

EDITORS

EDITOR-IN-CHIEF:	Wagner F. Gattaz (São Paulo, Brazil)
CO-EDITOR-IN-CHIEF:	José Alexandre de Souza Crippa (Ribeirão Preto, Brazil)
ASSISTANT EDITOR:	João Paulo Machado de Sousa (São Paulo, Brazil)
REGIONAL EDITOR USA:	Rodrigo Machado Vieira (Bethesda, USA)
REGIONAL EDITOR EUROPE:	Wulf Rössler (Zürich, Switzerland)

Psychology and Psychotherapy Psychology and Humanities Psychotherapy	EDITORS: Clarissa M. Corradi-Webster (Ribeirão Preto, Brazil) Julio Peres (São Paulo, Brazil)
	ASSISTANT EDITORS: Felipe D'Alessandro F. Corchs (São Paulo, Brazil) Paulo Clemente Sallet (São Paulo, Brazil)

Neurosciences Neurobiology Geriatric Psychiatry Basic Research Neuropsychology	EDITORS: Marcos H. N. Chagas (Ribeirão Preto, Brazil) Orestes Forlenza (São Paulo, Brazil)
	ASSISTANT EDITOR: Breno Satler de Oliveira Diniz (Belo Horizonte, Brazil)

Clinical Psychiatry Epidemiology Psychopathology Neuroimaging Biological Therapy	EDITORS: Jaime E. C. Hallak (Ribeirão Preto, Brazil) Tânia C. F. Alves (São Paulo, Brazil)
	ASSISTANT EDITOR: Marcus V. Zanetti (São Paulo, Brazil)

Instruments and Scales	EDITORS: Elaine Henna (São Paulo, Brazil) Flávia de Lima Osório (Ribeirão Preto, Brazil)
	ASSISTANT EDITOR: Juliana Teixeira Fiquer (São Paulo, Brazil)

Child and Adolescent Psychiatry	EDITORS: Guilherme Vanoni Polanczyk (São Paulo, Brazil) Maria Beatriz Linhares (Ribeirão Preto, Brazil)
	ASSISTANT EDITORS: Ana Soledade Graeff-Martins (São Paulo, Brazil) Tais Moriyama (São Paulo, Brazil)

Former Editors

Antonio Carlos Pacheco e Silva (1972-1985)
Fernando de Oliveira Bastos (1972-1985)
João Carvalhal Ribas (1980-1985)
José Roberto de Albuquerque Fortes (1985-1996)
Valentim Gentil Filho (1996-2010)

EDITORIAL BOARD

ALEXANDER MOREIRA-ALMEIDA
(Juiz de Fora, Brazil)

ALEXANDRE ANDRADE LOCH
(São Paulo, Brazil)

ALMIR RIBEIRO TAVARES JR.
(Belo Horizonte, Brazil)

ANDRÉ F. CARVALHO
(Fortaleza, Brazil)

ANDRÉ MALBERGIER
(São Paulo, Brazil)

ANDRÉ RUSSOWSKY BRUNONI
(São Paulo, Brazil)

ANDRÉA HORVATH MARQUES
(São Paulo, Brazil)

ANDREA SCHMITT
(Göttingen, Germany)

BENEDICTO CREPO-FACORRO
(Santander, Spain)

CARMITA HELENA NAJJAR ABDO
(São Paulo, Brazil)

CHRISTIAN COSTA KIELING
(Porto Alegre, Brazil)

DANIEL MARTINS DE SOUZA
(São Paulo, Brazil)

DORIS HUPFELD MORENO
(São Paulo, Brazil)

EDUARDO IACOPONI
(London, UK)

ELIDA PAULA BENQUIQUE OJOPI
(São Paulo, Brazil)

EMMANUEL DIAS NETO
(São Paulo, Brazil)

ÊNIO ROBERTO DE ANDRADE
(São Paulo, Brazil)

ESTER NAKAMURA PALACIOS
(Vitória, Brazil)

FREDERICO NAVAS DEMETRIO
(São Paulo, Brazil)

FULVIO ALEXANDRE SCORZA
(São Paulo, Brazil)

GUNTER ECKERT
(Frankfurt, Germany)

HELENA MARIA CALIL
(São Paulo, Brazil)

HELENA PAULA BRENTANI SAMAIA
(São Paulo, Brazil)

HÉLIO ELKIS
(São Paulo, Brazil)

HOMERO PINTO VALLADA FILHO
(São Paulo, Brazil)

IRISMAR REIS DE OLIVEIRA
(Salvador, Brazil)

JAIR CONSTANTE SOARES
(Texas, USA)

JERSON LAKS
(Rio de Janeiro, Brazil)

JOÃO LUCIANO DE QUEVEDO
(Criciúma, Brazil)

JORGE OSPINA DUQUE
(Medellín, Colombia)

LIGIA MONTENEGRO ITO
(São Paulo, Brazil)

LILIANA RENDÓN
(Assunção, Paraguai)

LUIS VALMOR CRUZ PORTELA
(Porto Alegre, Brazil)

MARCO AURÉLIO ROMANO SILVA
(Belo Horizonte, Brazil)

MARCOS HORTES NISHIHARA CHAGAS
(Ribeirão Preto, Brazil)

MARISTELA SCHAUFELBERGER SPANGHERO
(Ribeirão Preto, Brazil)

MÔNICA SANCHES YASSUDA
(São Paulo, Brazil)

OSVALDO PEREIRA DE ALMEIDA
(Crawley, Australia)

PAULO EDUARDO LUIZ DE MATTOS
(Rio de Janeiro, Brazil)

PAULO RENATO CANINEU
(São Paulo, Brazil)

PAULO ROSSI MENEZES
(São Paulo, Brazil)

PAULO SILVA BELMONTE ABREU
(Porto Alegre, Brazil)

RAFAEL TEIXEIRA DE SOUSA
(Bethesda, USA)

RENATO TEODORO RAMOS
(São Paulo, Brazil)

RENÉRIO FRAGUÁS JUNIOR
(São Paulo, Brazil)

RONALDO RAMOS LARANJEIRA
(São Paulo, Brazil)

SANDRA SCIVOLETTO
(São Paulo, Brazil)

TÁKI ATHANASSIOS CORDÁS
(São Paulo, Brazil)

TENG CHEI TUNG
(São Paulo, Brazil)

ZACARIA BORGE ALI RAMADAM
(São Paulo, Brazil)

INSTRUCTIONS FOR AUTHORS

Available on the journal's website (www.archivespsy.com) and published in the last issue every year (number 6).



We would like to thank the artist Laila Gattaz, who gently allowed, for exclusive use on the covers of the Archives of Clinical Psychiatry, the series of art works named “Imagens de São Paulo”.

This journal is printed on acid-free paper.

CATALOGUING IN PUBLICATION (CIP) DATA

Archives of Clinical Psychiatry / University of São Paulo Medical School. Institute of Psychiatry - vol. 44, n. 5 (2017). – São Paulo: / IPq-USP, 2011-

From volume 29 (2001), the articles of this journal are available in electronic form in the SciELO (Scientific Electronic Library Online) database.

1.1. Clinical Psychiatry. University of São Paulo Medical School. Institute of Psychiatry.

ISSN : 0101-6083 printed version

ISSN : 1806-938X online version

CDD 616.89

Indexing Sources

- ISI (Institute for Scientific Information)
 - Science Citation Index Expanded (SciSearch®)
 - Journal Citation Reports/Science Edition
- EMBASE - Excerpta Medica Database
- LILACS - Literatura Latino-Americana e do Caribe de Informação em Ciências da Saúde
- PERIODICA - Índice de Revistas Latino-Americanas em Ciências
- SciELO - Scientific Eletronic Library Online
- SIIC - Sociedad Iberoamericana de Información Científica
- Scopus (www.scopus.com)
- Gale Cengage Learning
- DOAJ - Directory of Open Access Journals
- HINARI - World Health Organization

Advertisers bear full responsibility for the content of their advertisements.
There is no commercial involvement by advertisers in the development of the content or in the editorial decision-making process for the Archives of Clinical Psychiatry.



Rua Anseriz, 27, Campo Belo – 04618-050 – São Paulo, SP. Fone: 11 3093-3300 • www.segmentofarma.com.br • segmentofarma@segmentofarma.com.br

Cód. da publicação: 21850.10.17

Todos os anúncios devem respeitar rigorosamente o disposto na RDC nº96/08

Financial Support

CEIP
Centro de Estudos
do Instituto de Psiquiatria



VOLUME 44 • NUMBER 5 • 2017**Original articles**

False memories in social anxiety disorder 113
Priscila de Camargo Palma, Carmem Beatriz Neufeld, Priscila Goergen Brust-Renck, Carolina Prates Ferreira Rossetto, José Alexandre de Souza Crippa

Efficacy indicators of four methods in outpatient addiction treatment 117
Andreia de Moura, Ricardo Pinto, Lígia Ferros, Inês Jongenelen, Jorge Negreiros

Burnout syndrome and coping strategies in Portuguese oncology health care providers..... 122
Vasco F. J. Cumbe, Andrea N. Pala, António J. P. Palha, Ana R. P. Gaio, Manuel F. Esteves, Jair de Jesus Mari, Milton Wainberg

Review article

Music performance anxiety: a critical review of etiological aspects, perceived causes, coping strategies and treatment 127
Ana Beatriz Burin, Flávia L. Osório

Brief report

Is there seasonality in hospitalizations for major depressive disorder in Canada? 134
Aiswarya Pillai, Lucie Richard, Salimah Z. Shariff, Akshya Vasudev

Letter to the editor

Trismus secondary to valproate treatment in a woman with bipolar disorder: a case report 137
Mariane Bagatin Bermudez, Diego Fabian Karvat Gracia, Diego Librenza Garcia, Elisa Gonçalves da Cunha, Fellipe Matos Melo Campos, Thiago Vinicius de Lima Santistevan, Gledis Lisiane Correa Luz Motta

False memories in social anxiety disorder

PRISCILA DE CAMARGO PALMA¹, CARMEM BEATRIZ NEUFELD¹, PRISCILA GOERGEN BRUST-RENCK²,
CAROLINA PRATES FERREIRA ROSSETTO¹, JOSÉ ALEXANDRE DE SOUZA CRIPPA¹

¹University of São Paulo (USP), Ribeirão Preto, SP, Brazil.

²Hospital of Clinics of Porto Alegre and University Center Ritter dos Reis, Porto Alegre, RS, Brazil.

Institution where the study was conducted: School of Philosophy, Sciences and Language of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil.

Received: 04/13/2017 – Accepted: 06/10/2017

DOI: 10.1590/0101-60830000000133

Abstract

Background: False memories are memories of events that never occurred or that occurred, but not exactly as we recall. Events with emotional content are subject to false memories production similar to neutral events. However, individual differences, such as the level of maladjustment and emotional instability characteristics of Social Anxiety Disorder (SAD), may interfere in the production of false memories. **Objectives:** This study aimed to assess the effect of emotion in memory performance for an event witnessed by participants with and without SAD. **Methods:** Participants were 61 young adults with SAD and 76 without any symptoms of SAD who were randomly assigned to watch a story with or without emotional arousal. Participants answered a subjective scale of emotion about the story and a recognition memory test. **Results:** Participants with SAD recovered more true memories and more false memories for the non-emotional version compared to the emotional version of the story. Overall, participants with SAD produced fewer false memories compared to those without SAD. **Discussion:** This finding suggests that social anxiety may have a significant impact on emotional memory accuracy, which may assist in the development and improvement of techniques for therapeutic intervention.

Palma PC et al. / Arch Clin Psychiatry. 2017;44(5):113-6

Keywords: False memories, emotional arousal, anxiety, social anxiety.

Introduction

False memories, also referred to as distortions or illusions of memory, are memories of events that actually did not occur exactly as we remember¹. This fact of recalling events that never occurred motivated several studies in the search for a greater understanding of these processes. It was observed that the level of emotional instability and mismatch significantly interferes in a greater number of false memories^{2,3}, which are present in anxiety disorders.

Among the anxiety disorders, Social Anxiety Disorder (SAD) stands out, consisting of a marked and persistent fear of social or performance situations in which the individual might feel ashamed, being afraid of taking action where he/she may be humiliated and embarrassed. The social exposure or performance provokes a response of anxiety interfering significantly in the individual's life^{4,5}. It is estimated that the 12-month prevalence of SAD is 6.8% for the adult population⁶, one of the most common psychiatric disorders with a lifetime prevalence of 12%⁷.

It is known that in anxiogenic situations, perceptions of high probability of failure in performance are activated, which trigger cognitive, behavioral, and somatic symptoms causing a shift of attention from the environment to the individuals themselves, who remain in constant monitoring of their behavior, feelings, and physical sensations of anxiety⁸. This process is known as selective attention bias; anxious individuals initially direct their attention to a threat (e.g., emotional arousal with negative content), but then tend to shift attention in order to relieve sensations of anxiety, resulting in memory selectivity^{9,10}.

Moreover, individuals with SAD tend to doubt their memories, interpreting ambiguous memories of social events in a less positive (or more negative) way compared to those without SAD¹¹. One of the reasons that may compromise reliability of an individual's memory is the belief that other people have a better memory¹². One study found that less confident people (as in the case of individuals with SAD) accept the way the situation is recalled by another person

(i.e., they acquiesce)², which can lead to increased vulnerability to mnemonic distortions¹³.

SAD seems to be directly related to the fear of being rejected in social situations¹⁴. Individuals with a chronic level of maladjustment and emotional instability, notably insecure and inadequate, seem to be more easily swayed and susceptible to mnemonic distortions, such as false memories^{15,16}. Recent studies have shown that individuals with psychosocial maladjustment produce more false memories³. Similarly, a desire for social interaction has been identified as a predictor of false memory for lists of semantically related words¹⁷. Despite these data, the literature still needs more research in clinical populations of individuals with anxiety disorders in general and with SAD, in particular.

Thus, the present study aims to investigate the performance of memory for events with and without emotional arousal, in a clinical sample of individuals with SAD. To do so, we used visual and audio material^{18,19}, as these conditions are highly more likely to stimulate emotional arousal in this population⁸. The main hypothesis to be tested presumes that individuals with SAD are more prone to false memories compared to healthy subjects. Furthermore, it is known that the levels of false memories seem to be influenced by the presence of emotion, which will be assessed systematically in this study^{20,21}.

Methods

Design

The present study involved a 2 x 2 x 3 x 3 full factorial, mixed design, with repeated measures for the final two variables. The first variable was clinical characteristic of the population, in which some participants presented SAD and others had no clinical characteristic of anxiety. The second between subjects variable was the emotional arousal of the story, in which half the participants were exposed to a story with emotional arousal and the other half to a story without emotional arousal. Participants with and without SAD were randomly

assigned to watch either version of the story. Both versions of the story were divided into three phases (phase 2 is where the versions of the story differed in terms of arousal) and into three types on the memory test (target, related distractor, and unrelated distractor). The dependent variables were the assessment target of the emotionality of the story (i.e., arousal), which was measured from the subjective scale of emotion, and memory performance for the story's information in a recognition test.

Participants

Participants were 164 college students from Ribeirão Preto, São Paulo, Brazil who were diagnosed as part of a larger study on the prevalence of SAD²². All 2,319 students were contacted and invited to complete memory portion of the study.

Inclusion criteria for SAD sample were obtaining scores greater than or equal to 19 points in the Social Phobia Inventory (SPIN)^{22,23} and scores greater than or equal to 20 points in the Beck Anxiety Inventory (BAI)²⁴, which indicate the presence of symptoms compatible with the diagnosis of SAD. The probable SAD individuals were evaluated by means of a version of the anxiety module of the Structured Clinical Interview for DSM-IV – Clinical Version (SCID-CV) translated and adapted to Portuguese²⁵, for diagnostic confirmation. Furthermore, additional inclusion criteria for both SAD and non-SAD samples included no significant symptoms of depression based on scores of 6 or less and 10 or less in the Patient Health Questionnaire (PHQ-9)²⁶ and the Beck Depression Inventory (BDI)²⁴, respectively; good quality of life and well-being based on scores equal to or lower than 7 points on the Self-Reported Questionnaire (SRQ-20)²⁷.

The final sample included 137 participants, 61 participants with SAD and 76 participants without symptoms of SAD. Among the participants with SAD, 98% did not use medication, 12% were in psychotherapy, no participant received a diagnosis of social phobia, 8% had a history of psychiatric disorder, and 18%, a history of psychiatric disorder in the family. Among the participants without SAD, 20% reported they had had some psychiatric symptom, however no one presented social phobia or was on medication, and 22% had a family history of psychiatric disorder. In addition, 6% of participants with SAD and 4% without SAD indicated that they were smokers or used drugs.

Participants were aged 17-34 years ($M = 22.33$; $SD = 3.78$), and 64% were female. Among the participants with SAD, 34 watched the emotional side of the story (mean age = 22.53, $SD = 3.69$), being 65% female. The number of participants with SAD who watched the non-emotional side of the story was 27 (mean age = 21.70, $SD = 3.97$), being 67% female. Among the participants without SAD, 44 watched the emotional version of the story (mean age = 23.32, $SD = 4.12$), and 64% were female. The number of participants without SAD who watched the non-emotional version was 32 (mean age = 21.28, $SD = 2.92$), being 59% female.

Instruments

The memory of the participants was assessed through a slideshow procedure¹⁹, which was translated and adapted to Brazilian reality and to the investigation of false memories¹⁸, with methodological improvements²⁸ for the memory test. The story consisted of 11 slides followed by a narrative divided into three phases. In phase 1 (slides 1-4), a mother and her son are on the way to the hospital where the father works; in phase 2 (slides 5-8), boy suffers an accident and goes to the hospital (arousal version) or the boy sees a crashed car and hospital procedures (non-arousal version); in phase 3 (slides 9-11), the mother goes away and calls home. Both versions had negative emotional content controlled for experimental purposes.

The emotional arousal of the story was assessed by a subjective 5-point Likert scale, ranging from "not emotional at all" (0) to "extremely emotional" (4).

Memory was tested by a self-administered memory recognition test composed of 84 yes-no items²⁸. Participants were instructed to mark "yes" whenever the phrase corresponded to what was presented in the target material and "no" to all options that were not seen in the target material, even if it were information that could not be inferred about the event. The items of the test belonged to three categories: (i) target (equivalent to the measure of true memories); (ii) related distractor (equivalent to the measure of false memories); and (iii) unrelated distractor (equivalent to unrelated answers from error or "guess"). The items were distributed proportionally in relation to the three phases of the original material.

Procedure

The study was approved by the Research Ethics Committee on Human Rights of the College of Philosophy, Sciences, and Letters of Ribeirão Preto – São Paulo University (USP) (N. CEP-FFCLRP nº 534/2010). All participants signed an informed consent form, prepared according to the ethical guidelines for research with human beings.

The memory material was presented with the use of multimedia equipment, and data collection was performed in groups in a silent room. Participants were advised to pay attention to the story, and to avoid comments throughout the procedure. Immediately after, subjects answered the subjective scale of emotion. Participants were instructed to be as honest as possible and to select the option that represents what they have really felt in terms of the arousal attributed to the emotion stimulated by the story. Before answering the memory recognition test, participants participated in a buffer activity. The buffer activity aimed to prevent the participant from retaining the online information.

