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Occurrence of male depression symptoms, suicidal behaviors, alcohol and tobacco use and level of personal resources in three male groups

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Abstract

Background and objective: The study was to compare the severity of male depression symptoms, suicidal behaviors, the use of psychoactive substances (alcohol, nicotine), and evaluate personal resources (self-efficacy, coping strategies and resilience) among men from three different groups.

Material and methods: The clinical group contained men with depression disorders diagnosed by psychiatrists and treated in psychiatric hospitals (*n* = 197). The control groups contained men with physical disorders treated in general hospitals in Warsaw, Poland (*n* = 198) and men who self-evaluated themselves as healthy without physical or mental disorders (*n* = 203). Several tests were used for evaluation: a test with sociodemographic variables, the AUDIT Test, the Fagerstrom Test, the Generalized Self-Efficacy Scale (GSES), the MINI-COPE Questionnaire, the Resilience Evaluation Questionnaire (KOP-26), the Suicide Behaviors Questionnaire-Revised by Osman (SBQ-R) and the Gotland Male Depression Scale (GMDS).

Results: Most of the men with depression disorders presented non-typical symptoms of depression which are not included in diagnostic criteria. It allows us to assume that a large percentage of men who suffer from depression are not properly being diagnosed. Moreover, we found that men with any type of physical disorder have the greatest severity of male depression symptoms than healthy men. Men with depression disorders have suicidal thoughts and have made efforts in the past more often, as well as having higher alcohol and nicotine addictions. Patients who overuse or are addicted to alcohol or nicotine should be additionally screened for the possible occurrence of depressive disorders, and substance usage should be treated as a symptom of male depression. Men with depression present low resilience and low self-efficacy. They also use negative strategies in dealing with stress.

Conclusion: There is a need to plan and implement effective prevention actions that will take the conditioning of these groups into account.

Keywords

Male depression symptoms; Suicide behaviors; Personal resources; Substance-related disorders

1. Introduction

Depression is one of the main predictors of suicide [1]. Even though depression and suicide attempts are more often ob-

served among women, men die much more often by suicide [2]. These disparities are particularly significant given that depression is estimated to underlie half to two-thirds of all suicide deaths [1]. The gender difference explanation is that men choose more lethal methods of suicide, and the suicide timeline (the time from the onset of suicidal thoughts to suicide death) is shorter-most of them act on impulse [3]. Another explanation is connected to coping with stress and resilience [4]. When problems occur, men attempt to self-medicate with psychoactive substances more often, which is, on the other hand, a recognized risk factor for suicidal behaviors [3]. There is a growing consensus among researchers, clinicians, professional organizations, and government agencies that male depression is under-diagnosed and poorly understood, and that many men experience, express, and respond to depression in ways that differ from ICD-10/DSM depression criteria [5]. Although women and men experience equal rates of psychiatric disorders overall [6], men are at a substantially greater risk for externalizing disorders [7] and, when depressed, for externalizing symptoms [8]. There are two approaches to men externalizing depression: the sex differences framework described by Addis [9], which is characterized by a great deal of psychiatric research, and Gender Role Strain Theory [10]. The Gender Role Strain theory frames masculine gender roles in terms of stereotypes, norms, and expectations such as success, power, dominance, competitiveness, toughness, self-reliance, independence, restrictive affection and emotionality, and avoidance of feminine-typed behavior [11]. Such masculine norms are theorized to be contradictory, variable across time, dependent on circumstances, and individually dystonic to differing degrees. Adherence to these norms is for many men grounded in shame and self-stigma and reinforced by social sanctions that are more severe for men than for women [5]. In consequence, men across the spectra of intersecting sexual and gender identities struggle to negotiate adherence to narrow, conflicting, dysfunctional, or unattainable standards. This struggle generates developmental and psychosocial strains, distress, and impairments often referred to as gender role strain. Additionally, continued adherence to masculine norms inhibits the ability of boys and men to cope adaptively, for example by hindering help-seeking and emotional expression. Rigid adherence to masculine norms is theorized to place men at increased risk of mental health issues, including depression [10].

It has been proven in the literature that approximately 50.9% of patients with mental disorders are also diagnosed with a disorder related to the use of psychoactive substances or risky alcohol abuse. Such co-occurrence of disorders is more often noted among men than women [2]. Depression largely predicts faster development and sustained use of such substances [12]. The occurrence of this double diagnosis in patients hinders the treatment process, including both pharmacotherapy and psychotherapy [13], and may also contribute to more frequent suicidal thoughts.

Excessive alcohol consumption may be both a cause and a consequence of depressive disorders [14]. The majority

(82%) of people who took their own lives had symptoms of mental disorders that were comorbid with depression and/or alcohol addiction [15].

It is believed that personal resources may play a key role in preventing suicide. Personal resources are relatively constant dispositions of a given person that have an impact on how individuals cope with a crisis and in stressful situations (every situation that causes a feeling of emotional strain and pressure [16]). The most important personal resources are self-efficacy, stress-coping strategies, and resilience. It should be noted that the aforementioned resources have had an impact on the effectiveness of therapy, especially among patients who struggle with the problem of substance abuse [17].

Due to stereotypes (socialization), men have problems with seeking medical help. They try to endure the pain on their own and they often perceive the situation of illness (hospitalization) as deprivation. This aspect is poorly tested and the results are inconclusive [18].

