	1.706	0.173
	1-2 year	16	1.88 ± 0.50		
	3-4 year	18	2.38 ± 0.86		
	5 years and over	32	2.20 ± 0.84		
Verbal aggression	**Less than 1 year**	14	2.54 ± 0.56	1.365	0.260
	1-2 year	16	2.51 ± 0.68		
	3-4 year	18	2.95 ± 0.77		
	5 years and over	32	2.68 ± 0.74		
Anger	**Less than 1 year**	14	2.32 ± 0.63	3.069	0.33
	1-2 year	16	2.14 ± 0.39		
	3-4 year	18	2.61 ± 0.68		
	5 years and over	32	2.64 ± 0.62		

p < 0.05

1.88 ± 0.50, and those with 3-4 years of age 2.38 ± 0 it was found to be 0.86, while those with 5 years and above were 2.20 ± 0.84.

In the verbal aggression sub-dimension, the mean of those with a sports age of less than 1 year was 2.54 ± 0.56, those with 1-2 years of age were 2.51 ± 0.68, those with 3-4 years of age were 2.95 ± 0.77, 5 years and It was observed that those with a higher value were 2.68 ± 0.74.

In the anger sub-dimension, the mean of those with a sports age of less than 1 year was 2.32 ± 0.63, the mean of those with 1-2 years of age was 2.14 ± 0.39, the mean of those with 3-4 years of age was 2.61 ± 0.68, 5 years or more It was observed that the ones with the highest score were 2.64 ± 0.62.

Discussion

Is there a significant difference between the gender of

the individuals participating in the research and aggression? As a result of the statistical analyzes made within the sub-problem, it was determined that there was a significant difference between the genders at the $p < 0.05$ alpha level in the physical aggression and verbal aggression sub-dimensions, while no significant difference was found in the anger sub-dimension.

When the literature is examined, it is seen that there are studies contrary to the results obtained in the study. As a result of studies and determinations on gender variability, it has been revealed that male students show more aggressive behaviors than female students; this is not unexpected [9]. According to these findings, it can be said that the aggression levels of boys are generally higher than that of girls, and that aggressive behaviors are expressed in different ways [10]. These studies are in contradiction with the results obtained from the research.

Is there a significant difference between the active sports status of the individuals participating in the research and aggression? As a result of the statistical analyzes made within the sub-problem, no significant difference was found between the physical aggression, verbal aggression and anger sub-dimensions at $p < 0.05$ alpha level between the individuals who do sports and those who do not.

Although it is thought that the destructive aggression levels of the students who do sports will be lower than the students who do not do sports, the findings show the opposite. It can be said that students who do sports are physically stronger than students who do not do sports, they are pressured by their peers to use this power when necessary, and when they act calmly during an argument, they can be accused of cowardice because they do not use force.

There is an inverse relationship between sports and aggression. When the rate of doing sports increases, the tendency to aggression decreases; When doing sports decreases, the tendency to aggression increases [10].

When athlete students encounter bad examples in sports environments, they believe that everything can be done to win, and considering that they have a lot of ambition to win due to their age, it can be said that they are more likely to exhibit aggressive behavior [11].

Is there a significant difference between licensed sports and aggression? As a result of the statistical analyzes made within the sub-problem, it was determined that there was a significant difference between the licensed sports status and aggression in the sub-dimensions of physical aggression and anger at $p < 0.05$ alpha, and there was no significant difference in the verbal aggression sub-dimension.

There is a decrease in the aggression tendencies of the students who do licensed sports, and there is an increase in the aggression tendencies of those who do not do sports. We see again that there is an inverse proportion between sports and aggression. When the rate of doing sports increases, the tendency to aggression decreases; when doing sports decreases, the tendency to aggression increases [10].

Is there a significant difference between the nationality status of the athletes and aggression? As a result of the statistical analyzes made within the sub-problem, it was determined that there was a significant difference between the national and non-national athletes at $p < 0.05$ alpha level in the physical aggression and anger sub-dimensions, but no significant difference was found in the verbal aggression sub-dimension.

When the literature is examined, it is thought that there is no study belonging to the sub-problem, so this result will contribute to the literature and the researches to be done later.

Is there a significant difference between the average income level of athletes and their aggression levels? Within the sub-problem, it was determined that there was no significant difference at the $p < 0.05$ level in all of the sub-dimensions.

In the study conducted by Tiryaki [6] to determine the aggression levels of individuals who do sports, it was revealed that there was no significant difference between the aggression scores of individuals in all comparisons made considering the income level [6]. This result supports the study.

Is there a significant difference between sports age and aggression levels of athletes? Within the sub-problem, it was determined that there was no significant difference at the $p < 0.05$ level in all of the sub-dimensions.

In their study, Afyon and Metin [12] concluded that the experience of the athletes who played football for a long time increased in parallel with the passing of the years, that they could better analyze which situation is aggression and which situation is the protection of their right, and that they know how to protect both their own rights and the rights of their opponents within the framework of competition rules [12]. This study contrasts with the obtained result. Summing up, the analysis of fouls committed in professional football matches in terms of frequency, timing, place, category, and player interactions, was made to determine the relationship of the fouls with aggressive behaviors from a theoretical perspective. The fouls could be attributed to the social learning theory that values the environmental factor in the cognitive process of aggression [13]. The presented results may be of help to football coaches and sport psychologists teaching players how to control aggression and how to play the game with minimum harm while increasing their performance [13]. frustration, aggression or as a result of excessive pressure from both the trainer and the audience and the press, he

sees his opponent as a hostile, and can perform actions to injure him in one-on-one struggle. But if we look at the general behavior, that is, if we look at fouls committed by professional football mags, there is a big [14].

Ethical consideration

All participants voluntary agreed to participate to the on-line survey and World Health Organization's COVID-19 protocol implemented.

Acknowledgement

The Authors would like to thank the individuals who generously shared their time and experience for the purposes of this research.

Funding

This research received no external funding.

Conflict of interest

The Authors declare no conflict of interest.

Author contributions

Authors significantly contributed to study conception, data acquisition, data analysis, or interpretation.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:163-169
DOI: 10.36148/2284-0249-427

Original article

The relationship between psychological hardiness and resilience and its role in the actual well-being of mothers with handicapped children

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SUMMARY

Background and aim

Children with disabilities cause many psychological problems for family members, especially mothers. Considering the importance of mothers' actual well-being in the family and society, the aim of this study was to investigate the relationship between psychological hardiness and resilience and its role in the actual well-being of mothers with handicapped children.

Materials and methods

This is a descriptive correlational study in which the statistical population was all mothers with children with handicapped (300) covered by the welfare of Tabriz in 2020-2021 using 150 simple random sampling method. People were selected as the sample. Data collection tools were: Ahvaz Kiamarsi et al. (1998) psychological hardiness questionnaire, Connor and Davidson resilience scale, Lyubomerisky and Leper actual happiness scale and Diner life satisfaction scale. Pearson correlation coefficient and multiple linear regression analysis were used to analyze the data using SPSS software version 19.

Results

The results showed that there is a significant positive relationship between psychological toughness and resilience of mothers with handicapped children. The results also showed that psychological hardiness and resilience have a significant positive relationship with actual well-being and its dimensions (happiness and life satisfaction).

Discussion

It can be said that psychological toughness reduces the level of anxiety and depression by equipping a person with a shield to deal with stressful situations, and by activating problem-based coping strategies in stressful situations, it makes a person look at events with more optimism.

Conclusions

The actual well-being of mothers with handicapped children can be predicted by their resilience and psychological resilience.

Key words: psychological hardiness, resilience, actual well-being, handicapped children

Received: April 22, 2021
Accepted: June 3, 2021

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How to cite this article: Salehian MH, Sarvari S. The relationship between psychological hardiness and resilience and its role in the actual well-being of mothers with handicapped children. Journal of Psychopathology 2021;27:163-169. https://doi.org/10.36148/2284-0249-427

Introduction

Physical disability is one of the major disabilities of children in many countries [1]. The World Health Organization uses disability as a general term for injuries, functional and participatory limitations that lead to dysfunction of the body and deprives the individual of participation in daily personal and social activities [2]. Awareness of any problems, developmental delays, or differences in the child can be very hard on parents. Therefore, parents experience intense emotions when they realize their child's disability. Meanwhile, mothers often experience more stress than fathers because

of their special role in the birth and care of a disabled child. Fathers usually do not express their feelings as much as mothers, while mothers show a wide range of emotions such as anger, sadness, crying and grief [3]. Studies have shown that mothers with disabled children have lower levels of general health and lower happiness, lower quality of life and psychological capital, lower life satisfaction and higher levels of stress compared to mothers of healthy children, and have lower psychological well-being [3-8].

According to statistics released by the World Health Organization, there are 6.5 million people with disabilities living in the world, of which about 70% are in developing countries. In Iranian society, according to the Welfare Organization, about 7% of the population suffers from some kind of disability and annually about 25,000 children with disabilities are born in the country with severe physical and motor disorders [9].

Active well-being is a broad concept that includes experiencing pleasant emotions, low levels of negative mood, and high life satisfaction. In short, actual well-being has two components, emotional and cognitive. Emotional or emotional components include the balance of positive emotion (happiness) and negative emotion. The cognitive component (life satisfaction) is also the cognitive assessment that each person makes of the overall quality of life or its specific areas [10]. Therefore, people with actual well-being have a sense of life satisfaction, high positive emotion and low negative emotion [11]. Resilience is one of the factors that help a person to cope with difficult and stressful life situations and protect people against obstacles, maintaining optimism and positive emotions in difficulties, and avoiding erosive strategies pathological disorders and life difficulties [12].