Data were analyzed using SPSS Statistics, version 20. To analyze the data obtained from these instruments, we used Analysis of Variance (ANOVA) with Bonferroni correction for post hoc analysis. All statistical treatments used a $\alpha < 0.05$ for hypothesis testing.

Results and discussion

An univariate ANOVA was conducted to test differences of emotional arousal between the versions of the story and presence of SAD. Results indicated a main effect of the version [$F(1.133) = 36.31$, $p < 0.001$], demonstrating that the emotional version stimulates more arousal ($M = 1.81$; $SD = 1.14$) than the non-emotional version ($M = 0.80$, $SD = 0.72$), which is consistent with previous studies^{18,28,29}. In addition, we observed an effect of the presence of SAD [$F(1.133) = 5.52$, $p < 0.05$], which was responsible for a more intense evaluation of the effect of the stories' emotional arousal ($M = 1.58$, $SD = 1.06$) in comparison to the participants without SAD ($M = 1.22$, $SD = 1.11$), which is consistent with typical aspects of this disorder, in which individuals often become hypervigilant regarding their physiological alterations and their bodily sensations, which seems to interfere in how participants with SAD rated the material³⁰.

One hypothesis for this finding is that individuals with SAD believe that their appearance will accurately reflect all their physiological reactions of anxiety, which can be subject to scrutiny¹¹, causing these individuals to utilize a protective measure, ignoring the physiological reactions experienced or by camouflaging them. Furthermore, one presumes that individuals with SAD get used to living with anxiety, so they somehow adapt to the physical reactions caused in situations that generate anxiety. As a result, subjects with SAD may have had difficulty in recognizing the emotions generated by the narrative.

Overall effects of memory performance were analyzed by means of an ANOVA with repeated measures for the presence of SAD and the version of the story for each item type. The rates of non-mnemonic responses (or guesses) were very low and there was no difference between the groups ($ps > 0.001$), suggesting that participants were paying attention to the task.

Regarding true memory, results showed higher rates for participants who watched the non-emotional version ($M = 0.75$, $SD = 0.10$) when compared to those who watched the emotional version of the story ($M = 0.70$, $SD = 0.13$) [$F(1,133) = 6.10$, $p < 0.05$]. Result were qualified by an interaction trend between presence of SAD and version of the story [$F(1,133) = 2.97$, $p = 0.09$]. Participants with SAD recovered more true memories for the non-emotional version ($M = 0.76$, $SD = 0.09$) than for the emotional version of the story ($M = 0.68$, $SD = 0.13$, $p < 0.05$). Given the typical processing of people with high levels of anxiety, it is possible to hypothesize that anticipatory anxiety prevailed over attentional processes³⁰, causing individuals with SAD to remain more vigilant about the information of the video. This may have led to the lower rate of true memories for the emotional version.

With respect to false memories, there was a trend towards interaction between the presence of SAD and version of the story [$F(1,133) = 3.76$, $p = 0.06$], demonstrating increased production of false memories between the participants with SAD who watched the non-emotional version ($M = 0.39$, $SD = 0.13$) in comparison to those who watched the emotional version of the story ($M = 0.31$, $SD = 0.15$; $p < 0.05$). Among the participants who watched the non-emotional version, there was a trend toward greater production of false memories in participants with SAD in comparison to those without SAD ($M = 0.32$, $SD = 0.12$; $p = 0.08$).

These results suggest that memory from participants with SAD is affected by emotional nature of the story, which, in addition to their poor social skills (responsible for high levels of maladjustment and emotional instability) and attentional biases, made them vulnerable to selective memory performance. Overall, individuals with SAD exhibit impaired activation in the associative, interpretative, and attentional processes potentially leading to an attentional bias^{31,32}, especially for stimuli perceived as dangerous or threatening^{33,34}.

Anxiety disorders result in distortions in information processing, leading to perceptual sensitivity and memory bias³⁴⁻³⁶. This result seems to be in line with the findings of the study that proposes that individuals with SAD accept more outside influences when the situation is devoid of arousal, believing that the source of the material is more reliable than their own memory, and they reject more information of the memory test in general (both true and false)².

An analysis of the results between the phases of the story was performed to isolate the effect of the arousal in the second phase of the story when arousal information was presented only in the emotional version. An ANOVA with repeated measures was performed for the presence of SAD and version of the story for each type of item (Table 1).

There was a main effect of phase for true memory [$F(2,132) = 91.53$, $p < 0.001$], indicating an increase in true memories in phase 2 in comparison to phase 3 ($p < 0.001$). This result was qualified by an interaction trend between the presence of SAD, version of the story, and phase [$F(2,132) = 2.47$, $p = 0.09$], in which we observed an increase in true memory in phase 2 compared to phase 3 under all conditions ($p < 0.05$ for all cases). The effect of emotion from phase 2 was also observed in an interaction with presence of SAD, given that participants without SAD recovered more accurate information than participants with SAD ($p < 0.05$). Among participants with SAD, there was an increase in true memories for phase 2 for the non-emotional version of the story compared to the emotional version ($p < 0.05$).

With respect to false memories, there was a main effect of phase [$F(2,132) = 116.17$, $p < 0.001$]. The results showed that fewer false memories are produced in phase 2 than in phases 1 and 3 ($ps < 0.001$) and in phase 1 than in phase 3 ($p < 0.05$). In contrast, we observed an effect of phase on the production of non-mnemonic responses [$F(2,132) = 3.69$, $p < 0.05$], with lower indices for phase 2 than phase 1, although all indices were low in general. In this sense, the vulnerability of memory does not seem to be associated with emotional arousal for individuals with SAD. Therefore, the emotional arousal seems to be protective of memory in subjects with SAD, in line with the idea that anxious people effectively recall information related to risk³⁴.

Finally, we can conclude that individuals with SAD present mnemonic changes. The results of this study help to further understand the attentional and mnemonic processes in individuals with SAD, and may assist in the development and improvement of techniques for therapeutic intervention. However, longitudinal studies, assessing memory performance before and after different treatment modalities (CBT, pharmacotherapy) and studies comparing SAD individuals to individuals with other anxiety disorders are deemed necessary and appropriate.

Acknowledgements

Preparation of this manuscript was supported in part by the São Paulo Research Foundation (Fapesp), Brazil, under Award Number 2010/11732-4 to the second author; a Masters Research fellowship by the Coordination for the Improvement of Higher Education Personnel (Capes), Brazil, to the first author; and a technical training fellowship from the São Paulo Research Foundation (Fapesp), Brazil, under Award Number 2011/08946-5 to the fourth author.

Table 1. Mean of recognition (and standard deviation) by version of the story, type of item, and phase for participants with and without social anxiety disorder

Phase	Item Type	Version of the story				Total
		Emotional		Non-emotional		
		With SAD	Without SAD	With SAD	Without SAD	
1	TM	0.72 (0.16)	0.78 (0.12)	0.83 (0.11)	0.77 (0.14)	0.77 (0.14)
	FM	0.33 (0.15)	0.37 (0.18)	0.43 (0.16)	0.36 (0.15)	0.37 (0.16)
	UA	0.05 (0.12)	0.02 (0.06)	0.05 (0.16)	0.03 (0.08)	0.03 (0.11)
2	TM	0.70 (0.16)	0.77 (0.16)	0.82 (0.12)	0.80 (0.13)	0.77 (0.15)
	FM	0.19 (0.15)	0.21 (0.13)	0.24 (0.13)	0.21 (0.16)	0.21 (0.14)
	UA	0.01 (0.06)	0.01 (0.05)	0.00 (0.00)	0.01 (0.04)	0.01 (0.05)
3	TM	0.62 (0.17)	0.61 (0.16)	0.65 (0.12)	0.64 (0.14)	0.63 (0.15)
	FM	0.42 (0.22)	0.44 (0.23)	0.50 (0.20)	0.41 (0.21)	0.44 (0.22)
	UA	0.01 (0.04)	0.01 (0.04)	0.05 (0.12)	0.02 (0.07)	0.02 (0.07)

SAD: social anxiety disorder; TM: true memory; FM: false memories; UA: unrelated answers.

References

1. Brainerd CJ, Reyna VF. The science of false memory. New York: Oxford University Press, 2005.
2. Wright DB, London K, Waechter M. Social anxiety moderates memory conformity in adolescents. *Appl Cogn Psychol*. 2010;24(7):1034-45.
3. Morgan J. Autobiographical memory biases in social anxiety. *Clin Psychol Rev*. 2010;30(3):288-97.
4. Knappe S, Beesdo-Baum K, Fehm L, Stein MB, Lieb R, Wittchen HU. Social fear and social phobia types among community youth: differential clinical features and vulnerability factors. *J Psychiatr Res*. 2011;45(1):111-20.
5. Schneier FR, Heimberg RG, Liebowitz MR, Blanco C, Gorenstein LA. Social anxiety and functional impairment in patients seeking surgical evaluation for hyperhidrosis. *Compr Psychiatry*. 2012;53(8):1181-6.
6. Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):617-27.
7. Schneier FR. Social anxiety disorder. *N Engl J Med*. 2006;355(10):1029-36.
8. Makkar SR, Grisham JR. Social anxiety and the effects of negative self-imagery on emotion, cognition, and post-event processing. *Behaviour research and therapy*. *Behav Res Ther*. 2011;49(10):654-64.
9. Liang CW, Hsu WY, Hung FC, Wang WT, Lin CH. Absence of a positive bias in social anxiety: The application of a directed forgetting paradigm. *J Behav Ther Exp Psychiatry*. 2011;42(2):204-10.
10. Moscovitch DA, Suvak MK, Hofmann SG. Emotional response patterns during social threat in individuals with generalized social anxiety disorder and non-anxious controls. *J Anxiety Disord*. 2010;24(7):785-91.
11. Hertel PT, Brozovich F, Joormann J, Gotlib IH. Biases in interpretation and memory in generalized social phobia. *J Abnorm Psychol*. 2008;117(2):278-88.
12. Horry R, Palmer MA, Sexton ML, Brewer N. Memory conformity for confidently recognized items: The power of social influence on memory reports. *J Exp Soc Psychol*. 2012;48(3):783-6.
13. Bernstein DM, Loftus EF. How to tell if a particular memory is true or false. *Perspect Psychol Sci*. 2009;4(4):370-4.
14. Bögels SM, Alden L, Beidel DC, Clark LA, Pine DS, Stein MB, et al. Social anxiety disorder: questions and answers for the DSM-V. *Depress Anxiety*. 2010;27(2):168-89.
15. Kaplan RL, Van Damme I, Levine LJ, Loftus EF. Emotion and false memory. *Emot Rev*. 2016;8(1):8-13.
16. Roediger III HL, McDermott KB. Tricks of memory. *Curr Dir Psychol Sci*. 2000;9(4):123-7.
17. Neufeld CB, Brust-Renck PG, da Rocha AF, Sossella M, da Rosa FH. Falsas memórias e diferenças individuais: um estudo sobre fatores de personalidade e qualidade da memória. *Psicol Reflex Crit*. 2013;26(2):319-27.
18. Neufeld CB, Brust PG, Stein LM. Adaptação de um método de investigação do impacto da emoção na memória. *PsicoUSF*. 2008;13(1):21-9.
19. Cahill L, Prins B, Weber M, McGaugh JL. Beta-adrenergic activation and memory for emotional events. *Nature*. 1994;371(6499):702-4.
20. Kensinger EA. Remembering the details: Effects of emotion. *Emot Rev*. 2009;1(2):99-113.
21. Brainerd CJ, Holliday RE, Reyna VF, Yang Y, Toglia MP. Developmental reversals in false memory: effects of emotional valence and arousal. *J Exp Child Psychol*. 2010;107(2):137-54.
22. Osório FL, Crippa JAS, Zuardi AW, Graeff FG, Busatto G, Pinho M, et al. Inventário de Fobia Social (SPIN): Validação para o Brasil. In: XXII Congresso Brasileiro de Psiquiatria; 2004, Salvador-BA. Pesquisas Originais, Ensaios Clínicos e Revisão Sistemática.
23. Connor KM, Kobak KA, Churchill LE, Katzelnick D, Davidson JR. Mini-SPIN: A brief screening assessment for generalized social anxiety disorder. *Depress Anxiety*. 2001;14(2):137-40.
24. Cunha JA. Manual da versão em português das escalas. São Paulo: Casa do Psicólogo, 2001.
25. Del-Ben CM, Vilela JA, de S Crippa JA, Hallak JE, Labate CM, Zuardi AW. Confiabilidade de "Entrevista Clínica Estruturada para o DSM-IV - Versão Clínica" traduzida para o português. *Rev Bras Psiquiatr*. 2001;23(3):156-9.
26. Osório FL, Mendes AV, Crippa JA, Loureiro SR. Study of the Discriminative Validity of the PHQ-9 and PHQ-2 in a Sample of Brazilian Women in the Context of Primary Health Care. *Perspect Psychiatr Care*. 2009;45(3):216-27.
27. Mari JJ, Williams P. A validity study of a psychiatric screening questionnaire (SRQ-20) in primary care in the city of Sao Paulo. *Br J Psychiatry*. 1986;148:23-6.
28. Barbosa ME, Brust-Renck PG, Stein LM. O papel do alerta nas memórias verdadeiras e falsas para informações centrais e periféricas. *Psicol Reflex Crit*. 2014;27(1):100-9.
29. Gasbarri A, Arnone B, Pompili A, Marchetti A, Pacitti F, Calil SS, et al. Sex-related lateralized effect of emotional content on declarative memory: An event related potential study. *Behav Brain Res*. 2006;168(2):177-84.
30. Clark DA, Beck AT. The anxiety and worry workbook: the cognitive behavioral solution. Guilford Press; 2011.
31. Indovina I, Robbins TW, Núñez-Elizalde AO, Dunn BD, Bishop SJ. Fear-conditioning mechanisms associated with trait vulnerability to anxiety in humans. *Neuron*. 2011;69(3):563-71.
32. Shin LM, Liberzon I. The neurocircuitry of fear, stress, and anxiety disorders. *Neuropsychopharmacology*. 2010;35(1):169-91.
33. Papageorgiou C, Wells A. Process and meta-cognitive dimensions of depressive and anxious thoughts and relationships with emotional intensity. *Clin Psychol Psychother*. 1999;6(2):156-62.
34. Jansson B, Najström M. Is preattentive bias predictive of autonomic reactivity in response to a stressor?. *J Anxiety Disord*. 2009;23(3):374-80.
35. Beck AT, Clark DA. An information processing model of anxiety: automatic and strategic processes. *Behav Res Ther*. 1997;35(1):49-58.
36. Bishop SJ. Neurocognitive mechanisms of anxiety: an integrative account. *Trends Cogn Sci*. 2007;11(7):307-16.

Efficacy indicators of four methods in outpatient addiction treatment

ANDREIA DE MOURA¹, RICARDO PINTO¹, LÍGIA FERROS², INÊS JONGENELEN¹, JORGE NEGREIROS³¹ Universidade Lusófona do Porto, Porto, Portugal.² Universidade Lusíada do Porto, Porto, Portugal.³ Universidade do Porto, Faculdade de Psicologia e de Ciências da Educação, Porto, Portugal.

Received: 04/17/17 – Accepted: 08/15/2017

DOI: 10.1590/0101-60830000000134

Abstract

Background: In Portugal, as far as we know, there are no recent studies that evaluated the comparative efficacy of therapeutic modalities in addiction problems by reference to a holistic and psychosocial model of effectiveness. **Objectives:** Using a sample of Portuguese patients in outpatient treatment for drug and alcohol abuse, this study aimed to examine if a combined treatment modality (group therapy with individual intervention) had greater overall efficacy when compared to other three types of treatment without group therapy. **Methods:** This is a correlational and cross-sectional study using a convenience sample of patients (N = 254) from an outpatient treatment in the Intervention Service on Addictive Behaviors and Substance Dependence. At the time of data collection, the patients were attending four types of treatment, such as receiving intervention based on individual psychological counseling (n = 66); receiving individual psychiatric counseling (n = 68); receiving both individual psychological and psychiatric counseling (n = 102); and receiving not only individual counseling (i.e., psychology or psychiatry), but also attending group therapy (n = 18). **Results:** Using MANOVA and Wilks's multivariate test criterion, there was a significant effect of treatment modality on the global efficacy, $\Lambda = 0.88$, $F(9, 603) = 3.75$, $p < 0.0001$. Examination of mean estimates indicated that patients in a combined therapeutic modality revealed more treatment involvement compared to patients in other therapeutic modalities without group therapy. **Discussion:** The results obtained in this study highlight the importance of integrating interventions in a collaborative way. A combined therapeutic modality, adding group therapy, was associated with positive effects, such as more levels of peer support and involvement in treatment, and increasing the individual's probability to remain abstinent.

Moura A et al. / Arch Clin Psychiatry. 2017;44(5):117-21

Keywords: Addiction, outpatient treatments, group therapy, treatment effectiveness evaluation.

Introduction

Outpatient treatments for drug or alcohol dependence can include a variety of treatment methods, such as individual or group therapy. The literature suggests that these specific types of treatment are more effective as more they take into account the diversity and the patients' deficit areas, through an eclectic and systematic approach¹. It is not just a question of finding a good match between patient and treatment modality², but of acting in a concerted manner upon the various deficit areas of the patient^{3,4}. It is an established fact in the scientific community that a combined and integrated treatment by itself increases the likelihood of obtaining better results not only in addiction problems^{3,4}, but also in various treatments for mental disorders¹.

However, some studies suggest that certain therapies and therapy combinations in treatment programs seem to increase the success of interventions in the treatment of addiction. This is the case of group therapy that has been considered by some authors as the intervention of choice in the treatment of addictions^{5,6}. Group therapy increases the perception of better peer support, being a privileged tool of persuasion, stabilization and social support in the treatment of addiction⁷. The positive social support and peer support help to maintain abstinence⁸, and improve treatment outcomes⁹. Group therapy has also been associated with the effectiveness of the treatment in psychological distress symptoms^{10,11} and has been found to be effective in reducing the negative affects¹². Additionally, group therapy also provides social, emotional, and relational skills in order to increase their perception of being accepted and accept others, as well as dealing with emotional states in the relationship with others¹³. Some factors that arise from the group therapy include catharsis, cohesion, interpersonal learning¹⁴, affiliation, confrontation, support, gratification, and identification, which seem to promote the involvement of patients in their treatment^{5,15}, and promote a better prognosis¹⁶. These factors promoted by group therapy increase the success of interventions, not only in the addiction problems, but also in psychotherapy in general¹⁷.

Given the advantages of group therapy, some studies specifically seek to understand if a combined modality of individual and group therapy would increase the probability of success of treatment programs. In fact, some literature corroborates this view stating that group therapy and individual therapy seem to complement each other in addiction treatment. The patients appear to be more likely to remain engaged in their recovery process if they have been involved in group therapy¹⁵. In this sense, some authors confirm that a combined intervention of an intensive individual counseling (individual drug counseling – IDC) added to group counseling (group drug counseling – GDC) increases the likelihood of effective treatment in cocaine dependence, raising abstinence rates¹⁸.

