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Τηλ.: 210-77 58 410, Fax: 210-77 09 044

Εκδότης:
Ελληνική Ψυχιατρική Εταιρεία
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Disaster Psychiatry: An urgent field in psychiatry posing a pertinent question

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Disasters, both natural and man-made, impose a significant burden on the mental health of individuals, communities, and societies. The frequency and intensity of disasters are increasing; 3–4fold compared to the last century, with 400–500 significant disasters/year, affecting >1.5 billion people worldwide and costing 250–400 billion dollars/year. Most natural disasters are directly or indirectly linked to climate change, itself a natural disaster of human origin. Armed conflict is another human self-infliction; 59 state-based conflicts are currently active, the highest since WW2 (Uppsala Conflict Data Program-UCDP¹).

The mental health impact of disasters is multifaceted, influencing both immediate and long-term mental health outcomes. Acute stress, anxiety, depression, and post-traumatic stress disorder (PTSD) represent just the direct impact of disasters on mental health. Forced displacement, economic hardship, and societal matrix disturbance can predispose survivors – especially the most vulnerable – to longer-term and indirect mental health morbidity. In some cases, there may be persistent, even transgenerational morbidity.^{2,3}

Disasters also have important systemic effects, especially in less well-developed systems, where disasters cause acute-on-chronic failures. The ethical handicap is that pressured systems fail exactly where the most vulnerable need them intact. Indeed, in disasters, mental health services are likely to fail early.^{2–4}

Disaster Psychiatry is a branch dedicated to preventing, preparing for, and responding to the mental health consequences of disasters. It relies on a range of evidence-based interventions designed to address the acute response to disasters, but more importantly, to address future disasters by prevention and preparedness.

Acute disaster response refers to supporting individuals and the wider system at times of crisis. It is well covered by guidelines by the WHO/IASC, the Sphere, RCPsych, APA, and the World Psychiatric Association, Section on Disaster Psychiatry.⁵ Beyond practical support and good clinical care, several well-supported interventions deal with the clinical sequelae of disasters. A key intervention is Psychological First Aid (PFA), which focuses on providing immediate and practical support to individuals following a disaster. Among others, effective therapeutic interventions include Eye Movement Desensitization and Reprocessing (EMDR), Cognitive-behavioral therapy (CBT), which has emerged as a gold standard for treating PTSD in meta-research, and Exposure Therapy (ET) which has lately been enhanced by XR and AI integration.

To minimize the escalation of disaster-related psychopathology, early intervention, social support, and good access to mental health services are critical. Supporting the wider system before, during, and after disasters includes psychoeducation and support for front-line responders, advising decision-makers, facilitating coordination and effective communication between services and up and down the chain of command, as well as assuming leadership when necessary.

While acute response is important, the most effective strategies for disaster psychiatry are prevention and preparedness. Disaster prevention has a broad scope involving measures that heavily rely on foresight and require multifaceted, often political, interventions. Disaster preparedness, on the other hand, focuses on enhancing individual and systemic resilience before an impending disaster. For communities, key interventions include precision screening to inform targeted prevention, community-based mental health promotion, and community-based preparedness training programs in stress management and coping skills, among others. Government and healthcare organizations also play a pivotal role in disaster preparedness; establishing effective and well-trained mental health response teams, training frontline non-mental healthcare professionals in disaster psychiatry, and ensuring that mental health services are integrated into formal disaster response plans can dramatically help. Disaster preparedness effectively constitutes secondary and tertiary preventive measures against potential psychiatric morbidity. Additionally, fostering global collaboration in research and policy development is essential. The World Health Organization (WHO) has set a global target of 80% of countries to have a system for mental health and psychosocial preparedness for disasters by 2030⁶ and the Inter-Agency Standing Committee (IASC) has called for increased

attention to mental health in disaster planning, emphasizing the need for an evidence-based, coordinated, and pro-implementation approach to disaster psychiatry.⁷

With major impending disasters like climate change, Disaster Psychiatry is posing a pertinent question: What is a psychiatrist's role in disasters? All doctors are trained to care for individual patients; therefore, responding to the clinical aftermath of disasters is familiar territory. However, disaster prevention and preparedness require a collective approach, promoting health across the wider society, as well as using selective and indicated prevention strategies, where appropriate. Furthermore, they require psychiatrists to inform decision-makers and advocate for disaster prevention measures that lie beyond the strict remit of mental health. This broader role of political advocacy constitutes a significant, but perhaps necessary, paradigm shift for the role of psychiatrists and an existential question for psychiatry.

Nikos Christodoulou

MBBS, MSc, PhD, MRCPsych,

*Associate Professor of Psychiatry, University of Thessaly Medical School,
Head, Department of Psychiatry, University Hospital of Larisa,
Chair, World Psychiatric Association, Section of Disaster Psychiatry*

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Άρθρο σύνταξης

Ψυχιατρική Καταστροφών: Ένας επείγων τομέας στην ψυχιατρική που θέτει ένα καίριο ερώτημα

ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ: Παραλήφθηκε 7 Δεκεμβρίου 2024/Δημοσιεύθηκε Διαδικτυακά 15 Δεκεμβρίου 2024

Οι καταστροφές, είτε φυσικές είτε ανθρωπογενείς, επιβαρύνουν σημαντικά την ψυχική υγεία των ατόμων, των κοινοτήτων και των κοινωνιών. Η συχνότητα και η ένταση των καταστροφών αυξάνονται: 3-4 φορές περισσότερο σε σχέση με τον περασμένο αιώνα, 400-500 σημαντικές καταστροφές/έτος, επηρεάζοντας πάνω από 1,5 δισεκατομμύριο ανθρώπους παγκοσμίως και κοστίζοντας 250-400 δισεκατομμύρια δολάρια τον χρόνο. Οι περισσότερες φυσικές καταστροφές συνδέονται άμεσα ή έμμεσα με την κλιματική αλλαγή, η οποία αποτελεί και η ίδια φυσική καταστροφή ανθρωπογενούς προέλευσης. Οι ένοπλες συγκρούσεις είναι μια ακόμη αυτοπροκληθείσα ανθρωπογενής καταστροφή: 59 κρατικές συγκρούσεις βρίσκονται σε εξέλιξη αυτή τη στιγμή, ο υψηλότερος αριθμός από τον Β΄ Παγκόσμιο Πόλεμο (Uppsala Conflict Data Program-UCDP¹).

Ο αντίκτυπος των καταστροφών στην ψυχική υγεία είναι πολυδιάστατος, επηρεάζοντας την ψυχική υγεία τόσο άμεσα όσο και μακροπρόθεσμα. Το οξύ στρες, το άγχος, η κατάθλιψη και η διαταραχή μετατραυματικού στρες (PTSD) αποτελούν τις άμεσες συνέπειες των καταστροφών στην ψυχική υγεία. Η αναγκαστική μετακίνηση πληθυσμού, οι οικονομικές δυσκολίες και η διατάραξη της κοινωνικής δομής μπορούν να προδιαθέσουν τους επιζώντες μιας καταστροφής –ιδιαίτερα τους πιο ευάλωτους– σε μακροχρόνια και έμμεση ψυχική νοσηρότητα. Σε ορισμένες περιπτώσεις, είναι πιθανό να υπάρξουν επίμονες, ακόμα και διαγενεακές επιπτώσεις.^{2,3}

Οι καταστροφές επηρεάζουν επίσης σημαντικά τα συστήματα, ιδίως τα λιγότερο ανεπτυγμένα, όπου οι καταστροφές προκαλούν οξείες επί χρονίων δυσλειτουργίες. Το ηθικό πρόβλημα εδώ έγκειται στο ότι τα υπό πίεση συστήματα αποτυγχάνουν ακριβώς εκεί όπου οι πιο ευάλωτοι τα χρειάζονται να είναι λειτουργικά. Πράγματι, κατά τη διάρκεια καταστροφών, οι υπηρεσίες ψυχικής υγείας είναι πολύ πιθανό να καταρρεύσουν νωρίς.²⁻⁴

Η Ψυχιατρική Καταστροφών είναι ένας κλάδος της ψυχιατρικής που ασχολείται με την πρόληψη, την ετοιμότητα και την αντιμετώπιση των συνεπειών των καταστροφών στην ψυχική υγεία. Βασίζεται σε μια σειρά από τεκμηριωμένες παρεμβάσεις, οι οποίες αποσκοπούν όχι μόνο στην άμεση αντιμετώπιση καταστροφών, αλλά κυρίως στην πρόληψη και στην ετοιμότητα για μελλοντικές καταστροφές.

Η οξεία αντιμετώπιση καταστροφών αφορά την υποστήριξη ατόμων και του ευρύτερου συστήματος σε περιόδους κρίσης. Αυτή καλύπτεται επαρκώς από κατευθυντήριες γραμμές του ΠΟΥ/IASC, της Sphere, του RCPsych, της APA, καθώς και του Τομέα Ψυχιατρικής Καταστροφών της Παγκόσμιας Ψυχιατρικής Εταιρείας.⁵ Πέραν της πρακτικής υποστήριξης και της καλής κλινικής φροντίδας, υπάρχουν αρκετές τεκμηριωμένες παρεμβάσεις για την αντιμετώπιση των κλινικών συνεπειών των καταστροφών. Μια βασική παρέμβαση είναι η Ψυχολογική Πρώτη Βοήθεια (Psychological First Aid - PFA), η οποία επικεντρώνεται στην παροχή άμεσης και πρακτικής υποστήριξης στα άτομα μετά από μια καταστροφή. Μεταξύ άλλων, αποτελεσματικές θεραπευτικές παρεμβάσεις περιλαμβάνουν την απευαισθητοποίηση και επανεπεξεργασία μέσω οφθαλμικών κινήσεων (Eye Movement Desensitization and Reprocessing - EMDR), τη Γνωσιακή-Συμπεριφορική Θεραπεία (Cognitive Behavioural Therapy - CBT), που έχει αναδειχθεί στη μετα-έρευνα ως η πρώτη επιλογή για τη θεραπεία της PTSD, και τη Θεραπεία Έκθεσης (Exposure Therapy - ET), η οποία τελευταία έχει ενισχυθεί μέσω ενσωμάτωσης των τεχνολογιών XR και AI.

Για την ελαχιστοποίηση της κλιμάκωσης της ψυχοπαθολογίας που σχετίζεται με καταστροφές, είναι κρίσιμη η έγκαιρη παρέμβαση, η κοινωνική υποστήριξη και η καλή πρόσβαση σε υπηρεσίες ψυχικής υγείας. Η υποστήριξη του ευρύτερου συστήματος πριν, κατά τη διάρκεια και μετά τις καταστροφές περιλαμβάνει την ψυχοεκπαίδευση και την υποστήριξη των επαγγελματιών υγείας της πρώτης γραμμής, τη συμβουλευτική υποστήριξη των ιθυνόντων, τη διευκόλυνση του συντονισμού και της αποτελεσματικής επικοινωνίας μεταξύ των εμπλεκόμενων υπηρεσιών, καθώς και την ανάληψη ηγετικού ρόλου όταν χρειάζεται.

Ενώ η άμεση αντιμετώπιση των καταστροφών είναι σημαντική, οι πιο αποτελεσματικές στρατηγικές για την Ψυχιατρική Καταστροφών είναι η πρόληψη και η ετοιμότητα. Η πρόληψη των καταστροφών έχει ευρύ πεδίο που περιλαμβάνει μέτρα τα οποία βασίζονται έντονα στη διορατικότητα και συχνά απαιτούν πολύπλευρες παρεμβάσεις, που συχνά είναι και πολιτικές. Από την άλλη πλευρά, η ετοιμότητα για καταστροφές επικεντρώνεται στην ενίσχυση της ατομικής και συστημικής ανθεκτικότητας πριν

από μια επικείμενη καταστροφή. Για τις κοινότητες, βασικές παρεμβάσεις περιλαμβάνουν την ακριβή ανίχνευση για να επιτευχθεί στοχευμένη πρόληψη, την προαγωγή ψυχικής υγείας σε κοινοτικό επίπεδο, τα κοινοτικά εκπαιδευτικά προγράμματα ετοιμότητας για τη διαχείριση του στρες και για δεξιότητες αυτοδιαχείρισης, μεταξύ άλλων. Οι κυβερνήσεις και οι οργανισμοί υγειονομικής περίθαλψης διαδραματίζουν επίσης καθοριστικό ρόλο στην ετοιμότητα για τις καταστροφές. Η δημιουργία αποτελεσματικών και καλά εκπαιδευμένων ομάδων ανταπόκρισης, η εκπαίδευση στην ψυχιατρική καταστροφών, των επαγγελματιών υγείας της πρώτης γραμμής που δεν ειδικεύονται στην ψυχική υγεία, καθώς και η ενσωμάτωση υπηρεσιών ψυχικής υγείας στα επίσημα σχέδια ανταπόκρισης σε καταστροφές μπορούν να βοηθήσουν σημαντικά. Η ετοιμότητα για καταστροφές συνιστά ουσιαστικά δευτερογενή και τριτογενή προληπτικά μέτρα έναντι της πιθανής ψυχιατρικής νοσηρότητας. Επιπλέον, είναι απαραίτητη η ενίσχυση της παγκόσμιας συνεργασίας στην έρευνα και στην ανάπτυξη πολιτικών. Ο Παγκόσμιος Οργανισμός Υγείας (ΠΟΥ) έχει θέσει ως στόχο το 80% των χωρών να διαθέτουν σύστημα για την ψυχική υγεία και την ψυχοκοινωνική ετοιμότητα για καταστροφές έως το 2030,⁶ ενώ η Inter-Agency Standing Committee (IASC) έχει ζητήσει αυξημένη προσοχή στην ψυχική υγεία στον σχεδιασμό για καταστροφές, δίνοντας έμφαση στην ανάγκη για τεκμηριωμένη, συντονισμένη και προσανατολισμένη στην εφαρμογή προσέγγιση για την ψυχιατρική των καταστροφών.⁷

Με επικείμενες μεγάλες καταστροφές, όπως η κλιματική αλλαγή, η Ψυχιατρική Καταστροφών θέτει ένα σημαντικό ερώτημα: Ποιος είναι ο ρόλος του ψυχιάτρου στις καταστροφές; Όλοι οι γιατροί είναι εκπαιδευμένοι να φροντίζουν ασθενείς ατομικά, επομένως η ανταπόκριση στις κλινικές συνέπειες των καταστροφών είναι γνώριμο πεδίο για τους γιατρούς. Ωστόσο, η πρόληψη και η ετοιμότητα για καταστροφές απαιτούν μια συλλογική προσέγγιση, προάγοντας την υγεία σε ολόκληρη την κοινωνία, καθώς και τη χρήση επιλεκτικών και ενδεδειγμένων στρατηγικών πρόληψης, όπου χρειάζεται. Επιπλέον, απαιτούν από τους ψυχιάτρους να υποστηρίζουν συμβουλευτικά τους υπεύθυνους λήψης αποφάσεων προτείνοντας μέτρα πρόληψης καταστροφών, τα οποία ενδέχεται να μη συνδέονται άμεσα με την ψυχική υγεία. Αυτός ο ευρύτερα πολιτικός ρόλος αποτελεί μια σημαντική, αλλά ίσως αναγκαία, αλλαγή παραδείγματος για τον ρόλο των ψυχιάτρων και ένα υπαρκτό ερώτημα για την ψυχιατρική.