In Poland, despite the persistently high rates of suicide among men, no comprehensive preventive measures are being taken aimed at this risk group. To prevent suicide among men, it is necessary to conduct a thorough analysis of masculine depression. The complexity of the problem requires the recognition of this specific type of depressive disorder and its determinants [19]. Currently, there is relatively little research on these problems. This is the first study among polish men that addresses mental problems while also taking into account male depressive syndrome that does not only refer to the classical depression symptoms which are included in the ICD-10. In the study, we used the Gotland Male Depression Scale to focus on the non-typical symptoms of depressive disorders among men.

The current study aimed to compare the severity of male depression symptoms, suicidal behaviors, the use of psychoactive substances (alcohol, nicotine) and evaluate personal resources (self-efficacy, coping strategies and resilience) of men with diagnosed depression, men with physical disorders and men who self-evaluated themselves as healthy (without physical or mental disorders). Authors want to find factors that distinguish men with depression disorders. The indirect aim of the study was to also draw the attention of decision-makers to the mental health of men in Poland.

2. Material and methods

2.1 Design

The study was carried out from 2018–2020 and used the paper-pencil method. Researchers obtained approval from the hospital management to conduct the study on its premises in all participating hospitals. The researcher, after making an appointment with the head of a ward, was introduced to the ward staff and to patients selected by the head of the ward and hospitalized in this ward (the patients' state of health had to allow for informed consent to participate in the study). Men from the psychiatric hospitals (who consist of the clinical group, CG) were chosen by the head of the psychiatric ward (they were permitted to conduct the study with individual

patients who have been diagnosed with depressive disorders). The researcher introduced himself and discussed the study participation procedure. The patient was provided with a questionnaire to complete where he had to give informed consent to participate in the study. It took the patients around 20–25 minutes to complete the questionnaire. The collected and digitized data was stored by the researcher by the guidelines in force at the Medical University of Warsaw. The study was approved by the Bioethics Committee of Warsaw Medical University No. KE-0254/335/2015.

2.2 Material

The studies were conducted in three groups: group I (clinical group, CG; diagnosed with depression by a psychiatrist), group II (first control group-CG1; physical disorders, mentally healthy), and group III (second control group-CG2; healthy physically and mentally). The study inclusion criteria for the clinical group (group I) were as follows: (1) at least 18 years of age, (2) male gender, (3) diagnosis of depressive disorders (F31 in the depressive phase, F32 and F33), (4) undergoing pharmacological and psychotherapeutic treatment in the psychiatric hospital.

The study inclusion criteria for the first control group (CG1) were as follows: (1) at least 18 years of age, (2) male gender, (3) no current pharmacological and psychotherapeutic treatment at any psychiatric hospital, (4) currently undergoing treatment in one of the four randomly selected hospitals in Warsaw. Patients from randomly selected hospitals in Warsaw were selected for the control group to collect responses from men with no history of depressive disorder. The randomness of hospitals and departments was used to reduce the error resulting from the specific health condition of the male respondents from the control group. Patients who qualified for the control group were recruited from the four randomly selected general hospitals in Warsaw [n = 183].

The study inclusion criteria for the second control group (CG2) were as follows: (1) at least 18 years of age, (2) male gender, (3) no current pharmacological and psychotherapeutic treatment at any psychiatric hospital, (4) physically and mentally healthy. For this group, men were selected using the snowball sampling.

A total of 598 questionnaires were collected, 197 from the clinical group (group I, CG), 198 from CG1, and 203 from CG2. In CG1, the Gotland Male Depression Scale revealed that 1 person showed depression syndromes and 14 men met the criteria of possible depression. In CG2 testing revealed 1 person with depression and 5 with possible depression. Therefore, those 15 persons (7.6%) were excluded from CG1 and 6 persons, 3.0% were excluded from CG2 due to this reason. Further analysis included only men with no symptoms of depression in control groups (n = 183 for CG1 and n = 197 for CG2).

Sociodemographic characteristics of the study and the distributions of the groups are presented in Table 1.

2.3 Instruments

The survey included socio-demographic variables with few additional questions: Have you ever had thoughts of suicide? Have you ever tried to take your own life? Have you had/are there any mental disorders in your family? Have you ever been treated psychiatrically? The last question was detailed with the number of treatment episodes, a diagnosis that had been established in the course of treatment and the extent of received treatment support from family. This was rated from very high, high, moderate, low to none.

Standardized screening questionnaires were used in this study:

1. AUDIT test—Alcohol-Related Disorders Test

A test commissioned by the World Health Organization, consisting of 10 questions and arranged in 3 parts: the first part deals with risky drinking (frequency of drinking, the typical amount of alcohol drunk, frequency of excessive drinking), the second part concerns symptoms of addiction (loss of control over drinking, drinking becoming an increasingly important issue in life, the need to drink in the morning), and the third part concerns harmful drinking (feeling guilty after drinking alcohol, memory lapses caused by drinking, physical injuries caused by drinking alcohol, other people's interest in drinking) [20]. The Polish version of AUDIT was used Cronbach's α = 0.78 in the original study and 0.903 in our study [21].

2. Fagerstrom Test

The Fagerstrom Nicotine Addiction Test consists of six questions, which are scored from 0 to 10. A score from 0 to 2 means a very low level of addiction, a score from 3–4-low, a score of 5-moderate, a score from 6–7 points-high, a score from 8–10-very high [22]. The Polish version of the Fagerstrom Test was used Cronbach's α = 0.76 in the original study and 0.65 in our study [23].