However, as far as we know, there are no studies in Portugal that have evaluated the comparative efficacy of therapeutic modalities by reference to a holistic and psychosocial model of effectiveness. Considering the previous discussion, this study aimed to examine, in a sample of Portuguese patients in outpatient treatment for drug and alcohol abuse, if a combined treatment modality (group therapy with individual intervention) had better outcomes, when compared to other three types of treatment without group therapy: group receiving intervention based on individual psychological counseling; group receiving intervention based on individual psychiatric counseling; and group receiving intervention based on individual psychological and psychiatric counseling. The groups were compared in terms of some indicators of efficacy that are described in the literature¹⁹ (i.e., abstinence, involvement in treatment, social and peer support, psychological distress symptoms and negative affects). We expected that patients who attended the combination of both individual and group therapies reported lower rates of psychological distress symptoms and negative affects, as well as higher rates of abstinence, involvement in treatment, and social and peer support, than other patients involved in individual therapies.

Methods

Participants

The present study is part of a larger research project funded by *Fundação para a Ciência e Tecnologia* (Foundation for Science and Technology – Portuguese and European funding) on the study of 608 Portuguese patients in treatment for drug addiction and alcohol abuse. For this study, as inclusion criteria, the participants had to be on outpatient alcohol and drug treatment (including the attending of at least one of the four treatments described below) and age over 18 years old. Exclusion criteria were having apparent psychosis, intoxication, or having mental retardation, in order to ensure that informed consent could be given. The participants who meet these criteria were 254 patients, male (85.8%) and female (14.2%) with ages range from 18 to 73 years; mean age for the sample was 41.58 ($SD = 8.71$), recruited from outpatient treatment programs at the Intervention Service on Addictive Behaviors and Substance Dependence (SICAD) - Regional Northern Section. There were no differences between the included vs. excluded participants in terms of age ($t(603) = 1.65, p = 0.099$) and gender ($\chi^2(1) = 0.340, p = 0.56$). At the time of the data collection (between January 2012 and May 2013), the participants were attending different four types of treatment for drug and alcohol, such as receiving intervention based on individual psychological counseling ($n = 66$) (therapeutic modality I), where 92.4% of this subsample was men, with ages ranging from 20 to 56 years ($M = 41.09, SD = 7.08$); receiving individual psychiatric counseling ($n = 68$) (therapeutic modality II), where 77.9% of this subsample was men, with ages ranging from 28 to 56 years ($M = 41.96, SD = 6.85$); receiving both individual psychological and psychiatric counseling ($n = 102$) (therapeutic modality III), where 88.2% of this subsample was men, with ages ranging from 18 to 66 years ($M = 40.88, SD = 10.24$); and receiving not only individual counseling (i.e., psychology or psychiatry), but also attending group therapy ($n = 18$) (therapeutic modality IV), which 77.8% of this subsample was men, with ages ranging from 33 to 73 years ($M = 45.94, SD = 24.10$). This was a cross-sectional and correlational study with a convenience sample, which no randomization of the participants by groups was made. The group treatment allocation was performed after the data collected considering the type of treatment that the patients were receiving. Further details about the descriptive analysis and the homogeneity of the 4 groups can be found in Table 1.

Measures

A Socio-Demographic Questionnaire^{20,21} collected information about gender, age, birthplace, treatment program, primary substance of abuse, treatment time, pattern of substance use and abstinence. The outcome variable abstinence was operationalized as follows: dichotomous variable (“absence of substance use” = 0 and “substance use” = 1) defined in terms of the presence vs. absence of substance use during treatment. The minimum time during which the individual restrained from using substances was of at least 1 month.

Brief Symptoms Inventory (BSI)²². This is a reduced version of the Symptom Check List 90 Revised (SCL-90-R), a self-report inventory consisting of 53 items. The individual must specify the degree to which each problem has affected them over the past week, on a Likert-type scale (1-Never, 2-Rarely, 3-Sometimes, 4-Often, 5-Very often). This inventory assesses psychological distress symptoms along nine basic dimensions (somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism) and three global indices (positive symptoms distress index – PSDI, global severity index – GSI, and positive symptom total – PST). In the current study, the various dimensions have an internal consistency ranging from moderate to high, with Cronbach’s alpha values between 0.67 to 0.86. The internal consistency of the overall BSI in this sample was 0.96.

Monitoring and Evaluation of Effectiveness and Progress (MEEP) –Portuguese short form^{20,21}. A short Portuguese measure

(MEEP) with psychometric qualities demonstrated²¹, covers 4 overall factors and 22 items: (a) *Therapeutic Progress subscale* ($\alpha = 0.88$) – includes items intended to measure treatment engagement, treatment satisfaction and counselling rapport; (b) *Negative Affects subscale* ($\alpha = 0.81$) – includes items that measure the psychological functioning; (c) *Social support subscale* ($\alpha = 0.83$) – seeks to measure the perception of social support received; and (d) *Peer support scale* ($\alpha = 0.85$) – includes items that measure the perception of social support received by peers. On average, it takes 15-20 minutes to complete the questionnaire properly. The response format is a 7-point Likert scale (1 – *I strongly disagree* to 7 – *I strongly agree*). The internal consistency of the overall MEEP-22 in this sample was .81.

Global Efficacy Measure was defined by a composite variable that included 3 components – absence of substance abuse (defined in terms of the absence or presence of substance abuse during treatment), psychological distress symptoms below the cutoff ($ISP < 1.7$) and high levels of involvement in treatment ($PT \geq 6$). These different components were evaluated through the Socio-Demographic Questionnaire^{20,21}; the Positive Symptoms Index (PSI) from BSI (Portuguese version of Canavaro, 1999)²² and the MEEP^{20,21} based on TCU-CEST²³. Higher scores reflect higher indicators of treatment efficacy.

Procedure

A formal contact with SICAD was established to obtain permission to conduct the investigation, as well as with the ethics committee of the Faculty of Psychology and Education Sciences (University of Porto). Professionals of these institutions made the first contact with the participants, where a general explanation of the study was provided to them, and then they were asked if they agreed to participate in the study. Written and verbal consent were obtained from each participant. To ensure the confidentiality of all participants, their names and personal information have been coded. The questionnaires were administered in an interview format by trained female psychologists at the facilities of SICAD (Regional Northern Delegation), in a private and quiet room.

Data analysis

Data analyses were carried out using the SPSS version 18 for Windows (United States, New York, IBM Corporation). Descriptive statistics were calculated to characterize the study variables. We used Chi-square analyses to examine differences among groups in terms of the dependent variable abstinence and Kruskal-Wallis test to explore differences among groups in terms of treatment retention. We used MANOVA and Wilks’s multivariate test criterion to examine differences among groups in terms of the dependent variables treatment involvement, negative affects, psychological distress symptoms, social support, and peer support. Pearson correlation analyses was conducted previously to verify if the dependent variables were correlated among them. Finally, we used a Mann-Whitney test to confirm the findings from MANOVA due to the lack of normal distribution to conduct parametric tests, with a Bonferroni correction by reducing the p value to < 0.0125 , adjusted for four groups.

Results

Further details about the descriptive analysis can be found in Table 1. Chi-square analyses revealed no significant associations between the four intervention modalities in terms of previous severity of the addiction ($\chi^2 = 7.94, p = 0.242$). Kruskal-Wallis test revealed no significant differences between groups in terms of treatment retention, $\chi^2(3) = 2.62, p = 0.454$. Considering the time interval between sessions, this interval ranged from weekly to monthly for all individual therapeutic modalities I, II and III (69% to 87% of cases). In combined therapeutic modality IV, this percentage was 75% of

cases. Chi-square analyses also revealed that patients in therapeutic modality I reported less drug therapy (42%, $n = 27$), compared to patients in therapeutic modality IV (77.8%, $n = 14$), therapeutic modality II (65.7%, $n = 44$), and therapeutic modality III (58%, $n = 57$) ($\chi^2 = 11.02$, $p = 0.012$).

Chi-square analyses shown that patients in therapeutic modality IV significantly reported more abstinence (78%; $n = 14$) than patients in other treatment program modalities, including therapeutic modality III (56%; $n = 57$), therapeutic modality II (55%; $n = 37$), and therapeutic modality I (42%; $n = 27$), ($\chi^2 = 8.34$, $p < 0.05$). Pearson correlation analyses showed that peer support was significantly correlated with social support ($r = 0.19$, $p = 0.002$). Treatment involvement was significantly correlated with social support ($r = 0.49$, $p < 0.0001$), and peer support ($r = 0.13$, $p = 0.03$), but was not significantly correlated with negative affects ($r = -0.02$, $p = 0.710$). Negative affects was also not significantly correlated with peer support ($r = -0.02$, $p = 0.740$). Similarly, psychological distress symptoms was not significantly correlated with treatment involvement ($r = -0.09$, $p = 0.13$), and peer support ($r = -0.02$, $p = 0.70$). Considering these results, the variables negative affects and psychological distress symptoms were not included in multivariate analyses.

Using MANOVA and Wilks's multivariate test criterion, there was a significant effect of treatment modality on the global efficacy, $\Lambda = 0.88$, $F(9, 603) = 3.75$, $p < 0.0001$. Univariate tests showed statistically significant effects for treatment involvement ($F(3,254) = 5.04$, $p = 0.002$) and also peer support ($F(3,254) = 6.15$, $p < 0.001$). Examination of mean estimates indicated that patients in therapeutic modality IV revealed more treatment involvement ($M = 52.89$; $SD = 2.93$) than patients in therapeutic modalities I ($M = 48.3$; $SD = 5.56$) and II ($M = 47.69$; $SD = 6.61$). There were no significant differences between patients in therapeutic modality IV and patients in therapeutic modality III ($p = .23$). The patients in therapeutic modality IV also revealed more peer support ($M = 9.56$; $SD = 3.24$) compared to patients in therapeutic modalities II ($M = 6.75$; $SD = 3.61$), and I ($M = 5.63$; $SD = 3.68$). There were no significant differences between patients in therapeutic modality IV and patients in therapeutic modality III ($p = 0.06$).

We verified that all nonparametric analyses confirmed the multivariate analyses, with exception of the differences between therapeutic modality IV and therapeutic modality III in terms of peer support. Particularly, in terms of treatment involvement, the therapeutic modality IV was significantly different from therapeutic modalities I ($U = 292.00$, $p = 0.001$) and II ($U = 326.00$, $p = 0.002$), as well as the therapeutic modality IV was significantly different from therapeutic modalities I ($U = 251.00$, $p < 0.0001$) and II ($U = 319.50$, $p = 0.002$), in terms of peer support. Regarding the treatment involvement, there were no significant differences between patients in therapeutic modality IV and patients in therapeutic modality III ($U = 640.00$, $p = 0.04$). However, considering the peer support, significant differences were found between patients in modality IV and patients in modality III ($U = 534.00$, $p = 0.004$). Patients in modality IV revealed more peer support (Mean Rank = 81.81) than patients in modality III (Mean Rank = 56.74).

Discussion

This study aimed to compare a combined treatment modality, including individual counseling and group therapy, with other three treatment modalities without group therapy, in terms of efficacy indicators among Portuguese patients in outpatient treatment for drug and alcohol abuse. According to the results, we confirmed our hypothesis regarding the efficacy indicators of abstinence, involvement in treatment, and peer support. Specifically, we found that patients engaged in therapeutic modality IV (attending individual and group therapy) showed significantly better therapeutic involvement than patients in therapeutic modality I (psychological counseling) and therapeutic modality II (psychiatric counseling). Comparatively to individual therapeutic modalities (I and II), the therapeutic modality IV seems to have clear advantages in terms of patient involvement in treatment. These results were expected since this view is corroborated in literature, stating that group therapy and individual therapy seem to complement each other in addiction treatment¹⁵. The patients appear to be more likely to remain engaged in their recovery process if also have been involved in group

Table 1. Descriptive statistics of the sample

	Therapeutic Modality I ($n = 66$)	Therapeutic Modality II ($n = 68$)	Therapeutic Modality III ($n = 102$)	Therapeutic Modality IV ($n = 18$)
Psychopathology symptoms in time of questionnaire administration (%)				
(≥ 1.7) (%)	63.6	60.3	55.9	55.6
Treatment retention (months)				
M	29.81	29.52	26.35	30.79
SD	21.04	23.86	21.93	17.1
Consumption patterns in time of questionnaire administration (%)				
Abstinence	41.6	55.2	55.9	77.8
Recreational use	35.4	28.4	18.6	22.2
Regular use	16.9	9.0	12.7	0.0
Substance abuse	4.6	6.0	7.8	0.0
Dependence	1.5	1.4	4.9	0.0
Consumption patterns prior to treatment (%)				
Regular use	0.0	1.5	2.0	0.0
Substance abuse	3.1	13.8	14.7	16.7
Dependence	96.9	84.7	83.3	83.3
Primary substance of abuse				
Heroin	51.5	26.5	34.4	11.1
Cocaine	4.5	22.1	17.6	5.6
Alcohol	4.5	19.1	28.4	83.3
Hashishe	1.5	0.0	2.9	0.0
Polydrug use	38.0	32.3	15.7	0.0
Psychopharmacotherapy	0.0	0.0	1.0	0.0

therapy¹⁵. Group therapy is indeed considered by some authors as the intervention of choice in the treatment of addictions^{5,6}, given that several aspects are strengthened, particularly the catharsis, group cohesion, interpersonal learning¹⁴, affiliation, confrontation, support, gratification, and identification¹⁵. These aspects seem to promote the involvement of patients in their treatment^{5,15}, which in turn increase the likelihood of better patient prognosis¹⁶.

Moreover, it is possible that patients who have attended a multimodal treatment (individual and group therapy) had felt more valued for having received more assistance and/or a better service, thus increasing their satisfaction with treatment and therapeutic involvement. In fact, according to a conceptual heuristic model oriented to the addiction area^{24,25}, the involvement in treatment implies some essential aspects, as therapeutic relationship, satisfaction with the treatment, participation and treatment compliance^{26,27}. This hypothesis seems to be supported by the fact that there were no differences between therapeutic modality IV and therapeutic modality III (individual counseling in both Psychology and Psychiatry). Indeed, both the combined treatment modalities (III and IV) add at least two complementary and concerted interventions in the same treatment program. The inclusion of two complementary interventions directed to the patients' deficit areas can promote a positive effect in treatment outcomes^{3,4}, specifically in the patient's involvement in treatment.

As hypothesized, the patients in treatment modality IV reported more positive peer support compared to the patients from the other individual therapeutic modalities (I and II). This result is consistent with empirical evidence showing that treatment modalities with group therapy increase the perception of better peer support⁷, being privileged ways of persuasion, stabilization and social support in the treatment of addiction⁷. Actually, one of the central goals of group therapy is to increase in patients the perception of being accepted and accept others, and to deal with emotional states in interpersonal relationships¹³. In the addictions area, the promotion of positive social and peer support increases the likelihood of success in interventions, helping to maintain abstinence⁸ and to obtain better treatment results⁹.

Additionally, our hypothesis was confirmed because patients engaged in therapeutic modality IV reported significantly better results in terms of abstinence than those who had attended in any of the other treatment modalities, consistent with literature previously discussed^{14,18}. In general, in the area of mental health, empirical evidence has shown that treatment protocols which include group therapy, particularly cognitive behavioral therapy, are more effective compared to other treatment modalities^{12,18}. Considering that this treatment modality (adding group therapy) was associated with better results in terms of involvement in treatment and positive peer support and these factors have been associated with better treatment outcomes^{16,9,15}, it was also expected that abstinence would be higher in this group.

Finally, this study also confirms the results of a previous study showing that a combined intervention of an intensive individual counseling (individual drug counseling – IDC), added to group counseling (group drug counseling – GDC), increased the likelihood of effective treatment in cocaine dependence, raising abstinence rates¹⁸. According to the authors of this study, these two combined interventions may have focused their similar goals in the maintenance of abstinence, boosting the effect of both interventions¹⁸.

Limitations

First, this is a cross-sectional study, which is not the best method to assess treatment efficacy because the participants were not randomly allocated to the group treatments and we have not pre-test data. Therefore, we cannot guarantee the homogeneity in terms of outcome variables among groups before the treatments. For instance, we have no data about the patients' health status at the time of the admission to treatment (e.g., psychological distress symptoms and

negative affects). These limitations reduce the internal validity of the study when groups are compared in terms of outcome variables, and any causality relationships between the variables under study must be interpreted with care. Additionally, this research focuses on patients with different types of dependence, from either drugs or alcohol, which can be considered a limitation because increase the heterogeneity of the sample. Finally, we did not assess marital status and income and they are important markers of treatment effectiveness.

Conclusions

Despite the limitations, the contribution of this study focus on the novelty in testing a psychosocial model that conceptualizes the effectiveness of dependence treatments, identifying specific therapeutic modalities that best enhance these predictive factors of therapeutic success. It is known that most studies only use abstinence as an effective treatment criterion, or psychological and social variables alone, and not in an integrated manner. As far as we know, there are no studies in Portugal and Brazil that evaluated the comparative efficacy of therapeutic modalities by reference to a holistic and psychosocial model of effectiveness. The results of this study suggest the importance of integrating interventions in a collaborative way, showing that individual and group therapies are not mutually exclusive and that they should be integrated. A combined therapeutic modality, adding group therapy, was associated with positive effects in peer support and involvement in treatment, while increasing the individual's probability to remain abstinent.