Connor and Davidson [13] describe resilience as the ability to balance bio-psychological balance in dangerous situations. They see resilience not only as resilience to threatening conditions, but also as the active and effective participation of the individual in the environment. In addition, researchers believe that resilience is a kind of self-healing with positive emotional and cognitive consequences, which in itself plays an important role in adaptation and satisfaction with life as much as possible [14].

In general, resilience includes: maintaining calm when faced with pressure, being resilient to. In addition, resilient people are normally able to think creatively and flexibly about problem solving, and seek help from others when needed and help others in times of crisis. These people have degrees of health and independence. They believe in their ability to change the environment [15]. Cohn et al. [16] showed that resilience has an effect on increasing positive emotions, happiness and reducing negative emotions. In another study, Suri et al. [17] stated that psychological well-being is affected by personality factors, including resilience, which can predict 27% of psychological well-being. The results of the study of Sattarpour et al. [18] showed that resilience has a significant positive relationship with the actual well-being of mothers of students with mental disabilities and its dimensions (actual happiness and life satisfaction) and is able to predict about 11% of them.

Pardel et al. [19] concluded that psychological resilience has a significant effect on the feeling of happiness and improving the quality of life of mothers of children with ADHD. Poursardar et al. [20] showed that resilience leads to greater life satisfaction by reducing negative emotions and increasing mental health.

It should be noted that another variable that is closely related to actual well-being is psychological hardiness. Stubbornness is a combination of beliefs about self and the world using the existential theories of personality, which consists of three components: challenge, control and commitment [21]. In fact, psychological rigidity is a single structure that deals with the integrity of its components and creates homogeneity in them [22].

Psychological stubbornness is born of the knowledge that a person has more resources to respond to stress. In other words, it is a fundamental sense of control that allows the stubborn person to achieve a number of useful and effective strategies. Also, psychological stubbornness causes a person to consider their stresses in a realistic and far-sighted way. Ultimately, psychological stubbornness reinforces an optimistic view of psychological stress.

In fact, psychological resilience is a shield against intense physiological arousal due to stressful events [23]. Psychological hardiness has a negative effect on stress and a positive effect on satisfaction. Hardiness may act as an important coping force against the effects of pressure for change [24]. Studies show that there is a significant relationship between psychological toughness with physical and mental health, mental happiness, emotion control, anger, anxiety, depression and quality of life [25-28]. Baghchaghi et al. [29] concluded that psychological toughness is an important predictor of cognitive emotion regulation strategies that lead to improved quality of life in mothers of autistic children. Also, Asghari and Mamizadeh [30] showed that psychological hardiness can predict 51% of psychological well-being.

Obviously, all people can achieve well despite the hardships and sufferings that lie ahead. Mothers with handicapped children are no exception.

In view of the above, and considering that the mother has a key role in maintaining the psychological and social balance of the family, and creating tension and pressure in the mother affects other family members, and given that the mother has an important role in mental

health of family members It is very important to address the situation of mothers with handicapped children.
Considering the mentioned effects of individual psychological and personality capacities (resilience and psychological hardiness) on the well-being of mothers of exceptional children and the importance of actual well-being for mothers of children with handicapped children, as well as insufficient research in this field, The predictive role of psychological toughness and resilience in the actual well-being of mothers with handicapped children was assessed.

Materials and methods

This study according to the purpose of basic studies and in terms of data collection and analysis; the method used is descriptive and correlational design. The statistical population studied in this study was all mothers with handicapped children covered by the General Welfare Office of Tabriz in 2020 (400 people according to the statistics of the General Welfare Office of Tabriz). The sample size was estimated to be 196 based on Cochran's formula and the samples were selected by simple random sampling.
Inclusion criteria: 1. Having a child with a physical disability; 2. Having a minimum diploma; 3. Age range 30 to 45 years; 4. Having an average economic status; 5. To have complete satisfaction to participate in the research. And exclusion criteria; There was no completion of the questionnaire or any particular problem during the research.
After receiving permission from the General Welfare Office of Tabriz and coordination with the authorities, the selected mothers (196 people) were invited to attend the amphitheater of the General Welfare Office of Tabriz at the appointed time. After the presence of mothers with handicapped children and the researcher's relationship with them, the researcher explained the purpose of the research, the method of completing the questionnaire and after obtaining cooperation and informed consent, three questionnaires were presented to mothers continuously and together to complete it. Questionnaires were designed without a name and were collected by the subject after completion.

Following tools have been used to collect information

Ahvaz Hardiness Inventory (AHI): This questionnaire was developed by Kiamarsi, Najarian and Mehrabizadeh Honarmand [23]. This questionnaire has 20 items and its purpose is to evaluate the degree of stubbornness and its factors in individuals. The way of scoring this questionnaire is that the options will never, rarely, sometimes and often will get scores of 4, 3, 2, 1, respectively. The sum of the total scores of these questions is considered as the toughness score of the subject and the higher this score is, the higher the toughness of the respondent and vice versa. In this questionnaire, questions 1 to 9 are related to the commitment factor, questions 10 to 16 are related to the control factor and questions 17 to 20 are related to the struggle factor.
Cronbach's alpha coefficient was used to measure the internal consistency of "Ahvaz Hardiness Questionnaire" and based on the findings of alpha coefficients for the whole sample, male and female subjects were 0.76, 0.76 and 0.74, respectively. To assess the reliability of the "Ahvaz Hardiness Scale", this test was presented again to 119 students (53 boys and 66 girls) after six weeks. Correlation coefficients between the subjects' scores were obtained in two rounds, ie pretest and post-test again for all subjects, r = 0.84, male subjects = r = 0.84 and female subjects: r = 0.85. The Maslow Self-Prosperity Scale, the Structural Validity Scale, the Ahvaz Depression Scale, and the Anxiety Scale were given to groups of students.
The correlation coefficients between the scores of all subjects on the scale of stubbornness and anxiety for the whole sample, male and female subjects were -0.62, -0.71, -0.57, respectively. The correlation coefficients between the total scores of the subjects, male and female subjects on the self-fulfillment scale with the Ahvaz hardness scale were 0.55, 0.65 and /45, respectively. The results of Pearson correlation tests between the subjects' scores on the Hardness Structure Validity Scale and the Ahvaz Stiffness Scale showed that the correlation coefficients were statistically significant and these coefficients were 0.51, 0.61 and 0.46 for all subjects, male and female subjects, respectively [23].
Resilience Questionnaire: Connor and Davison Resilience Scale were used to measure resilience [13]. This scale consists of 25 items, each of which is graded on a five-point Likert scale from zero to four and has a total score. Validity (by factor analysis and convergent and divergent validity) and reliability (by retesting and Cronbach's alpha) resilience scale has been achieved by the test manufacturers in different normal and at-risk groups. In Iran, Mohammadi [31] reported the reliability of this scale as 0.89 and its validity between 0.14 to 0.64. In the present study, the reliability of the resilience scale was calculated to be 0.86 using Cronbach's alpha method.
Tests such as the Lyubomirsky & Lepper Active Happiness Scale [32] and the Diener Life Satisfaction Scale [33] are among the most appropriate scales for assessing actual well-being. These two self-assessment tests were used to assess the actual well-being of retired teachers. Therefore, the total score of happiness and life satisfaction will be the level of actual well-being [34].
The actual happiness scale has 4 items and people respond to it on a five-point scale. This scale measures

people's happiness independently and in comparison with their peers. The internal validity of the scale is reported from 0.85 to 0.95 based on Cronbach's alpha [35]. The Persian version of this scale has been validated in Iran [35]. Cronbach's alpha coefficient of Persian version is equal to 0.76 and its correlation with life satisfaction scale is reported between 0.43 to 0.47 [36].
The Life Satisfaction Scale has five items and is a single factor. This scale is designed to measure the cognitive dimension of actual well-being. The validity of the scale was 0.87 with Cronbach's alpha method and 0.82 with two-month interval with retest method [34]. This scale has been validated in Iran by Bayani et al. [36] They obtained the validity of the scale using the Cronbach's alpha method of 0.83 and the retest method of 0.69.

Data analysis
Data were analyzed using SPSS software and Pearson correlation and multiple regression tests.