3. GSES-Generalized Self-Efficacy Scale

The scale by Schwarzer, Jerusalem, and Juczyński in the Polish adaptation by Juczyński [24]. The scale consists of ten statements, which determined the level of self-efficacy of the examined person—Cronbach's α = 0.85 in the original study and 0.908 in our study.

4. MINI-COPE Questionnaire (Brief COPE Inventory)

Coping strategies were measured by the MINI-COPE Questionnaire (Brief COPE Inventory) [25] in the Polish adaptation by Juczyński and Ogińska-Bulik [26]. There are 28 statements integrated into 14 coping strategies (i.e., two statements per strategy), these being as follows: Active coping, planning, positive reframing, acceptance, humor, religious solace, use of emotional support, use of instrumental support, self-distraction, denial, venting, substance abuse, behavioral disengagement, and self-blame. The respondent selected one out of four possible replies ranging in scores from "I have rarely been doing this" (0 points) to "I have almost always been doing this" (3 points). Each of the coping strategies was assessed separately and the higher the score, the more often a particular strategy was adopted. Depending on subscale, Cronbach's α = 0.45–0.82 in the original study and 0.484–0.912 in our study.

T A B L E 1. Sociodemographic characteristic of study groups.

Characteristic	Clinical group	Control group 1	Control group 2	Effect size	P
N	197	183	197		
Age, years[1]	44.14 ± 14.27	47.97 ± 17.40	42.99 ± 14.48	0.02	0.005
Place of living					
Large city (> 200 k habitants)	84 (42.6)	110 (60.1)	155 (78.7)		
Medium city (50 k–200 k habitants)	41 (20.8)	45 (24.6)	33 (16.8)		
Small city (< 50 k habitants)	41 (20.8)	13 (7.1)	6 (3.0)	0.26	< 0.001
Village	31 (15.7)	15 (8.2)	3 (1.5)		
Education					
Primary	20 (10.2)	3 (1.6)	12 (6.1)		
Secondary	87 (44.2)	41 (22.4)	39 (19.8)		
Vocational	38 (19.3)	65 (35.5)	44 (22.3)	0.23	< 0.001
Higher	52 (26.4)	74 (40.4)	102 (51.8)		
Work status					
Student	8 (4.1)	7 (3.8)	17 (8.6)		
Unemployed	34 (17.3)	2 (1.1)	1 (0.5)		
Working	101 (51.5)	117 (63.9)	157 (79.7)	0.30	< 0.001
Retired/pensioner	43 (21.9)	56 (30.6)	21 (10.7)		
Dependence on another family member	10 (5.1)	1 (0.5)	1 (0.5)		
Marital status					
Married	66 (33.5)	107 (58.5)	110 (55.8)		
Separated/divorced	33 (16.8)	11 (6.0)	17 (8.6)		
Widower	8 (4.1)	10 (5.5)	6 (3.0)	0.21	<0.001
Bachelor	66 (33.5)	29 (1.8)	29 (14.7)		
Informal relationship	23 (11.7)	26 (14.2)	35 (17.8)		
Having kids	102 (52.0)	123 (67.6)	119 (60.4)	0.13	0.009
Number of kids[2]	2.00 (1.00; 2.00)	2.00 (1.25; 2.00)	1.00 (1.00; 1.00)	0.004	0.320
Financial situation satisfaction, 1–5 Likert scale[1]	2.92 ± 1.23	3.30 ± 0.93	3.73 ± 0.90	0.10	< 0.001

Note: Data is presented as n (% of group) for nominal variables and as mean ± SD[1] or median (25th–75th percentile)[2] for continuous variables.

Groups compared with ANOVA[1] for continuous variables, Kruskal-Wallis test[2] and chi-square test/Fisher exact test for categorical variables.

Effect size measures: Cramer's V for chi-square test/Fisher exact test, Eta-squared for ANOVA, Epsilon-squared for Kruskal-Wallis test.

5. Resilience Evaluation Questionnaire (KOP-26)

A questionnaire that was created by Gąsior, Chodkiewicz & Cechowski [27]. The questionnaire consists of 26 items. The assessment of the extent to which the respondent agrees with a given statement is made on a 5-point Likert scale (from 1-I completely disagree to 5-I completely agree). Four variables are assessed based on the questionnaire: personal competencies, family competencies, social competencies, and general resilience (assumed by all three types of competencies). Cronbach's α = 0.90 for total scale, 0.78–0.90 for subscales in the original study and in our study: 0.943 for total scale, 0.847–0.925 for subscales.

6. Suicide Behaviors Questionnaire-Revised (SBQ-R) by Osman

The scale created by Osman *et al.* [28] in the Polish adaptation of Chodkiewicz & Gruszczyńska [29]. The questionnaire is a self-descriptive measure of suicidal tendencies (suicidal behaviors, including ideation and attempts) composed of four questions. Cronbach's α = 0.83 in the Polish adaptation study and 0.866 in our study.