References

1. Beutler LE, Consoli AJ, Lane G. Systematic treatment selection and prescriptive psychotherapy: an integrative eclectic approach. In: Norcross JC, Goldfried MR, editors, *Handbook of psychotherapy integration*, 2nd ed. New York: Oxford University Press; 2005;121-43.
2. McLellan AT, Grissom GR, Zanis D, Randall M, Brill P, O'Brien CP. Problem-service 'matching' in addiction treatment: a prospective study in 4 programs. *Arch Gen Psychiatry*. 1997;54(8):730-5.
3. Schütz C, Linden IA, Torchalla I, Li K, Al-Desouki M, Krausz M. The Burnaby treatment center for mental health and addiction, a novel integrated treatment program for patients with addiction and concurrent disorders: results from a program evaluation. *BMC Health Serv Res*. 2013;13(1):288.
4. McLellan AT, McKay JR, Forman R, Cacciola J, Kemp J. Reconsidering the evaluation of addiction treatment: from retrospective follow-up to concurrent recovery monitoring. *Addiction*. 2005;100(4):447-58.
5. Galanter M, Hayden F, Castañeda R, Franco H. Group Therapy, Self-Help Groups, and Network Therapy. In: Frances RJ, Miller SI, Mack AH, editors. *Clinical textbook of addictive disorders*. Guilford Press; 2004.
6. Matano RN, Yalom ID. Approaches to chemical dependency: Chemical dependency and interactive group therapy – a synthesis. *Int J Group Psychother*. 1991;41(3):269-93.
7. Center for Substance Abuse Treatment (2005). *Substance Abuse Treatment: Group Therapy*. Treatment Improvement Protocol (TIP) Series 41. DHHS Publication No. (SMA) 05-3991. Rockville, MD: Substance Abuse and Mental Health Services Administration.
8. Matano RA, Yalom ID, Schwartz K. Interactive group therapy for substance abusers. In: Spira JL, editor. *Group Therapy for Medically Ill Patients*. New York: Guilford Press; 1997. p. 296-325.
9. Akers RL, Krohn MD, Lanza-Kaduce L, Radosevich M. Social learning and deviant behavior: a specific test of a general theory. *Am Sociol Rev*. 1979;44(4):636-55.
10. Gomes BC, Lafer B. Group psychotherapy for bipolar disorder patients. *Rev Psiquiatr Clin*. 2007;34(2):84-89.
11. Weiss RD, Griffin ML, Greenfield SF, Najavits LM, Wyner D, Soto JA, et al. Group therapy for patients with bipolar disorder and substance dependence: results of a pilot study. *J Clin Psychiatry*. 2000;61(5):361-7.
12. Dolbeault S, Cayrou S, Bredart A, Viala AL, Desclaux B, Saltel P, et al. The effectiveness of a psycho-educational group after early-stage breast

- cancer treatment: results of a randomized French study. *Psychooncology*. 2009;18(6):647-56.
13. Fehr SS. *Introduction to group therapy: a practical guide*. Routledge; 2014.
 14. Ahmed S, Abolmagd S, Rakhawy M, Erfan S, Mamdouh R. Therapeutic factors in group psychotherapy: a study of Egyptian drug addicts. *J Groups Addict Recover*. 2010;5(3-4):194-213.
 15. Project MATCH Research Group. Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH post treatment drinking outcomes. *J Stud Alcohol*. 1997;58(1):7-29.
 16. Joe GW, Simpson DD, Broome KM. Retention and patient engagement models for different treatment modalities in DATOS. *Drug Alcohol Depend*. 1999;57(2):113-25.
 17. Grencavage LM, Norcross JC. Where are the commonalities among the therapeutic common factors?. *Prof Psychol Res Pr*. 1990;21(5):372.
 18. Crits-Christoph P, Siqueland L, Blaine J, Frank A, Luborsky L, Onken LS, et al. Psychosocial treatments for cocaine dependence: National Institute on Drug Abuse collaborative cocaine treatment study. *Arch Gen Psychiatry*. 1999;56(6):493-502.
 19. Marlatt GA, Gordon JR. *Relapse Prevention – Maintenance strategies in the treatment of addictive behaviors*. New York: The Guilford Press; 1985.
 20. Moura A, Ferros LC, Negreiros JN. Evaluation and monitoring instrument: Client Evaluation of Self and Treatment. *Arch Clin Psychiatry*. 2013;40(4):165-66.
 21. Moura A, Ferros LC, Negreiros JN. The effectiveness of substance abuse treatment: Development of a brief questionnaire. *Arch Clin Psychiatry*. 2015;42(4):83-9.
 22. Canavarro MC. Inventário de sintomas psicopatológicos – BSI [Brief symptom Inventory (BSI)]. In: Simões MR, Gonçalves M, Almeida LS, editors. *Testes e provas psicológicas em Portugal [Psychological tests and proofs in Portugal]*. Braga: SHO/APPORT; 1999. p. 87-109.
 23. Joe GW, Broome KM, Rowan-Szal GA, Simpson DD. Measuring patient attributes and engagement in treatment. *J Subst Abuse Treat*. 2002;22(4):183-96.
 24. Simpson DD. A conceptual framework for transferring research to practice. *J Subst Abuse Treat*. 2002;22(4):171-82.
 25. Simpson DD. A conceptual framework for drug treatment process and outcomes. *J Subst Abuse Treat*. 2004;27(2):99-121.
 26. Lehman WE, Greener JM, Simpson DD. Assessing organizational readiness for change. *J Subst Abuse Treat*. 2002;22(4):197-209.
 27. Greener JM, Joe GW, Simpson DD, Rowan-Szal GA, Lehman WE. Influence of organizational functioning on client engagement in treatment. *J Subst Abuse Treat*. 2007;33(2):139-47.

Burnout syndrome and coping strategies in Portuguese oncology health care providers

VASCO F. J. CUMBE^{1,2,3}, ANDREA N. PALA⁴, ANTÓNIO J. P. PALHA^{5,6,7}, ANA R. P. GAIO^{8,9}, MANUEL F. ESTEVES⁵, JAIR DE JESUS MARF³, MILTON WAINBERG⁴

¹ Department of Mental Health, Ministry of Health, Sofala Provincial Health Directorate, Beira, Mozambique.

² Department of Medicine – Psychiatry, Beira Central Hospital, Beira, Mozambique.

³ Department of Psychiatry, Paulista School of Medicine, Federal University of São Paulo, São Paulo, SP, Brazil.

⁴ Department of Psychiatry, College of Physicians and Surgeons, Columbia University, New York, NY, USA.

⁵ Psychiatry and Mental Health, Faculty of Medicine of the University of Porto, FMUP.

⁶ Honorary Member of the World Psychiatric Association (WPA).

⁷ Former President of the Portuguese Society of Psychiatry and Mental Health.

⁸ Department of Mathematics, Faculty of Sciences of the University of Porto, FCUP.

⁹ Centre for Mathematics of the University of Porto, CMUP.

Received: 04/21/2017 – **Accepted:** 05/24/2017

DOI: 10.1590/0101-6083000000135

Abstract

Background: Burnout is a multidimensional syndrome and includes symptoms of emotional exhaustion, depersonalization, and reduced personal accomplishment at work. Oncology health care providers are at high risk to develop symptoms of burnout because of work-related stressors. Adaptive coping strategies adopted to deal with stressors may prevent the development of burnout. **Objective:** The present study aims to assess the association between burnout, functional coping strategies, and occupational factors in a sample of oncology providers, mostly nurses. **Methods:** Sociodemographic Questionnaire, the Maslach Burnout Inventory, and the Problem Solving Inventory “*Inventário de Resolução de Problemas*” were administered. Descriptive, correlational, and linear regression analyses were performed. **Results:** The study showed that emotional exhaustion correlated with lower levels of adaptive coping, less years of experience in Oncology, and a greater amount of hours worked per week. Personal accomplishment was associated with the adaptive coping strategies. No further statistically significant associations were identified. **Discussion:** Our findings support the importance of adaptive coping strategies in order to prevent symptoms of burnout when health professionals face potentially stressful occupational factors. Training aimed at improving adaptive coping skills may prevent burnout syndrome for health care professionals working in Oncology.

Cumbe VFJ et al. / Arch Clin Psychiatry. 2017;44(5):122-6

Keywords: Burnout, oncology, health professionals, coping strategies.

Introduction

Health professionals, particularly nurses, working in oncology are at high risk for burnout, a complex phenomenon initially identified in parole officers working in community treatment programs¹⁻³. Care providers dealing with situations beyond their skills, power, and energy may develop burnout syndrome^{2,4}. Several definitions of burnout have been produced over the last 30 years, all depicting a general state of fatigue and frustration, feelings of emptiness and personal failure, and an inability to work⁵⁻⁸. Burnout was operationalized as composed by three dimensions: Emotional Exhaustion; Dehumanization; and Reduced Personal Accomplishment. Emotional Exhaustion involves a sense of emotional and physical fatigue as well as lack of energy required to carry out professional activities. Dehumanization represents emotionally distant attitudes and actions toward colleagues and patients. Reduced Personal Accomplishment depicts feelings of personal dissatisfaction and loss of professional fulfillment.

Among the several factors promoting burnout, chronic occupational stress (e.g., night shifts, patient pressure, and work overload) coupled with poor coping strategies may be the most defining⁹⁻¹¹. Considering this risk factor, an exceptional number of health professionals show symptoms of burnout, specifically those who work with patients suffering from chronic diseases and cancer^{3,12-17}. For many of these health professionals, interactions with oncology patients heightens an intense fear of death and uncertainty about the future, perpetuating stress and increasingly likelihood of burnout¹⁸⁻²¹. Occupational-related factors such as insufficient personal, vacation time, and problems concerning care management are also associated with burnout symptoms^{11,22,23}. Burnout negatively affects health professionals' wellbeing and work performance

including job withdrawal, absenteeism, quality of care provided to patients, and increased number of medical errors²⁴⁻²⁶.

The ways health professionals face work-related stressors largely determines the development of burnout^{10,27}. Two general categories of coping may be identified: adaptive and maladaptive²⁸⁻³⁰. Adaptive strategies, such as reappraisal, are proactive, as they involve challenging the problem with direct changes in behavior. Alternatively, maladaptive strategies, such as avoidance and denial, may alleviate stress temporarily without elimination or modification of the source^{31,32}. Moreover, coping strategies play an important role in determining the resulting levels of burnout. Burnout levels are higher among individuals who adopt maladaptive coping compared to those who enact adaptive coping strategies¹³.

The aims of the current study were: (1) to explore the association of burnout's dimensions (i.e. Emotional Exhaustion, Dehumanization, and Personal Accomplishment) with functional coping strategies; and (2) to explore the association between burnout and occupational-related variables, in a sample of oncology health care providers. Overall, we hypothesized to find high scores on burnout dimensions correlated (aim#1) with low levels of adaptive coping strategies and (aim#2) greater amount of hours worked per week, and less work-related experience in Oncology.

Methods

Participants and procedures

Participants were health care professionals (N = 46) recruited in four Portugal Multipurpose Hospital Day Oncology Units: *Hospital São João* (n = 28), *Hospital Geral Santo António* (n = 9), *Hospital de Faro*

(n = 5) and Hospital de Beja (n = 4). Participants were included if they had history of working in the outpatient Oncology clinic for at least one year and signed the informed consent. Participants were recruited using a convenience sampling method.

Instruments

The sociodemographic questionnaire administered included gender, age, marital status and occupation-related variables (years of work in oncology, hours worked per week). Burnout was assessed using the Portuguese version of the Maslach Burnout Inventory^{5,33}. The Maslach Burnout Inventory is a 22-item instrument assessing personal feelings and attitudes of the professional in relation to their work. The three dimensions assessed include: Emotional Exhaustion which assesses the feelings of the subject in relation to the emotional state caused by the work (9 items); Dehumanization which describes what may be a cold and impersonal response of the individual towards their patients (5 items); and Personal Accomplishment which evaluates feelings of competence and professional effectiveness in carrying out their work (8 items). Each item is rated on a 7-point Likert – type scale ranging from 0 (never) to 6 (everyday). Higher levels of burnout are indicated by higher scores on Emotional Exhaustion and Dehumanization, and lower score on Personal Accomplishment. Cronbach's alpha coefficients indicated good internal consistency for the sub-scales Emotional Exhaustion and Personal Accomplishment, alpha 0.85 and 0.80, respectively. Internal consistency of Dehumanization was low yet acceptable, alpha 0.67.

Coping strategies were assessed by Problem-Solving Inventory “Inventário de Resolução de Problemas”³⁴, a 40-item questionnaire assessing 9 coping strategies. These strategies include: ‘request for help’, ‘confrontation and active problem solving’, ‘emotional abandonment in the face of the situation’, ‘internal = external locus of control’, ‘emotional control strategies’, ‘active attitude in not allowing incidents interfere with daily living’, ‘internalized = externalized aggression’, ‘self-responsibility and fear of the consequences’, and ‘facing the problem and planning strategies’. The score of the sub-scales measuring maladaptive coping were reversed, so that the total score reflects the overall levels of adaptive coping strategies. The Brazilian Portuguese version of Maslach Burnout Inventory’s cut-off scores was adopted³⁵: Emotional Exhaustion was considered high if ≥ 26 ; Dehumanization score equal to or greater than 9 was considered high; and a Personal Accomplishment score equal to or lower than ≤ 33 corresponded to diminished Personal Accomplishment. Although results were primarily analyzed using the Brazilian Portuguese Maslach Burnout Inventory cut-off scores, results were also compared to the cut-off scores utilized in the United States⁵. High levels of burnout corresponded to Emotional Exhaustion scores ≥ 21 ; Dehumanization scores ≥ 8 ; and Personal Accomplishment scores ≤ 28 ⁵. The scale had good internal consistency, as indicated by Cronbach's alpha 0.85.

Data analysis

Descriptive analysis was conducted using SPSS version 23 (IBM, 2015). Descriptive statistics included the mean and the standard deviation (SD) for continuous variables (e.g., age), and frequencies for nominal variables (e.g., gender). Shapiro-Wilk test was used to assess variables’ distribution. Cronbach's alpha was used to evaluate the internal consistency of the Maslach Burnout Inventory sub-scales and Problem Solving Inventory. Spearman's rho coefficient and Spearman correlation test were used to identify and test the variables’ correlation. Linear regression was conducted using Mplus 7.3³⁶. Maximum likelihood estimation with robust standard errors was used since it demonstrated to be robust against departure from the normal distribution³⁷. Statistical analyses were performed using SPSS version 23 and Mplus 7.3 software. The significance level was set at 0.05.

Results

Sample characteristics

The sample consisted of 46 health care professionals, of whom 37 were nurses (80.4%) and 9 doctors, with greater representation of females (n = 42, 91.3%) compared to males (n = 4, 8.7%). The majority was married (n = 36, 78.26%; single n = 8, 17.39%, and divorced n = 2, 4.35%). Participant mean age was 40.13 years (SD = 9.79); mean number of years working in health care settings was 16.78 (SD = 9.30); mean number of years working in oncology was 8.62 (SD = 6.72). Hours of work per week: 35 hours/week (n = 28, 60.87%), 40 hour/week (n = 13, 28.26%), more than 40 hour/week (n = 5, 10.87%). Participants’ mean scores on Maslach Burnout Inventory sub-scales were: Emotional Exhaustion = 20.89 (SD = 9.95); Dehumanization = 3.28 (SD = 4.28); and Personal Accomplishment = 37.11 (SD = 7.78) (Table 1).

Table 1. General description of the sample

		Overall sample (N = 46)
Sex (%)	Female	42 (91.3)
	Male	4 (8.7)
Age, mean (SD)		40.13 (9.79)
Marital status (%)	Single	8 (17.39)
	Married	36 (78.26)
	Divorced	2 (4.35)
Years of work in health settings, mean (SD)		16.78 (9.30)
Years of work in oncology mean (SD)		8.62 (6.72)
Hours of work (%)	35 hours/week	28 (60.87)
	40 hour/week	13 (28.26)
	more than 40 hour/week	5 (10.87)
MBI sub-scales, mean (SD)	EE	20.89 (9.95)
	D	03.28 (4.28)
	PA	37.11 (97.78)
IRP, mean (SD)		153.89 (14.45)

Categorical variables are described by absolute (relative) frequencies of the classes. Continuous variables are described by the mean (standard deviation). EE: emotional exhaustion. D: depersonalization. PA: personal accomplishment. IRP: problem solving inventory. MBI: Maslach burnout inventory.

Adopting the Brazilian cut-offs of the Maslach Burnout Inventory³⁸, participants revealed low Emotional Exhaustion, low Dehumanization, and high Personal Accomplishment. When the US based cut-offs⁵ were used, our sample showed moderate levels of Emotional Exhaustion and Dehumanization, and high levels of Personal Accomplishment.

The Maslach Burnout Inventory dimensions’ mean scores were comparable to previous studies conducted in similar contexts, except for the levels of Dehumanization that were higher among physicians in Horta’s³⁹ study (Table 2). The mean of the overall score of the Problem Solving Inventory was 153.89 (SD = 14.45; Table 1). The average was higher compared to the study by Carvalho⁴⁰, (Mean = 149, SD = 12.13).

Table 2. Comparison of burnout dimensions score with other studies

	N	EE	D	PA
		Mean (SD)	Mean (SD)	Mean (SD)
Horta, 2005 ²	72	20.00 (9.66)	6.90 (4.91)	39.20 (5.27)
Silva, 2008 ¹	46	17.81 (9.84)	2.81 (3.27)	40.12 (5.46)
Current study ³	46	20.89 (9.95)	3.28 (4.28)	37.11 (7.78)

¹ Portuguese nurses; ² Portuguese medical doctors; ³ Portuguese medical doctors and nurses; EE: emotional exhaustion; D: depersonalization; PA: personal accomplishment.

Burnout dimensions, coping strategies, and occupational characteristics

Preliminary analyses of the associations between the independent variables were performed to test for collinearity. The results (Table 3) illustrate the presence of high collinearity between three variables: age, years of profession, and years of work in oncology. Therefore, and due to the sample size, only the variable “years of work in oncology” was included in the regression models. The spearman correlations between the dependent and the independent variables were also considered. Most of the correlation coefficients were statistically non-significant although of magnitude greater than 0.20. We hypothesize this to be caused by the small size of the sample. Only coefficients greater than .30 resulted in statistically significant values.

Overall, the Maslach Burnout Inventory sub-scales were inter-correlated, only Emotional Exhaustion and Dehumanization were not significantly associated. High score on Problem Solving Inventory was reported by health professionals essentially with low levels of Emotional Exhaustion and with high levels of Personal Accomplishment. Greater levels of Problem Solving Inventory were reported by health professionals with older age and with more years of work experience, but were not associated with years of work in oncology.

Linear regression models

Table 4 reports the results of the 3 linear regressions performed. Lower Emotional Exhaustion was significantly associated with more years of experience in oncology, and with greater levels of coping strategies measured by Problem Solving Inventory. A significantly positive association between Emotional Exhaustion and the number of hours of work per week was also identified. The dimension Dehumanization was not significantly associated with any of the independent variables included in the model. Greater levels of Personal Accomplishment were only significantly associated with greater level of coping strategies measured by Problem Solving Inventory (Table 4).

Discussion

The current study investigates the association between burnout, coping strategies, and occupational factors (e.g., years of work in health care settings, hours worked per week) in a Portuguese sample of health care professionals. The 46 participants recruited in four Portuguese hospitals are predominantly nurses, a work category at a greater risk to develop burnout due to their close involvement in the care of patients^{2,3,17}. Participants have low emotional exhaustion, low depersonalization, and high personal accomplishment, according to the Brazilian cut-offs of the Maslach Burnout Inventory³⁸. Whereas, based on the US cut-offs⁵, our sample shows moderate levels of emotional exhaustion and depersonalization, and high

levels of personal achievement. This discrepancy demonstrates the importance of the cultural background in determining and interpreting the levels of burnout symptoms. The lack cut-offs based on Portuguese samples may represent a limitation to the study. The cut-offs identified in different cultural and working contexts, should be used and interpreted with caution and skepticism⁴¹. Therefore, we decided to use the Maslach Burnout Inventory sub-sales raw score in our analysis. The mean scores on the burnout inventory⁵ are comparable to the mean scores obtained in studies conducted in Portugal on samples of physician and nurses^{39,42}. Though, physicians in Silva’s study⁴² have slightly higher levels of depersonalization compared to nurses in our and Horta’s study³⁹.