Νίκος Χριστοδούλου,

MBBS, MSc, PhD, MRCPsych,

Αναπληρωτής Καθηγητής Ψυχιατρικής, Τμήμα Ιατρικής, Πανεπιστήμιο Θεσσαλίας,

Διευθυντής Πανεπιστημιακής Ψυχιατρικής Κλινικής, Π.Γ.Ν. Λάρισας,

Πρόεδρος, Τομέας Ψυχιατρικής Καταστροφών, Παγκόσμια Ψυχιατρική Εταιρεία

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Research article

The impact of the COVID-19 pandemic on hospital admissions in a psychiatric ward in a general hospital in Greece

Ioanna Athina Botsari,^{1*} Anastasios Papatsoris,^{2*} Petros Argitis,² Nicholas-Tiberio Economou,³ Vaios Peritogiannis⁴

¹Early Intervention in Psychosis Unit, University Mental Health Research Institute, Athens,

²Department of Psychiatry, General Hospital of Corfu, Corfu,

³Sleep Study Unit, Department of Psychiatry, University of Athens, Athens,

⁴Mobile Mental Health Unit of the prefectures of Ioannina and Thesprotia, Society for the Promotion of Mental Health in Epirus, Ioannina, Greece

*These two authors contributed equally to this work

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ABSTRACT

The negative consequences of the COVID-19 pandemic and the subsequent restrictive measures on the mental health and well-being of the population and psychiatric patients have been widely recognized. Patients' treatment attendance and engagement with mental health services had been negatively affected by the pandemic, whereas patients were less likely to receive timely outpatient care. The pandemic also impacted the use of inpatient services. The present study aimed to explore the variability of attendance and admissions to a general hospital psychiatric ward over a 12-month interval after the onset of the pandemic (March 2020), compared to the respective 12-month pre-pandemic interval. A retrospective, observational pre/post study was performed, involving a general hospital psychiatric ward in Corfu, Northwest Greece, which serves an insular catchment area of approximately 100,000 inhabitants. For data analysis, c- and u-charts of statistical process control charts were employed, using monthly data (March 2019 to February 2021). Overall, a significant decline in attendance rates was observed, mostly accounted for by a 26.5% reduction in voluntary attendance rates (1516 patients prior vs. 1114 patients after the onset of the pandemic). The involuntary commitment of patients did not differ between the two periods (106 prior vs. 100 after the onset of the pandemic). Admission rates did not change significantly between the two periods. Diagnoses that exhibited significant variance in examinations between the two study periods were mood disorders and personality disorders, whereas there was no significant variation in the number of admissions across different diagnoses. Length of hospital stay increased significantly by 13.2% over the first year of the pandemic, from 25.57 days (Md= 13, IQR= 22) during the pre-COVID-19 period to 28.95 days (Md= 22, IQR= 28) during the COVID-19 period. Patients with schizophrenia and related disorders (Mean= 34.25 days, SD= 43.19) and mood disorders (Mean= 26.26, SD= 33.48) had prolonged hospital stays compared to other diagnoses. These findings highlight significant shifts in psychiatric care delivery during the pandemic and underscore the need for targeted interventions to address the evolving demands on mental health services during public health crises.

KEYWORDS: Admissions, COVID-19 pandemic, emergency attendance, general hospital psychiatric ward, involuntary admissions, length of hospital stay.

Introduction

As a result of the COVID-19 outbreak in early 2020, most countries imposed restrictive measures that affected the mental health of the population and the mental healthcare systems globally. A survey in 130 countries found that mental healthcare needs had increased over the COVID-19 pandemic, whereas access to mental health services had been disrupted in 93% of countries.¹ The consequences of the COVID-19 pandemic and the subsequent restrictive measures on the mental health and well-being of the general population have been widely recognized and high rates of negative mental health outcomes have been reported.^{2,3} However, a wide variability in the prevalence of pandemic-associated mental health problems and psychosocial consequences has been observed across countries.⁴ Patients' attendance to treatment and engagement with mental health services had also been affected by the pandemic, whereas community and rehabilitation services had been considerably reduced or occasionally ceased; accordingly, patients were less likely to receive timely outpatient care.⁵

The application of restrictive measures also impacted patients' access to inpatient psychiatric services. In Spain, a 37.9% decrease in psychiatric admissions was recorded, but the percentage of emergency admissions increased.⁶ Other research in Italy found that during the COVID-19 lockdown, a 41% reduction in psychiatric admissions took place, which was restored in the post-lockdown period, whereas an increase in long-stay admissions was also observed.⁷ Less profound a reduction in mental hospital admissions was observed in Malta⁸ and Switzerland,⁹ where an increase in the proportion of involuntary admissions was recorded.

Changes in inpatient psychiatric wards had also been reported, concerning the increase of the threshold for admission, the reduction of the provided services, the reduction of bed availability, and early discharge.^{5,10} Practices such as restricting patients from leaving the hospital or from receiving visits and reducing activities within the wards have also been applied.⁵

In Greece, several studies have addressed the psychological impact of the COVID-19 pandemic on the general population^{11–13} and on persons with pre-existing mental health problems,¹⁴ yet, to the best of our knowledge, there have been no studies addressing the effect of the pandemic on psychiatric admissions. The aim of the present study was therefore to assess attendance and admissions to a psychiatric ward in a general hospital over the first two waves of the pandemic and to compare attendance and admissions over the first year of the pandemic with the respective period before the pandemic.

Materials and Method

Participants

The study was conducted in the psychiatric emergency department and the psychiatric ward of the general hospital of Corfu, Northwest Greece, which serves an insular catchment area of approximately 100,000 inhabitants. The study involved adult individuals seeking assessment and subsequently admitted to the acute and short-stay units within the psychiatric ward of the hospital which has a 24-bed capacity. The research procedures were approved by the Scientific Committee of the General Hospital of Corfu, which waived the need for patients' informed consent due to the retrospective, observational design of the study.

Procedures

The study included adult patients who were either referred voluntarily or involuntarily to the emergency psychiatric department or were admitted to the adult psychiatric ward of the General Hospital of Corfu from March 2019 to February 2021. It also encompassed patients who were transferred from other hospital wards to the psychiatric ward and those referred from other mental health facilities within the hospital's psychiatric sector. Exclusion criteria were: patients admitted to the substance detoxification unit, as their 21-day stay was pre-scheduled; individuals <16 years old falling under child psychiatry care; and those seeking various types of certificates or documentation.

Measures

This is a retrospective, observational pre-post study. All emergency visits and admissions of adult patients over 2 years were considered. Data were retrieved from patients' charts and involved two distinct periods: March 2019–February 2020 (that is, prior to the COVID-19 pandemic outbreak) and March 2020–February 2021 (that is, after the pandemic outbreak), respectively. Comparisons concerned the number of emergency visits, the number of admissions (involuntary and voluntary), and the length of hospital stay over each period. All diagnoses were made by the ward's consultant psychiatrists, according to the International Classification of Diseases, 10th revision (ICD-10), and were recorded in patients' charts.

Statistical analysis

Statistical analysis was performed using SPSS 29.0 software. Cases with missing data were excluded from the analysis to ensure the robustness and accuracy of the findings. Normality of distributions was assessed with the use of the Kolmogorov-Smirnov criterion. For comparisons of quantitative variables between two groups, either Student's t-test or the Mann-Whitney U

test was employed, depending on the distribution of the data. Comparisons across multiple groups were carried out with a non-parametric Kruskal-Wallis analysis of variance. To control Type I error due to multiple comparisons, Bonferroni correction was applied by adjusting the significance threshold to $0.05/\kappa$, where κ represents the number of comparisons. All tests were two-tailed, and statistical significance was set at a p-value of 0.05.

The variability of the attendance and admissions of patients for the 12-month interval prior to the official onset of the COVID-19 pandemic in Greece (March 2020) and the respective 12-month interval after the pandemic onset was studied on the basis of attendance/admission type (voluntary and involuntary), biological sex, and diagnostic category. For data analysis, c- and u-charts of statistical process control (SPC) charts were employed, with the use of monthly data (March 2019 to February 2021). Significant shifts in the measures were prospectively identified with the use of traditional rules for patterns on SPC.

Results

Impact of the COVID-19 pandemic on examinations and admissions

A total of 2836 examinations (1469 males, 51.8%) were carried out in the psychiatric department of the gener-

al hospital of Corfu over the study period. During the pre-COVID-19 period, 809 female examinations were carried out (representing 59.1% of females) and 820 male examinations (55.8% of males); that dropped to 558 (40.9%) and 649 (44.2%) examinations, respectively, during the COVID-19 period. During the year prior to the pandemic (March 2019-February 2020), 1622 examinations were conducted, whereas during the first year of the pandemic (March 2020-February 2021), the number dropped to 1214 examinations. A slight decrease of 5.7% was observed in involuntary examinations (total 206, 106 during the pre-pandemic period and 100 during the pandemic period). Regarding voluntary examinations (n=2630), there was a decrease of 26.52% over the pandemic period (n=1114), compared to the pre-pandemic period (n=1516). Figure 1 shows the c-chart of total attendance rate. The average monthly number is 118.38 outpatient visits, with a lower limit of 85.73 and an upper limit of 151.02 outpatient visits. Six grey points appear on the chart, which indicate that there is a difference in the variability of attendance. The 4 points that are higher than the upper limit correspond to months before the onset of the pandemic, while the 2 points that are lower than the lower limit correspond to months after the onset of the pandemic.

Among the 206 examinations that were conducted involuntarily, 168 resulted in admissions over the 2-year

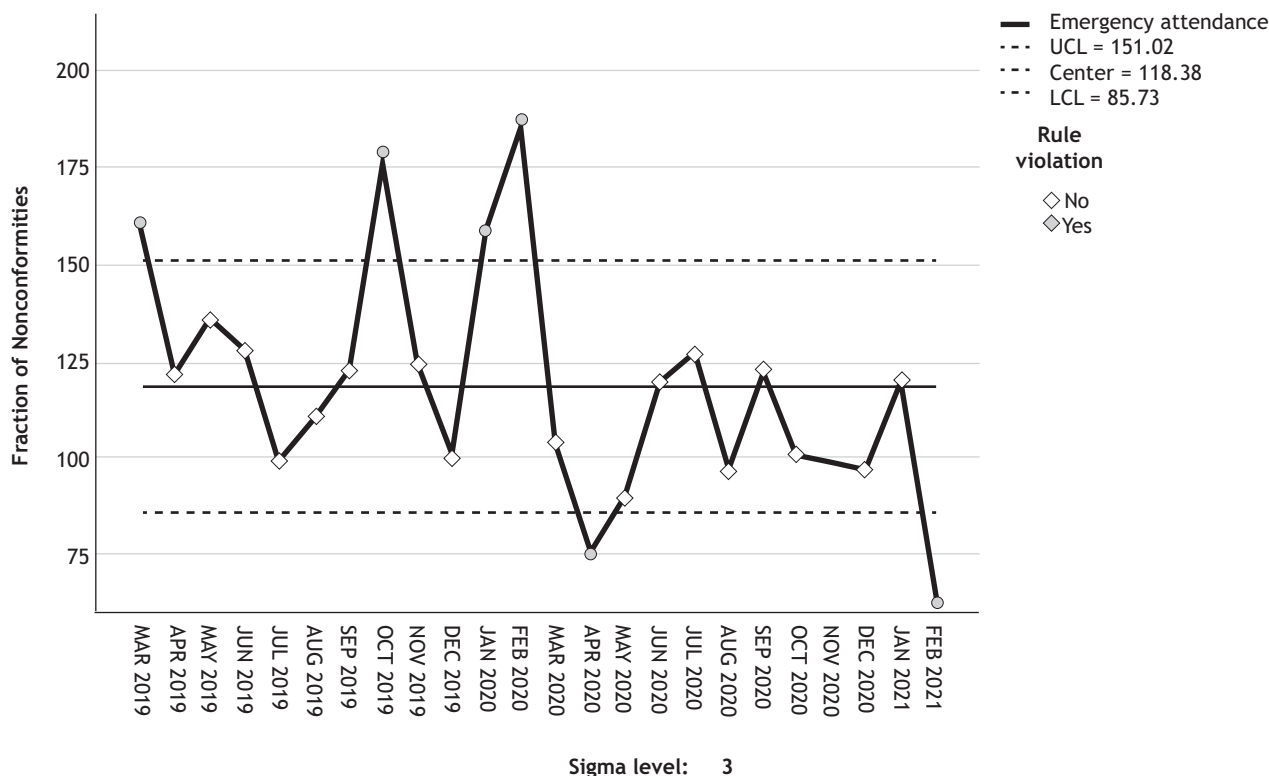


Figure 1. Control c-chart of patients' attendance before and after the onset of the COVID-19 pandemic.

study period. Out of 2630 voluntary examinations, only 594 led to hospitalizations. Therefore, out of the total 762 admissions, 168 were involuntary, and 594 were voluntary admissions. Figure 2a shows the control c-chart of voluntary outpatient visits and examinations. The average monthly number is 111.04 voluntary examinations, with a lower limit of 79.43 and an upper limit of 142.65 voluntary examinations. Six grey points appear on the chart, indicating a difference in the variability of voluntary attendance. The 4 points that are higher than the upper limit correspond to months before the onset of the pandemic, while the 2 points that are lower than the lower limit correspond to months after the onset of the pandemic. Figure 2b shows the control c-chart of involuntary examinations. The average monthly number is 7.50 involuntary examinations, with a lower limit of 0.00 and an upper limit of 15.72 involuntary examinations. No difference in the variability is observed as all points on the chart are within the limits. Figure 3 shows control u-chart of total admissions. The average admission rate is 0.27 (27%). The chart shows that there is no difference in the variability of the number of admissions, as all points are within the control limits.