7. Gotland Male Depression Scale

The scale was created by Rutz [30] in the Polish adaptation of Chodkiewicz [31]. The scale consists of 13 statements describing the depressive symptoms of the people examined a month before. Each of the statements is scored on the four-

point Likert scale: from 0 ("completely untrue") to 3 ("completely true"). The overall result is in the range from 0 to 39 points. The authors adopted the following interpretation of the results on the full scale: 0–12 points-no signs of depression; 13–26-possible depression, appropriate treatment should be considered; 27–39-depression, most likely treatment is necessary (including pharmacological). Cronbach's α = 0.85 in the Polish adaptation study and 0.948 in our study.

The survey was voluntary and anonymous.

2.4 Statistical analysis

Categorical variables are presented as n (% of the total group) and continuous variables as mean ± SD or median (25th–75th percentile), depending on data distribution. Normality of distribution was assessed with the use of the Shapiro-Wilk test, skewness and kurtosis values as well as visual assessment of histograms. Nominal variables were analyzed among the groups with the chi-square test or *Fisher exact test, as appropriate*. To detect significant differences between groups, *continuous variables were compared* with ANOVA or Kruskal-Wallis test. *Post-hoc* Tukey test or Dunn test with Bonferroni correction was used, as appropriate. The use of nonparametric tests was related to a lack of normal distribution of variables. Due to large study groups, apart

from calculating *P*-values, effect size measures were calculated: Cramer's *V* for chi-square test and Fisher exact test, Eta-squared for ANOVA (η^2), Epsilon-squared for Kruskal-Wallis test (ϵ^2). All tests were two-tailed and results were regarded as statistically significant at the level of $P < 0.05$. There was a *Post-hoc* power analysis conducted: for GDMS and SBQ-R variables between 3 groups analyzed, using G Power 3.1.9.2 version. Based on the data from the current study for GDMS (comparison of 3 groups with a total size of 577, significance level $\alpha = 0.05$ and effect size = 0.66), we attained power of 99%. For SBQ-R (comparison of 3 groups with a total size of 577, significance level $\alpha = 0.05$ and effect size = 0.33), we attained power of 99%. The percentage of missing data for each variable is available in Supplementary Table 1. For sociodemographic characteristics, GDMS, SBQ-R, KOP-26, % of missing data did not exceed 1% in each group, differences between groups were not significant. For AUDIT, % of missing data was 1.5% in CG vs. 0% in CG1, CG2, the difference was not significant. In the case of the question 'Have you ever been treated psychiatrically?' there were 2.7–3.0% of missing data depending on the group, the difference was not significant. In the case of mini-COPE subscales, the amount of missing data was 4.1% in CG vs. 0–1.6% in CG1 and CG2, $P = 0.007$. The greatest number of missing data was for the clinical group, due mostly to men missing the other side of the questionnaire, therefore this is not a systematic error. The analysis was conducted in statistical software R (version 3.5.1) (http://cran.r-project.org).

3. Results

Men in CG1 were significantly older (47.97 ± 17.40 years) than in CG (44.14 ± 14.27 years) and CG2 (42.99 ± 14.48 years) with weak effect size, $\eta^2 = 0.02$; $P = 0.005$. Education, place of living, work status, and marital status were also significantly different between groups with weak effect size (V from 0.21 to 0.30; $P < 0.001$ for each characteristic). Patients from villages and small cities were more frequent in CG (in total 36% vs. 15% in CG1 and 5% in CG2). Men in CG were less educated more frequently the level of education was primary or secondary, while men in control groups declared vocational and higher education more often. Responders from control groups were more often professionally active than CG patients (52% in CG vs. 64% in CG1 and 80% in CG2) and were more frequently married (34% in CG vs. 59% in CG1 and 56% in CG2). Patients from the test group were more often unemployed or remained single than in the control groups. The frequency of having children was significantly different between groups with small effect size (52% in CG vs. 68% in CG1 and 60% in CG2; $V = 0.13$; $P = 0.009$), but there was no significant difference in the number of children among groups. For all sociodemographic characteristics, the effect size of differences between groups was very weak or weak.

Based on the GMDS questionnaire, 35% of patients in the clinical group had no male depression symptoms, possible male depression applied to 50% of patients, remaining 15%

had symptoms of male depression. The *Post-hoc* test confirmed that the GMDS level was significantly different not only between the clinical group and CG1/CG2 ($P < 0.001$) but also between CG1 and CG2 ($P = 0.042$).

Patients from the clinical group declared significantly more suicidal thoughts frequently than control groups with moderate effect size (72% vs. 26% in CG1 and 27% in CG2, $V = 0.43$; $P < 0.001$) and significantly more suicidal efforts in the past with strong effect size (45% vs. 2% in CG1 and 1% in CG2, $V = 0.57$; $P < 0.001$). The SBQ-R score was significantly different among the clinical group and CG1/CG2 groups ($P < 0.001$), no significant differences were confirmed between CG1 and CG2 groups ($P = 0.596$).

Patients from the clinical group also declared mental disorders in family members more frequently (33% in CG vs. 13% in CG1 and 11% in CG2, $V = 0.19$; $P < 0.001$), Table 2. The level of family support in the clinical group treatment was dispersed: 43% of patients declared a high or very high level of family support, 25% declared little or no family support.

There were n = 125/64% of smokers in the clinical group (n = 31/17% in CG1 and n = 38/19% in CG2), $V = 0.46$; $P < 0.001$. Nicotine addiction level measured with the Fagerstrom questionnaire was also significantly different among groups, moderate effect size, $\eta^2 = 0.09$; $P < 0.001$. Difference in nicotine addiction was significant between the clinical group vs. CG2 ($P < 0.001$) and CG1 vs. CG2 ($P < 0.043$). High or very high level of nicotine addiction applied to 37% of clinical group patients vs. 5% in CG1 and 3% in CG2, $V = 0.031$; $P < 0.001$.