Results
According to the findings of Table I, the mean of actual well-being (± 5.11) is 19.51, psychological hardiness (13 6.13) is 57.23 and resilience (54 10.54) is 56.34.
Kolmogorov-Smirnov test was used to evaluate the normality of the distribution of variables. The results of Kolmogorov-Smirnov test (Tab. II) indicate that all variables have a normal distribution ($p < 0.05$).
Pearson correlation was used to investigate the relationship between variables. The results of Pearson correlation test are given in Tab. III. The results of Pearson correlation test show that there is a relationship between psychological toughness with actual well-being ($p < 0.05$, $r = 0.50$), actual happiness ($p < 0.05$, $r = 0.30$) and life satisfaction (0.05). > p, r = 0.52) There is a significant positive relationship. Between resilience with actual well-being ($p < 0.05$, $r = 0.38$), actual happiness ($p < 0.05$, $r = 0.37$) and life satisfaction ($p < 0.05$, $r = 0.23$) There is a significant positive relationship.
Simultaneous multiple linear regression has been used to investigate the predictive role of psychological toughness and resilience in the actual well-being of mothers with handicapped children. The multiple correlation coefficient is 0.56 and the determination coefficient is 0.31. In fact, 31% of the variance of actual well-being is explained by the variables of psychological toughness and resilience. The value of the Watson camera is 1.87. Since this value is between 1.5 and 2.5, it is concluded that the criterion variable is not self-correlated and the errors are independent of each other. Also, the significance level of F test is equal to 0.001. Considering that the level of significance of F-test is less than 0.05, it shows that there is a significant linear relationship between the criterion variable and the predictor variables (Tab. IV).
The final regression results are presented in Table V. According to the table, it is concluded that psychological hardiness ($p = 0.001$ and beta = 0.43) and resilience ($p = 0.001$ and beta = 0.25) have a positive effect on the actual well-being of mothers with handicapped children. They are meaningful. Thus, psychological hardiness and resilience variables can predict the actual well-being of mothers with handicapped children. Psychological hardiness with a standardized coefficient (beta) of 0.43 has the greatest effect on predicting actual well-being.

Discussion
The aim of this research was to study the relationship between psychological hardiness and resilience and its role in the actual well-being of mothers with handicapped children. The results showed that psychological hardiness and its components (commitment, control, struggle) have a significant positive relationship with the actual well-being of mothers with handicapped children and its dimensions (actual happiness and life satisfaction) and is able to improve their well-being.
There is no report in the research literature about the role of psychological hardiness in the actual well-being of mothers with handicapped children; But the result obtained with the results of Florian et al. [25], Tavakoli et al. [26], Azarian et al. [27], Shokouhi Fard et al. [28], Baghchaghi et al. There is a significant positive relationship between psychological toughness with physical and mental health,

TABLE I. *Descriptive statistics of variables (n = 196).*

Variables	M	Standard deviation	Skew	Elongation	Minimum	Maximum
General welfare	19.51	5.11	-0.02	-0.51	8	32
Happy activity	8.90	3.32	-0.11	-0.94	2	15
Life satisfaction	10.60	2.97	0.12	-0.33	4	18
Psychological hardiness	57.23	6.13	-0.49	0.04	40	70
Resilience	56.34	10.54	-0.36	-0.44	28	77

TABLE II. *Results of Kolmogorov-Smirnov test to check the normality of the distribution of variables.*

Variables	N	Statistics Z Kolmogorov-Smirnov	Sig.
General welfare	196	0.979	0.293
Happy activity	196	1.312	0.075
Life satisfaction	196	1.249	0.088
Psychological hardiness	196	1.24	0.092
Resilience	196	1.022	0.247

TABLE III. *Pearson correlation test results for variable relationships (n = 196).*

Variables	General welfare	General welfare	Life satisfaction	Psychological hardiness	Resilience
General welfare	r	1			
	p				
Happy activity	r	0.834	1		
	p	0.001			
Life satisfaction	r	0.787	0.316	1	
	p	0.001	0.001		
Psychological hardiness	r	0.502	0.304	0.523	1
	p	0.001	0.001	0.001	
Resilience	r	0.378	0.371	0.234	0.301
	p	0.001	0.001	0.001	0.001

TABLE IV. *Correlation table, camera-Watson and F for the effect of resilience and psychological toughness on mothers' actual well-being.*

Multiple correlation coefficient	Determination coefficient	Watson camera	F	Sig.
0.555	0.308	1.866	42.961	0.001

TABLE V. *Table of regression coefficients.*

	Non-standardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Dev.	Beta		
Fixed value	-7.643	2.985		-2.561	0.011
Psychological hardiness	0.355	0.052	0.427	6.794	0.001
Resilience	0.121	0.03	0.249	3.968	0.001

psychological well-being, control of negative emotions, mental happiness and improving quality of life. Families with children with disabilities are under more stress than families with healthy children. In addition, the first person who has direct contact with the child is the mother. While constant maintenance and the need to provide special conditions for growth and exposure to pressures such as, stereotyped behaviors and lack of self-care skills in these children weaken the normal functioning of the mother and also mothers react negatively to their

child's behaviors. It causes high levels of stress and marital conflicts, separation, divorce, low self-esteem, decreased happiness and life satisfaction in mothers with handicapped children [7].

Explaining this research finding, it can be stated that how the mother deals with this issue (birth crisis of a disabled child) depends on the personality traits of the mother.

Hardship, defined by Kubasa as a personality construct, is a combination of components of commitment, control, and struggle that contribute to individuals' physical and mental health by coping with traumatic events and modifying life stressors, also, mothers who score high in the struggle component view life problems and stressors as an opportunity for growth and change rather than failure. This attitude to stress and problems effectively deal with it and prevents the weakening of the immune system and vulnerability of people and brings them mental and physical health, and as a result with positive emotions and life satisfaction in mothers with handicapped children. There is a movement.

The results also showed that resilience has a significant positive relationship with the actual well-being of mothers with handicapped children and its dimensions (actual happiness and life satisfaction) and is able to predict their actual well-being. This finding suggests that by promoting resilience, mothers can resist and overcome stressors as well as factors that cause many psychological problems.

Resilience also ensures the psychological well-being of individuals by modulating and mitigating factors such as stress and depression [37]. This finding is consistent with the results of the research of Sattarpour et al. [18] showed that the inclusion of significant variance in the actual well-being (happiness and practical satisfaction and life satisfaction) of mothers of mentally retarded students explains.

Also, it is consistent with the results of studies by Cohn et al. [16], Souri et al. [17], Pardel et al. [19], Poursardar et al. [20], that resilience on increasing positive emotions, happiness and decreasing negative emotions, well-being it has a greater psychological effect on life and satisfaction. Explaining this research finding, it can be stated that resilience, which means coping with problems in traumatic events and being flexible in responding to the pressures of daily life, is a trait that varies from person to person and can grow or decrease over time [38].

Resilience strengthens successful coping with negative experiences by increasing levels of positive emotions. Based on this, it seems that resilient people look at problems creatively and flexibly, plan to solve them and do not hesitate to ask for help from others when needed, and have complete resources to deal with the problems that these factors cause the person have a life satisfaction [39].

Therefore, it can be said that by promoting resilience, mothers with handicapped children can resist and overcome stressors as well as factors that cause many psychological problems. By reducing psycho-emotional problems in mothers, mental well-being and life satisfaction in mothers are improved.

The results of simultaneous multiple regression analysis also showed that psychological hardiness and resilience explained 31% of the actual welfare variance of mothers with handicapped children and had significant predictive power and psychological resilience and resilience with standardized beta coefficient (0.43 and 0.25) have the most and the least effect on the prediction of actual well-being, respectively. Therefore, the most important predictor variable in this study is psychological toughness.

In fact, it can be said that psychological toughness reduces the level of anxiety and depression by equipping a person with a shield to deal with stressful situations, and by activating problem-based coping strategies in stressful situations, it makes a person look at events with more optimism. As a result, it reduces the risk of diseases and increases pleasant emotions, happiness and positive feelings about life and well-being in the individual, and as a result, increases life satisfaction in mothers.

Conclusions

The results of the present study showed that psychological hardiness and productivity can significantly predict changes in actual well-being in mothers with handicapped children and strong variables in explaining the actual well-being of mothers with handicapped children. Therefore, it is recommended that mothers and their families be taught how to increase them, and that government institutions and organizations provide the necessary support for them. Also, due to the limitations of the research, which is a sample only of mothers with handicapped children, it is suggested that such research be conducted in mothers of other groups with special needs, fathers and in other cities.

Ethical consideration

This research has been conducted in compliance with ethical standards and participants' satisfaction.

Acknowledgement

Researchers appreciate all the participants in this study.

Funding

It is worth mentioning that the present study was conducted without any financial support.

Conflict of interest

There is no conflict of interest for the authors of this article.

Author contributions

Both Authors had a common share.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:170-175
DOI: 10.36148/2284-0249-433

Original article

Relationship between biological rhythm and somatization levels of individuals who play sports or do not

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SUMMARY

Objective

The aim of this study is to compare and examine the biological rhythm and somatization levels of individuals who do and do not do sports, according to some variables.

Methods

The data used in this study were obtained by questionnaire. Personal Information Form, Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN), and Somatization Scale were used as data collection tools in the study.

Results

As a result of the research, it was seen that there was a negative and significant relationship between Biological Rhythm Levels and Somatization Levels ($r = -2.231$, $p < 0.01$) of individuals who do and do not do sports. In addition, it was observed that Somatization and Biological Rhythm levels did not show a significant difference in gender variable dimension. There is no significant difference in the somatization dimension of the status of doing sports, there is a significant difference in the $p < 0.05$ level of doing sports in the Biological Rhythm dimension, there is no significant difference between the biological rhythm and somatization and the occupational status variable, and there is no significant difference between the age ranges and somatization. It was concluded that there was a significant difference at $p < 0.05$ level between Biological Rhythm and age ranges.

Conclusions

It has been stated that age-related changes are affected by biological (hormone level, body temperature, pulse, blood pressure, etc.) as well as environmental conditions.