Data on admissions ($n=762$) indicated that male admissions ($n=398$, 52.1%) were slightly higher than female admissions ($n=364$, 47.9%). The average age of patients admitted to the psychiatric department of the General Hospital of Corfu was 51 years ($Md=51.5$, $SD=14.3$ years), with a median hospital stay of 16.5 days ($IQR=26$ days). Among them, 39.8% were diagnosed with mood disorders, 32.6% with schizophrenia-spectrum disorders, and 12.5% with personality disorders.

Impact of the COVID-19 pandemic on length of hospital stay

Length of hospital stay differed significantly between the two phases of the study (table 1). The mean length of hospitalization during the pre-COVID-19 pandemic period was 25.57 days ($Md=13$, $IQR=22$), while during the COVID-19 period, it increased by 13.2%, up to 28.95 days ($Md=22$, $IQR=28$).

Over the 2-year study period, the mean length of hospitalization in involuntary admissions was significantly higher at 32.13 days ($Md=22$, $IQR=30$), compared with the mean length of 25.27 days ($Md=15$, $IQR=24$) in voluntary admissions ($U=41569$, $z=-4.120$, $p<0.001$). Males exhibited a significantly higher mean rank (397.76, 28.88 days) in hospital stay duration compared to females, whose mean rank (363.62, 24.68 days) was lower. This indicates that, on average, males experienced longer hospital stays than females ($U=78907.5$, $z=2.139$, $p=0.032$) (data not shown in table).

Examinations and admission trends across different diagnostic categories

Diagnoses appeared in the records of 2652 out of the 2836 individuals that were examined at the psychiatric department (93.56% diagnostic rate). Mood disorders accounted for the highest percentage of cases (909 cases, 32%), whereas schizophrenia and related disorders (679 cases) accounted for 23.9% of the total. The diagnostic groups that exhibited significant variances in examinations between the two periods were mood disorders, personality disorders, and other diagnoses (figure 4).

Regarding admissions, 40% of cases were diagnosed with mood disorders ($n=305$), 33.2% with schizophrenia-spectrum disorders ($n=253$), and 12.3% with personality disorders ($n=94$). Control u-charts of admissions showed there were no differences in the variability of the number of admissions across different diagnoses, as all points were within the control limits (figure 5).

Length of hospital stay across diagnoses

Analysis of the length of hospitalization across various diagnostic categories showed a statistically significant difference. Further post-hoc pairwise comparisons (Bonferroni correction) were conducted, revealing specific pairs of diagnostic categories demonstrating statistically significant differences in their distributions. Schizophrenia and related disorders ($Mean=34.25$ days, $SD=43.19$) and mood disorders ($Mean=26.26$, $SD=33.48$) displayed prolonged hospital stay compared to other diagnoses (table 2).

Discussion

The present study investigated the impact of the COVID-19 pandemic on care provided by a psychiatric ward in a general hospital, with a focus on attendance rates, admissions, and length of hospitalization. The findings revealed some substantial shifts in various facets of psychiatric care. Attendance rates were lower during the first year of the pandemic, whereas admission rates remained unchanged. Patients who were admitted to the ward after the onset of the pandemic spent more days in the hospital.

Emergency outpatient attendance presented a notable decline during the pandemic period compared to the pre-COVID-19 period, accounted for by a significant decline in voluntary assessments, whereas rates of involuntary attendance remained almost unchanged. The results align with previous studies during the pandemic and the subsequent lockdowns, indicating a decline in outpatient examinations. Studies from Canada,¹⁵ Sweden¹⁶ and

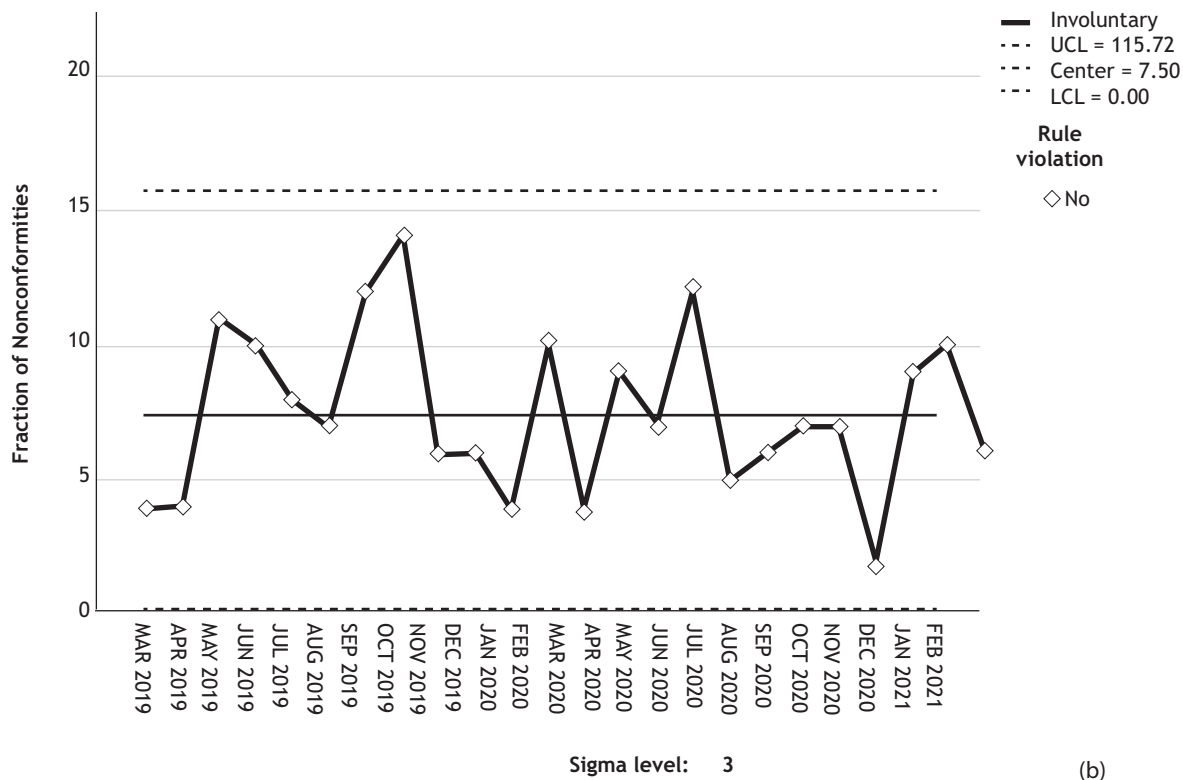
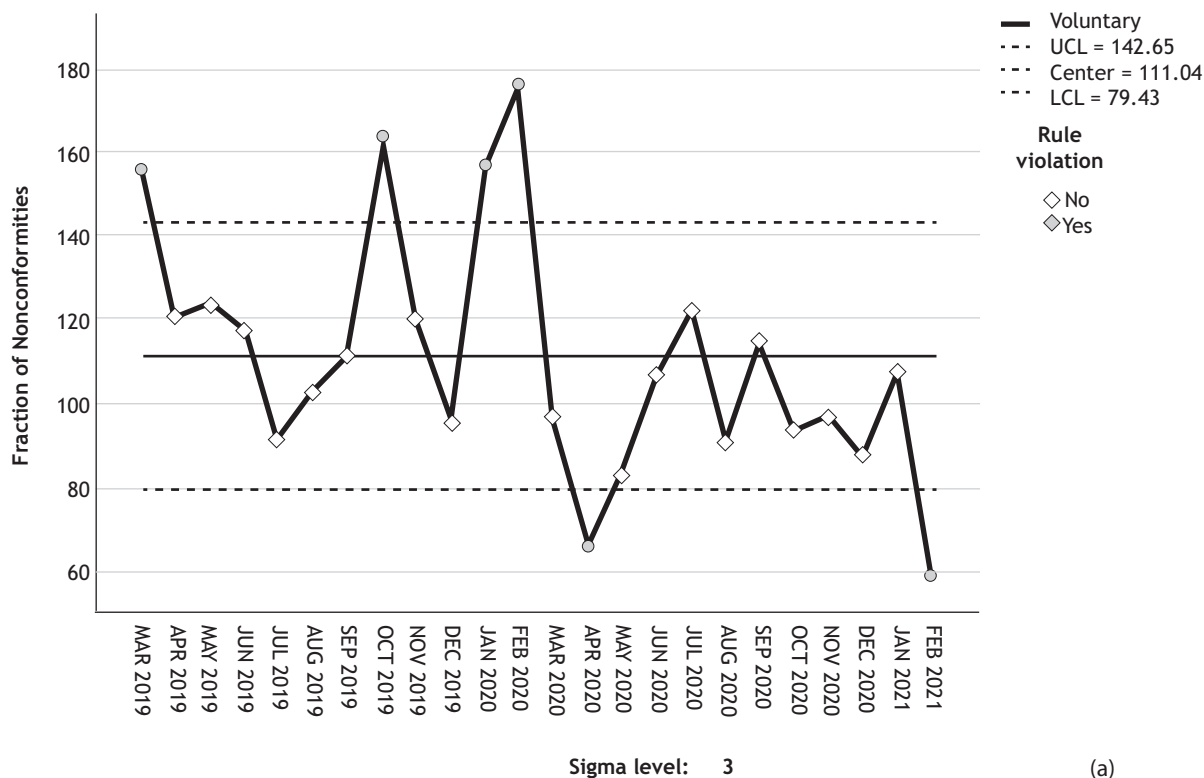


Figure 2. (a) Control c-chart of patients' voluntary attendance before and after the onset of the COVID-19 pandemic. (b) Control c-chart of patients' involuntary attendance prior to and after the onset of the COVID-19 pandemic.

Italy^{7,17,18} reported a decrease in psychiatric patients' visits, ranging from 15% to 59% during the pandemic waves. However, another study in Italy that assessed outpatient attendance over the 4-month interval after the initial

lockdown imposed during the COVID-19 outbreak found an increase in emergency room psychiatric consultations compared to the previous year. According to the authors, the finding indicated the increased psychological distress

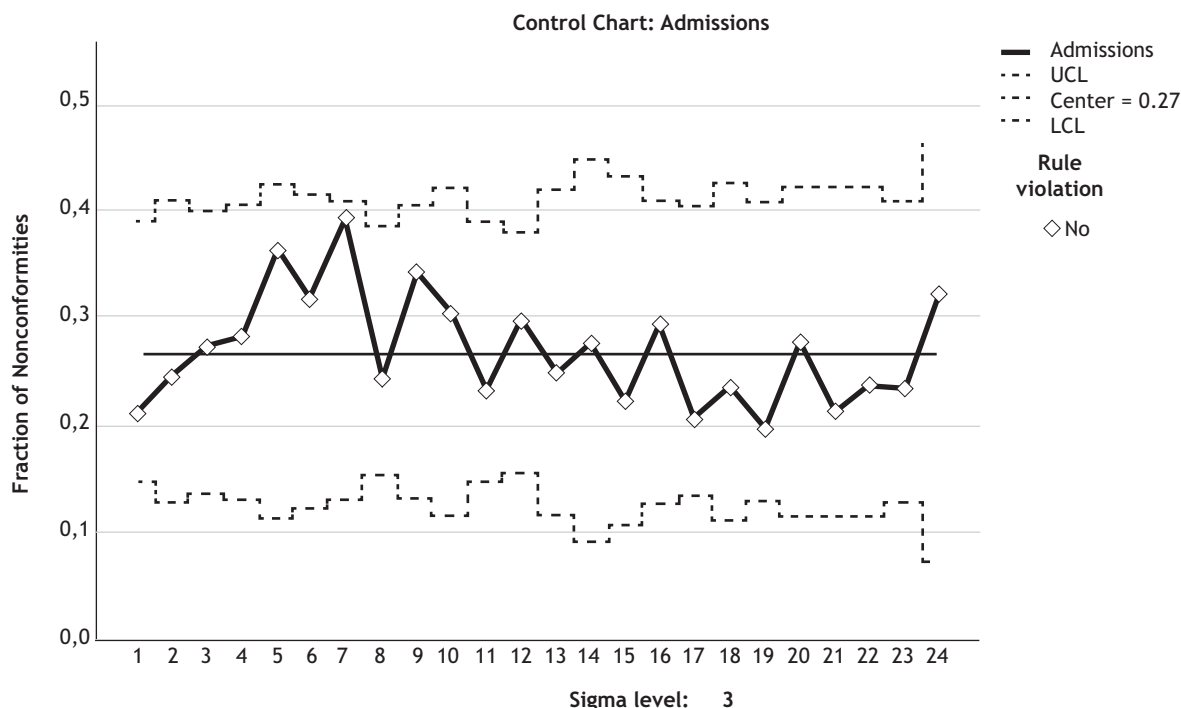


Figure 3. Control U-chart of patients’ admissions prior to and after the onset of the COVID-19 pandemic.