Alcohol addiction level was also significantly different among groups, strong effect size, $\epsilon^2 = 0.99$, $P < 0.001$. The *Post-hoc* test revealed that the level of alcohol addiction was higher in the clinical group vs. CG1 ($P < 0.001$) and the clinical group vs. CG2 ($P < 0.001$). No significant difference was confirmed in alcohol addiction between CG1 and CG2. Patients in the clinical group showed a significance in all types of alcohol addictions more often: risky drinking (13% vs. 1–5% in control groups, $P < 0.001$), harmful drinking (10% vs. 1–2% in control groups, $P < 0.001$) and suspected addiction (19% vs. 1–2% of control groups, $P < 0.001$). Alcohol abuse in the family was also significantly more frequent in the clinical group than in control groups (49% vs. 12% in CG1 and 21% in CG2, $P < 0.001$).

Significant differences among groups were confirmed for all personal resources analyzed: self-efficacy (GSES), resilience (KOP-26), and dealing with stress strategies (mini-COPE). For GSES, the *Post-hoc* test confirmed a significantly lower level of self-efficacy in the clinical group vs. CG1 and CG2 ($P < 0.001$ in both comparisons). No significant differences in GSES between CG1 and CG2 were confirmed. A high level of self-efficacy had 49% of CG patients vs. 91% of CG1 and 91% of CG2, $P < 0.001$. For mini-COPE strategies, significant differences were confirmed among the groups for all strategies ($P < 0.001$) but 'sense of humor' and 'Venting'. Based on the *Post-hoc* test, all remaining 12 strategies were significantly different between TG and CG2 groups ($P < 0.001$): 'Religion', 'Denial', 'Use of psychoactive

T A B L E 2. Male depression symptoms (GMDS) and suicidal behaviors of study groups.

Characteristic	Clinical group	Control group 1	Control group 2	Effect size	P	Post-hoc test
GMDS[1]	16.82 ± 8.01	1.56 ± 2.40	1.06 ± 2.08	0.66	< 0.001	CG > CG1, CG2 CG1 > CG2
Have you ever had thoughts of suicide? Yes	141 (71.9)	48 (26.2)	53 (27.0)	0.43	< 0.001	
Have you ever tried to take your own life? Yes	89 (45.4)	3 (1.6)	1 (0.5)	0.57	< 0.001	
SBQ-R score[1]	8.73 ± 4.51	4.19 ± 1.69	4.48 ± 1.75	0.33	< 0.001	CG > CG1, CG2
Mental disorders in family, Yes	64 (32.7)	23 (12.6)	21 (10.7)	0.19	< 0.001	
Have you ever been treated psychiatrically? Yes	147 (77.0)	2 (1.1)	1 (0.5)	0.82	< 0.001	

Note: Data is presented as *n* (% of group) for nominal variables and as mean ± *SD*[1] for continuous variables.

Groups compared with ANOVA (Tukey *Post-hoc* test)[1] for continuous variables and chi-square test/Fisher exact test for categorical variables.

Effect size measures: Cramer's V for chi-square test/Fisher exact test, Eta-squared for ANOVA.

CG-CG1; CG-CG2; CG1-CG2—significant differences between groups (*P* < 0.05).

T A B L E 3. Addictions, self-efficacy (GSES) and resilience (KOP-26) in study groups.

Characteristic	Clinical group	Control group 1 (somatic disease)	Control group 2 (healthy)	Effect size	P	Post-hoc test
Fagerstrom score	5.38 ± 2.48	4.97 ± 1.48	3.61 ± 2.05	0.09	< 0.001	CG, CG1 > CG2
AUDIT score[1]	7.00 (3.00; 17.00)	3.00 (2.00; 5.00)	3.00 (2.00; 6.00)	0.99	< 0.001	CG > CG1, CG2
GSES score	28.89 ± 5.78	33.03 ± 3.84	34.11 ± 4.02	0.19	< 0.001	CG < CG1, CG2
KOP-26 score	91.14 ± 21.20	104.62 ± 10.86	104.55 ± 12.24	0.14	< 0.001	CG < CG1, CG2
Personal competence	31.41 ± 8.21	36.61 ± 3.85	36.53 ± 4.61	0.15	< 0.001	CG < CG1, CG2
Family competence	40.70 ± 10.57	45.17 ± 5.29	46.15 ± 6.45	0.09	< 0.001	CG < CG1, CG2
Social competence	19.04 ± 5.23	22.84 ± 3.87	21.87 ± 4.41	0.11	< 0.001	CG < CG1, CG2

Note: Data is presented as mean ± *SD* or median (25th–75th percentile)[1].

Groups compared with ANOVA (Tukey *Post-hoc* test) or Kruskal-Wallis test (Dunn *Post-hoc* test)[1].

Effect size measures: Eta-squared for ANOVA, Epsilon-squared for Kruskal-Wallis test.