Key words: sport, somatization, biological rhythm

Received: May 2, 2021
Accepted: June 14, 2021

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How to cite this article: Gümüşdağ H, Aydoğan, M. Relationship between biological rhythm and somatization levels of individuals who play sports or do not. Journal of Psychopathology2021;27:170-175.https://doi.org/10.36148/2284-0249-433

Introduction

In the 21st century, in parallel with technological and scientific developments, the problems affecting human health and thus athlete performance also show a rapid change. Social environment, diet, intense human relations in virtual and real life, environmental factors due to urbanization, economic and cultural turmoil, changes in moral and spiritual values, psychological and physical problems bring with them more intensely than in the past. The biological clock, which regulates the activities in our body, records hourly, twenty-four-hour, thirty-day or seasonal rhythms in organs and their functions. In this intense lifestyle, the timing of daily life of individuals leads to sleep and eating disorders, and therefore to psychological problems. Experiencing uneasiness and distress, coping strategies with social, life burdens and disappointments of individuals appear in the form of physical psychosomatic reactions. As in all sports branches, it is known that besides physical development, psychological state and mental fa-

ctors affect performance [1]. Environmental factors that trigger stress such as changes in technology, scientific developments, population growth and economic problems also increase people's anxiety levels. This situation may show behavioral symptoms along with personal differences [2].

In such disorders, also called "somatoform disorder", no physical results have been found to explain the discomfort within the scope of neurological and physiological studies. It has been observed in studies that children and young people show similar symptoms of discomfort. Studies on the biological history of somatization are limited [3]. Somatization (somatization) is defined as experiencing and transferring psychological discomfort in the form of somatic symptoms [4]. In another name, somatization is the behavior of somatic complaints that cannot be explained by medical findings and seeking medical help with these symptoms. In somatization, psychosocial or emotional problems are tried to be explained with somatic symptoms. Along with these symptoms, medical help is sought by establishing a physical illness relationship. Somatization has received many definitions as a still mysterious problem in psychiatry and general medicine. The common point in these nomenclatures was the presence of somatic symptoms that could not be adequately explained by organic findings [5].

In this context, the relationship between biological rhythm and somatization was examined in our study. Like all existence, the bodily activities of living things work within a certain system. The system can be daily, monthly or annual with periodic effects. Daily periods of 24 hours are defined as "Biological Hours". Many biological variables such as body temperature, heart rhythm, blood pressure, and hormone levels show periodicity in a 24-hour period [6]. This year's winners of the 2017 Nobel Prize in Medicine have proven how this clock works in the "Biological Clock" studies by US scientists Hall, Rosbash and Young [7]. A person living under normal conditions usually wakes up at the same time without any external influence. The body keeps it in balance by constantly adjusting it. In addition, the biological clock regulates the hormonal balance of living things and makes adjustments regarding oscillations.

The biological clock regulates all these metabolic interactions. In humans, many events with bodily biology, physiology, endocrine system, actions, and psychological effects occur in accordance with a standard rhythm. Sleeping and being awake, body temperature, endocrinal levels, changes in mood and cognitive processes occur in a twenty-four-hour system called the circadian rhythm [8]. The biological clock, which carries out chemical activity in our body, records hourly, twenty-four hour, thirty-day or seasonal rhythms for organs and their functions [9]. It is thought that these cyclical changes that occur during the day in physiological functions may also affect sports performance, which is a physiological process. Taking this into account, sports scientists investigated the effect of rhythm on sports performance and concluded that many parameters related to sports performance vary during the day [9-13].

The interaction of these psychological and biological factors, which form the basis of the present study, with sports was examined, and the daily life patterns, social adaptation, physical and psychological differences, biological rhythm and somatization levels of individuals who do and do not do sports were examined. As a result, it is predicted that individuals will be able to lead a higher quality psychophysical life with the contribution of sports to biological rhythm optimization and somatization absorption on individuals.

Methods

In this study, the biological rhythm and somatization levels of individuals who do and do not do sports were examined. In the descriptive study; In a universe consisting of many elements, a scanning arrangement was made on the whole universe or a group to be taken from it in order to make a general judgment about the universe [14].

Participants

The personal information distribution of the athletes participating in the research is given in the table above. 49.6% (n = 119) of the individuals participating in the research were male and 50.4% (n = 121) were female. 83.8% (n = 201) of the individuals are 18-25 years old,

TABLE I. *Demographic characteristics of the study group.*

Gender		f	%
	Male	119	49,6
	Female	121	50,4
	Total	240	100
Age	**18-25 age**	201	83.8
	26-34 age	28	11.7
	35 and above	11	4.6
	Toplam	240	100
Working status	**Working**	54	22.5
	Not working	36	15.0
	Student	150	62.5
	Total	240	100
State of doing sports	**Yes**	139	51.5
	No	101	48.5
	Total	240	100

TABLE II. *Correlation results between biological rhythm and somatization levels of ındividuals who played and didn't do sports.*

	Biological rhythm	Somatization
Biological rhythm	1	-2.231**
Somatization	-2.231**	1

r = -2.231, p < 0.01

11.7% (n = 28) are 26-34 years old, 4.6% (n = 11) are 35 years old and over. 22.5% of individuals are working, 15% are not working and 62.5% are students. Again, 51.5% of individuals do sports, while 48.5% do not do any sports.

Procedures

The data used in this study were obtained by questionnaire. Personal Information Form, Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN), and Somatization Scale were used as data collection tools in the study. The Turkish adaptation was made by Aydemir et al. [16]. The validity and reliability study of the Somatizaston Scale was conducted by Dülgerler [17]. All of the data were included in the research. Then, statistical analyzes were applied on the data transferred to the computer on the SPSS 22.0 program. T-test was used for comparing differences between two groups, and one-way ANOVA followed by Tukey's HSD test for comparing differences between multiple groups. Differences were considered significant at P < 0.05.

Results

When Table II is examined, it is seen that there is a negative and significant relationship between Biological Rhythm Levels and Somatization Levels (r = -2.231, p < 0.01) of individuals who do and do not do sports.
When Table III was examined, it was seen that the Somatization and Biological Rhythm levels did not show a significant difference in the gender variable dimension. When Table IV is examined, it is seen that there is no significant difference in the somatization dimension of doing sports, there is a significant difference in the case of doing sports at a p < 0.05 level in the Biological Rhythm dimension, and this significant difference is due to the fact that the average of those who do not do sports is higher than those who do. When Table V is examined, it is seen that there is no significant difference between Biological Rhythm and Somatization and the occupational status variable.
When Table VI is examined, it is seen that there is no significant difference between age ranges and somatization, while there is a significant difference at p < 0.05 level between Biological Rhythm and age ranges, and this significant difference is between 18-25 age range and 26-34 age range.

Discussion

It is seen that there is a negative and significant relationship between Biological Rhythm Levels and Somatization Levels (r = -2.231, p < 0.01) of individuals who do and do not do sports. It was observed that somatization and Biological Rhythm levels did not show a significant difference in gender variable dimension.

TABLE III. *Examination of the biological rhythm and somatization levels of individuals who do and do not do sports in terms of gender.*

	Gender	N	$\bar{x}$ ± SD	T	P
Somatization	Man	119	48.21 ± 4.54	-1.684	0.095
	Woman	121	49.06 ± 3.13		
Biological rhythm	Man	119	51.61 ± 12.36	0.931	0.353
	Woman	121	50.26 ± 11.00		

p < 0.05

TABLE IV. *Examination of the biological rhythm and somatization levels of individuals who do and do not do sports in terms of their sporting status.*

	State of doing sports	N	$\bar{x}$ ± SD	T	P
Somatization	**Yes**	119	48.62 ± 3.81	-0.092	0.926
	No	121	48.67 ± 4.06		
Biological rhythm	**Yes**	119	49.20 ± 11.39	-2.680	0.008*
	No	121	53.24 ± 11.76		

p < 0.05

TABLE V. *The test results between the occupational status of the participants and their biological rhythm and somatization levels.*

	Working status	n	$\bar{x}$ ± SD	F	P Tukey HSD
Somatization	**Working**	54	47.85 ± 4.05	4.078	0.18
	Not working	36	47.55 ± 4.29		
	student	150	49.13 ± 3.68		
Biological rhythm	**Working**	54	52.29 ± 11.72	0.693	0.50
	Not working	36	49.38 ± 11.04		
	student	150	50.76 ± 11.85		

p < 0.05

TABLE VI. *The test results between the age range and biological rhythm and somatization levels of the participants.*

	Age	n	$\bar{x}$ ± SD	F	P Tukey HSD
Somatization	**18-25 age**	201	48.72 ± 3.99	0.269	0.764
	26-34 age	28	48.17 ± 3.97		
	35 and above	11	48.36 ± 1.80		
Biological rhythm	**18-25 age**	201	50.28 ± 11.32	3.000	**(18-25)-(26-34)*** 0,052 **(26-34) (35 and above)***
	26-34 age	28	55.92 ± 11.90		
	35 and above	11	49.45 ± 15.48		

p < 0.05

Işık et al. [15] concluded that somatization is more common in women. In similar studies, Bolat T. [16] found a significant difference that somatization is seen more in favor of women (t = 2.987 p = 0.003), while Fidanoğlu [17] found that somatization scores of women and men were different, and women's somatization score It has been revealed that the mean mean (13.18 ± 5.26) of men is higher than the somatization score (10.18 ± 4.69) of men. As revealed in our study, studies on somatic symptoms reported that the frequency of symptoms was higher in women [18,19].