The results of the linear regression analysis suggest that Portuguese health professionals who have high levels of emotional exhaustion are characterized with low levels of functional coping, less years of experience in Oncology care, and report a greater amount of hours worked per week. Emotional exhaustion may occur as a consequence of poor adaptive strategies of coping enacted to deal with work-related stressors. Health care professionals with less work experience in Oncology show high levels of emotional exhaustion. We hypothesized that work experience may help health professionals developing functional coping strategies to deal with work-related stressors. This is supported by the association between functional coping and the years of work in Oncology clinics. In addition, work experience in such settings may change health professionals’ perception and attitudes towards their job⁴³. For instance, as age progresses the health professionals might improve their confidence in work tasks, which reduces their vulnerability to work-related stressors^{13,44}. Lastly, the amount of hours worked per week is an important stressor that health professionals have to deal with⁴⁵.

Participants with high levels of personal accomplishment are characterized with high levels of adaptive coping, whereas, depersonalization does not correlate with coping and occupational factors. Overall, the results of our study support the importance of the adoption of functional coping strategies in order to prevent symptoms of burnout^{46,47}. Structural adjustment including reducing hours worked per week might limit the risk of developing symptoms of burnout. Training aimed at improving coping skills to deal with work-related stress may prevent burnout syndrome in health professionals^{48,49}.

Table 4. Standardized regression coefficients of the regression model of each burnout dimension (EE, D, PA) with years of work in oncology, hours per week and IRP

	EE	D	PA
Years of work in oncology	-0.26*	-0.07	-0.05
Hours per week	0.32**	0.11	0.18
IRP	-0.34**	-0.03	0.38*

* p < 0.05; ** p < 0.01. EE: emotional exhaustion; D: depersonalization; PA: personal accomplishment; IRP: “Inventário de Resolução de Problemas” (Problem Solving Inventory).

Table 3. Spearman correlation coefficients between burnout dimensions, IRP, age, years of profession, years of work in oncology and hours of work per week

	1	2	3	4	5	6	7
1) Age							
2) Years of profession	.97***						
3) Years of work in oncology	.70***	0.71***					
4) Hours per week	-0.18	-0.21	0.20				
5) EE	-0.26	-0.23	-0.22	0.23			
6) D	0.06	0.06	-0.04	0.08	0.20		
7) PA	-0.10	0.12	0.02	0.16	-0.36*	-0.46***	
8) IRP	0.21*	0.21*	0.08	-0.05	-0.43***	-0.06	0.39**

* p < 0.05; ** p < 0.01, *** p < 0.001, for the Spearman correlation test. EE: emotional exhaustion; D: depersonalization; PA: personal accomplishment; IRP: “Inventário de Resolução de Problemas” (Problem Solving Inventory).

Conclusions

Further investigation with probabilistic samples will be necessary to better understand the role of coping strategies in determining the levels of burnout in oncology. Interventions aimed to improve individuals' adaptive coping skills should be tested longitudinally on a larger sample of health professionals.

Limitations and future directions

Our study presents methodological limitations. The small sample size, predominantly composed by female nurses, and the use of non-probabilistic sampling method are the main limitations. Therefore, we consider our findings preliminary.

Competing interests

The authors declare no competing interests.

Ethical approval

This study was approved by the institutional review boards at *Hospital São João do Porto*, *Hospital Geral Santo António*, *Hospital de Faro*, *Hospital de Beja*.

Author's contributions

VFJC worked to develop the research and data collection protocol, data collection, cleaning, database management, data analysis, and draft the first manuscript. AJPP worked to develop the research and bibliography revision. MFE worked in the study design, bibliography revision, and statistical analysis. ARPG worked in study design and statistical analysis. ANP, JDJM, MW worked in bibliography revision, statistical analysis, and helped to draft the manuscript. All authors provided creative input on the final manuscript version and approved it for publication.

Acknowledgements

Special thanks to Maria Lídia Chauque Gouveia, Head Officer of Mental Health Department in the Ministry of Health – Mozambique. We thank Prof. Dr. Miguel Ângelo Marques Ferreira Bragança from Psychiatry Department in Hospital São João – Porto. Thanks to Dr. Hipólito N'Zwalo who helped collecting data in Faro and Beja. Also thanks to Prof. Dr. Adriano Vaz Serra and Prof. Dr. Cristina Queirós in helping with some instruments.

Conflict of interest and funding

The authors acknowledge that they have no conflicts of interest. This work was supported by the Department of Mental Health – Ministry of Health in Mozambique (MISAU). The content is solely the responsibility of the authors.

References

- Bradley H. Community-based treatment for young adult offenders. *Crime Delinq.* 1969;15:359-70.
- Le Blanc PM, Bakker AB, Peeters MC, et al. Emotional job demands and burnout among oncology care providers. *Anxiety Stress Coping.* 2001;14:243-63.
- Villani D, Grassi A, Cognetta C, Toniolo D, Cipresso P, Riva G. Self-help stress management training through mobile phones: an experience with oncology nurses. *Psychol Serv.* 2013;10(3):315-22.
- Trufelli DC, Bensi CG, Garcia JB, Narahara JL, Abrão MN, Diniz RW, et al. Burnout in cancer professionals: a systematic review and meta-analysis. *Eur J Cancer Care (Engl).* 2008;17(6):524-31.
- Maslach C, Jackson SE, Leiter MP. *Maslach burnout inventory manual.* Mountain View, CA: CPP, Inc., and Davies-Black, 1996.
- Schaufeli WB, Buunk BP. Burnout: An Overview of 25 Years of Research and Theorizing. In: Schabracq MJ, Winnubst JAM, Cooper CL (eds). *The Handbook of Work and Health Psychology*, Second Edition. Chichester, UK: John Wiley & Sons, Ltd, 2002. doi: 10.1002/0470013400.ch19.
- Gama G, Barbosa F, Vieira M. Personal determinants of nurses' burnout in end of life care. *Eur J Oncol Nurs.* 2014 Oct;18(5):527-33.
- Maslach C, Jackson SE. *Maslach Burnout Inventory Manual.* 2nd ed. Palo Alto, Calif: Consulting Psychologists Press; 1986.
- Maslach C, Leiter MP. *The Truth about Burnout: How Organizations Cause Personal Stress and What to Do About it.* San Francisco, CA: Jossey-Bass; 1997.
- Rodrigues AB, Chaves EC. Stressing factors and coping strategies used by oncology nurses. *Rev Lat Am Enfermagem.* 2008;16(1):24-8.
- Poulsen MG, Poulsen AA, Baumann KC, McQuitty S, Sharpley CF. A cross-sectional study of stressors and coping mechanisms used by radiation therapists and oncology nurses: Resilience in Cancer Care Study. *J Med Radiat Sci.* 2014;61(4):225-32.
- Olkinuora M, Asp S, Juntunen J, Kauttu K, Strid L, Aärämaa M. Stress symptoms, burnout and suicidal thoughts in Finnish physicians. *Soc Psychiatry Psychiatr Epidemiol.* 1990;25(2):81-6.
- Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol.* 2001;52(1):397-422.
- Korkeila JA, Töyry S, Kumpulainen K, Toivola JM, Räsänen K, Kalimo R. Burnout and self-perceived health among Finnish psychiatrists and child psychiatrists: a national survey. *Scand J Public Health.* 2003;31(2):85-91.
- de Carvalho EC, Muller M, de Carvalho PB, de Souza Melo A. Stress in the professional practice of oncology nurses. *Cancer Nurs.* 2005;28(3):187-92.
- Sá LO. Burnout e controle sobre o trabalho em enfermagem – Resultados. *Enfermagem Oncológica.* 2006;34:15-24.
- Orzechowska A1, Talarowska M, Drozda R, Mirowska D, Florkowski A, Zboralski K, et al. [The burnout syndrome among doctors and nurses]. *Pol Merkur Lekarski.* 2008;25(150):507-9.
- Maguire P, Faulkner A. Communicate with cancer patients: 2. Handling uncertainty, collusion, and denial. *BMJ.* 1988 Oct 15;297(6654):972-4.
- Hinds PS, Puckett P, Donohoe M, Milligan M, Payne K, Phipps S, et al. The impact of a grief workshop for pediatric oncology nurses on their grief and perceived stress. *J Pediatr Nurs.* 1994;9(6):388-97.
- Breitbart W, Rosenfeld B, Pessin H, Kaim M, Funesti-Esch J, Galietta M, et al. Depression, hopelessness, and desire for hastened death in terminally ill patients with cancer. *JAMA.* 2000;284(22):2907-11.
- Sherman AC, Edwards D, Simonton S, Mehta P. Caregiver stress and burnout in an oncology unit. *alliat Support Care.* 2006;4(1):65-80.
- Lyckholm L. Dealing with stress, burnout, and grief in the practice of oncology. *Lancet Oncol.* 2001;2(12):750-5.
- Girgis A, Hansen V, Goldstein D. Are Australian oncology health professionals burning out? A view from the trenches. *Eur J Cancer.* 2009;45(3):393-9.
- Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med.* 2002;136(5):358-67.
- Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, et al. Burnout and suicidal ideation among U.S. medical students. *Ann Intern Med.* 2008;149(5):334-41.
- Coffeng JK, Hendriksen IJ, Duijts SF, Twisk JW, van Mechelen W, Boot CR, et al. Effectiveness of a combined social and physical environmental intervention on presenteeism, absenteeism, work performance, and work engagement in office employees. *J Occup Environ Med.* 2014;56(3):258-65.
- Zander M, Hutton A, King L. Coping and resilience factors in pediatric oncology nurses. *J Pediatr Oncol Nurs.* 2010;27(2):94-108.
- Folkman S, Lazarus RS, Dunkel-Schetter C, DeLongis A, Gruen RJ. Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes. *J Pers Soc Psychol.* 1986;50(5):992-1003.
- Folkman S, Moskowitz JT. Stress, Positive Emotion, and Coping. *Curr Dir Psychol Sci.* 2000;9(4):115-8.
- Folkman S. Stress, coping, and hope. *Psycho-Oncology.* 2010;19(9):901-8. <http://doi.org/10.1002/pon.1836>.
- Cherniss C. *Professional burnout in human service organizations.* New York: Praeger, 1980.
- Folkman S, Moskowitz JT. Coping: pitfalls and promise. *Annu Rev Psychol.* 2004;55:745-74.
- Manita C. Quando escutar faz mal... Prevenção do Burnout num grupo de profissionais de atendimentos a vítimas de violência doméstica

- (projecto de investigação-acção). Porto: F.P.C.E.U.P. (policopiado, não publicado), 2003.
34. Vaz Serra A. Inventário de Resolução de Problemas – IRP. Documento fornecido pelo autor. Faculdade de Medicina da Universidade de Coimbra, FMUC, 1987.
 35. Benevides-Pereira AMT. Burnout: o processo de adoecer pelo trabalho. In: Benevides-Pereira AMT (ed). Burnout: Quando o trabalho ameaça o bem estar do trabalhador. São Paulo, BR: Casa do Psicólogo, 2002. p. 21-92.
 36. Muthén LK, Muthén BO. Mplus User's Guide. Seventh Edition. Los Angeles, CA: Muthén & Muthén, (1998-2012).
 37. Yuan KH, Bentler PM. Three likelihood-based methods for mean and covariance structure analysis with non-normal missing data. In: Sobel ME, Becker MP (eds). *Sociological Methodology*. Washington, DC: ASA, 2000. p. 165-200.
 38. Truzzi A, Souza W, Bucasio E, Berger W, Figueira I, Engelhardt E, et al. Burnout in a sample of Alzheimer's disease caregivers in Brazil. *Eur J Psychiat*. 2008;22(3):151-60.
 39. Horta AM. Síndrome de Burnout nos Médicos do Serviço de Urgência do Hospital de São João. Tese de Mestrado. Faculdade de Medicina da Universidade de Porto, FMUP, 2005.
 40. Carvalho AIAD. Sintomatologia Depressiva e Estratégias de Coping em Adultos em Idade Laboral. Tese de Mestrado. Faculdade de Ciências Sociais e Humanas da Universidade da Beira Interior, FCSH – UBI, 2002.
 41. Morse G, Salyers MP, Rollins AL, Monroe-DeVita M, Pfahler C, et al. Burnout in mental health services: a review of the problem and its remediation. *Adm Policy Ment Health*. 2012;39(5):341-52.
 42. Silva MP. Ansiedade e Burnout em Enfermeiros dos Cuidados de Saúde Primários do Interior – Norte de Portugal. Tese de mestrado integrado. Faculdade de Psicologia e de Ciências de Educação da Universidade do Porto – FPCEUP, 2008.
 43. Pines A. On burnout and the buffering effects of social support. BA Farber (Ed.), *Stress and burnout in the human service professions*. New York: Pergamon Press; 1983. p. 155-74.
 44. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol*. 2001;52:397-422.
 45. Karasek R, Theorell T. *Healthy work: stress, productivity, and the reconstruction of working life*. New York: Basic Books; 1990.
 46. Hättinen M, Mäkikangas A, Kinnunen U, et al. Recovery from burnout during a one-year rehabilitation intervention with six-month follow-up: Associations with coping strategies. *Int J Stress Manag*. 2013;20(4):364-90.
 47. Shin H, Park YM, Ying J, Kim B, Noh H, Lee SM. Relationships between coping strategies and burnout symptoms: a meta-analytic approach. *Prof Psychol Res Pr*. 2014;45(1):44-56.
 48. Zimber A, Rudolf A, Teufel S. [Reducing work stress in geriatric care: a training program for nursing team and administrators]. *Z Gerontol Geriatr*. 2001;34(5):401-7.
 49. Gillman L, Adams J, Watts R, et al. Strategies to promote coping and resilience in oncology and palliative care nurses caring for adult patients with malignancy: a systematic review. *JBHI Database System Rev Implement Rep*. 2012;10(56):75-90.

Music performance anxiety: a critical review of etiological aspects, perceived causes, coping strategies and treatment

ANA BEATRIZ BURIN¹, FLÁVIA L. OSÓRIO^{1,2}

¹ Department of Neurosciences and Behavioural Sciences of the Ribeirão Preto Medical School, University of São Paulo (FMRP-USP), Ribeirão Preto, SP, Brazil.

² National Institute of Sciences and Technology for Translational Medicine, Brazil.

Received: 01/27/2017 – Accepted: 07/31/2017

DOI: 10.1590/0101-60830000000136

Abstract

Background: Music performance anxiety (MPA) is understood as a sub-type of social anxiety and is characterised by fears of a musical presentation. **Objective:** To carry out a critical literature review on clinical and etiological aspects, perceived causes, coping strategies and treatment of MPA. **Methods:** Electronic databases PubMed, PsycINFO and Lilacs as well as specific periodicals were used based on the key-words symptoms, diagnosis, aetiology, perceived causes, coping strategies and treatment. **Results:** MPA is highly prevalent among musicians (> 16%), regardless of culture and formation. Cognitive, behavioural and physiological factors are associated with the aetiology of MPA, including biological and psychological predispositions. In addition, one should highlight factors related to the individual, aspects related to tasks and musical situation as perceived causes and/or predictor variables of MPA. As for the coping strategies, one can also highlight the use of breathing/relaxing techniques, increased musical practice, use of homeopathy and substances without medical prescription. **Discussion:** MPA is impacting in the musician's life. Despite the increasing interest in its study, it is necessary to better understand this complex phenomenon, mainly in the therapeutic context, in addition to the publicising and offering of services for prevention and treatment of MPA.

Burin AB, Osório FL / Arch Clin Psychiatry. 2017;44(5):127-33

Keywords: performance anxiety, musicians, coping, perceived causes, review.

Introduction

Music as a profession

The practice of music on a professional or amateur basis requires the musician to have a set of knowledge, techniques and skills which consolidate during an often long process of preparation. In addition to having a vast technical knowledge on the practice, being a musician requires high levels of skills such as motor co-ordination, attention and memorisation^{1,2}, speed, precision and strength³.

Smilde⁴ states that the career of musician requires that he or she performs multiple functions/roles, such as being an artist, a composer, a teacher, a mentor, a coach, a leader, among others, which demands a set of skills for a successful career. In addition to these characteristics of the musical careers, according to Kenny⁵ and Galvão¹, there is a relationship between level of music knowledge, practice and successful performance, that is, the greater the knowledge and the longer the practice, the higher the possibility of success in the performance. In this sense, one can mention the so-called high-performance musicians, that is, musicians who in general have classical music formation and dedicate 4-6 hours a day to their studies, on average, aiming to improve their performance⁶.

According to Ericsson *et al.*⁷, these musicians intentionally make a great effort to practice the musical instrument, which may have a positive impact on the performance on the one hand, but a negative impact on the musician's general health on the other hand. Andrade and Fonseca⁸ report that high-performance musicians and athletes have similarities in their practices, such as use of muscle groups for training/rehearsal and intensive dedication with long periods of practices aiming at presentations. In view of this intense dedication, the high-performance musicians often present with muscle pain (many times debilitating) related to the instrument being played. The authors also state that there is a remarkable difference between musicians and athletes in this condition, that is, the latter is often followed up by a technical health team, whereas the former is not.

Moreover, many musicians end up developing conditions which involve physical suffering, such as pain in the muscles used for playing

the instrument as a result of many hours of training, repetition and extreme tiredness^{9,10}. The performance-related musculoskeletal disorder is defined by pain, weakness, numbness, tingling or other symptoms which interfere with the ability to play the instrument at the level the musician is accustomed to¹¹. This condition affects many musicians, mainly those of high performance. According to Kenny and Ackermann⁹, about 55 to 86% of the members of the Australian Symphony Orchestra presented this condition, which impairs significantly their musical career.

In addition to the long hours of typical practice in the musical career^{1,12}, there is also several intrinsic requirements of the profession, such as working in shifts, being available to travel for presentations, leaving the family during tours, adjusting to the time zone, dealing with the often typical financial instability of the profession, among other factors¹³.

In this sense, the psychological distress experienced by most of the musicians is extensive, involving anxiety symptoms, depressive symptoms and music performance anxiety (MPA), this latter being related to the public's and musician's demands^{9,14,15}. A study by Barbar *et al.*¹⁴ showed that 19% of a sample of 230 Brazilian professional and amateur musicians had indicators of social anxiety, 20% had indicators of depression and 24% had indicators of MPA. In a previous study, Kenny *et al.*¹⁶ also identified a significant pattern of indicators of depression (32%), social anxiety (33%) and post-traumatic stress (22%) among the members of the Australian Symphony Orchestra, suggesting that the condition is independent of the musician's culture and musical formation.

It is still possible to highlight other clinical conditions associated with the musician's career, such as problems related to sleep and use of substances. Pereira *et al.*¹⁷ conducted a study on the quality of sleep in classical musicians and found that 71% of the participants had a poor quality of sleep, which seems to be associated with pain and physical discomfort.

With regard to the use of substances, West¹⁸ reports the use of licit substances such as alcohol, coffee and medications as well as of illicit substances such as cannabis and cocaine. It is known that

many musicians rely on substances to deal with the typical demands of the career, which includes performance in public, many hours of rehearsal, travels and time zones¹⁸.

This whole panorama seems to have a negative overall impact on the musician's quality of life, which is perceived by them¹⁷. Nevertheless, there is little attention to this specific population on the part of the public healthcare policies, as well as the search for alternative support and treatment measures on the part of the musicians, thus contributing to the worsening of the problem.

Therefore, the objective of this work is to present a critical literature review regarding the music performance anxiety, including aetiological aspects, perceived causes, coping strategies and treatment.