Table 1. Patients’ length of hospital stay prior and after the onset of the COVID-19 pandemic.

	Pre-COVID-19	COVID-19	Statistical test	p
Days of hospital stay (mean±SD)				
Total admissions	25.57±41.95	28.95±26.62	U=88242.5, z=-6.511	<0.001
Voluntary	23.66±40.19	28.20±26.81		
Involuntary	33.53±48.08	30.71±22.67		

caused by the lockdown.¹⁹ Other research in Italy reported a significant increase in emergency department visits for an acute psychiatric condition over the COVID-19 pandemic outbreak.²⁰ According to figure 1, a fluctuation of attendance rates over the first year of the pandemic was observed in the present study, corresponding to the different waves of the pandemic and the subsequent relaxation or reinforcement of restrictive measures. This notion is consistent with other research in various countries.²⁰⁻²³

In the present study, admission rates did not differ significantly prior to and during the COVID-19 pandemic. Similarly, a previous study in the United Kingdom found no pre/post-pandemic differences in patients’ psychiatric admissions.²⁴ In contrast, a multicenter study in Germany recorded a decrease of approximately 40% in patients’ admissions across 38 psychiatric hospitals.²⁵ The rate of involuntary admissions in the present study did not differ between the two examined periods. Other research that assessed involuntary admissions as a per-

centage of total admissions found that the proportion of involuntary admissions increased significantly during the pandemic period.^{9,23} Although most studies point toward a global trend of reduced psychiatric patient visits and admissions during the pandemic, there is great variability in findings across different regions and healthcare systems, suggesting methodological differences among studies. Despite these inconsistencies, gender distribution remained relatively balanced across both periods.²⁴

The study also unveiled substantial changes in hospitalization duration. The mean length of hospital stay increased significantly by 13.2% during the COVID-19 period. Notably, involuntarily admitted patients experienced longer hospitalizations compared with those admitted voluntarily, emphasizing the severity of conditions requiring involuntary inpatient care. Patients with mood disorders or schizophrenia-spectrum disorders exhibited prolonged hospital stays compared to patients with anxiety disorders. Gender differences were

also observed, with males experiencing longer hospital stays than females.

Several studies reported increased median length of hospital stay after the onset of the COVID-19 pan-

demic.^{15,17} Other research⁷ recorded an increase in the median length of hospital stay, both in moderate duration (7 to 14 days) and longer duration (>14 days) during the first lockdown, to be followed by a 39% reduc-

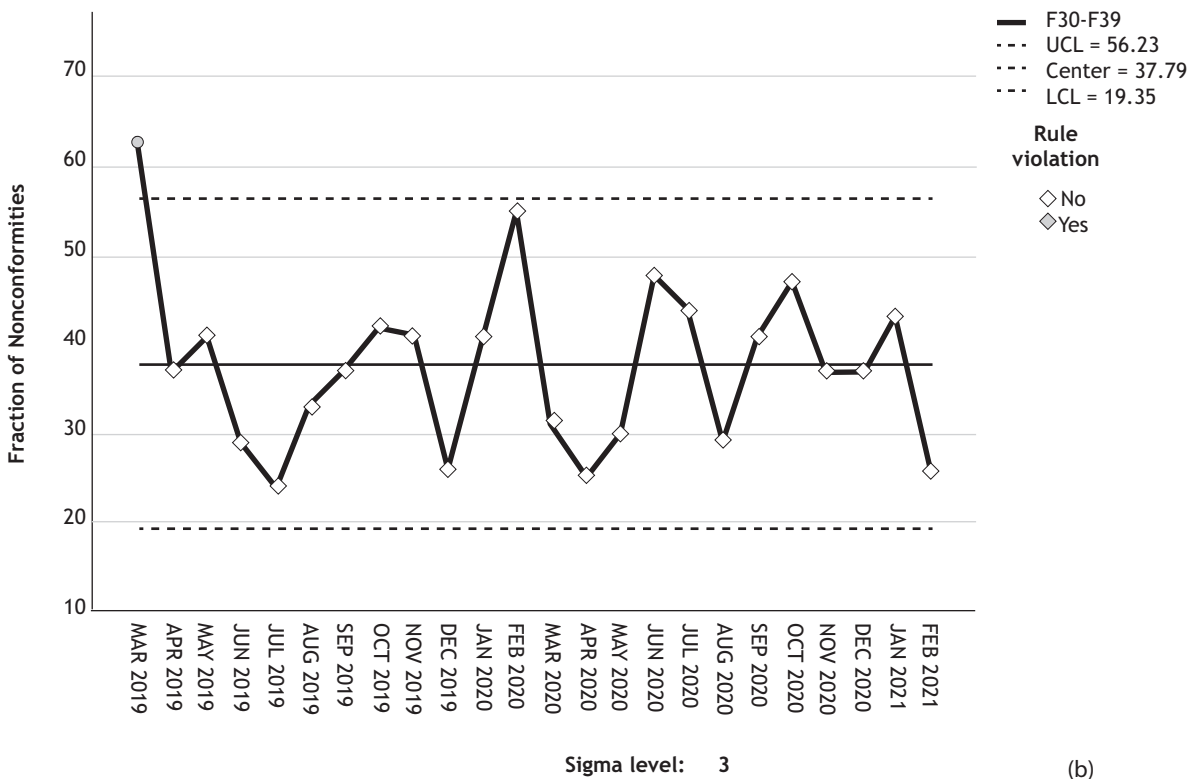
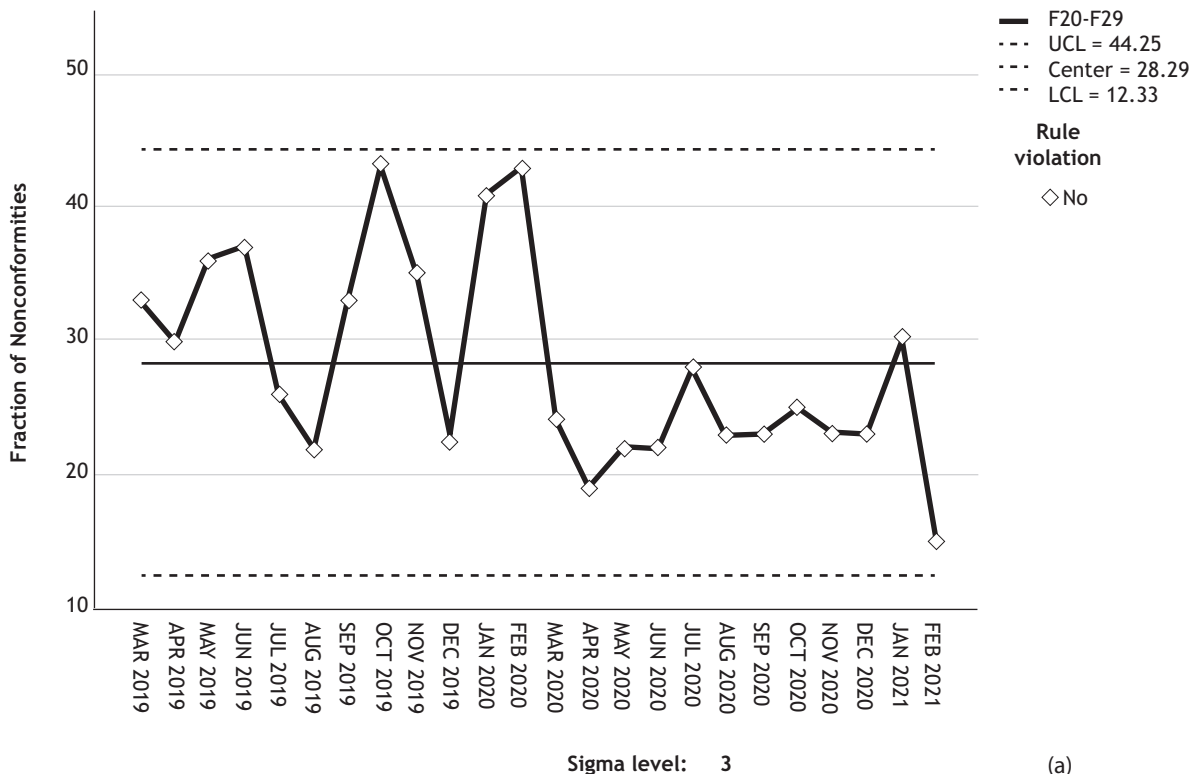
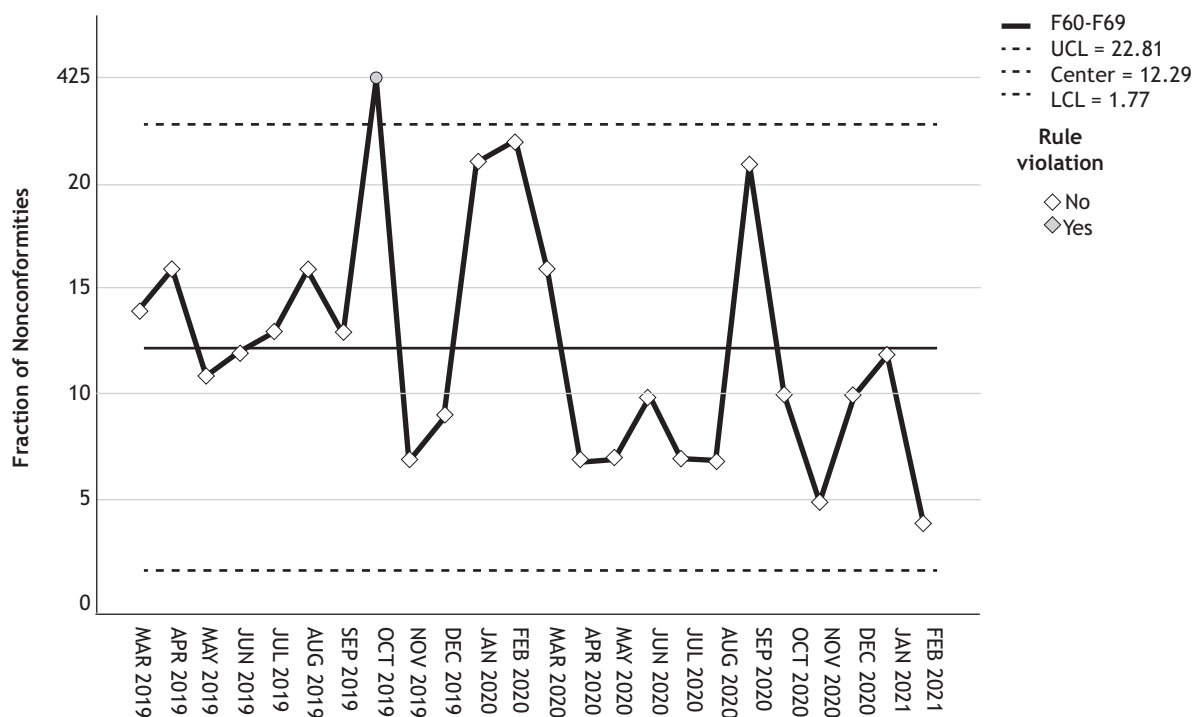
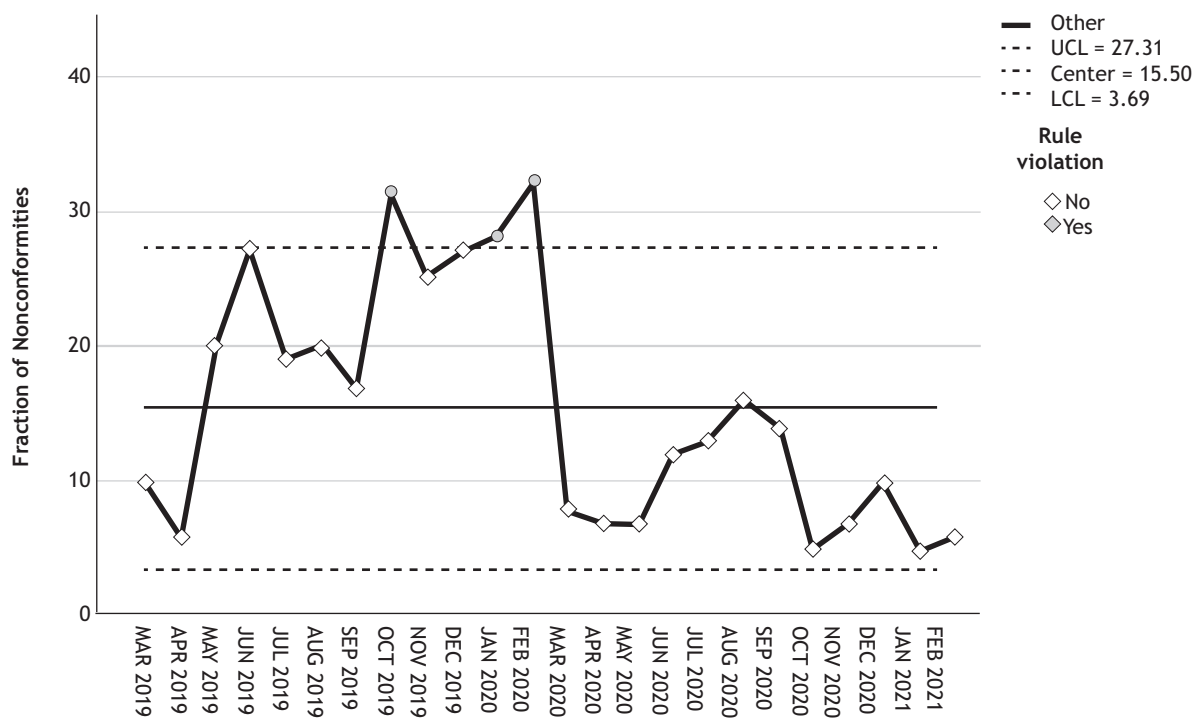


Figure 4. Control c-chart of patients' attendance prior to and after the onset of the COVID-19 pandemic across different diagnoses. (a) Schizophrenia and related disorders (F20-F29). (b) Mood disorders (F30-F39).