In similar studies in the literature, Adan and Natale [20] reported that men were more evening eater in the study they carried out on 1256 Italian and 879 Spanish university students, while some other studies in Spain and the USA revealed that women were more morning oriented. On the other hand, there are also studies showing that there is no significant difference between the sexes [21]. In the study of Giannotti et al. [22] conducted on a large sample (n = 6631 participants), and in the study of Kim et al. [23], no gender difference was found in adolescents in terms of being morning-night.

It was seen that there was no significant difference in the somatization dimension of doing sports, there was a significant difference in the p < 0.05 level of doing sports in the Biological Rhythm dimension and this significant difference was due to the fact that the average of those who did not do sports was higher than those who did.

Eker et al. [24] reached different results in their study and determined that the results of the SCL-90-R test in those who do not do sports are not different from those who do sports, considering the somatization values.

Morning people mostly prefer outdoor sports (eg golf), while evening people prefer indoor sports (eg water polo). Daytime training has no significant effect on melatonin release. Moderate or high-intensity nighttime exercise suppresses the release of melatonin the next night. In short, this means that the circadian clock functions are affected due to the suppression of the release of melatonin during sleep and the intense exercise. The

effects of exercise on melatonin concentration vary according to age and exercise habits [25].

It was observed that there was no significant difference between Biological Rhythm and Somatization and occupational status variable.

The authors stated in their studies that the somatization levels of the individuals in the research group were seen at a higher level with the (S.O 155.45) value, followed by students with (S.O 147.97) and individuals who did not work with (S.O 125.68). Considering the data of individuals who are working and students, it can be said that social engagement is directly proportional to the level of somatization. In another study, Saatçi and Akpınar [26] found that most of the students had a high index of somatization and depression [26].

In a study conducted in the USA, 8% of university students were morning, 63% were intermediate and 29% were evening people [27], similarly, in a study in India, participants aged 8-23 years were found. It was found that 2% of them are evening and 35% are morning people [28].

In our study, the chronotype distribution of the group coincides with the above-mentioned findings obtained from two different cultures (America and India). The fact that young people go out more at night during university years, irregular sleep and study hours, and the absence of factors that make it compulsory to get up early, such as work life, bring evening features to the fore. In adulthood, regular business life, marriage and having children bring responsibility for life and morning sickness.

While there is no significant difference between age ranges and somatization, it is seen that there is a significant difference at $p < 0.05$ level between Biological Rhythm and age ranges, and this significant difference is between 18-25 age range and 26-34 age range.

Individuals who show morning features in childhood begin to show more evening features around the age of 13. Studies have shown that adolescents and young adults are mostly evening eater [23,29]. From the age of 18-20, the needle changes direction in favor of morning sickness [30]. As a result of Monk and Kupfer's [31] study conducted with young adults, adults, elderly and elderly individuals, when all age groups were compared, it was shown that morning characteristics increase with advancing age. This finding is also consistent with the findings of some other studies [32]. It has been stated that age-related changes are affected by biological (hormone level, body temperature, pulse, blood pressure, etc.) as well as environmental conditions [30].

Ethical consideration

All participants voluntary agreed to participate to the online survey and WHO COVID-19 protocol implemented.

Acknowledgement

The Authors would like to thank the individuals who generously shared their time and experience for the purposes of this project.

Funding

This research received no external funding.

Conflict of interest

The Authors declare no conflict of interest.

Author contributions

Authors significantly contributed to study conception, data acquisition, data analysis, or interpretation.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:176-180
DOI: 10.36148/2284-0249-439

Brief Article

Screening autism spectrum disorder in adults with Down syndrome: preliminary findings

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SUMMARY

Objectives

In recent years, several studies have highlighted the presence of autism spectrum disorder in individuals with other neurodevelopmental disorders. The objective of this preliminary study is to detect the presence of autistic traits in a sample of adults with Down syndrome.

Methods

31 adults with Down syndrome participated in the study. An evaluation of the Intelligence Quotient and a screening of the presence of autistic traits through standardized instruments were done.

Results

The obtained Intelligent Quotient scores confirm the presence of intellectual disability.
The preliminary results show the presence of autistic traits in our sample. In addition, we collected additional evidence on those who show familiarity for psychiatric or neurological disorders.

Conclusions

It is necessary to proceed to a formal screening of the presence of autism in Down syndrome and in other neurodevelopmental disorders.

Key words: autism spectrum disorder, Down syndrome, intellectual disability, developmental disabilities

Received: July 5, 2021
Accepted: August 2, 2021

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How to cite this article: Brighenti S, Santagata F, Lala R, et al. Screening autism spectrum disorder in adults with Down syndrome: preliminary findings. Journal of Psychopathology 2021;27:176-180. https://doi.org/10.36148/2284-0249-439

Introduction

Neurodevelopmental disorders consist of a wide range of disorders, evident from early childhood that last for lifetime. Neurodevelopment disorders, which often occur in comorbidity, include communication, tic and motor disorders, specific learning disorder, Attention-Deficit Hyperactivity Disorder (ADHD) as well as Autism Spectrum Disorder (ASD) and Intellectual Disability (ID) [1].

Down Syndrome (DS) is a genetic disorder arising from a chromosome defect involving chromosome 21 (also called trisomy-21) and is one of the most common genetic causes of ID [2]. Individuals with DS often show a cognitive decline associated with ageing characterized by a deterioration in memory, language and cognitive functioning. Individuals with DS show typical organization of brain structures related to some cognitive abilities, such as reduced volume in frontal and prefrontal areas, which is related to poor executive and linguistic abilities. They also frequently show psychiatric disorders such as externalizing disorders as well as depression,

anxiety and obsessive-compulsive disorder. Nevertheless, as for other genetic syndrome with intellectual disability, there is a significant lack of research specifically focused on treatments of psychiatric and behavioural problems in DS [3].

ASD is a neurodevelopmental disorder with early onset in childhood diagnosed on the basis of persistent deficits in social communication and social interaction across multiple contexts (deficits in social-emotional reciprocity, in nonverbal communicative behaviors used for social interaction, and in developing, maintaining, and understand relationships) and restricted, repetitive patterns of behavior, interests, or activities and/or hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment [1]. In a study population in ASD, ID was found in 53%, which was mild in 35.8% of cases, moderate in 34%, and severe in 30.2% [4].

In recent years, many studies have reported the presence of autistic traits in people with DS [5-7].

ASD prevalence in general population is 1.85% [8]. In people with DS, the prevalence of ASD varies from 1 to 19% depending on the studies [5,6].

All considered, the main purpose of the present study is to assess autistic traits and behaviors in a sample of DS adults.

Methods

Participants

Participants were recruited from Transitional Care Clinic of Città della Salute e della Scienza Hospital. Inclusion criteria were age greater than 18 years and diagnosis of DS. People with other genetic conditions were excluded from the sample. An informed consensus was collected from the patient or the legal guardian. The privacy rights have been observed.

31 people with DS were included in the study. Mean age was 29.77 (± 6.14) years, minimum age 19, maximum age 43. Mean years of schooling 11.70 (± 2.2; min 8-max 13,); 16 participants were females (51.61%) and 15 were males (48.39%).

Demographic characteristics are summarized in Table I.

38.7% (n = 12) of our sample had at least one person with a psychiatric or neurological disorder in their family. These include neurological conditions such as epilepsy, neurodegenerative diseases (e.g., multiple sclerosis, amyotrophic lateral sclerosis, prion disease, unspecified dementia, colorblindness) or psychiatric disorders (e.g., bipolar, depression).

Specifically, 6.45% (n = 2) had familiarity in uncles, 12.9% (n = 4) in parents, 12.9% in grandparents (n = 4), and 6.45% in both parents and grandparents (n = 2).

In contrast, 61.29% (n = 19) showed no familiarity for these disorders.

Instruments

We administered the Wechsler Adult Intelligence Scale - Fourth Edition; WAIS-IV scale [9] to evaluate the Full Scale IQ (FSIQ).

In addition, we calculated Verbal Comprehension (VCI), Perceptual Reasoning (PRI), Working Memory (WMI) and Processing Speed (PSI) Indices.

We used the Italian version of WAIS-IV [10] to calculate FSIQ score, VCI, PRI, WMI, PSI comparing our sample' scores to standardization samples'.

We also use the Italian version of Scale of Pervasive Developmental Disorder in Mentally Retarded Persons (PDD-MRS in Italian STA-DI: Scala di valutazione dei Tratti Autistici nelle persone con Disabilità Intellettiva) [11,12]: this is a screening instrument useful to guide clinician to identify autistic traits in people with intellectual disability. The interviews were administered directly to the subject or to the caregiver.

Both IQ and PDD-MRS/STA-DI scales have been administered by a psychologist with expertise in both ASD and cognitive and neuropsychological assessment in neurodevelopmental disorders.

Results

Full Scale IQ and indices

The administration of the WAIS- IV scale showed the following results. For the whole sample the minimum score on the Full IQ scale was 32, while the maximum was 74 with an average score of 37.58 (± 8.46).

VCI, PRI, MMI and PSI scores are summarized in the table below (Tab. I).

Autism

12.09% of the total sample obtain scores indicative of the presence of autistic traits. However, 9.67% of the sample obtain borderline scores that require an additional clinical and diagnostic study. Considering borderline and positive scores, therefore, 22.58% of our sample shows autistic traits. PDD-MRS/STA-DI scores for all participants and according to age and gender are summarized in Table I.