Methods

Electronic databases PubMed, PsycINFO and Lilacs, periodicals specific to the music field (*Research in Musical Behaviour*, the *Journal of Research in Music Education*, *Medical Problems of Performing Artists*, *Psychology of Music and Music Education* and the *Journal of Music Therapy*), as well as the bibliographical references of the articles selected were used for this critical review, based on the keywords: symptoms, diagnosis, etiology, perceived causes, coping strategies and treatment.

Results

Music performance anxiety

Anxiety is defined as the anticipation of an upcoming event and is associated with experiencing muscle tension and vigilance as a way to prepare for future danger through avoidance behaviours¹⁹. It is important to emphasise that anxiety itself is not a problem. For Barlow²⁰, anxiety is a natural feeling which is part of the human emotions, being necessary for survival. However, when the level of anxiety increases to the point to affect negatively the individual's functioning and cause distress, then it is considered pathological.

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders – DSM-V¹⁹, the anxiety disorders are characterised by the presence of excessive fear and anxiety, including related dysfunctional behaviours. Although these two emotional states occur concomitantly in most cases, fear is characterised by an emotional response to an imminent or real threat and is usually accompanied by fight-or-flight behaviours.

According to the DSM-V¹⁹, anxiety disorders differ depending on the type of object or event producing feelings of fear/anxiety, cognitive changes related to the event, or objects generating avoidance behaviours, whereas anxiety refers to the anticipation of future threat, being more associated with muscular tension and vigilance. Among the anxiety disorders, one can highlight the social anxiety disorder (SAD), whose main characteristic is the presence of fear or anxiety in situations of social interaction in which the individual becomes afraid and worried with the possibility of being evaluated by others. In SAD the feelings of fear and anxiety as well as avoidance are very strong, resulting in significant distress and impairment of social functioning¹⁸.

Performance anxiety is associated with only the performance and can be considered a specific type of SAD in which the individuals present performance-related fears, in general affecting their professional lives as is the case of musicians, athletes and other performing artists¹⁹. Therefore, the term MPA refers to a performance anxiety condition specifically related to musical performance in both solo and group presentations involving any music instrument, including singing²¹⁻²³, and thus can be considered a sub-type of social anxiety. In MAP, there is a symptom intensity scale in which the feelings experienced by musicians range from stress and anxiety, considered normal in the practice of the profession, to severe and harmful symptoms, including a sensation of terror very similar to panic attacks²⁴⁻²⁶.

MPA can impact not only the performance of musicians, but also their career and quality of life^{5,27}. According to the literature, it is common that musicians with MPA also display comorbid symptoms of depression and social anxiety^{14,16}, which influence their quality of life and may play an important negative role in their professional development.

With regard to the prevalence of MPA in the population of musicians, there seems to be no consensus in the literature and the explanation of this fact may be related to the difficulty health practitioners and even musicians have in detecting this disorder¹⁴. A study conducted in Brazil¹⁴ showed a MPA prevalence of 24% among Brazilian musicians and Bruges²⁸, in a literature review, reported a prevalence ranging from 16% to 70% in musicians playing in the United States and European countries in the 1980s and 1990s. According to Steptoe²⁹, who also performed a literature review, the prevalence of MPA among musicians ranged from 15 to 25%. As for gender, there seems to be a higher prevalence in women compared to men, as well as social anxiety and other anxiety disorders^{24,25,27,30,31}.

According to Fehm and Schmidt³², there is no estimation of the MPA prevalence in children and adolescents. Kenny and Osborne³³ state that very young children rarely experience MPA in the same way as adults, quite on the contrary, they seem to like presentations and seemingly do not feel uncomfortable with possible failures in the performance.

For the latter authors, the transition of these children to adulthood who may suffer with MPA involves a combination of several factors which may have both positive and negative results, namely: inborn temperament, anxiety trait, increased cognitive capacity, self-reflexive function, perspective taking, parent's education type, impact of other interpersonal experiences, perception and interpretation of the world, technical skills and previous experiences related to performance³³.

Anxiety can be triggered by conscious and rational preoccupations as well as by unconscious stimuli of previous anxiety experiences producing uncomfortable somatic sensations. These stimuli can be called "triggers" and may include previous aversive experiences, which in turn can underlie the development of negative cognitions and dysfunctional thinking³⁴. Studies aimed at investigating more specifically young musicians^{32,33}, as well as research works on treatments and interventions for MPA in this population³⁵⁻³⁷, have been performed in the recent years. Understanding that MPA can start developing early in life opens a pathway which should be better investigated in order to prevent more effectively this condition.

Music performance anxiety and stage fright

In the field of knowledge on music performance, one can note the use of the term "stage fright", which in many cases has been used as synonyms of MPA³⁸. However, Kenny⁵ and Steptoe²⁹ state that it is important to distinguish these concepts to obtain a more conceptual rigour and consequently a greater methodological rigour in studies aimed at investigating these two performance-related phenomena, since both approaches are different.

According to Steptoe²⁹, MPA refers to feelings experienced by musicians in various moments and contexts, and not exclusively on the stage. Stage fright involves a sudden fear or dread related to the moment of the presentation on stage, whereas MPA can gradually develop and begins a few days prior to the performance.

Kenny⁵ emphasises that experiencing MPA may be related to a defensive means against the possibility of re-experiencing an intense painful emotional state or fearful anticipation related to the possibility of an upcoming threat involving shame or humiliation in a performance situation.

MPA can also have important implications on how music is played, that is, the quality of the presentation, and this issue does not seem to have the same importance when the stage fright is considered²⁹. This happens because stage fright diminishes as the musicians' exposure to presentation situations increases, which may

reflect positively on the quality of the performance. Conversely, in the case of MPA, which also includes symptoms at the cognitive level, the desensitization caused by increased exposure does not occur³⁹.

Symptoms of music performance anxiety

The symptoms of MPA involve three main groups, namely: physiological, mental and behavioural ones⁴⁰. In general, these symptoms are concomitantly experienced⁴¹.

Among the physiological symptoms, one can cite the increase in heart rate, heart palpitation, shortness of breath, hyperventilation, dry mouth, sweating, nausea, diarrhoea and dizziness⁴². Sinico⁴³ also reports other physical symptoms, such as headache, digestive problems, excessive sweating, musculoskeletal problems, muscle tension, cold hands, fatigue, and changes in blood pressure, heart rate and respiratory rate.

The mental symptoms can be divided into two groups for a better understanding, namely: cognitive and emotional symptoms⁴³. The cognitive symptoms involve difficulty of concentration, high distraction, memory-related problems, distorted thoughts, poor interpretation of the score, among others²⁹. Lehman *et al.*⁴¹ call attention to the importance of cognitive symptoms in the maintenance of MPA and quality of performance. As for the emotional symptoms, it is possible to highlight stress, apprehension, insecurity, dread and panic²⁹.

With regard to behavioural symptoms, one can highlight agitation, tremor, muscle stiffness and impairment of the performance (i.e. difficulty in maintaining body posture and technical failures)^{29,40}, which are the visible aspects made public to the audience. Therefore, these symptoms can be perceived as a sign of anxiety and thus further increase it as a result, since the musician can feel that he or she is being evaluated and this favours the start of a vicious cycle. Moreover, in many cases the behavioural symptoms end up compromising the performance as they can affect the playing of the instrument.

Etiology of music performance anxiety

With regard to the etiology of MPA, there is a consensus among researchers about the interaction of three factors in the development of such a condition, namely: cognitive, behavioural and physiological ones^{5,23,32}. However, there seems to exist no study describing in detail the participation of each one of these factors in the development of MPA.

The Barlow's model of anxiety disorders is widely used for their understanding²⁰. This model is intended to integrate three factors possibly involved in the development of anxiety, namely: generalised biological vulnerability (genetic inheritance), generalised psychological vulnerability, and specific psychological vulnerability, in which anxiety is correlated with certain stimuli by conditioning answers and beliefs.

According to such a model, one can suppose that anxiety can be explained by physiological processes and experiences over the individual's life course. Each of the above-mentioned factors plays a determining role in the development of anxiety. However, Rocha *et al.*⁴⁴ state that the third factor (i.e. specific psychological vulnerability) seems to be more related to the development of specific anxieties, such as specific phobia and panic disorders. It is possible that social anxieties, especially the performance anxiety, are more influenced by this factor because of the involvement of more specific psychological vulnerabilities.

Papageorgi *et al.*²² and Kenny⁵ point to the existence of both biological and psychological predispositions which are inherent to the individual. The authors believe that extrinsic factors, such as previous musical experiences and other anxiety-related experiences involved in the personal and professional histories, are also important in the development of MPA.

Valentine⁴⁰ states that MPA is influenced by three elements, namely: person, task and situation. For the author, person is a set

of individual personality characteristics encompassing aspects such as perfectionism, self-esteem and anxiety trait/state; task refers to related aspects (e.g. repertoire, score interpretation, memorisation); and situation refers to the context, that is, whether it is a rehearsal or presentation, or whether it is evaluative or not, and so on. Next, we will address each one of these elements in detail.

Person-related variables associated with music performance anxiety

According to two of the main technical models cited in the present work^{20,40}, whose aim is to discuss the origin of MPA, there is a consensus that the focus on the person (i.e. understood as a set of aspects which form his or her personality) is key to better understand the MPA. In this sense, it is indispensable to conduct a careful analysis of socio-demographic variables, concepts of self-esteem, perfectionism, anxiety trait/state, cognition and peculiarities of cultural values.

Self-esteem, understood as the way by which the individual thinks about himself or herself, seems to be an important factor in the development of MPA. According to Mei-Yuk⁴⁵, it is suggested that high levels of anxiety may be related to low levels of self-esteem. Conceptually, self-esteem is a process, that is, it develops over time and the social relationships of the individual play an important role in the construction of this feeling⁴⁶. For Mei-Yuk⁴⁵, anxiety may not affect directly the performance, but it is directly related to self-esteem and can distort the individual's perception of his or her performance.

Brand⁴⁷ conducted a study to compare the levels of self-esteem of music students in America, Australia and China. The results showed that cultural groups differ in the perception of themselves. Chinese music students, which belong to a collectivist culture, had low levels of self-esteem compared to their American counterparts. The results of the study demonstrate that cultural differences, understood as a set of aspects and values of each country or region, play an important role in the understanding and development of MPA, including prevention and treatment.

With regard to perfectionism, it can be characterised as a personality trait and defined as the presence of high-performance patterns accompanied with excessively critical self-evaluations⁴⁸. Two aspects of this concept are particularly important for the understanding of MPA, namely: perfectionist efforts and perfectionist preoccupations⁴⁹. The perfectionist efforts are related to the search for a high pattern, in general being associated with positive aspects. Kobori *et al.*⁵⁰ investigated the role of perfectionism on MPA in Japanese musicians and highlighted that it is important, in terms of self-evaluation, to meet the parent's and teacher's expectations. In this sense, perfectionism can be positive, because internalize high standards of exigency, that before were external, can favor greater training and better performance.

Perfectionist preoccupations refer to an ill-adaptive facet of the perfectionism in which there is excessive worry with mistakes, doubts about own actions and negative responses to failures and imperfections. As for this negative aspect of perfectionism, Kenny⁵ states that perfectionist individuals use a high amount of energy when they become involved with evaluative behaviours and end up developing a cognitive rigidity about concepts of success, mistake or failure, often rating success dichotomically, that is, all or nothing.

Research studies on the relationship between trait-anxiety and state-anxiety have been performed in order to investigate possible associations between them and MPA^{2,16}. According to Silva and Spielberg⁵¹, state-anxiety is defined as an emotional state which happens in a given period of time and is characterised by stress, apprehension, nervousness and preoccupation. On the other hand, trait-anxiety refers to a relatively stable trend to interpret certain situations as being threatening, which intensifies the reactions of state-anxiety. The trait-anxiety, because of its trend to help the individual interpret certain situations as being aversive and threatening, to elevate the levels of state-anxiety of the individual and

to make the individual feel chronically apprehensive and worried, causes the musicians to perform poorly in situations of evaluation or fear of a possible failure compared to situations of lower levels of this type of anxiety⁵. Kenny *et al.*² found a strong association between trait-anxiety and MPA as well as between high level of trait-anxiety and work-related stress among musicians.

Another important aspect in the field of anxiety is the notion of susceptibility to anxiety. Conceptually, Kenny⁵ states that susceptibility to anxiety is the individual's trend to perceive the own state of anxiety and interpret its symptoms as being dangerous/threatening. A study by Stephenson and Quarrier⁵² shows that susceptibility to anxiety was an important predictor of MPA, especially regarding women. Another important correlation was that musicians presenting high levels of susceptibility to anxiety experience more pain and less pleasure while playing their instruments.

Gender is an important factor related to MPA. According to an extensive study by Kenny *et al.*¹⁶, who evaluated musicians of the Australian Symphony Orchestra, found that women experienced significantly more MPA than men. These results are corroborated by previous studies^{12,14,22,25,27} as they showed higher prevalence of MPA and higher intensity in women.

Age is another socio-demographic variable to be highlighted. The results of the study by Kenny *et al.*¹⁶ show that young musicians (less than 30 years old) are more affected by MPA than the older counterparts (more than 51 years old). These findings suggest that as musicians gain more experience, the symptoms of MPA are made milder.

With regard to cognition, individuals with high levels of MPA seem to think about themselves and performance situation differently from those with low levels. For Kenny⁵, among the most recurrent thoughts in individuals with high levels of MPA, one can cite the following: a) strong negative expectancies prior to the event; b) strong negative bias in self-evaluations of previous performances; c) strong expectancy that performance will be negatively evaluated by raters/audience; d) marked preoccupation with the consequences of a poor performance; e) high susceptibility to changes regarding the rater's or audience's reactions, and f) inability to feel comfortable, even through evidence that they had already dealt with previous situations skilfully^{5,32}.

Task-related variables associated with music performance anxiety

Task is also an important element associated with MPA, and according to Valentine⁴⁰, it comprises aspects such as repertoire to be played, competence to interpret the score and memorisation. Sinico and Winter⁵³ highlight that the level of anxiety experienced is directly proportional to the difficulty and complexity of the task. Therefore, for the authors^{53,54}, the choice of repertoire is very important when the level of requirement and technical demand are incompatible with the musician's skills, since there are risks of negative impact on the performance anxiety. In a descriptive study on the causes of anxiety in flautists, the same authors reported that musical repertoire was pointed out as the main cause of APM.

Memorisation is a related-task element which also deserves attention. Depending on the level of excitement felt during the performance, memory lapses may occur, and because in many situations it is expected that the musician plays without score, relying on the memory and running the risk of forgetfulness can favour the emergence of more symptoms of MPA during the presentation⁴².

Situation-related variables associated with music performance anxiety

As mentioned above, the contextual variables in which the performance is carried out interferes with the experience of anxiety, particularly MPA. Therefore, in addition to the person-related factors, it is important to analyse the specificities of each performance situation (i.e. solo or joint presentation, music genre, rehearsal,

evaluation presentation and access to musical education) and how the musicians deal with them.

According to Ryan and Andrews²¹, although MPA may occur in both solo and joint presentations²¹⁻²³, the former generates more anxiety as the musician is more exposed to the risk of committing mistakes which can be perceived by the audience.

The musician's formation is also another important aspect to be analysed. A study of choral singers demonstrated that experiencing MPA was common among them. However, the participants who had access to university musical education reported less episodes of MPA, but not less severe than those reported by the non-educated counterparts. In another study, McKenzie⁵⁵ assessed six musicians who had access to university musical formation and the results showed that they experienced anxiety even when they felt prepared for presentation. In view of this, it was concluded that MPA can be experienced regardless of the musician's preparation, that is, its manifestation may be more related to the inability to deal with states of apprehension rather than with an adequate preparation.

Still, with regard to musical formation, Barbar *et al.*¹⁴ showed evidence that professional musicians have higher rates of MPA (39%) compared to amateur ones (14%). According to the authors, this can be explained by the typical demands of the profession. With regard to music genre, data from a study by Papageorgi *et al.*⁵⁶ suggest that musicians from a variety of music genres share similar perceptions and preoccupations, although classical musicians have higher levels of MPA.

Papageorgi *et al.*⁵⁶ also demonstrates that the musician's anxiety increases as the presentation approaches, reaching a peak immediately before the performance. On the other hand, this anxiety begins to decrease as the presentation progresses. This suggests that the presentation can be divided into at least three distinctive moments, namely: a) the period preceding the presentation, with mild symptoms of MPA being already present; b) the period immediately before the presentation, with more intense symptoms of MPA being perceived; c) the most critical period, when the presentation is actually taking place, with symptoms of MPA still present, but decreasing.

The situation/context of the presentation is also an important aspect regarding the MPA. The levels of MPA can vary depending on the context of presentation, that is, whether it involves rehearsal or public presentation, whether it involves evaluation or competition, and so on. Data from a study by Yoshie *et al.*⁵⁷ suggest that musicians experienced higher levels of MPA in evaluation than in rehearsal situations. LeBlanc *et al.*⁵⁸ evaluated secondary school adolescent musicians in three situations as follows: in an empty rehearsal room, in a rehearsal room with one researcher, and in a rehearsal room with researchers, classmates and a camera recording them. The results suggest that levels of MPA and heart rate were similar in the two first situations, increasing considerably in the third one. However, in the studies by Craske and Craig⁵⁹ and Yoshie *et al.*⁶⁰, there was no significant difference in the quality of performance when the situations of rehearsal and performance were compared to that of evaluation.

Music performance anxiety: related causes perceived by musicians

Considering the importance of cognitive process in the aetiology and maintenance of MPA, it is important to understand the causes perceived by the musicians as being associated with the development of MPA. The identification of causes, as well as of whether they are internal (i.e. thoughts, feelings and sensations) or external (i.e. reactions to audience) to the musician, can contribute to a more effective intervention in pathological conditions involving MPA.

Despite this, there are still a few studies on this theme. Among them, one can highlight the study by Kenny *et al.*¹⁶, who used a sample of 377 members of the Australian Symphony Orchestra. For those musicians, the three causes most associated with MPA were: self-pressure, excessive physical arousal before and during

the presentation and bad performance experience. According to the authors, these data suggest the presence of psychological vulnerability and ill-adaptive perfectionism traits.

The study by Sinico⁴³, who studied Brazilian flautists, showing that the most reported causes of MPA involved difficult repertoire, public presentation and evaluation. Further studies on this theme are important to understand the development and maintenance of MPA.

Coping strategies associated with music performance anxiety

Coping strategies refer to a set of skills that people use to deal with adverse and stressful situations⁶¹. In the musical context, coping strategies are behaviours and thoughts the musicians use to deal with MPA. One should highlight that the affectivity of these strategies varies depending on the situation and individual's characteristics.

According to Sinico⁴³, the choice of certain strategies over others is closely related to the symptoms being experienced by each musician. In other words, each symptom requires one or more strategies to ease the sensations resulting from MPA, which not always works well.