CG-CG1; CG-CG2; CG1-CG2—significant differences between groups (*P* < 0.05).

substances', 'Behavioral disengagement' and 'self-blame' had a higher level in CG patients vs. CG2 while 'Active coping', 'Planning', 'Positive reframing', 'Acceptance', 'Use of emotional support', 'Use of instrumental support' and 'self-distraction' had a lower level in CG patients vs. CG2. Between CG and CG1 groups, significant differences were confirmed for: 'substance use' and 'self-blame' (higher level in CG patients vs. CG1) as well as for 'Active coping', 'Planning', 'Positive reframing', 'Acceptance', 'Use of instrumental support' and 'self-distraction' (lower level in CG patients vs. CG1). Strategies of 'Religion', 'Use of emotional support', 'Denial' and 'Behavioral disengagement' were significantly different only between CG and CG2 and not between CG and CG1. Total resilience (KOP-26), as well as its competencies (personal, family, social), were significantly different among all groups with moderate or strong effect size (*P* < 0.001). The *Post-hoc* test revealed that the CG group had a significantly lower level of KOP-26 and all components than CG1 and CG2 (*P* < 0.001). No significant differences were confirmed between CG1 and CG2 for KOP-26, Tables 3,4.

4. Discussion

The Gotland Male Depression Scale is the instrument that includes male depression symptoms-the in-house study suggests that most of the CG members have non-typical symptoms while over 1/3 (35%) did not have "male" depression symptoms. Nadeau *et al.* [32] described that part of men

suffering from depressive disorders can meet the criteria for male depression, but others can exhibit the "classical depression" symptoms.

The occurrence of physical problems is one of the depression risk factors but, on the other hand, physical symptoms often occur among depressive men [33]. In a current study, men with any kind of physical disorder have the greatest severity of male depression symptoms than healthy men. A physical disorder, especially a chronic one, is associated with the feeling of chronic stress, emotional tension, and negative emotions, such as anxiety or anger. Many patients complain of multiple symptoms concurrently and over time. This requires the use of appropriate adaptation mechanisms to the new situation. This situation can also affect the patient's mental well-being because patients are often frustrated [34]. It is hard to explain whether men from the CG1 have the greatest severity of male depression symptoms because of their poor physical health or whether it is the consequence of untreated depression, this makes the suicide risk assessment difficult.

A review and meta-analysis of the genetic epidemiology in major depression have indicated that major depression is considered a familial disorder, which mostly or entirely results from genetic influences [35]. The study of Angelini *et al.* [36] noted that individuals who were exposed during childhood to a parent with mental health problems suffered from depressive symptoms more often in late adulthood than those who were not. In our study, 33% of men with depressive disorders reported a history of a mental disorder

T A B L E 4. Coping Strategies with Stress (Mini-COPE) in study groups.

Characteristic	Test group	Control group 1 (somatic disease)	Control group 2 (healthy)	Effect size	*P*	*Post-hoc* test
Mini-Cope Active coping	1.89 ± 0.66	2.24 ± 0.47	2.50 ± 0.49	0.17	< 0.001	CG < CG1, CG2 CG1 < CG2
Planning	1.87 ± 0.71	2.15 ± 0.45	2.38 ± 0.45	0.13	< 0.001	CG < CG1, CG2 CG1 < CG2
Positive reframing	1.66 ± 0.73	2.04 ± 0.48	2.15 ± 0.66	0.10	< 0.001	CG < CG1, CG2
Acceptance	1.83 ± 0.67	1.99 ± 0.53	2.31 ± 0.57	0.10	< 0.001	CG < CG1, CG2 CG1 < CG2
Humor	1.08 ± 0.68	1.13 ± 0.65	1.04 ± 0.66	0.01	0.470	
Religion	0.99 ± 1.00	0.83 ± 0.94	0.39 ± 0.84	0.07	< 0.001	CG, CG1 > CG2
Use of emotional support	1.67 ± 0.78	1.81 ± 0.68	1.96 ± 0.56	0.03	< 0.001	CG < CG2
Use of instrumental support	1.58 ± 0.75	1.76 ± 0.61	1.89 ± 0.58	0.04	< 0.001	CG < CG1, CG2
Self-distraction	1.73 ± 0.75	2.14 ± 0.58	2.29 ± 0.79	0.10	< 0.001	CG < CG1, CG2
Denial	1.20 ± 0.91	1.09 ± 0.69	0.70 ± 0.68	0.07	< 0.001	CG, CG1 > CG2
Venting	1.59 ± 0.73	1.53 ± 0.57	1.56 ± 0.62	0.01	0.698	
Substance use	1.20 ± 0.99	0.90 ± 0.84	0.52 ± 0.67	0.10	< 0.001	CG > CG1, CG2 CG1 > CG2
Behavioral disengagement	1.02 ± 0.73	0.94 ± 0.70	0.46 ± 0.58	0.12	< 0.001	CG, CG1 > CG2
Self-blame	1.65 ± 0.80	1.33 ± 0.63	1.24 ± 0.66	0.06	< 0.001	CG > CG1, CG2

Note: Data is presented as mean $\pm$ *SD*.

Groups compared with ANOVA (Tukey *Post-hoc* test).

Effect size measure: Eta-squared.

CG-CG1; CG-CG2; CG1-CG2—significant differences between groups ($P < 0.05$).

in family members. This fact should be taken into account when constructing prevention programs. This is especially important because family prevention programs can reduce the risk of depression as found in a systematic review and meta-analysis of randomized controlled trials Loechner *et al.* [37] provide evidence that appropriate intervention targeting the offspring of depressed parents can reduce symptoms of depression but also prevent the onset of depression, at least immediately after the intervention.