Further analysis

We first conducted a t-test to detect any gender and age differences in the WAIS- IV Full Scale IQ or Indices and in the score at PDD-MRS/STA-DI. The results show us that there are no gender or age differences.

Then, we conducted a t-test to see if there were any differences related to psychiatric and neurological familiarity. The results show us that there were no significant differences in the scores obtained on the Full Scale IQ and Indices on WAIS-IV.

The results, on the other hand, show a statistically significant difference regarding the scores obtained on the

TABLE I. *Demographic characteristics, Full Scale IQ (FSIQ), Verbal Comprehension (VCI), Perceptual Reasoning (PRI), Working Memory (WMI) and Processing Speed (PSI) Indices and PDD-MRS/STA-DI scores according to gender, to age groups and for all participants. For PDD-MRS/STA-DI scores percentages are also indicated.*

	AGE	Y. SCHOOLING	FSIQ	VCI	PRI
	Min-max Mean (± SD)	Min-max Mean (± SD)	Min-max Mean (± SD)	Min-max Mean (± SD)	Min-max Mean (± SD)
Females (n = 16)	20-41 31.06 (± 6.47)	8-13 11.43 (± 2.39)	32-58 37.31 (± 6.49)	47-78 51.689 (± 7.83)	44-65 50.18 (± 6.70)
Males (n = 15)	19-41 28.4 (± 5.66)	8-13 12 (± 2.07)	32-74 37.86 (± 10.39)	47-100 52.26 (± 13.36)	44-65 50.13 (± 6.05)
19-30 years old group (n = 16)	19-29 24.87 (± 2.96)	8-13 12.68 (± 1.25)	32-74 37.18 (± 10.41)	47-100 51.43 (± 13.10)	44-65 48.43 (± 5.85)
31-41 years old group (n = 15)	31-41 35 (± 3.85)	8-13 10.66 (± 2.8)	33-58 38 (± 6.08)	47-78 52.53 (± 7.73)	45-65 52 (± 6.41)
All partecipants (n = 31)	19-43 29.77 (± 6.14)	8-13 11.70 (± 2.22)	32-74 37.58 (± 8.46)	47-100 51.97 (± 10.68)	44-65 50.16 (± 6.29)

PDD-MRS/STA-DI. In particular, subjects with psychiatric or neurological familiarity (n = 12, mean = 8.17, SD = 4.01) show significantly higher scores than those without familiarity (n =19, mean = 4.21, SD = 1.75), t = -3.78, p < .001.
We conducted an ANOVA to detect any differences in the scores obtained at the various scales by comparing them by degree of familiarity. The results show us that there are significant differences in PDD-MRS/STA-DI. In particular, subjects whose parents showed psychiatric or neurological pathologies (n = 4, mean = 12.25, SD = 2.17) obtained significantly higher scores, F = 13.80, p < 001.
In addition, we wanted to investigate the relationship between Full Scale IQ and Indices of the WAIS-IV and the scores on the PDD-MRS/STA-DI scale: to do so, we created a dichotomous (0 *vs* 1) index that grouped scores below the PDD-MRS/STA-DI cut-off (<= 6) on one side and borderline or positive scores (>= 7) on the other.
T-test scores show us that there are significant differences exclusively for the Perceptual Reasoning (PRI) Index. In particular, subjects who expressed borderline or positive scores obtained significantly lower PRI scores (n = 7) (mean = 46, SD = 1.63) t = 2.09, p < 05.
Despite the absence of significance, we attempted to calculate the effect size to measure the strength of the relationship between the variables.
The results show us that for both the FSIQ, PRI and PSI subscale, Cohen's d expresses a large effect size.
Cohen's d for the VCI and WMI indices expresses a mean score (see Table II).

Discussion

Our study underlines the need of a multi-level analysis in DS and, generally, in the neurodevelopmental disorders. Neurodevelopmental disorder should be considered as an unique spectrum and co-occurrence with ASD, ID, ADHD, communication, tic and motor disorders and specific learning disorder should drive clinicians to look to this disorders with a wide range of investigations [13].
Medical diseases (such as epilepsy, thyroid and cardiac diseases) and psychological or psychiatric disorders (such as mood disorders and cognitive deficits similar to Alzheimer disease) have been shown in adults with DS [14-16]. However the life expectancy of people with DS has increased in the last decades [14].
Our study confirms the presence of intellectual disability in DS but, at the same time, highlights the presence of

TABLE II. *Cohen's d for WAIS-IV Full Scale QI and Indices. * dichotomous (0 vs 1) indicate scores below the PDD-MRS/STA-DI cut-off and borderline or positive scores.*

	PDD-MRS/ STA-DI *	N	Mean	SD	Cohen's d
FSIQ	0	24	38.79	9.25	**0.80**
	1	7	33.43	2.07	
VCI	0	24	53.25	11.87	0.66
	1	7	47.57	0.97	
PRI	0	24	51.38	6.64	**1**
	1	7	46	1.63	
WMI	0	24	52.13	6.68	0.66
	1	7	49	0	
PSI	0	24	53.92	6.36	**0.87**
	1	7	50	0	

WMI	PSI	PDD-MRS/STA-DI				
Min-max Mean (± SD)	Min-max Mean (±S D)	% Negative (n)	% Borderline (n)	% Positive (n)	% Borderline + positive (n)	Total Score Min-max Mean (± SD)
49-60 51.56 (± 3.52)	50-67 53.13 (± 5.79)	68.75% (11)	12.5% (2)	18.75% (3)	31.25% (5)	1-14 6.75 (± 3.69)
49-80 51.26 (± 7.98)	50-72 52.73 (± 6.02)	86.66% (13)	6.66% (1)	6.66% (1)	13.33% (2)	1-12 4.67 (± 2.79)
49-80 52.37 (± 7.97)	50-72 53.06 (± 6.23)	75% (12)	12.5% (2)	12.5% (2)	25% (4)	1-14 5.56(± 3.63)
49-57 50.4 (± 2.61)	50-67 53 (± 5.55)	80% (12)	6.66% (1)	13.33 (2)	20% (3)	1-13 5.93 (± 3.26)
49-80 51.42 (± 5.99)	50-72 53.03 (± 5.81)	77.4% (24)	9.7% (3)	12.9% (4)	22.58% (7)	1-14 5.74 (± 3.40)

autistic traits in DS population that deserve further analysis by specialized and multidisciplinary teams, as with multistep-multinetwork model [4]. Furthermore, it seems that the comorbidity between DS and ASD leads to the manifestation of a greater number of behavioral problems such as stereotypic, compulsive or self-injurious behaviors (see [17] for a summary) or aggressive behavior [15]. In adults, DS may show a cognitive deficit not only related to ID but also to cognitive impairment, that should be detected. We suggest that, in DS, ASD should be considered as a co-occurrence and detected, too.

Screening test, as PDD-MRS/STA-DI, should be used routinely in visiting DS people. If possible, a complete neuropsychological evaluation should be used in this population.

If screening of ASD is positive in DS, a complete evaluation for ASD should be used, with Autism diagnostic interview-revised- ADI-r [18] and Childhood Autism Rating Scale-CARS-st [19].

In clinical practice, clinicians should be careful to consider the high co-occurrence among neurodevelopmental disorder. This study underlies the high prevalence of ASD in DS. This result goes against the common thoughts that describe DS population as very friendly and not prone to ASD social deficits. A good clinical guideline for clinicians visiting a patient with a neurodevelopmental disorder should be to carefully explore all neurodevelopmental disorders to detect a possible co-occurrence using a systematized screening with testing.

Conclusions

Recognizing ASD traits in DS, or ASD with complete syndrome could be useful to better understand challenging behavior in DS linked to autism functioning, as hyper-sensoriality or sameness research or routinary behavior related to autism functioning.

If ASD is confirmed, a cognitive-behavioral treatments should be considered to improve ASD symptoms in DS.

The major limitation of the present study is the sample size; however, the data obtained can be useful for defining further research protocols and guiding clinical practice. Future research and clinical practice should detect ASD among other neurodevelopmental disorder as intellectual disability, ADHD, Specific learning disabilities and especially in genetic syndromes, as Down's syndrome, that could drive to ASD misdiagnosis; so a specific ASD screening should be used in clinical practice in all Neurodevelopmental disorder. On the base of high co-occurrence among neurodevelopmental disorder, in the specialized visit for ADHD, or ASD or ID, all neurodevelopmental disorder should be carefully screened.

Ethical consideration

None.

Acknowledgement

None.

Funding

None.

Conflict of interest

The Authors declare no conflict of interest.

Author contributions

The Authors contributed equally to the work.

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JOURNAL OF PSYCHOPATHOLOGY 2021;27:181-186
DOI: 10.36148/2284-0249-424

Nutrients in schizophrenia: a focus on the pathophysiological pathway

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SUMMARY

Objectives

The aim of this article is to explain the nutrients that play an active role in the pathophysiology of schizophrenia.

Methods

This paper is a narrative literature review of relevant articles and prior works that have been central to the topic including the active nutrients in the pathophysiology of schizophrenia.

Results

The findings are compiled under six headings. The changes in the antioxidant defense system, dopamine pathway, serotonin pathway, gamma-aminobutyric acid (GABA) pathway, glutamate pathway, the endocannabinoid system, and metabolomic profile were investigated in relation to nutrients.