Sinico⁴³ proposed a classification of these strategies into cognitive, behavioural and cognitive-behavioural. According to the author, cognitive strategies are aimed at altering poor cognitive processes, such as negative or distorted thinking patterns related to the performance, by means of cognitive re-structuring, for example. The behavioural strategies are based on specific techniques aimed at altering behaviours by means of systematic desensitisation. Finally, the cognitive-behavioural strategies are aimed at altering inadequate patterns of problematic thoughts and behaviours.

Despite this classification, in general the coping strategies have an effect on both cognition and behaviours. According to Lazarus and Folkman⁶², an effective coping involves changes in cognitive and behaviour efforts so that the affected individual can control internal/external demands.

Among the main coping strategies used by orchestra musicians, there are the following: deep breathing, distraction techniques, self-talk, more training, relaxing techniques, search for medical assistance, hypnosis, use of medication, and use of alcohol¹⁶.

In another study by Zakaria *et al.*⁶³, it was found that the main forms of coping with MPA as reported by undergraduate musicians were: praying, use of breathing and relaxing techniques, more practice and accumulation of previous performance experiences.

Studer *et al.*³⁸ studied undergraduate musicians and found that the most frequently cited coping strategies were breathing techniques, self-control techniques and use of natural substances (especially homeopathic ones). As for the effectiveness of such strategies, the most effective ones were breathing exercises, use of medication and self-control techniques. On the other hand, the use of coffee was the least effective strategy.

Still, in this direction, flautists reported that familiarity with repertoire to be played, score reading skills, constant practice, musical expression and memorisation were the main coping strategies⁴³.

In this context, Allen⁶⁴ conducted an interesting study with pianists. The objective of author was to investigate a possible coping strategy. The results suggested that coping strategy can be a tool to reduce anxiety sensations during presentations, since it enables an action in view of a possible failure. Thus, the musician is encouraged to explore aspects (e.g. creativity) to control stress and nervousness during performance.

Other authors emphasize that the teaching-learning process by itself, can function as coping strategies of APM. In this sense, the development of techniques for studying, memorizing and solving problems, techniques for gradual and pre-performance training, and the emotional preparation of the students by the teaching staff stand out^{65,66}.

There are also other coping strategies employed by musicians, such as use of alcohol and illicit drugs, mainly to control the

symptoms²¹. It should be emphasised that these poor adaptive strategies are commonly used, despite not always being effective, and contribute to the development of psychiatric co-morbidities.

Treatment of music performance anxiety

The research on treatment of MPA was first performed in the 1970s and has drawn attention from researchers in the recent years^{67,68}.

In a recent systematic review⁶⁹, the most studied intervention modalities were cognitive behavioural therapy (CBT), yoga, bio-feedback, meditation, virtual exposure, music therapy and Alexander's technique. Among the modalities, CBT is more evidenced as it has already been reported by previous studies^{67,68}. Yoga has been highlighted as an innovative modality because of some favourable results, but further studies are needed in order to support its use in this context. As for the other techniques, it was not possible to draw a conclusion about their efficacies given the small number of studies and their methodological weakness⁶⁹. The authors also emphasise that more rigorous studies are needed, including pharmacological ones.

As for studies with medication, these are more rare and generally focus on beta-blockers. Kenny⁶⁷ in a review study, found that this substance favored improvements in the control of the symptoms associated with sympathetic hyperactivity, that is, papiness, hyperventilation, tremors, sweating, among others.

However, according to Nascimento⁷⁰, pharmacological treatment turns out to be a less viable option for musicians, since anxiolytics may compromise fine motor control, and beta-blockers may impair musical performance.

Nevertheless, an important study by Fishbein *et al.*⁷¹ with 2212 orchestral musicians who pointed out that 27% of them used beta-blockers, being the most frequent use by women. In a survey conducted in Brazil with music bachelors⁷⁰, 17.27% of the interviewees reported using this type of substance for MPA control, Especially in situations of solo performance, contests and masterclasses. According to the qualitative perception of these musicians, the use of the beta-blocker favored a decrease in fear of exposure, self-criticism and negative thoughts.

In this sense, one can highlight partial data from a clinical trial on oxytocin, a neuropeptide produced by the hypothalamus, which is currently underway by our research group. The findings point that an acute dose of oxytocin seems to decrease negative cognitions associated with MPA. If confirmed, oxytocin will have important implications for the music practice by benefiting musicians who suffer from the disorder and with minimum side effects.

Although some treatments have been studied, the attention given to this specific population on the part of public healthcare policies is still scanty, including the search for alternative support measures by the own musicians, which contributes to the lack of due treatment of MPA. According to Nascimento⁷⁰, 36% of music students reported needing help in dealing with MPA, while 73% would like to receive support from a specialist.

The exception to this is the Comprehensive Healthcare Program for Performing Artists, provided by the Brazilian Healthcare System (SUS) in conjunction with the Federal University of Minas Gerais⁷². This program was implemented in 2009 and since then 122 musicians have been treated, in the majority of the cases, for physical symptoms such as problems related to posture, tendonitis and fibromyalgia. Positive impacts have been reported by the musicians, especially regarding strategies against the risk of getting ill. Moreover, a group activity protocol involving breathing techniques, self-massage, perception of tension in the body, body awareness and MPA is currently being assessed⁷⁰.

Final considerations

MPA is a complex condition and has drawn attention from researchers in the recent decades, possibly because of its high prevalence among musicians and its impact on their career and quality of life.

One can observe that musicians, who often interpret the symptoms of MPA as being normal and inherent to the profession, have not been seeking treatment as expected. Services of healthcare and treatment for musicians are scanty and the diagnosis of MPA is frequently compromised because the healthcare practitioners have a poor knowledge on the condition as a result of lack of information.

Although there are still many gaps in the literature regarding this theme, they have been filled in the recent years. It is expected that in the near future we will have a better understanding of MPA in order to allow the spread of information on the problem, intervention techniques and prevention measures, thus contributing to the well-being of the musicians.

Funding

The São Paulo Research Foundation, FAPESP (Process No. 2015/00097-0).

References

- Galvão A. Cognição, Emoção e Expertise Musical. *Psic Teor e Pesq*. 2006;22(2):169-74.
- Kenny D, Davis P, Oates J. Music performance anxiety and occupational stress amongst opera chorus artists and their relationship with state and trait anxiety and perfectionism. *J Anxiety Disord*. 2004;18(6):757-77.
- Tubiana R. Functional Disorders in Musicians. *Eur Orthop Bul Effort*. 2000;13:9-12.
- Smilde R. A profissão musical e o músico profissional: uma reflexão. *Em pauta*. 2008;19(32/33):110-7.
- Kenny DT. *The psychology of music performance anxiety*. Oxford: Oxford University Press; 2011.
- Fonseca MPM. Discussão sobre os desconfortos físicos-posturais em flautistas e sua relação com a técnica de performance de flauta transversal. [tese]. Belo Horizonte [MG]: Programa de Pós-Graduação em Saúde do Adulto/UFGM; 2013.
- Ericsson KA, Krampe RT, Tesch-Romer C. The role of deliberate practice in the acquisition of expert performance. *Psycho Rew*. 1993;100:363-406.
- Andrade EQ, Fonseca JGM. Artista-atleta: reflexões sobre a utilização do corpo na performance dos instrumentos de cordas. *Per Mus*. 2000;2:118-28.
- Kenny D, Ackermann B. Performance-related musculoskeletal pain, depression and music performance anxiety in professional orchestral musicians: a population study. *Psychol Music*. 2013;1-18.
- Costa C. Quando tocar dói: análise ergonômica do trabalho de violistas de orquestra. [dissertação]. Brasília [DF]: Programa de Pós-Graduação em Psicologia Social, do Trabalho e das Organizações/UnB; 2003.
- Zaza C, Charles C, Muszynski A. The meaning of playing-related musculoskeletal disorders to classical musicians. *Soc Sci Med*. 1998;47:2013-23.
- Hallam S The Development of Metacognition in Musicians: Implication for Education. *Brit J Music Educ*. 2001;18(1):27-39.
- Kenny DT, Ackermann B. Optimising physical and mental health in performing musicians. *Oxford handbook of music psychology*. Oxford: Oxford University Press; 2009.
- Barbar AEM, Crippa JAS, Osório FL. Performance anxiety in Brazilian musicians: Prevalence and association with psychopathology indicators. *J Affect Disord*. 2014;152(154):381-6.
- Persson RS. The Maestro Music Teacher and Musicians' Mental Health. Presented at the 104th Annual Convention of the American Psychological Association in Toronto, Canada, 1996.
- Kenny D, Driscoll T, Ackermann B. Psychological well-being in professional orchestral musicians in Australia: A descriptive population study. *Psychol Music*. 2014;2(42):210-32.
- Pereira EF, Teixeira, CS, Kothe F, Merino EAD, Daronco LSE. Percepção de qualidade do sono e da qualidade de vida de músicos de orquestra. *Rev Bras Psiquiatr*. 2010;37(2):48-51.
- West R. Drugs and Musical Performance. In Williamon A. *Musical Excellence: Strategies and Techniques to Enhance Performance*. Oxford University Press; 2004.
- American PA. *DSM-5: manual estatístico e diagnóstico de transtornos mentais*. 5 ed. Porto Alegre: Artmed, 2014.
- Barlow DH. Unravelling the mysteries of anxiety and its disorders from the perspective of emotion theory. *Am Psychol*. 2000;55(11):1247-63.
- Ryan C, Andrews N. An investigation into the choral singer's experience of music performance anxiety. *J Res Music Educ*. 2009;57(2):108-26.
- Papageorgi I, Hallam S, Welch GF. A conceptual framework for understanding musical performance anxiety. *Research Studies in Music Education*. 2007;28(1):83-107.
- Taborsky C. Musical performance anxiety: a review of literature. *Update Appl Res Music Educ*. 2007;26:15-25.
- Osborne MS, Kenny DT. The role of sensitizing experiences in music performance anxiety in adolescent musicians. *Psychol Music*. 2008;36(4):447-62.
- Osborne MS, Kenny DT. Development and validation of a music performance anxiety inventory for gifted adolescent musicians. *J Anxiety Disord*. 2005;19(7):725-51.
- Powell D. Treating individuals with debilitating performance anxiety: an introduction. *J Clin Psychol*. 2004;60(8):801-8.
- Yondem ZD. Performance anxiety, dysfunctional attitudes and gender in university music students. *Soc Behav Personal*. 2007;35(10):1415-26.
- Brugés AO. Music Performance Anxiety-a review of the literature. [tese]. Doktorgrades der Medizinischen Fakultät der Albert-Ludwigs-Universität. Freiburg im Breisgau, Deutschland; 2009.
- Steptoe A. Negative Emotions in Music Making: The Problem of Performance Anxiety. In: Juslin, Patrick N, John A. (Ed). *Music & Emotion*. New York: Oxford University Press. 2001. p. 291-307.
- Thomas JP, Nettelbeck T. Performance anxiety in adolescent musicians. *Psychol Music*. 2013:1-11.
- Rae G, McCambridge K. Correlates of performance anxiety in practical music exams. *Psychol Music*. 2004;32(4):432-9.
- Fehm L, Schmidt K. Performance anxiety in gifted adolescent musicians. *J Anxiety Disord*. 2006;20:98-109.
- Kenny DT, Osborne MS. Music performance anxiety: new insights from young musicians. *Adv Cogn Psychol*. 2006;2(2-3):103-14.
- Barlow DH. *Anxiety and its disorders: the nature and treatment of anxiety and panic*. 2nd ed. New York: Guilford Press; 2002.
- Braden AM, Osborne MS, Wilson SJ. Psychological intervention reduces self-reported performance anxiety in high school music students. *Front Psychol*. 2015;3(6):195.
- Khalsa SB, Shorter SM, Cope S, Wyshak G, Sklar E. Yoga ameliorates performance anxiety and mood disturbance in young professional musicians. *Appl Psychophysiol Biofeedback*. 2009;34(4):279-89.
- Osborne MS, Kenny DT, Cooksey J. Impact of a cognitive-behavioural treatment program on music performance anxiety in secondary school music students: a pilot study. *Music Sci Special Issue*. 2007;53-84.
- Studer R, Gomez P, Hildebrandt H, Arial M, Danuser B. Stage fright: its experience as a problem and coping with it. *Int Arch Occ Env Hea*. 2011;84(7):761-71.
- Steptoe A, Fidler H. Stage fright in orchestral musicians: a study of cognitive and behavioural strategies in performance anxiety. *Br J Psychol*. 1987;78(Pt2):241-9.
- Valentine E. The fear of performance. In: Rink J. *Musical Performance: A Guide to Understanding*. Cambridge: Cambridge University Press; 2002. p. 168-82.
- Lehmann A, Sloboda J, Woody R. *Psychology for Musicians: understanding and acquiring the skills*. New York: Oxford Press; 2007.
- Marshall AJ. Perspectives about musician's anxiety performance. [dissertation]. University of Pretoria; 2008.
- Sinico A. Ansiedade na performance musical: causas, sintomas e estratégias de estudantes de flauta. [dissertação]. Porto Alegre [RS]. Programa de Pós-Graduação em Música/UFRGS; 2013.
- Rocha SF, Dias-Neto E, Gattaz WF. Ansiedade na performance musical: tradução, adaptação e validação do Kenny Music Performance Anxiety Inventory (K-MPAI) para a língua portuguesa. *Rev Psiquiatr Clín*. 2011;38(6):217-21.
- Mei-Yuk C. The Relationship Between Music Performance Anxiety, Age, Self-Esteem, and Performance Outcomes in Hong Kong Music Students. [tese]. Durham University; 2011.
- Guilhardi HJ. Auto-estima, autoconfiança e responsabilidade. Tudo (ou quase tudo) que você precisa saber para viver melhor. Orgs.: Maria Zilah da Silva, 2002.

47. Brand M. Collectivistic versus individualistic cultures: a comparison of American, Australian and Chinese music education students' self-esteem. *Mus Educat Research*. 2007;6(1):57-66.
48. Frost RO, Marten P, Lahart C, Rosenblate R. The dimensions of perfectionism. *Cognitive Ther Res*. 1990;14:449-68.
49. Frost RO, Heimberg RG, Holt CS, Mattia JI, Neubauer, AL. A comparison of two measures of perfectionism. *Pers Indiv Differ*. 1993;14:119-26.
50. Kobori O, Yoshie M, Kudo K, Ohtsuki T. Traits and cognitions of perfectionism and their relation with coping style, effort, achievement, and performance anxiety in Japanese musicians. *J Anxiety Disord*. 2011;25:674-9.
51. Silva DR, Spielberger CD. Manual do Inventário de Estado-Traço de Ansiedade (STAI). 1983, 2007. Available from: <www.mindgarden.com>. Access on: Aug. 15, 2016.
52. Stephenson H, Quarrier N. Anxiety sensitivity and performance anxiety in college music students. *Med Probl Perform Art*. 2005;20(3):119-25.
53. Sinico A, Winter LL. Ansiedade na Performance Musical: definições, causas, sintomas, estratégias e tratamento. *Revista Conservatório de Música UFPel*. 2012;5:36-64.
54. Sinico A, Winter LL. A influência do repertório sob a ansiedade na performance musical de estudantes de flauta. *Comunicação Oral XXIII Congresso da Associação Nacional de Pesquisa e Pós-Graduação em Música – Natal*, 2013.
55. McKenzie LM. Music performance anxiety and performance degradation in students who study or have studied music at a collegiate level: a case study. [dissertation]. Tennessee State University, 2013.
56. Papageorgi I, Creech A, Welch G. Perceived performance anxiety in advanced musicians specializing in different musical genres. *Psychol Music*. 2013;41(1):18-41.
57. Yoshie M, Kudo K, Murakoshi T, Ohtsuki T. Music performance anxiety in skilled pianists: effects of social-evaluative performance situation on subjective, autonomic, and electromyographic reactions. *Exp Brain Res*. 2009;199:117-26.
58. LeBlanc A, Chand YJ, Obert M, Siivola C. The effect of Audience on Music Performance Anxiety. *J Res Music Educ*. 1997;45(3):480-96.
59. Craske MG, Craig KD. Musical performance anxiety: the three-systems model and self-efficacy theory. *Behav Res Ther*. 1984;22(3):267-80.
60. Yoshie M, Kudo K, Ohtsuki T. Effects of psychological stress on state anxiety, electromyographic activity, and arpeggio performance in pianists. *Med Probl Perform Art*. 2008;23:120-32.
61. Antoniazzi AS, Dell'Aglio DD, Bandeira DR. O conceito de coping: uma revisão teórica. *Estud Psicol*. 1998;3(2):273-94.
62. Lazarus RS, Folkman S. *Stress, appraisal, and coping*. New York: Springer Publishing Company, Inc, 1984.
63. Zakaria JB, Musib HB, Shariff SM. Overcoming performance anxiety among music undergraduates. *Procedia – Social and Behavioral Sciences*. 2013;90:226-34.
64. Allen R. Free improvisation and performance anxiety among piano students. *Psychol Music*. 2013;41(1):75-88.
65. Cerqueira DL, Lemos D, Zorzal RC, Ávila GA. Considerações sobre a aprendizagem da performance musical. *Per Musi* 2012;26:94-109.
66. Maciente MN. Estratégias de enfrentamento para a ansiedade de performance musical (APM): um olhar sobre músicos profissionais de orquestras paulistas [dissertation]. São Paulo [SP]: Escola de Comunicação e Artes; 2016.
67. Kenny D. A systematic review of treatments for music performance anxiety. *Anxiety Stress Coping*. 2005;18(3):183-208.
68. Bruges AO. Music performance anxiety-part 2. A review of treatment options. *Med Probl Perform Art*. 2011;26(3):164-71.
69. Burin AB, Osório FL. Interventions for music performance anxiety: results from a systematic literature review. *Arch Clin Psychiatry*. 2016;43(5):116-31.
70. Nascimento SEF. Ansiedade de Performance Musical: um estudo sobre o uso de betabloqueadores por bacharelados em música [dissertation]. Belo Horizonte [MG]: Programa de Pós-Graduação em Música/UFMG; 2013.
71. Fishbein MC, Lei L-Q, Rubin SA. Long-term propranolol administration alters myocyte and ventricular geometry in rat hearts with and without infarction. *Circulation*. 1988;78(2):369-75.
72. Lima RC, Silva TNR, Alves GBO, Sampaio RF, Fonseca JGM, Lacerda LL, et al. Programa de Atenção Integral à Saúde do Artista de Performance: relato da experiência desenvolvida em um serviço universitário em Minas Gerais. *Rev Ter Ocup Univ São Paulo*. 2016;27(2):221-7.

Brief report

Is there seasonality in hospitalizations for major depressive disorder in Canada?

AISWARYA PILLAI¹, LUCIE RICHARD², SALIMAH Z. SHARIFF³, AKSHYA VASUDEV⁴

¹Psychiatry, University of Ottawa.

²Institute for Clinical Evaluative Sciences (ICES) Western Satellite Site.

³Institute for Clinical Evaluative Sciences (ICES).

⁴Psychiatry and Medicine, Western University.