Not only a prevention program but also support is important in male patients with depression. Studies showed that the support of family is a very important issue in the depression treatment process [38]. The findings of Taylor *et al.* [39] indicate that family and friend support is associated with lower intensity of depressive symptoms. Moreover, it is believed that friendships and/or family support may be preventive. Therefore, enhancing affiliate relationships and positive family environments may benefit mental health [40]. In a present study, nearly 50% of men with psychiatric treatment history have strong support from their families. One-quarter of these men do not have any or little support. The social phenomenon that men have to deal with mental problems on their own should be regarded as a dangerous situation. The feeling of lack of support and of being incomprehensible will surely put the man away from seeking help. Oliffe *et al.* [41] demonstrated that men rarely seek help from their relatives in solving their problems. It is believed that it might be related to fear of stigma, which might lead to lower self-esteem and feels of shame [2]. This results in the suppression of emotions and unacceptance of their limitations of coping with difficult situations. In this context, it should be noted that the type of support is essential. It is reported that social support is an important factor that can affect mental health. However, researchers suggest that social support is more effective in conjunction with other types of support. Moreover, social support has different effects based on age and gender [42]. Therefore, support programs should be very individual and take into account various factors, including individual and social aspects.

Our results showed that men from the clinical group (CG) had more suicidal thoughts, more suicide attempts in the past, and have stronger suicide inclinations compared to CG1 and CG2. This suggests that the presence of depression may increase the risk of suicide more than the presence of physical illnesses. A study of Lund, Nadorff & Seader [43] showed that in people with mental disorders, suicide happens more often than in people without mental disorders. Moreover, they found that people with mental disorders experienced significantly greater suicide incidents than people with non-mental disorders. Furthermore, there was no significant difference in suicide incidents in men with non-mental disorders and compared with men without any disorders. Therefore, it is crucial to undertake research aimed at determining the factors influencing suicide attempts. Ribeiro *et al.* [44] conducted a meta-analysis to evaluate depression and hopelessness as risk factors for suicidal thoughts, attempts, and death. They observed that the overall prediction was weaker than expected.

Several epidemiological studies have shown substance use to be strongly associated with depression among adults [45]. In the present study, most of the smokers with high or a very high level of nicotine addiction were incorporated into the clinical group. Current research proves that smokers, compared with non-smokers, have higher rates

of major depression, and smokers, particularly those who are nicotine dependent, are more than twice as likely as non-smokers to have a history of major depression [46]. A Finnish prospective cohort study to investigate whether smoking predicts depression showed that prolonged smoking is associated with a higher likelihood of depression, an effect that is stronger in men than in women [47]. Other researchers argue that women who smoke are more prone to depression than men who smoke [48]. Published papers show that smokers with depression have higher nicotine dependence and, after quitting, experience more severe negative moods and are at increased risk of major depression [49]. According to Haukkala et al. [50], higher depression scores were associated with lower self-efficacy in quitting smoking, especially among male smokers. Men often associated their smoking behaviors with common male features such as being powerful, being emotionally stable, being in control, and having self-reliance [51]. It is often believed that smokers diagnosed with depressive disorder do not want to quit smoking, but numerous studies do not support this thesis [52]. It happens, however, that patients are not encouraged by medical staff to quit tobacco use because it is believed that quitting smoking may worsen symptoms of depression [53], although scientific evidence suggests that giving up smoking may improve the functioning of the patient [54]. Healthcare professionals should consider encouraging their patients with depressive symptoms to quit smoking with the support of behavioral mood management [55].

The present study shows the differences in the nicotine addiction intensity among healthy men and men with some kind of physical disorder. Smoking is associated with adverse health effects and significant disease burden among men, making it an important men's health issue [56]. Smokers have a higher prevalence of chronic physical, psychiatric and addictive disorders that confer an independent risk for suicide [57]. On the other hand, men with physical disorders could use smoking as a part of their coping strategies for stress reduction [51].

A study by Toftdahl, Nordentoft & Hjorthøj [58] showed that alcohol overuse was the most common substance use disorder among analyzed psychiatric patients with male over-representation in the Danish population. The close relationship between psychiatric disorders and alcohol use disorders (AUDs) suggests that psychiatric disorders are predisposing factors for AUDs [59]. Acheson et al. [60] also proved that nicotine increased alcohol consumption in men. In the present study, patients in the clinical group showed significantly more types of alcohol addictions and were also more often to have alcohol abuse in the family. Studies in the general population show that people with depressive disorders have a 2- to 3-fold increased risk of AUDs [61]. Concerning 12-month comorbidity among respondents with a diagnosis of alcohol dependence, 29% of respondents had at least one affective disorder and the most common was major depression (28%) [62]. The study by Lee et al. [63] showed a significant correlation between drinking and the severity of depressive symptoms. The results of a study by Pavkovic et al. [64] showed that more harmful alcohol consumption is associated with stronger symptoms of depression in men. It is worth noting that the author used the Beck Depression Index (BDI)—so the specificity of male depression was not taken into account. For alcohol abuse/dependence, the most important risk factor is being male and having a family history of alcoholism [65]. It is suggested that depression is likely to be a pathogenic factor in triggering AUDs. Likewise, chronic drinking may promote depression indirectly as well [66].