Sigma level: 3

(c)



Sigma level: 3

(d)

Figure 4. Control c-chart of patients' attendance prior to and after the onset of the COVID-19 pandemic across different diagnoses. (c) Personality disorders (F60-F69). (d) Other diagnoses.

tion in longer-duration admissions after the lockdown. Presumably, admissions after the onset of the pandemic had been overdue, and patients had probably more symptoms that would require more time to be effec-

tively treated. Or, this prolonged inpatient stay could rather correspond to the optimal duration of hospitalization that previously could not be implemented due to the increased demand for inpatient treatment. Perhaps

both explanations could be taken into account. Other research did not find any differences in the length of hospital stay prior to and after the onset of the pandemic in patients with schizophrenia and related disorders, whereas length of hospitalization in patients with affective disorders admitted during the post-lockdown 2020

period was significantly higher than those admitted in the lockdown or pre-lockdown periods.²³ It should be noted, however, that hospital stays in involuntary admissions in the study site had been longer in the pre-COVID era compared to other psychiatric wards in the mainland in Northwest Greece.²⁶

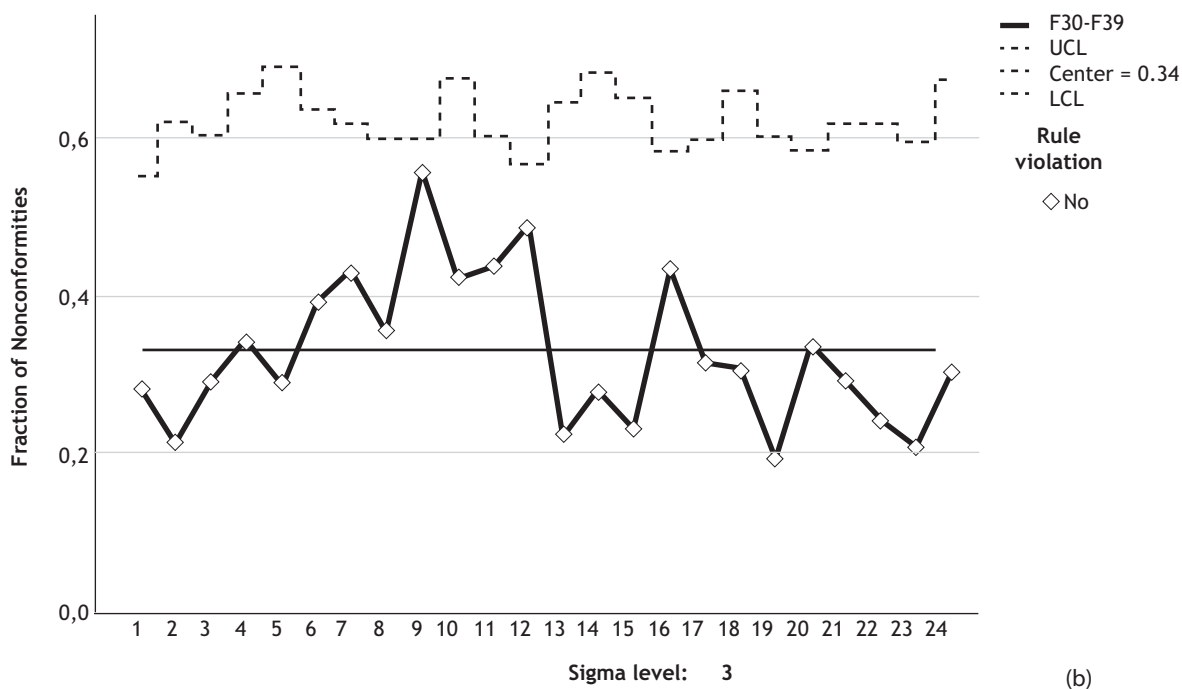
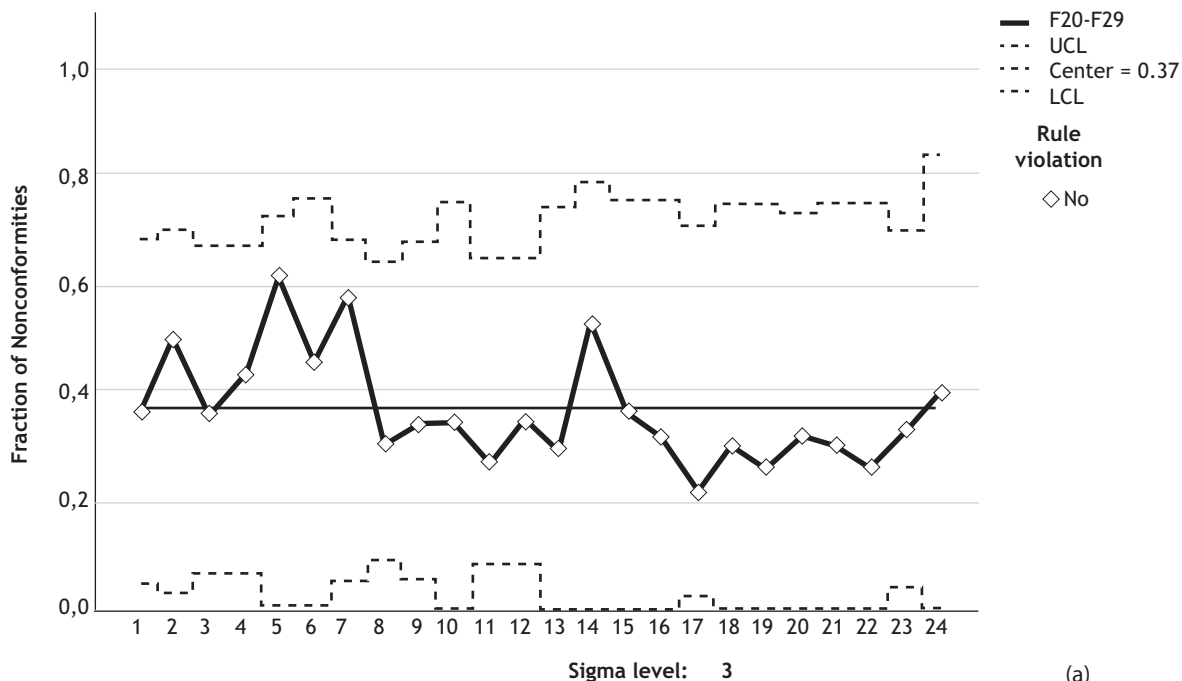


Figure 5. Control u-chart of patients' admissions before and after the onset of the COVID-19 pandemic across different diagnoses. (a) Schizophrenia and related disorders (F20-F29). (b) Mood disorders (F30-F39).

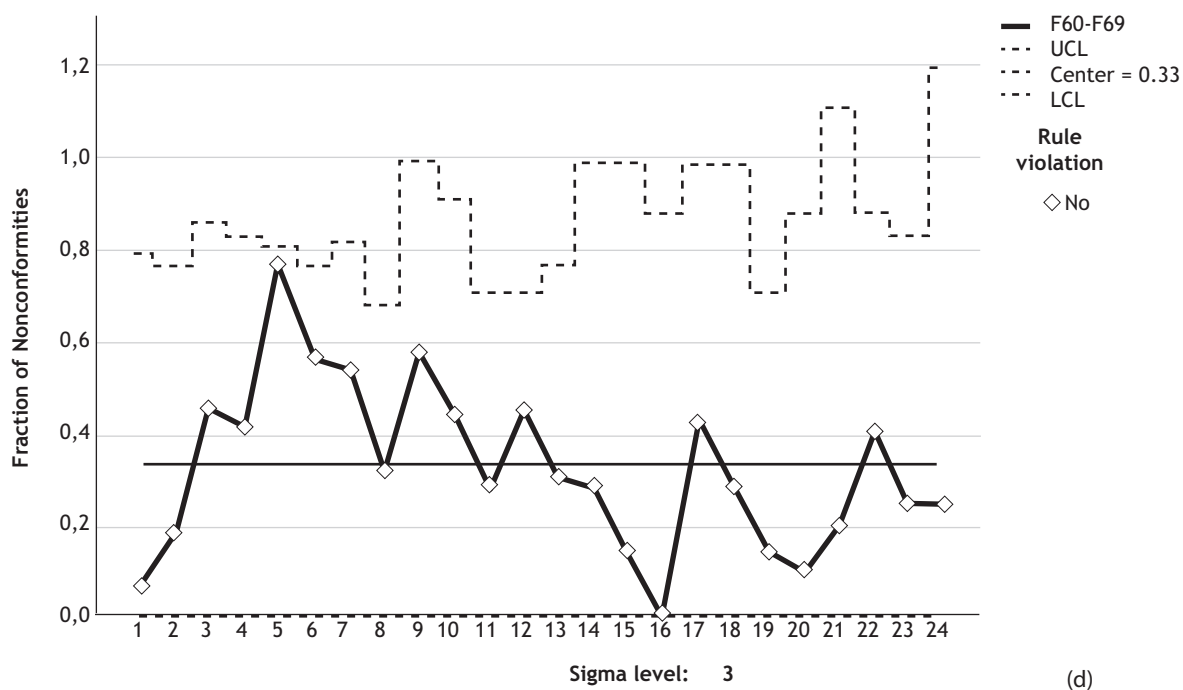
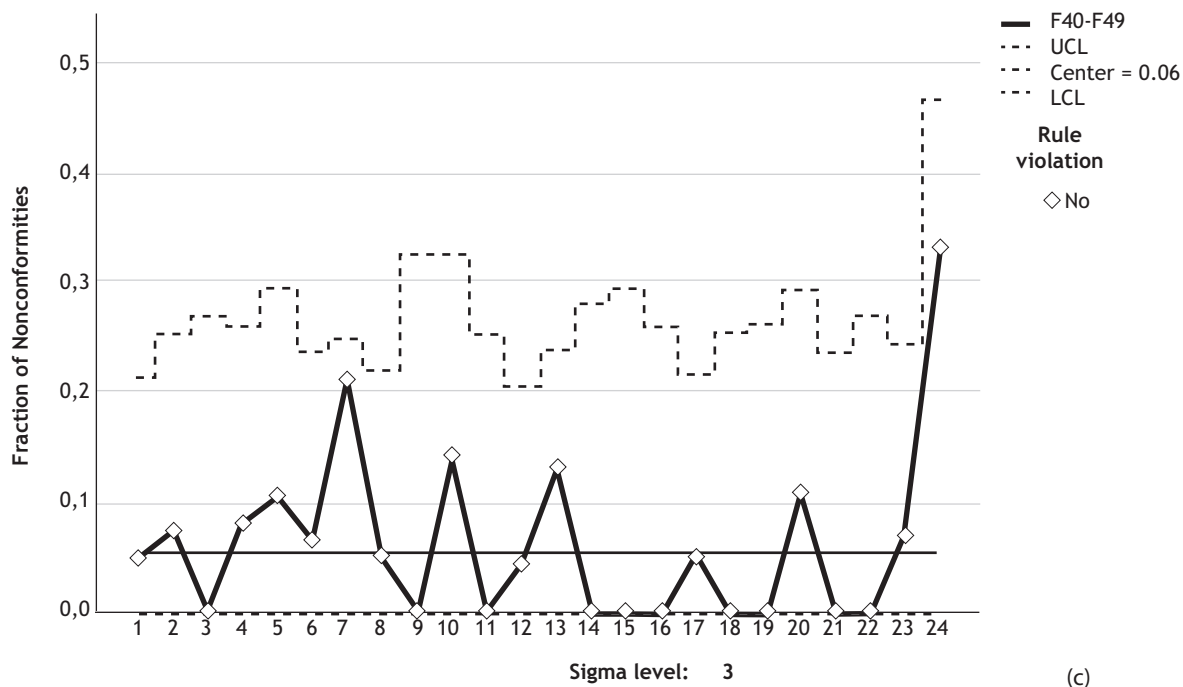


Figure 5. Control u-chart of patients’ admissions before and after the onset of the COVID-19 pandemic across different diagnoses. (c) Anxiety disorders (F40-F49). (d) Personality disorders (F60-F69).

In the present study, no changes in admission rates across different diagnoses were found. It has been argued that the impact of the COVID-19 pandemic on psychiatric admissions may have been more relevant in patients suffering a severe mental illness, such as chronic psychoses.²⁷ However, there are contradictory reports concerning the association of diagnosis with emergency attendance and admission rates during the COVID-19

pandemic. A study in Romania suggested that inpatient admissions in patients with a psychotic or affective disorder decreased significantly during lockdown compared with the pre-lockdown period and immediate post-lockdown period.²³ Contrary to that, other research showed that admissions due to psychosis increased by 22.9% during the pandemic compared with the pre-pandemic period.²⁸ A more recent study²⁹ noted a

Table 2. Length of hospital stay across admission types and diagnostic categories before and during the COVID-19 pandemic.