Conclusions

This review provides an update of scientific knowledge on the growing role of nutrition in schizophrenia. Nutrient deficiencies that occur frequently in these patients should be followed and eliminated to ensure the correct functioning of the pathophysiological pathways of the disease.

Key words: endocannabinoids, neurotransmitter agents, nutrients, schizophrenia

Received: February 10, 2021
Accepted: May 25, 2021

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How to cite this article: Akduman G, Kurtbeyoglu E, Gunes FE. Nutrients in schizophrenia: a focus on the pathophysiological pathway. Journal of Psychopathology 2021;27:181-186. https://doi.org/10.36148/2284-0249-424

Introduction

Schizophrenia is a type of psychosis with many mental signals, such as positive symptoms as hallucinations and delusions, or negative symptoms as motivation and social communication problems. Over time, cognitive problems such as attention deficit and speech disorders also appear [1]. Schizophrenia is a complex neurodevelopmental disorder in which environment and genetics play a role. It can be said that risk alleles (SNPs), de nova hereditary mutations, or a combination of variants together with environmental factors affect brain development. However, it usually does not show symptoms until the adolescent period [2]. Different possible etiological factors are effective in Schizophrenia. While explaining the pathophysiological processes, different mechanisms such as neurotransmitter pathway and oxidative stress are emphasized [3-5]. Vitamins, minerals, and other nutrients are important for reducing symptoms of schizophrenia by decreasing oxidative stress or modulating neurological pathways [6]. This review will focus on the nutrients involved in these pathways while emphasizing the pathophysiological processes associated with schizophrenia (Fig. 1). This review provides an update of scientific knowledge on the growing role of nutrition in schizophrenia. To do so, the pathophysiological pathways of schizophrenia have been reviewed as well as the efficacy of specific nutrients on these pathways were reviewed.

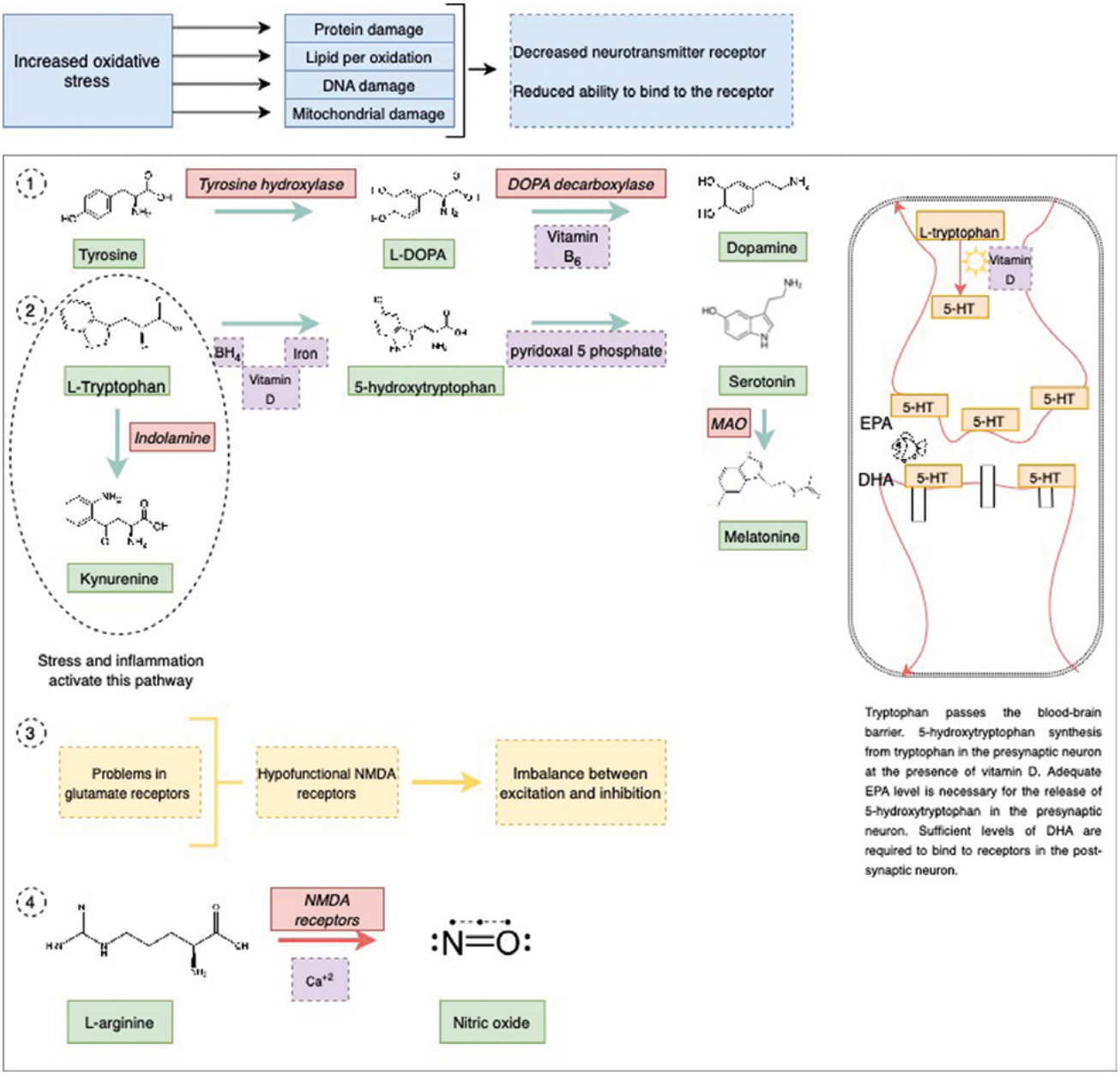

FIGURE 1. *The pathways that are effective in the pathophysiology of schizophrenia and the nutrients that regulate these pathways.*

Antioxidant defense system

It is thought that inflammation and oxidative stress play an important role in the etiology of schizophrenia. Free radical production has increased in schizophrenia and proinflammatory cytokine release has also increased due to disorders in detoxifying ability. Increased pro-inflammatory cytokines are known to be important for normal central nerve development and the proper functioning of neural networks and neurotransmitters. Increased immune system activation causes increased proinflammatory cytokine release and disorders in neurotransmitter balance. Inflammation and oxidative stress trigger psychotic symptoms [7,8]. In a study, it was emphasized that the severity of the neurological signals of patients increased four times compared to the healthy control group and important enzymes for oxidative stress, such as glutathione peroxidase and superoxide dismutase, have been found to be reduced [9].

Many nutrients are known to have anti-inflammatory and antioxidant functions by various mechanisms in our

body [8]. Omega-3 polyunsaturated fatty acids (PUFAs) form about 20% of the dry weight of the brain and 1/3 of all fat in the central nervous system. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are the two most specific omega-3 PUFAs known to have therapeutic antioxidant and anti-inflammatory effects in mental health [9]. In addition, it has been shown to have anti-excitotoxic effects on brain tissue by preventing neuron damage as a result of excessive release of excitatory neurotransmitters such as glutamate [10]. However, it has been found that undesirable fats in the structure of the Western Diet, which is high in saturated and trans-fatty acids, may aggravate the symptoms of schizophrenia by entering into the structure of phospholipids and competing with omega-3 PUFA. Studies have found that individuals with schizophrenia have lower levels of omega-3. Omega-3 supplementation is effective in improving symptoms of schizophrenia, especially positive symptoms [8].

Homocysteine, an oxidative stress agent, increases in schizophrenia. Homocysteine turns into glutathione, one of the important components of the antioxidant defense system, from the presence of pyridoxal 5 phosphates. Vitamin B_2 is required for the formation of pyridoxal 5 phosphate from pyridoxine. While vitamin B_2 is indirectly involved in this path, vitamin B_6 is directly involved. In a study, impaired glutathione function was detected in schizophrenia and it was emphasized that there may be glutathione deficits and abnormalities in patients with schizophrenia in the glutathione redox cycle [11]. Another pathway of homocysteine metabolism is the formation of methionine. Vitamin B_{12} is a cofactor in this pathway. Folic acid acts as a methyl supplier. Another pathway in which homocysteine is converted to another metabolite is the formation of cysteine. Vitamin B6 is also involved in the formation of cysteine from homocysteine [12,13]. Studies have shown that in cases of B_2, B_6, B_{12}, and folic acid deficiency, the level of homocysteine increases, and oxidative stress increases accordingly. This situation causes increased DNA damage and exacerbation of psychotic attacks due to schizophrenia [14,15].