Our study also showed significant differences in personal resources among groups. It was observed that self-efficacy (SE) was significantly lower in the clinical group vs. CG1 and CG2. Only 49% of the control group has a high level of self-efficacy. No significant differences in GSES between CG1 and CG2 were confirmed. There is evidence in research papers that low self-efficacy usually increases emotional and social problems which influence mental health [67]. For this reason, support programs for people with depression should include self-efficacy enhancement activities. It is noticed that self-efficacy plays an important role in the deployment of functional skills in everyday life for individuals with major depressive disorder (MDD) [68].

The differences were also noted in dealing with stress strategies in the domain of CG, CG1, and CG2. For mini-COPE strategies, significant differences were confirmed between the groups for all strategies. Indirectly, the results may indicate that depression is a disease associated with experiencing stress. Patients with depression take action to adapt to a stressful situation, which may not always be effective. The clinical group used such strategies as 'Use of psychoactive substances', 'Behavioral disengagement' and 'self-blame', while CG2 or CG1 used 'Active coping', 'Planning', 'Positive reframing', 'Acceptance'. Such different stress-coping strategies show the need to develop activities aimed at helping men with depression to develop the skills for effectively coping with stress.

Stress is a common phenomenon in everyone's life. Patients with depression also experience stress. Research has shown that stress exposure conceivably plays a causal role in the etiology of major depression and depression-like disorders [69]. Therefore, developing the ability to effectively deal with stress is crucial. This is especially important because significant differences between CG and CG1 groups were confirmed for: 'substance use' and 'self-blame' (higher level in CG patients vs. CG1) as well as for 'Active coping', 'Planning', 'Positive reframing', 'Acceptance', 'Use of instrumental support' and 'self-distraction' (lower level in CG patients vs. CG1).

The next important individual resource is resilience. It defines the capability of successfully adapting to stressors and maintaining psychological well-being when facing difficulties in life. Resilience to stress is dynamic and multidimensional [70]. Total resilience, as well as its components (personal, family, social competencies), were significantly different between all groups with moderate or strong effect size. The clinical group had a significantly lower level of KOP-26 and

all components than CG1 and CG2. No significant differences were confirmed between CG1 and CG2 for KOP-26. This observation was confirmed by a meta-analysis study conducted by Wermelinger Avila *et al.* [71]. It proved that people without depression attain higher scores on a resilience scale than people with depression.

5. Limitations

This study has several limitations. Researchers used self-report methods, so questionnaires were self-fulfilled by patients included in the study. Participants from the CG and CG1 had undergone hospital treatment, which we found as one of the factors that can have an impact on their answers (hospitalization as a bias factor). The second important limitation of the study is voluntary participation in the study. This means that only some of the patients agreed to participate in the study. This could have influenced the results obtained-there could be other reasons for participation refusal the research trial may include people without some certain aggravating factors. Another limitation is that there is no information about the co-occurring physical disorders in the clinical group. We had no information on particular physical disorders of patients in the CG1 group. Men from CG2 self-evaluated their physical and mental health. It could have also influenced the obtained results. Moreover, the study was cross-sectional, which makes it impossible to draw cause-and-effect conclusions. No data was collected on the number of people invited as well as the number and characteristics of those who refused, therefore selection bias related to characteristics of refusals could not be estimated.

6. Conclusions

Our study shows that among a group of men who have depression, only 1/3 do not have male depression symptoms. Most of them present non-typical symptoms of depression which are not included in diagnostic criteria. It allows us to assume that a large part of men who suffer from depression cannot be properly diagnosed. Moreover, we found that men with any kind of physical disorder have the greatest severity of male depression symptoms than healthy men. These patients should also be examined by medical staff for depressive disorders including male depression symptoms. Treatment plans for men diagnosed with some kind of physical disorder should also include appropriate adaptation mechanisms for the new situation. This will allow for necessary tools to be given to deal with the disease and the accompanying stress. It is evidence-based on the fact that men with depression disorders more often have suicidal thoughts and efforts in the past and higher alcohol and nicotine addiction. These connections show the complexity of mental health problems. Our results suggest that patients who overuse or are addicted to alcohol or nicotine should be additionally screened for the possible occurrence of depressive disorders and that the substance usage may be a manifestation of the male depressive symptom. Men with depression present low resilience and low self-efficacy. They also use negative strategies to deal with stress. These facts have been proved years ago. Our results emphasize that these problems are up-to-date and there is a need to plan and implement preventative actions. We also want to note the possible occurrence of male depressive symptoms which could often not be considered by the medical staff. There is a need to take care of men's mental health and apply an appropriate and thorough diagnosis for them. Decision-makers should take into account the needs of this group when designing activities aimed at preventing depression, but also see how important it is to implement it in the National Suicide Prevention Program.

Author contributions

AK is contributed in study design, data collecting, data analysis, manuscript writing, and submission; MJ is contributed in manuscript writing; AM is contributed in manuscript writing; JC is contributed in study design and manuscript writing; ŁŚ is contributed in manuscript writing; BW is contributed in manuscript writing.

Ethics approval and consent to participate

The study was approved by the Bioethics Committee AKBE/197/16.

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Conflict of interest

The authors declare no conflict of interest.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at https://oss.jomh.org/jomh/article/1392729553795727360/attachment/Supplementary%20Table%201.docx.

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