Attendance period	Admission type	F20-F29 Length of hospital stay (days)		F30-F39 Length of hospital stay (days)		F60-F69 Length of hospital stay (days)		Statistical test	p
		Median	IQR	Median	IQR	Median	IQR		
Pre-COVID-19	Involuntary	23.00	30.00	39.00	36.00	9.00	9.00	H(8)=42.065	<0.001
	Voluntary	14.00	11.00	27.00	23.00	4.00	11.50		
COVID-19	Involuntary	34.50	25.50	27.00	15.00	23.00	12.50		
	Voluntary	25.00	16.00	27.18	11.00	23.50	20.00		

Post-hoc pairwise comparisons of the length of hospitalization across different diagnoses

F30-F39 vs. F60-F69	0.009
F30-F39 vs. F40-F48	0.049
F20-F29 vs. F60-F69	<0.001
F20-F29 vs. F40-F48	0.017

F20-F29: Schizophrenia-spectrum disorders; F30-F39: Mood disorders; F40-F48: Anxiety disorders; F60-F69: Personality disorders

rise in acute psychiatric admissions for first and repeated episodes of psychosis during the COVID-19 period, despite an overall decrease in hospital admissions. Reasons cited for the overall reduction in psychiatric admissions include concerns about contagion and adjustments in admission criteria to limit infection spread and manage reduced staff capacity.⁷

Concerning emergency attendance according to diagnosis, the present study found that there was a significant decrease in attendance rates in patients with mood disorders and personality disorders, whereas no changes were revealed in patients with schizophrenia and related disorders. This finding is in line with previous research in Sweden¹⁶ and Portugal,³⁰ where the 52.2% decrease in psychiatric emergency visits was mostly accounted for by the large decrease in visits due to affective disorders. Other studies suggested that attendance rates in patients with psychotic disorders during the COVID-19 period did not differ compared with the pre-COVID-19 period.^{9,31} Still, other research²² did not reveal any differences in diagnoses among patients visiting hospitals before and during the pandemic.

The present study has some limitations that need consideration. Firstly, conducting the research solely with-

in a psychiatric department of a general hospital might limit the broader applicability of the findings. Moreover, the absence of an automated system for recording visits to the emergency psychiatric department led to potential inaccuracies in cases' documentation by the medical staff. This resulted in missing data, and consequently, patients with incomplete data were excluded from the study. A major strength of the study is that it involves a large insular catchment area, and due to geographical reasons, all potential cases were included.

Conclusions

The results of the present study are consistent with several previous international studies while differing from other research. Emergency attendance in the psychiatric ward in a general hospital in Greece declined after the onset of the COVID-19 pandemic; admission rates did not change, whereas the length of hospital stay increased. The diagnoses that mostly accounted for the reduction of emergency attendance were mood disorders and personality disorders. Further research on the effects of the pandemic on psychiatric attendance and admissions is needed for health systems to be prepared for future health and mental health crises.

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Ερευνητική εργασία

Η επίδραση της πανδημίας COVID-19 στις νοσηλείες σε ψυχιατρική κλινική γενικού νοσοκομείου στην Ελλάδα

Ιωάννα-Αθηνά Μπότσαρη,^{1*} Αναστάσιος Παπατσώρης,^{2*} Πέτρος Αργίτης,²
Νικόλαος-Τιβέριος Οικονόμου,³ Βάιος Περιτογιάννης⁴

¹Μονάδα Έγκαιρης Παρέμβασης στην Ψύχωση, Ερευνητικό Πανεπιστημιακό Ινστιτούτο Ψυχικής Υγιεινής, Αθήνα,

²Ψυχιατρικός Τομέας, Γενικό Νοσοκομείο Κέρκυρας, Κέρκυρα,

³Μονάδα Μελέτης Ύπνου, Ψυχιατρικός Τομέας, Πανεπιστήμιο Αθηνών, Αθήνα,

⁴Κινητή Μονάδα Ψυχικής Υγείας Ιωαννίνων-Θεσπρωτίας, Εταιρεία Προαγωγής Ψυχικής Υγείας Ηπείρου, Ιωάννινα

*Οι δύο αυτοί συγγραφείς είχαν ισότιμη συμμετοχή στη μελέτη

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ΠΕΡΙΛΗΨΗ

Οι αρνητικές επιπτώσεις της πανδημίας COVID-19 και των συνακόλουθων περιοριστικών μέτρων στη ψυχική υγεία και ευζωία του πληθυσμού και των ασθενών με ψυχικές διαταραχές έχουν ευρέως μελετηθεί. Η προσέλευση των ασθενών στις υπηρεσίες ψυχικής υγείας και η τακτική παρακολούθηση επηρεάστηκαν αρνητικά από την πανδημία, ενώ οι ασθενείς ήταν λιγότερο πιθανό να λάβουν έγκαιρη εξωνοσοκομειακή φροντίδα. Η πανδημία επηρέασε επίσης την πρόσβαση και τη χρησιμοποίηση της ενδονοσοκομειακής περίθαλψης. Στην Ελλάδα δεν υπάρχουν αντίστοιχα δεδομένα, και γι' αυτό πραγματοποιήθηκε μια αναδρομική μελέτη παρατήρησης, με σχεδιασμό πριν/μετά στην ψυχιατρική κλινική του γενικού νοσοκομείου Κέρκυρας, στη βορειοδυτική Ελλάδα, που εξυπηρετεί μια περιοχή ευθύνης περίπου 100000 κατοίκων. Ο σκοπός της μελέτης ήταν να διερευνήσει την διακύμανση της προσέλευσης και των εισαγωγών για τις περιόδους των 12 μηνών πριν την έναρξη της πανδημίας και των 12 μηνών έπειτα από την επίσημη έναρξη στη χώρα μας (Μάρτιος 2020). Η ανάλυση των δεδομένων έγινε με τη χρησιμοποίηση των στατιστικών διαγραμμάτων C και U για την επεξεργασία μηνιαίων δεδομένων (Μάρτιος 2019 έως Φεβρουάριος 2021). Συνολικά παρατηρήθηκε σημαντική μείωση στην προσέλευση, οφειλόμενη κυρίως σε μείωση κατά 26,5% της εκούσιας προσέλευσης (1516 ασθενείς πριν την έναρξη της πανδημίας, έναντι 1114 μετά). Η ακούσια προσέλευση δεν διέφερε μεταξύ των δύο περιόδων (106 ασθενείς πριν την έναρξη της πανδημίας, έναντι 100 μετά). Τα ποσοστά εισαγωγής δεν μεταβλήθηκαν σημαντικά μεταξύ των δύο περιόδων. Οι συναισθηματικές διαταραχές και οι διαταραχές προσωπικότητας παρουσίασαν σημαντικές διακυμάνσεις στην προσέλευση για εξέταση, ενώ τα ποσοστά εισαγωγών σε όλες τις διαγνωστικές κατηγορίες παρέμειναν σταθερά. Η διάρκεια νοσηλείας αυξήθηκε σημαντικά κατά 13,2% τον πρώτο χρόνο από την έναρξη της πανδημίας, από 25,57 μέρες (Md= 13, IQR= 22) πριν από την έναρξη της πανδημίας σε 28,95 μέρες (Md= 22, IQR= 28) έπειτα από την έναρξη. Οι ασθενείς με σχιζοφρένεια και συναφείς ψυχώσεις (μέση διάρκεια νοσηλείας 34,25 μέρες, SD= 43,19) και διαταραχές της διάθεσης (μέση διάρκεια νοσηλείας 26,26 μέρες, SD= 33,48) είχαν παρατεταμένες νοσηλείες σε σχέση με άλλες διαγνωστικές κατηγορίες. Τα αποτελέσματα υπογραμμίζουν την ανάγκη προσαρμοσμένων παρεμβάσεων για την αντιμετώπιση των εξελισσόμενων απαιτήσεων στις υπηρεσίες ψυχικής υγείας κατά τη διάρκεια κρίσεων δημόσιας υγείας.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Εισαγωγές, πανδημία COVID-19, προσέλευση, ψυχιατρική κλινική γενικού νοσοκομείου, ακούσιες νοσηλείες, διάρκεια νοσηλείας.

Research article

Vaccination coverage of persons using hospital outpatient mental health services at Heraklion, Crete, Greece: A cross-sectional study during pandemic

Epameinondas Evangelos Kantidakis,¹ Emmanouil K. Symvoulakis,² Maria Basta,³ Evgenia Chourdaki,⁴ Helen Dimitriou⁵

¹General Practice and Family Medicine, Venizeleion General Hospital, Heraklion, Crete,

²Primary Health Care, Clinic of Social and Family Medicine, Medical School, University of Crete, Heraklion, Crete,

³Department of Psychiatry and Behavioral Science, Medical School, University of Crete, Heraklion, Crete,

⁴Psychiatric Sector, Venizeleion General Hospital, Heraklion, Crete,

⁵Experimental Pediatrics, Division of Mother and Child Health, Medical School, University of Crete, Heraklion, Crete, Greece

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ABSTRACT

Persons with mental health disorders are vulnerable, with demanding care needs. This cross-sectional study aimed to report on their vaccination coverage against COVID-19 and common vaccine-preventable diseases. The study was conducted from September to November 2022 at the psychiatric outpatient settings of Venizeleion General Hospital of Heraklion, Crete, Greece, and the Mental Health Center of Heraklion. Information was collected via personal medical interviews and prescription data. The study population included 361 participants, with a mean age of 49.8±14.3 years, 59.0% women. The most common diagnoses were recurrent depressive disorder (24.1%), schizophrenia (22.7%), anxiety disorder (21.3%), and bipolar disorder (15.7%). Vaccination coverage against seasonal influenza for 2020, 2021, and 2022 was 43.2%, 39.8%, and 40.7%, respectively. Pneumococcal vaccination included the conjugate (28.8%) and polysaccharide (7.7%) vaccines. Vaccination against Tetanus, Diphtheria, Pertussis (TDP) accounted for 11.0%, Hepatitis B for 5.8%, and Herpes Zoster for 27.1%. COVID-19 vaccination, with at least one booster dose, reached a high of 73.6%. Patients with severe mental illness, 139 out of 361, were less likely to have contracted COVID-19 (50/139, 35.9%) than those without (108/222, 46.6%), ($p=0.018$). Coverage with polysaccharide vaccine, TDP, and Hepatitis B, was very low. Patients annually vaccinated for influenza in the last three consecutive years were most likely to be fully vaccinated for pneumococcal disease and for COVID-19 (with at least one booster dose). Future research and clinical practice should focus on identifying patients at risk of not receiving preventive services, such as vaccines.

KEYWORDS: COVID-19, influenza, mental illness, pneumococcus, prevention, vaccination.

Introduction

Mental disorders cause an increasing burden on public health and represent an important cause of disability for many patients.¹ It is estimated that one out of five adults experienced a common mental disorder manifestation within the past 12 months.² Women show high-

er rates of mood disorders and anxiety, while regarding geographical distribution, mental disorders are low among countries in Sub-Saharan Africa, and North and Southeast Asia and higher in English-speaking countries.² In Greece, 14% of the general population suffers from clinically evident mental illness, with the most

commonly observed mental disorders being generalized anxiety disorder and depression.³

Persons with mental illness have mortality rates two to three times higher than the general population,⁴ partially explained by the interaction between mental disorders and multiple comorbidities, such as obesity, hypertension, diabetes, cardiovascular, chronic lung, rheumatic, neurological, and gastrointestinal diseases, thyroid disorders, and malignancies.⁵ The effect of comorbidity is more amplified due to an eventually modified immune status, involving the development of low-grade inflammation, commonly described among a series of major depressive disorders, bipolar disorder, and schizophrenia.^{5,6}

Patients with severe mental illness are reported to have higher hospitalization risk and mortality from influenza in comparison to general population groups, independently of comorbidities.⁷ In addition, those with depression, bipolar disorder, anxiety disorder, and schizophrenia have nearly twice the risk of pneumococcal infection and an increased likelihood of disease complications.⁸ The overall burden for public health is estimated to be significant, as mental disorder sufferers concerning vaccination show increased hesitancy⁹ moreover, due to their condition, experience limited access to healthcare services.¹⁰

Regarding hepatitis B, the eventuality of infection among persons with mental illness was found to be even five times higher than those mentally healthy,¹¹ linked to high-risk behaviors, such as substance use and frivolous sexual behavior.¹²

Given the recent COVID-19 pandemic, a meta-analysis targeting individuals with mental illness described a significant risk of infection and mortality from severe COVID-19 disease,¹³ and hence included them in the high-risk groups for prioritization of COVID-19 vaccination.¹⁴

Most relevant studies investigated influenza and COVID-19 vaccine intake. Data on coverage against seasonal influenza have shown some discrepancy, findings that could partially be attributed to the different study designs and sample heterogeneity.⁶ Factors associated with higher vaccination rates against seasonal influenza included private insurance, recommendation by a healthcare professional, and perception of vaccines as an effective preventive measure.¹⁵

Regarding overall vaccine coverage, data from the study of Miles et al., showed that almost half of the participants mentioned vaccination against tetanus, diphtheria, and pertussis, and less than 10% for measles,

mumps, and rubella (MMR), and hepatitis B.¹⁶ The 23-valent polysaccharide vaccine rates against pneumococcus seemed age-dependent, with a frequency of 36.2% for those between 18 and 64 years and just 2.8% for persons older than 65 years.¹⁶

As far as immunization against COVID-19 is concerned, in France, it was found that mental disorder groups, not linked to substance use, were related to higher vaccination rates in comparison to the general population groups.¹⁷ On the contrary, a large study from China reported lower vaccination coverage among persons with a history of mental illness, compared to those of their home or community environment, and also an association between schizophrenia diagnosis and non-vaccination.¹⁸ Similarly, in Israel, a cohort of 125,273 patients with a history of hospitalization to a psychiatry ward, reported low vaccination rates against COVID-19.¹⁹ Previous research has not identified factors like education level, alcohol consumption, substance misuse, gender, chronicity of a mental disorder, and hospitalization history to be associated with vaccination uptake.²⁰

This study aimed to determine vaccine coverage of mental illness sufferers in Heraklion, Crete, according to the National Immunization Program for Adults and according to the recommendations of the National Immunization Committee for vaccination against COVID-19, and finally define influential variables related to vaccination acceptance.