Dopamine pathway

Dopamine regulates the formation of emotional learning, perception, and memory. It is known that dysregulation of dopaminergic neuron activities is effective for the appearance of symptoms of schizophrenia [16]. It is known that dopamine release increases in schizophrenia. It has been revealed that imbalance that occurs as a result of excessive subcortical dopamine release and deficiency in cortical dopamine has played an important role in the pathogenesis of schizophrenia [17]. It is thought that excessive activation of dopaminergic neurons plays a role in the formation of positive symptoms of psychosis such as hallucination. Negative symptoms are thought to be related to a deficit in dopaminergic neuron activity in a mesocortical area extending to the ventromedial prefrontal cortex. The studies emphasize that dopamine dysregulation leads to symptoms of schizophrenia [18]. One of the reported neurochemical abnormalities in a patient with schizophrenia is an increase in the synthesis of dopamine and the release of dopamine in the dorsal striatum [19]. There are some enzymes and hormones which are affected by releasing of dopamine. One of these is estrogen. It is known that estrogen regulates the expression of dopamine receptors and carriers and activities of the monoamine oxidase enzyme [20]. Tyrosine is an essential amino acid that readily passes the blood-brain barrier. Once in the brain, it is a precursor for dopamine. The concentration of dopamine in the brain depends on the amount of dietary tyrosine. Tyrosine is rapidly metabolized and folic acid, copper, and vitamin C are cofactor nutrients of these reactions (http://www.dcnutrition.com). Studies have emphasized that the deficiency of tyrosine hydroxylase enzyme activation increases the loss of the neuron and affects the dopaminergic pathway and causes decreases in tyrosine synthesis. The result of the lack of tyrosine, psychotic attacks exacerbates [21]. Tyrosine is an essential amino acid and is abundant in protein-rich foods. Nutrition affects tyrosine intake and hence dopamine release [22,23]. Impairment of dopaminergic transmission due to deficiency of tyrosine can be broke cognitive function. Therefore, abnormal tyrosine kinetics in patients with schizophrenia may be associated with cognitive dysfunction [24].

Serotonin pathway

Serotonin is found in many organs, like the brain. serotonin, which is located in the brain, plays an important role in homeostatic balance. It is synthesized by the tryptophan hydroxylase enzyme in the presence of oxygen [25]. 5-hydroxy tryptophan is synthesized from tryptophan in the presence of tetrahydrobiopterin and iron and vitamin D. Then, in the presence of pyridoxal 5-P, serotonin synthesis takes place. In inflammation and stress indolamine 2,3-dioxygenase and tryptophan2,3-dioxygenase enzymes are activated and kynurenine is synthesized from tryptophan [26,27]. Additionally, tryptophan is metabolized by the tryptophan hydroxylase 1 enzyme and 5-hydroxytryptophan is produced. Tetrahydrobiopterin and iron are cofactors in the pathway5-hydroxytryptophan are metabolized by l-amino acid decarboxylase and pyridoxal 5 phosphatase plays a role as a cofactor. tryptophan must be passed the blood-brain barrier for the production of serotonin in the brain. This transfer is influenced by the ratio of tryptophan and branched-chain amino acid. In the situation which removes the branched-chain amino acid in the circulation like exercise, passed tryptophan from the blood-brain barrier can be increased. An adequate EPA

level is necessary for the release of 5-hydroxy tryptophan from the presynaptic neuron. Sufficient levels of DHA are required to bind to receptors in the postsynaptic neuron [28,29]. Insufficent EPA, DHA, and vitamin D will cause problems in the nervous system in the pathway of serotonin synthesis. This will bring abnormal serotonin levels and behavioral problems [29]. Studies have found that individuals with schizophrenia have low vitamin D levels and their supplementation is associated with a decrease in proinflammatory cytokines such as Tumor necrosis factor-alpha (TNF-a), Interleukin 6 (IL-6) [30].

Gamma-aminobutyric acid (GABA) pathway

GABA is the main inhibitory effect neurotransmitter in the brain. A decrease in GABA cell density or loss of activity causes to decrease of regulatory inhibitory effect on dopaminergic and glutamatergic neurons of GABA [31]. In schizophrenia, GABAergic neurons are inhibited. Accordingly, there are imbalances between excitation and inhibition in the brain cortex [32]. Increased norepinephrine levels in schizophrenia cause an increase in sensitivity to emotional input. Second-generation antipsychotics increase norepinephrine levels by 5HT2C blockade in GABA interneurons. Increased norepinephrine and dopamine are also thought to have a positive effect on cognitive and affective symptoms in schizophrenia [18].

Glutamate pathway

Glutamate is a non-essential and excitatory neurotransmitter of the central nervous system. It is a neurotransmitter with adverse effects, and it has an “activator” effect on release towards dopamine and an “inhibitory” effect on release towards GABA. It has two types of receptors: α-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid (AMPA), N-methyl-D-aspartate (NMDA). In resting potential, the NMDA receptor is blocked both by a passage and by the magnesium ion side. Phencyclidine, which acts by blocking NMDA, a glutamate receptor, causes a clinical picture with symptoms similar to the positive and negative symptoms of schizophrenia and exacerbates the role of the glutamate system in schizophrenia. NMDA receptors are hypofunctional in untreated schizophrenia [18,33]. Studies have found that l-theanine, which is abundant in the structure of green tea, is effective in stabilizing the concentration of glutaminergic neurotransmitters (34). Nitric oxide (NO) is produced by a reaction catalyzed by the nitric oxide synthase (NOS) enzyme from L-arginine. NO synthesis in neurons is activated by the leakage of Ca^{+2} into the cell. NMDA receptors are important for the Ca^{+2} leaks. NO, which is present at high levels in neurons, modulates neuronal functions as a secondary messenger. Studies have reported that nitrite plasma level, which is the stable last product of NO metabolism, is higher in schizophrenia patients than in healthy controls [32].

Endocannabinoid system in schizophrenia

The endocannabinoid signal is a lipid signal system that has regulatory functions in many different pathways in the central nervous system [34]. The endocannabinoid system is a recently discovered signaling system consisting of cannabinoid receptors (CB1 and CB2 receptors), endocannabinoids (Anandamide, cannabinoids, virodhamin, noladin, and n-arachidonoyl dopamine (NADA)), and enzymes (fatty acid hydrolase (FAAH) and monoacylglycerol lipase (MAGL)) on the surface of the cell wall [34-36]. The Endocannabinoid system regulates glutamatergic, GABAergic, and dopaminergic synaptic functions [37]. Increased endocannabinoids in the body fluids and increased CB1 receptor levels in postmortem brains of patients with schizophrenia were detected [38,39]. In schizophrenia, as a result of excessive activation of the endocannabinoid system, disturbances in balance in glutaminergic and dopaminergic neurons occurred. Psychotic symptoms (delusions, hallucinations, cognitive disorders) increase after an overdose of tetrahydrocannabinol (THC) in healthy individuals. Similarly, psychotic symptoms were found to increase even more in schizophrenia [40]. Cannabis use has been found to increase psychotic attacks in patients with schizophrenia [35]. Caspi et al. found that cannabinoid use leads to polymorphism on catechol-O methyltransferase (COMT), which encodes an important dopamine degradation enzyme and this causes increases the risk of psychosis [41].

Cannabinoid type-1 (CB1) receptors have a large expression on the cortical glutaminergic neurons of the main olfactory bulb in the brain. This increases the smell sensation and the food intake increases [42]. Studies have shown that blocking CB1 receptors reduces food intake [43]. Overactivity of the endocannabinoid system in patients with schizophrenia is thought to be associated with increased nutrient intake in these patients [44].

Metabolome in schizophrenia

Metabolomics is a technology based on the determination of metabolites from lipids, carbohydrates, vitamins, and minerals in body tissues and fluids [45]. Pathogenic processes in the body can cause changes in circulating concentrations of metabolites. Metabolomics can be used in psychiatric research to investigate disease susceptibility and response to treatment [46]. Findings from studies show that metabolic deviations detected in plasma can be used as potential biomarkers to help diagnose schizophrenia [47].

Obesity, impaired glucose tolerance, and impaired lipid profile are common in patients with schizophrenia. Studies have found that saturated fatty acids are high in the metabolic profiles of patients with schizophrenia. Therefore, specific metabolic abnormalities associated with glucoregulatory markers and proline metabolism indicate that metabolomics can be used in patients with schizophre-

nia [47]. Another study revealed abnormalities in biosynthetic pathways due to glutamine and arginine metabolism in patients with schizophrenia. It is thought that the follow-up of these components in the blood profile may be important for monitoring the prognosis of the disease [15]. Kynurenine is also considered metabolomic in schizophrenic patients. Kynurenine occurs from the l-tryptophan presence of indolamine in cases plasma iron, vitamin D and pyridoxal 5 phosphate levels are not sufficient [48,49].

Final consideration

Nutritional factors in psychiatric diseases should be evaluated with a multidisciplinary approach in order to achieve better results in patients' health status and quality of life. Many different pathways can be mentioned that affect the nutritional status of patients. However, it is difficult to make the desired changes in the diet of these patients [50]. However, the association between schizophrenia and nutritional deficiency does not imply a causal relationship, and studies related to dietary supplements do not always show proven effects. Therefore, more studies are needed on the effectiveness of nutrition in schizophrenia and other psychotic diseases. Although the results are not entirely consistent, omega-3, vitamin D, and group B vitamins have activity on pathophysiological pathways associated with schizophrenia, which may be useful as complementary strategies. Patients with schizophrenia have low antioxidant and anti-inflammatory component levels. This situation causes problems in neurotransmitter pathways and increases positive and negative symptoms. The results obtained from the studies indicate that the deficiency of nutrients is effective in the pathophysiology of schizophrenia. Nutrient deficiencies that occur frequently in these patients should be followed and eliminated to ensure the correct functioning of the pathophysiological pathways of the disease.

Ethical consideration

The articles that contributed to this review were reviewed by considering international ethical standards.

Acknowledgement

None.

Funding

This paper received no external funding.

Conflict of interest

The Authors have no conflict of interest to declare.

Author contributions

All Authors have read and approved the final manuscript. The first draft was written by Gul Akduman and Emine Kurtbeyoğlu, and F. Esra Gunes reviewed and provided feedback that led to considerable changes to the original draft.

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