Institution where the study was conducted: Institute for Clinical Evaluative Sciences (ICES) Western, London, Ontario, Canada

Received: 04/29/2017 – Accepted: 05/24/2017

DOI: 10.1590/0101-6083000000137

Abstract

Background: Canada, a temperate country with four defined seasons incurs an annual productivity loss of over \$30 billion on major depressive disorder (MDD); however it remains unknown whether inpatient hospitalization for MDD exhibits seasonal variations. **Objective:** Our study objective was to determine if there are seasonal variations in hospitalization rates for MDD in Canada. **Methods:** We used time series analysis to determine monthly rates of hospitalizations for MDD from 2006 – 2013, on data from population level health-administrative databases in Ontario, Canada. We also stratified analysis by gender and three age groups: 18 to 39, 40 to 65 and those over 65. We compared demographic and comorbidity profiles of patients admitted in April, August and December to elucidate if patient characteristics differed by season of admission. **Results:** We identified a total of 130,336 admissions for MDD for 95,439 unique patients. Baseline characteristics of the patients were similar across seasons. We did not detect significant seasonality of hospitalizations for MDD across any of the gender or age subgroups. **Discussion:** Our results question the popularly held belief that hospitalizations for MDD vary with seasons. These findings highlight the need for uniform hospital resource allocation for MDD throughout the year in Canada.

Pillai A et al. / Arch Clin Psychiatry. 2017;44(5):134-6

Keywords: MDD, depression, seasonality, Canada, ICES.

Introduction

Canada incurs an annual health care cost of \$51 billion for managing 6.7 million people living with mental illnesses, and an estimated \$32.3 billion productivity loss is incurred by the country annually on the most common mental illness, major depressive disorder (MDD)¹. Depression, by its clinical nature, is prone to recur with moderate to severe major depressive episodes often needing hospitalization for treatment, stabilization and risk management^{2,3}. Existing literature has shown seasonal variations in the rates of hospital admissions for MDD across the world. A Polish study found that more hospitalizations for depression occurred during spring and autumn⁴. In Norway, admission rates for depression were highest in November for women while it was highest in April for men⁵. In contrast, a recent Canadian study that used the National Population Health Survey and the Canadian Community Health Survey data showed that the highest proportion of a self-diagnosed depressive episode occurred in December, January and February and the lowest proportions occurred in June, July and August⁶. To our knowledge, no previous study has attempted to examine if there is seasonality in inpatient hospitalization rates for MDD in Canada. It is important to assess such rates for MDD, as hospitalization is a direct measure of the extent of hospital usage. Hence, we conducted a population-based study in Canada's most populous province, Ontario, to assess whether rates of hospital admissions for MDD exhibit seasonal variation.

Methods

This study was approved by the institutional review board at Sunnybrook Health Sciences Centre, Toronto, Canada.

Using linked healthcare databases, we performed time series analyses of the rates of hospitalizations for MDD in Ontario, Canada from January 1, 2006 until December 31, 2013. We collected all hospital encounters for MDD for residents of Ontario aged 18 and older using the Ontario Mental Health Reporting System, which

codes information on all patients admitted to inpatient psychiatry units across the province, and the Discharge Abstract Database (DAD), which captures data for discharges from other inpatient hospital beds. MDD was captured using International Classification of Diseases, 10th Revision codes (ICD-10) codes F32, F33, F412, F480, or the Diagnostic and Statistical Manual IV (DSM-IV) codes 29630 through 29635, 29620 through 29625 and 311. Our study time frame was divided into one month intervals. If included individuals had more than one hospitalization in a monthly interval, we counted only their first encounter during the relevant interval to ensure estimates were not driven by select individuals transferred from one institution to another. We stratified encounters for males and females in three age groups; working age adults aged 18 to 39, middle aged 40 to 65 years, and, seniors as those over 65. Rates were calculated by dividing the number of monthly encounters by the estimated population of Ontario for the appropriate year, gender and age group. Population estimates were provided by IntelliHealth Ontario⁷.

Patient age and gender was obtained from the Registered Persons Database. Presence of common comorbid conditions such as dementia, alcoholism and psychosis were determined using the Discharge Abstract and National Ambulatory Care Reporting System databases. Antidepressant use among the over 65 group was determined using the Ontario Drug Benefit database. These datasets were linked using unique coded identifiers and analyzed at the Institute of Clinical Evaluative Sciences (ICES).

To compare characteristics of patients hospitalized for MDD during the four main seasons, we investigated patients admitted during April, August and December to represent the three quarters of the year from 2007–2009. Presence of comorbid conditions were identified and flagged if found within 5 years of the hospitalization. Also, antidepressant use among patients above age 65 was identified and flagged if dispensed within 120 days of the hospitalization.

To assess seasonality, we applied descriptive time-series analyses. We tested for seasonality using the Fisher's Kappa and

Bartlett Kolmogorov Smirnov (BKS) statistics, which tests the null hypothesis that the series consists of random noise. We then used R^2 autoregression coefficients from a model fitted to the series to quantify the strength of seasonality. The values of 0 to < 0.4 represent non-existent to weak seasonality, 0.4 to < 0.7 represent moderate seasonality, and values higher than 0.7 represent strong seasonality⁸. All analyses were completed using SAS Enterprise Guide Version 6.1 (SAS Institute, Cary, North Carolina).

Results

Over the 91-month study window (2006-2013), we identified 158,376 inpatient hospitalizations for MDD. We excluded 28,040 hospitalizations due to missing or invalid health card numbers, invalid age (missing or under 18), non-Ontario residency at the time of the encounter, or where a patient had another encounter during the relevant interval, creating a final cohort of 130,336 hospitalizations for 95,439 unique patients. Over the study period, the rate of monthly hospitalizations for MDD remained relatively stable and was higher in females ranging from 0.13-0.16 compared to 0.10-0.13 for males per 1000 persons. Females consistently experienced increased rates of hospitalizations compared to males across all age groups. Baseline characteristics of the patients were, for the most part, similar across seasons. Notable exceptions to this trend included males aged 18 to 39 admitted in April who were less likely to have had a prior comorbid diagnosis of psychosis, alcoholism or drug dependence compared to those admitted in August or December, and elderly males seen in August were more likely to have had a prior history of alcoholism.

We did not detect significant seasonality of hospitalizations for MDD across any of the female subgroups (Figure 1). Although males aged 18-39 showed significant values for Fisher’s Kappa and BKS statistics, the R^2 statistic failed to provide evidence of substantive seasonal variation (R^2 values were 0.2 and 0.24, for males aged 18-39 and males overall, respectively).

Discussion

Our study, which utilized a database that constituted a large, representative sample of inpatient admissions in Ontario, Canada, showed that there is no seasonal variation in hospitalizations for MDD across both the genders. Our findings contrast with seasonality observed in MDD hospitalizations in Norway and Poland^{4,5}. Our results suggest that the specific demographic structure of Ontario, Canada, which includes an enriched multi-cultural society with a high proportion of an immigrant population, nullifies the theoretical effect of a geographical temperate climate causing increased risk of depression related hospitalization in the winter months. The findings of our study should help the government, policy makers and hospital managers plan appropriate resources towards adequate number of inpatient mental health beds for the management of MDD through the year.

Another recent Canadian study, however, did show higher rates of self-diagnosed depressive symptoms in the winter months⁶. In contrast to that study which used survey data, we used inpatient hospitalization data for our analysis and hence our findings are reflective of inpatient healthcare needs. This variance in findings does have important clinical implications as the combined data suggests that patients likely with underlying MDD continue to have higher rates of self-diagnosed depression in the winters in Ontario, but, they likely do not meet the severity threshold of a major depressive episode warranting an inpatient hospital admission during these months. Inpatient hospitalization remains a major determinant of severity of MDD and resource utilization⁹.

Currently, there is lack of specificity in out-patient coding for MDD in Ontario, hence we restricted our study to inpatient hospitalization only. However, our study cannot rule out possible seasonal variation of presentation to other healthcare services, such as primary care services or emergency room visits. Our results point to the fact that more research is warranted on the seasonality of

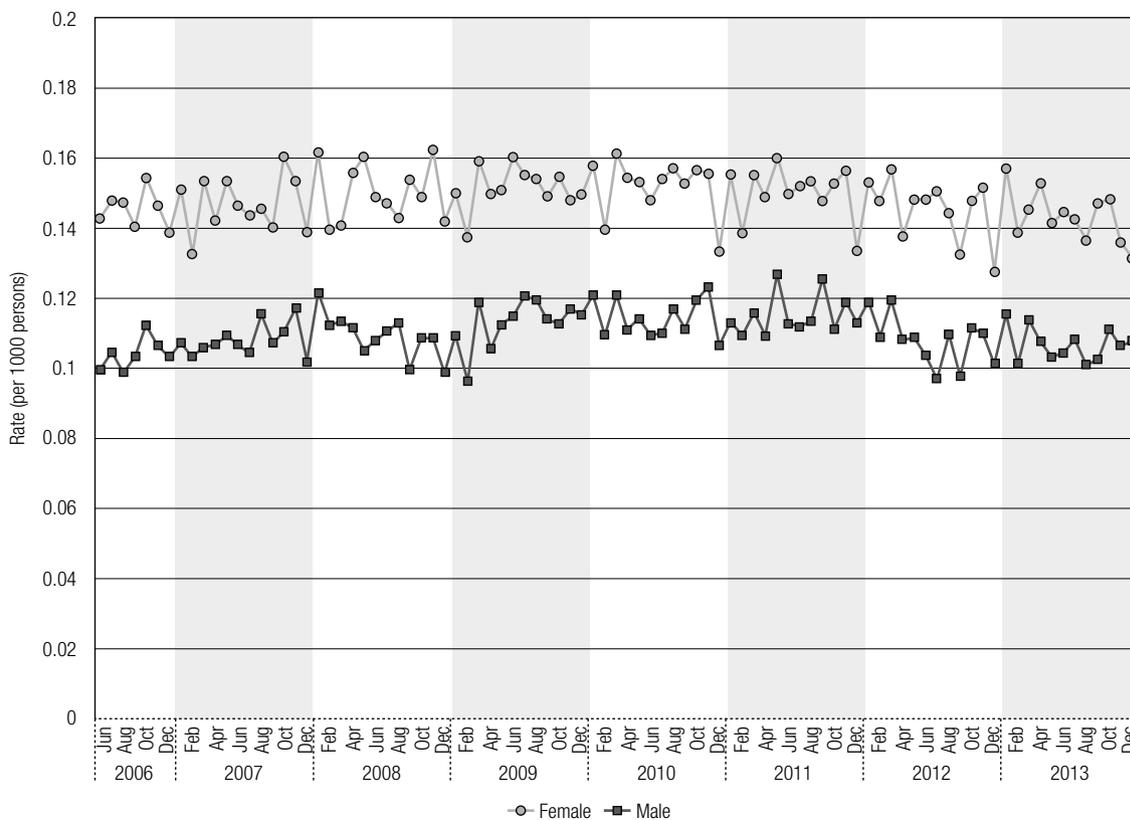


Figure 1. Monthly rate (per 1000 persons) of hospitalization for major depressive disorder in Ontario.

MDD, especially in Canada's other provinces and other countries where there are four well delineated seasons. To elicit a more comprehensive account of seasonal variation in the presentation of MDD, future research should consider utilizing additional data from the emergency room, primary care and outpatient mental health settings.

Acknowledgement

This study was conducted at the ICES Western Site. ICES is funded by an annual grant from the Ontario Ministry of Health and Long-Term Care (MOHLTC). Core funding for ICES Western is provided by Academic Medical Organization of Southwestern Ontario (AMOSO), the Schulich School of Medicine and Dentistry (SSMD), Western University, and the Lawson Health Research Institute (LHRI). The opinions, results and conclusions are those of the authors and are independent from the funding sources. No endorsement by ICES, AMOSO, SSMD, LHRI or the MOHLTC is intended or should be inferred. Parts of this material are based on data and information compiled and provided by the Canadian Institute for Health Information (CIHI). However, the analyses, conclusions, opinions and statements expressed herein are those of the authors, and not necessarily those of CIHI. Ontario population estimates were derived from information provided by IntelliHEALTH Ontario.

Funding

This study was funded by an Innovation Fund of the Alternative Funding Plan of the Academic Health Sciences Centers of Ontario.

Declaration of conflicting interests

The authors declare that there is no conflict of interest.

References

1. Unmet Mental Health Care Needs Costing Canadian Economy Billions. 2017.
2. Dinger U, Klipsch O, Köhling J, Ehrental JC, Nikendei C, Herzog W, et al. Day-clinic and inpatient psychotherapy for depression (DIP-D): a randomized controlled pilot study in routine clinical care. *Psychother Psychosom.* 2014;83(3):194-5.
3. When Hospitalization is Needed for Depression. 2017. Ref Type: Online Source. Available from: <https://www.promises.com/articles/depression-articles/when-hospitalization-is-needed-for-depression/>. Access on: Sep. 14, 2016.
4. Dominiak M, Swiecicki L, Rybakowski J. Psychiatric hospitalizations for affective disorders in Warsaw, Poland: Effect of season and intensity of sunlight. *Psychiatry Res.* 2015;229(1-2):287-94.
5. Morken G, Lilleeng S, Linaker OM. Seasonal variation in suicides and in admissions to hospital for mania and depression. *J Affect Disord.* 2002;69(1-3):39-45.
6. Patten SB, Williams JV, Lavorato DH, Bulloch AG, Fiest KM, Wang JL, et al. Seasonal variation in major depressive episode prevalence in Canada. *Epidemiol Psychiatr Sci.* 2017;26(2):169-76.
7. Population Estimates 2006-2013, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO. 2016. Available from: <https://intellihealth.moh.gov.on.ca/>. Access on: Oct. 18, 2016.
8. Moineddin R, Upshur RE, Crighton E, Mamdani M. Autoregression as a means of assessing the strength of seasonality in a time series. *Popul Health Metr.* 2003;1(1):10.
9. Fiest KM, Jette N, Quan H, St Germaine-Smith C, Metcalfe A, Patten SB, et al. Systematic review and assessment of validated case definitions for depression in administrative data. *BMC Psychiatry.* 2014;14:289.

Trismus secondary to valproate treatment in a woman with bipolar disorder: a case report

MARIANE BAGATIN BERMUDEZ¹, DIEGO FABIAN KARVAT GRACIA¹, DIEGO LIBRENZA GARCIA¹, ELISA GONÇALVES DA CUNHA¹, FELLIPE MATOS MELO CAMPOS¹, THIAGO VINÍCIUS DE LIMA SANTISTEVAN¹, GLEDIS LISIANE CORREA LUZ MOTTA²

¹ Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSA), Porto Alegre, RS, Brazil.

² Hospital Materno Infantil Presidente Vargas, Porto Alegre, RS, Brazil

Received: 03/13/2017 – Accepted: 07/19/2017

DOI: 10.1590/0101-6083000000138

Bermudez MB et al. / Arch Clin Psychiatry. 2017;44(5):137

Dear Editor,

Muscle contracture is a common symptom of valproate. However, there is no report in the literature of lockjaw (trismus) associated with this drug. We therefore present a case of lockjaw during valproate treatment in a patient with bipolar disorder and hypoparathyroidism.

A 62-year-old Caucasian female was admitted on November, 2015 at a psychiatric unit during a manic episode. Patient was previously diagnosed with bipolar disorder and had manic and depressive episodes in the past. She underwent a total thyroidectomy three months prior to her admission, for suspicion of malignancy (not confirmed by biopsy) and has been since then in treatment for hypothyroidism and iatrogenic hypoparathyroidism with levothyroxine, calcitriol and calcium carbonate. She had no cognitive impairment and no relevant findings in laboratory exams. A cerebral perfusion scintigraphy was performed showing slight hypoperfusion in the frontal lobe and posterior cerebellar areas. It is noteworthy that the patient did not tolerate lithium carbonate due to severe extremity tremors. Therefore, valproate was initiated and gradually increased up to 1000 mg/day. She developed lockjaw three days after. She was unable to open her mouth and also fractured two teeth. She had difficulty in diction and in chewing food. No painful symptom or other muscular manifestation had been reported. Biperiden and clonazepam were prescribed without response. She had no prior symptoms of muscular spasm and she denied previous use of valproate. The diagnosis of valproate-induced trismus was made after other causes of trismus, such as infections, neurological illness and oro-dental abnormalities were excluded. The laboratory tests show no alterations on serum levels of TSH, PTH, phosphate and calcium. Thus, the valproate was replaced by olanzapine, which lead to symptom resolution. Patient has been in follow-up for two years and did not have any trismus symptoms since valproic acid withdrawal.

Trismus is defined as a tonic contraction of the muscles of mastication with mouth opening of ≤ 35 mm¹. It can result in difficulty in activities such as biting, chewing, swallowing and speaking and may further lead to poor oral hygiene, pain and weight loss². Some of the causal factors implicated in this condition are tumors, infections, surgery and radiotherapy complications, and drugs side effect³. There are case reports of trismus induced by succinylcholine⁴ and duloxetine⁵, but none regarding this side effect

with valproate. A recent systematic review of the untoward effects of valproate showed that drug-induced parkinsonism is a relatively common side effect in elderly women⁶. It's known that valproate can safely be used in patients with thyroid and parathyroid dysfunction, once it does not interfere on these hormone levels⁷. The mechanism of how valproate can induce trismus is unclear. A preclinical study found that low concentrations of valproate can induce muscle contractions, which were abolished by indomethacin.⁸ Therefore, prostaglandins may be implicated in the contractile effect of valproate⁸.

In summary, the present study was the first to show a valproate-induced trismus. This case report demonstrates that clinicians need to be vigilant for potential side effects after the beginning of a treatment with a psychoactive drug even when they are not reported in the scientific literature.

References

1. Dijkstra PU, Kalk WWI, Roodenburg JLN. Trismus in head and neck oncology: a systematic review. *Oral Oncol.* 2004;40(9):879-89.
2. Lee R, Slevin N, Musgrove B, Swindell R, Molassiotis A. Prediction of post-treatment trismus in head and neck cancer patients. *Br J Oral Maxillofac Surg.* 2012;50(4):328-32.
3. Agarwal P, Shiva Kumar HR, Rai KK. Trismus in oral cancer patients undergoing surgery and radiotherapy. *J Oral Biol craniofacial Res.* 2016;6(Suppl 1):S9-S13.
4. Fitzpatrick LR. Succinylcholine Administration : A Case Report. 2008;76(5):349-54.
5. Chen PY, Lin PY, Tien SC, Chang YY, Lee Y. Duloxetine-related tardive dystonia and tardive dyskinesia: a case report. *Gen Hosp Psychiatry.* 2010;32(6):646.e9-646.e11.
6. Nanau RM, Neuman MG. Adverse drug reactions induced by valproic acid. *Clin Biochem.* 2013;46(15):1323-38.
7. Caksen H, Dulger H, Cesur Y, Odabas D, Tuncer O, Atas B. No effect of long-term valproate therapy on thyroid and parathyroid functions in children. *Int J Neurosci.* 2002;112(11):1371-4.
8. Kristev A, Peichev L, Zaprianov G, Lukanov J. Effect of sodium valproate on the spontaneous contractile and bioelectric activity of smooth muscle fibres isolated from experimental animals. *Folia Med (Plovdiv).* 1994;36(3):11-9.