Material and Method

Study design

It is a cross-sectional study, conducted at the Psychiatry Department of Venizeleion General Hospital of Heraklion and the Mental Health Center of Heraklion from September 8th to November 25th, 2022. The study was approved by the Ethics Committee of the Hospital (approval reference: 44979/8-9-2022) and the corresponding committee of the 7th Health Region of Crete (approval reference: 54658/2022). Written informed consent was obtained by each participant. Information about vaccine coverage of individuals with mental illness was collected. A convenience but consecutive sampling technique was used to recruit patients attending their medical appointments. The inclusion criteria were adulthood (18 years old or older), consultation and follow-up by a psychiatrist in the past 6 months, prescription of medication for mental illness, and capacity for written informed consent from the participant. Patients exclusively treated with psychotherapy were excluded.

Data collection

Data were collected via personal interview by an MD researcher, and this information was cross-checked with the online prescription and patients' records whenever primary information was poor. Before the interview, every participant, after being informed about the objective of the study, had given written consent.

The data collected included mental illness diagnosis (ICD 10/date of onset), socio-demographic information, habits (smoking, alcohol misuse, substance use), history of admission to a psychiatry ward, consultation with an internist during the past year, attendance of medical appointments with the help of an escort, route of administration for psychiatric medications, presence of polypharmacy (≥ 5 different medications in total), history of COVID-19 infection, co-morbidities, vaccine coverage for influenza, COVID-19, herpes zoster, hepatitis B, varicella, pneumococcal conjugate vaccine, polysaccharide pneumococcal vaccine, tetanus, diphtheria, and pertussis, and MMR.

Data analysis

The numerical variables were expressed as means (standard deviation). For qualitative variables, statistical significance was determined using the chi-square test (χ^2). Direct comparisons across different groups of physical and psychiatric diagnoses were not feasible due to the sample size. Based on that, analyses were conducted by grouping variables. Influenza vaccination rates for 2022 and vaccination with the 13-valent pneumococcus conjugate vaccine were correlated to age group (≥ 50 years old), time since diagnosis (≥ 5 years), gender, nationality, place of living, insurance capacity, presence of polypharmacy, history of admission to a psychiatry ward, assessment by an internist during the past year, and attendance of medical appointments with the help of an escort. Associations were investigated between influenza vaccination for 2022 and vaccination with the 13-valent conjugate pneumococcal vaccine, between influenza vaccination for the past three years (2020, 2021, and 2022) vaccination with both pneumococcal vaccines (13-valent conjugate and 23-valent polysaccharide), and vaccination with at least one booster dose against COVID-19. Associations were tested between tetanus vaccination and age groups (< 50 years old and ≥ 50 years old), severe mental illness (diagnosis of bipolar disorder or schizophrenia) and COVID-19 infection, COVID-19 vaccination with at least one booster dose, and COVID-19 infection. Odds Ratio was calculated using binary logistic regres-

sion for the evaluation of the various associations. IBM SPSS Statistics 2017 (IBM Corp., Armonk, NY) was used for the statistical analysis. Statistical significance was set at $p \leq 0.05$.

Results

A total of 391 patients were contacted during the study period. For those seeking consultation multiple times, only the first contact was taken into account. Of the 391 patients, 19 denied consent, and 11 did not meet the inclusion criteria, resulting in 361 participants (response rate: 92.3%).

The mean age was 49.8 ± 14.3 years, ranging from 18 to 84 years old. Among the two age groups (< 50 and ≥ 50 years), those ≥ 50 years accounted for 52.6% of the participants. Women were more than men (59.0%), most participants were natives (94.1%), living in the city (80.3%), and insured (73.6%). 27.4% of the participants were primary education graduates, 50.6% had received secondary education, and 21.8% were tertiary education graduates or had a master's degree. Moreover, 28.8% were employed, 26.3% were pensioners, 25.2% were receiving a disability benefit, and 19.6% were unemployed.

The most common diagnoses were recurrent depressive disorder (F33, 24.1%) and schizophrenia (F20, 22.7%), while unspecified non-organic psychosis (F29, 8.9%), depressive episode (F32, 4.7%), and obsessive-compulsive disorder (F42, 2.5%) were observed less commonly. Table 1 summarizes the basic demographic and clinical characteristics of the patients. Regarding the medication intake route, 80.0% was oral, 4.1% intramuscular, and 15.7% both. Also, 36.0% had at least one psychiatric hospital admission.

Concerning co-morbidities, obesity was frequently reported (40.7%), followed by dyslipidemia (38.2%) and hypertension (25.7%). Thyroid disorders, diabetes, and chronic lung disease accounted for 18.2%, 16.3%, and 13.5%, respectively. Nearly one out of ten participants suffered from rheumatic (10.2%) or cardiovascular disease (9.6%).

Polypharmacy (defined as the use of ≥ 5 different medications) was observed in 41.0% of the participants, 63.1% had an internist consultation during the past year, and 28.5% reported attendance to medical appointments with the help of an escort. Concerning the patients' habits, 51.5% were smokers, whilst substance use (3.3%) and alcohol misuse (1.9%) were found at low levels.

Table 1. Basic demographic and clinical characteristics of the study population.

Parameter		n (%)
Gender	Female	213 (59)
	Male	148 (41)
Age	≥50 years old	190 (52.6)
	<50 years old	171 (47.4)
Nationality	Foreigner	21 (5.8)
	Native	340 (94.2)
Place of stay	Country	71 (19.7)
	City	290 (80.3)
Level of education	Primary	99 (27.4)
	Secondary	183 (50.7)
	Tertiary	63 (17.5)
	Master's degree	16 (4.4)
Insurance capacity	Insured	266 (73.7)
	Uninsured	95 (26.3)
Occupational status	Employed	104 (28.8)
	Unemployed	71 (19.7)
	Retired	95 (26.3)
	Disability benefit	91 (25.2)
Diagnosis (ICD-10)	Schizophrenia (F20)	82 (22.7)
	Unspecified psychosis (F29)	32 (8.9)
	Bipolar disorder (F31)	57 (15.8)
	Depressive episode (F32)	17 (4.7)
	Major depressive disorder, recurrent (F33)	87 (24.1)
	Other anxiety disorders (F41)	77 (21.3)
	Obsessive-compulsive disorder (F42)	9 (2.5)

Vaccine coverage

Vaccine coverage for the influenza vaccine in 2020 accounted for 43.2%. Vaccination showed a small downward trend in the last two years, with the percentage being 39.8% for 2021 and 40.7% for 2022. Only one-third of the participants (33.7%) mentioned influenza vaccination for the past three consecutive years. Regarding influenza vaccination for 2022, higher rates were found among people with anxiety disorders (41.5%) and a depressive episode (41.1%), while the lowest rates were reported among patients with schizophrenia (26.8%), bipolar disorder (24.5%), and obsessive-compulsive disorder (22.2%).

Pneumococcus vaccination accounted for 28.8% of the participants with the 13-valent conjugate vaccine and 7.7% with the 23-valent polysaccharide vaccine. If only those with strong recommendations for pneumococcal vaccination were taken into account, the respec-

tive rates were 35.6% and 9.5%. Only 6.9% were fully vaccinated with both pneumococcal vaccines (8.5% of those with proper indication). The highest vaccination rates with the conjugate vaccine were observed among patients with recurrent depressive disorder (49.4%), whilst the lowest rates were recorded among patients with schizophrenia (20.7%), unspecified non-organic psychosis (15.6%), and obsessive-compulsive disorder (11.1%).

In table 2 is seen that vaccination coverage against tetanus, diphtheria, and pertussis, reached 11.0%, whilst for hepatitis B 5.8%. For the vaccine against measles, mumps, and rubella, 57.0% of people born after 1970 mentioned a history of vaccination with two doses. People born after 1990 reported varicella vaccination at 36.1%. Among participants aged ≥60 years, 27.1% mentioned vaccination against herpes zoster.

Finally, most participants had been vaccinated against COVID-19 with the recommended basic scheme and

Table 2. Vaccination coverage (absolute number and percentage) of all patients per vaccine.

Vaccine	Response	n (%)
Influenza vaccine 2020	Yes	156 (43.2)
	No	205 (56.8)
Influenza vaccine 2021	Yes	144 (39.9)
	No	217 (60.1)
Influenza vaccine 2022	Yes	147 (40.7)
	No	214 (59.3)
Pneumococcal conjugate (PCV13)	Yes	104 (28.8)
	No	257 (71.2)
Pneumococcal polysaccharide (PPSV23)	Yes	28 (7.8)
	No	333 (92.2)
Tetanus, diphtheria, pertussis (Td or Tdap/Tdap-IPV)	Yes	40 (11.1)
	No	321 (88.9)
Hepatitis B (HepB)	Yes	21 (5.8)
	No	338 (93.6)
	I don't know	0 (0.0)
	I have been infected	2 (0.6)
Measles, mumps, rubella (MMR), people born after 1970 (total 207)	1 dose	1 (0.5)
	2 doses	118 (57.0)
	I have been infected	51 (24.6)
	I don't know	37 (17.9)
Varicella (VAR), people born after 1990 (total 47)	1 dose	0 (0.0)
	2 doses	17 (36.2)
	I have been infected	16 (34.0)
	I don't know	0 (0.0)
Herpes zoster (HZV), people aged 60 years or older (total 92)	I haven't been infected/vaccinated	14 (29.8)
	Yes	25 (27.2)
	No	67 (72.8)

one booster dose (65.6%). The unvaccinated group accounted for 14.6%, as it is shown in figure 1.

Age (≥ 50 years, $p < 0.001$), nationality (native, $p = 0.011$), insurance coverage, polypharmacy, non-hospitalization to a psychiatry ward, and examination by an internist during the past year ($p < 0.001$) are factors positively associated with influenza vaccination for 2022.

Predictors contributing to the 13-valent conjugate pneumococcal vaccination appear to be age (≥ 50 years, $p < 0.001$), gender (women vs. men, $p = 0.012$), health insurance ($p = 0.006$), intake of ≥ 5 medications ($p < 0.001$), ≥ 5 years since diagnosis ($p = 0.018$), admission to a psychiatry ward in the past ($p = 0.022$), and consultations with an internist during the past year ($p < 0.001$). The various associations are summarized in table 3.

Additionally, a person vaccinated with the 13-valent conjugate vaccine had 14 times the odds of being vacci-

nated against influenza in 2022 (OR=14.07, 95% CI 7.92, 24.97, $p < 0.001$) and participants vaccinated with both pneumococcal vaccines were 17.3 times more likely to be annually vaccinated against influenza within the previous 3 years (OR=17.3, 95% CI 5.06, 59.13, $p < 0.001$). Older age (≥ 50 years) appears to play a role in receipt of tetanus immunization [6.25 times less likely (OR=0.16, 95% CI 0.06, 0.37, $p < 0.001$)]. Persons with severe mental health disorders were 1.68 times less likely to be infected (OR=1.68, 95% CI 0.38, 0.91, $p = 0.018$) by COVID-19. Finally, persons vaccinated with at least one booster dose against COVID-19 were 9.57 times more likely to be annually vaccinated against influenza within the past three consecutive years (OR=9.57, 95% CI 4.27, 21.45, $p < 0.001$), revealing the importance of patient education and 1.82 times less likely to be infected with COVID-19 (OR=0.548, 95% CI 0.34, 0.87, $p = 0.012$), indicating a trend of prevention effectiveness.

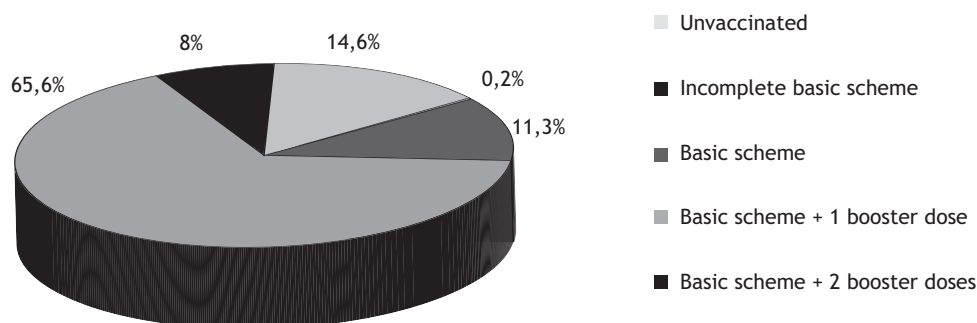


Figure 1. Vaccine coverage against COVID-19 for the participants in total. Participants with a diagnosis of severe mental illness showed similar vaccination rates for each subgroup.

Discussion

The primary goal of this study was to evaluate the vaccine coverage for individuals with mental illness, since limited studies exist on this issue, both in Greece and worldwide. According to our results, depression, and schizophrenia prevail as top-listed diagnoses, a finding also reported elsewhere.¹⁵ Miles et al (2019) explained that depression and anxiety disorders were often reported, possibly due to the criteria of their study, targeting any mental health disorder comorbidity, primary or secondary.¹⁶ Comparing comorbidities, the rates of diabetes, cardiovascular, and chronic liver diseases in the present study were higher than those reported in the literature, while chronic lung and kidney disease occurrence was lower.¹⁶

Vaccination rates against influenza for the past three years were recorded high in the medical files of individuals with mental illness, in contrast to Lorenz et al findings, which study though, dates a decade back.¹⁵ This is pointed out because the extended national influenza vaccine campaigns during the last decade may have led to an increase of vaccination against influenza.²¹ On the other hand, if compared to vaccination coverage among the adult population in Greece, a multicenter nationwide study by Tsiligianni et al reports better vaccination rates of 55%.²² In any case, influenza vaccination is still far below the 75% that ECDC had set for groups with chronic health conditions.²³ In the present study, it was further highlighted a positive influence of variables such as age, nativity, polypharmacy, and non-hospitalization in a psychiatry ward. In addition, participants who were consistent with their annual influenza vaccination were also up-to-date with the rest of the vaccine recommendations.

In our study, the number of patients who received the 13-valent pneumococcal conjugate vaccine was rather low. Concerning the administration of the 23-valent polysaccharide vaccine, the rates of persons aged

18–65 years were found lower and the ones of persons >65 years higher in the present study in comparison with the study of Miles et al, a difference that could be explained by the prompt administration of the vaccine to younger patients due to comorbidities.¹⁶ Tsiligianni et al examined the administration of at least one pneumococcal vaccine among high-risk individuals, and the reported rates were almost identical to ours.²² The low vaccination rates with the 23-valent polysaccharide vaccine in the present study could be attributed to a lack of information about the current vaccine recommendations, as well as consultation by a doctor, other than the one who administered the 13-valent conjugate vaccine.²⁴ Studies have found that pneumococcal vaccine status was positively associated with insurance capacity and annual consultations with the attending physician,^{25,26} while the present study, in addition, underlines the positive role of age, gender, polypharmacy, the time since diagnosis, and non-hospitalization to a psychiatry ward.

Many persons in Crete work in agriculture; hence, they have an increased exposure risk to *Clostridium tetani*.²⁷ Despite that, vaccine coverage against tetanus was quite low, and the finding was aligned with other studies that took place in Greece in 2019 and 2020.^{22,28} The same trend was found when comparing with the studies by Miles et al. and Carney et al.^{16,29} A challenge faced during our survey was the inability of participants to clarify if they had been vaccinated against tetanus or had received anti-tetanus immunoglobulin. This issue was solved after cross-checking with the online prescription information. The younger age group was more frequently vaccinated against tetanus, as those between 19 and 25 years of age were usually prompted by a pediatrician for the booster dose, or there was mandatory immunization at the beginning of the military service.³⁰

Table 3. Association between sociodemographic/clinical parameters and vaccination for influenza (2022) and Pneumococcal Conjugate Vaccine (PCV13).

Parameter	Influenza vaccination (%)	Chi-Square	p-value	PCV13 vaccination (%)	Chi-Square	p-value
Years since diagnosis						
	<5	42/120 (34.16)	2.437	25/120 (20.83)	5.575	0.018*
	≥5	105/241 (43.56)		79/241 (30.29)		
Age						
	<50 years old	39/171 (22.80)	43.190	20/171 (11.69)	46.393	<0.001*
	≥50 years old	108/190 (56.84)		84/190 (44.21)		
Gender						
	Male	53/148 (35.81)	2.505	32/148 (21.62)	6.318	0.012*
	Female	94/213 (44.13)		72/213 (33.80)		
Nationality						
	Native	144/340 (42.35)	6.455	100/340 (29.41)	1.036	0.309
	Foreigner	3/21 (14.28)		4/21 (19.04)		
Place of living						
	City	117/290 (40.34)	0.086	88/290 (30.34)	1.696	0.193
	Countryside	30/71 (42.25)		16/71 (22.53)		
Insurance capacity						
	Insured	125/266 (46.99)	16.474	87/266 (32.70)	7.488	0.006*
	Uninsured	22/95 (23.15)		17/95 (17.89)		
Polypharmacy						
	Yes	92/148 (62.16)	47.775	68/148 (45.94)	35.918	<0.001*
	No	55/213 (25.82)		36/213 (16.90)		
Admission to a psychiatric ward						
	Yes	35/130 (26.92)	16.021	28/130 (21.53)	5.236	0.022*
	No	112/231 (48.48)		76/231 (32.90)		
Assessment by an internist during the past year						
	Yes	140/228 (61.40)	109.676	94/228 (41.22)	46.540	<0.001*
	No	7/133 (5.26)		10/133 (7.51)		
Attendance of medical appointments with an escort						
	Yes	50/103 (48.54)	3.654	34/103 (33.00)	1.240	0.265
	No	97/258 (37.59)		70/258 (27.13)		

* Indicates a statistically significant result

Hepatitis B rates, although similar to the study by Miles et al were found nearly half in comparison to the study by Carney et al which though included a very low number of participants.^{16,29} In comparison to high-risk adults in Greece, the rates of Tsiligianni et al were nearly twofold higher but remained very low.²² Long-term follow-up studies of persons who were vaccinated against hepatitis B as infants had reported an overall 50–70% no detection of anti-HBs 15–30 years later.³¹ Under-vaccination also deserves major attention, as eventual hepatitis B infection can cause significant chronic morbidity, disability, and financial burden.

The patients in this study were more commonly vaccinated with the MMR vaccine in comparison to other studies among the mentally ill population.¹⁶ The same pattern was found for the coverage of the adult Greek population eligible for this vaccine.²² However, it is noteworthy that nearly one out of five participants born after 1970 could not recall or provide documents about their vaccination status. Developing tools like registries and electronic medical records could save physicians' time related to consultation and increase vaccine uptake.³² Low MMR vaccination rates could easily explain measles epidemic outbreaks.³³

The relatively low rates of vaccine coverage against herpes zoster in the present study, although higher than those reported by Tsiligianni et al and Papagiannis et al^{22,28} were lower in comparison to the USA study in 2018.³⁴ This is possibly explained by the fact that this particular vaccine was one of the most recently adopted in Greece, as it became available in 2014, six years later in comparison to the USA.^{35,36}

The so-far-published studies about vaccination against COVID-19 for sufferers of mental disorders examined the administration of the first dose of the vaccine or the completion of the basic recommended scheme.^{17–20,37} In the current study, people with mental disorders presented higher vaccination rates against COVID-19 compared to the general population. The

same observation was shared by Fond et al by excluding substance use disorder sufferers,¹⁷ but it differed from the overall lower rates reported by Arumuham et al and Peritogiannis et al.^{20,37} This could derive from the different study designs and settings. Finally, those who had at least 3 mRNA COVID-19 doses were less likely to be symptomatically infected.³⁸

This was a regional study that involved a clinical sample of patients who were engaged in mental health treatment; hence, no generalization of the results for the whole patient population can be suggested. Many participants had not had a consultation with an internist during the past year, which might underestimate the actual occurrence of comorbidities. Self-reporting biases or uncertainty may also occur. The current study was a cross-sectional one, based on convenience sampling with consecutive data collection. The history of COVID-19 infection did not include asymptomatic carriers of the disease, except for the known cases, due to random testing.

Conclusion

The close collaboration of various healthcare professionals and, more specifically, of psychiatrists with internists or general practitioners could ensure a multidisciplinary approach in the treatment of the vulnerable group of mentally ill people and provide further protection through preventive measures, such as vaccinations. Persons with mental illness seem to be receptive if receiving prompt and trusted information. On the other side, emerging determinants from innovative research for clinical and policy-making decisions, which could allow for modern strategic planning, should be discussed in order to improve healthcare services in terms of digital information processing, complementary competencies, health teams, and investment into more personalized care for groups most in need. Moreover, research findings can open a discussion to motivate awareness towards both directions, mental health care and prevention.

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Ερευνητική εργασία

Εμβολιαστική κάλυψη ατόμων που χρησιμοποιούν υπηρεσίες ψυχικής υγείας εξωτερικού ιατρείου στο Ηράκλειο Κρήτης: Μια συγχρονική μελέτη κατά τη διάρκεια της πανδημίας

Επαμεινώνδας Ευάγγελος Καντιδάκης,¹ Εμμανουήλ Κ. Συμβουλάκης,² Μαρία Μπάστα,³ Ευγενία Χουρδάκη,⁴ Ελένη Δημητρίου⁵

¹Γενική και Οικογενειακή Ιατρική, Βενιζέλειο Γενικό Νοσοκομείο, Ηράκλειο, Κρήτη,

²Πρωτοβάθμια Φροντίδα Υγείας, Τομέας Κοινωνικής Ιατρικής, Ιατρική Σχολή, Πανεπιστήμιο Κρήτης, Ηράκλειο, Κρήτη,

³Τομέας Ψυχιατρικής και Επιστημών Συμπεριφοράς, Ιατρική Σχολή, Πανεπιστήμιο Κρήτης, Ηράκλειο, Κρήτη,

⁴Ψυχιατρικό τμήμα, Βενιζέλειο Γενικό Νοσοκομείο, Ηράκλειο, Κρήτη,

⁵Παιδιατρική με έμφαση στην εργαστηριακή έρευνα, Τομέας Μητέρας-Παιδιού, Ιατρική Σχολή, Πανεπιστήμιο Κρήτης, Ηράκλειο, Κρήτη

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ΠΕΡΙΛΗΨΗ

Τα άτομα με διαταραχές ψυχικής υγείας είναι ευάλωτα και με απαιτητικές ανάγκες φροντίδας. Η παρούσα συγχρονική μελέτη είχε στόχο να μελετήσει την εμβολιαστική τους κάλυψη κατά της COVID-19 και άλλων κοινών ασθενειών που μπορούν να προληφθούν με κάποιο εμβόλιο. Η μελέτη διεξήχθη, από τον Σεπτέμβριο έως τον Νοέμβριο του 2022, στα εξωτερικά ιατρεία της Ψυχιατρικής του Βενιζέλειου Γενικού Νοσοκομείου Ηρακλείου Κρήτης και του Κέντρου Ψυχικής Υγείας Ηρακλείου. Οι πληροφορίες συλλέχθηκαν μέσω προσωπικών ιατρικών συνεντεύξεων και δεδομένων συνταγογράφησης. Το τελικό δείγμα περιλάμβανε 361 συμμετέχοντες, μέσης ηλικίας $49,8 \pm 14,3$ έτη, εκ των οποίων το 59,0% ήταν γυναίκες. Οι συχνότερα καταγεγραμμένες διαγνώσεις ήταν η υποτροπιάζουσα καταθλιπτική διαταραχή (24,1%), η σχιζοφρένεια (22,7%), η αγχώδης διαταραχή (21,3%) και η διπολική διαταραχή (15,7%). Η εμβολιαστική κάλυψη κατά της εποχικής γρίπης για τα έτη 2020, 2021, 2022 ήταν 43,2%, 39,8%, 40,7% αντίστοιχα. Ο εμβολιασμός κατά του πνευμονιόκοκκου περιλάμβανε τα συζευγμένα (28,8%) και πολυσακχαριδικά (7,7%) εμβόλια. Ο εμβολιασμός κατά του τετάνου, της διφθερίτιδας, του κοκκύτη (TDP) αντιπροσώπευε το 11,0%, της ηπατίτιδας Β το 5,8% και του έρπητα ζωστήρα το 27,1%. Ο εμβολιασμός κατά της COVID-19, με τουλάχιστον μία αναμνηστική δόση, ανήλθε στο 73,6%. Οι ασθενείς με μείζονα ψυχική διαταραχή, 139 από τους 361, είχαν λιγότερες πιθανότητες να έχουν προσβληθεί από την COVID-19 (50/139, 35,9%) από εκείνους με μη-μείζονα ψυχική διαταραχή (108/222, 46,6%), ($p=0,018$). Η κάλυψη με πολυσακχαριδικό εμβόλιο, TDP και ηπατίτιδα Β ήταν πολύ χαμηλή. Οι ασθενείς που εμβολιάζονταν ετησίως για τη γρίπη τα τελευταία τρία συνεχόμενα χρόνια, ήταν πιο πιθανό να εμβολιαστούν πλήρως για την πνευμονιοκοκκική νόσο και για την COVID-19 (με τουλάχιστον μία αναμνηστική δόση). Η μελλοντική έρευνα και η κλινική πρακτική θα πρέπει να επικεντρωθούν στον εντοπισμό ασθενών που κινδυνεύουν να μη λάβουν προληπτικές υπηρεσίες, όπως τα εμβόλια.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: COVID-19, γρίπη, ψυχικές διαταραχές, πνευμονιόκοκκος, πρόληψη, εμβολιασμός.

Research article

Greek anaesthesiologists' post-traumatic stress syndrome in the post-COVID-19 era: An observational, multicenter, cross-sectional study from COVID-19 referral, university/tertiary hospitals

Maria P. Ntalouka,¹ Agathi Karakosta,² Diamanto Aretha,³ Alexandra Papaioannou,⁴ Vasileia Nyktari,⁴ Pelagia Chloropoulou,⁵ Eleni Koraki,⁶ Efstathia Pistioli,⁷ Paraskevi K. Matsota,⁷ Petros Tzimas,² Mary Gouva,⁸ Eleni M. Arnaoutoglou¹

¹Department of Anaesthesiology, Faculty of Medicine, University of Thessaly, Larissa University Hospital, Larissa,

²Department of Anaesthesiology and Postoperative Intensive Care, Faculty of Medicine, University of Ioannina, Ioannina,

³University Hospital of Patras, Department of Anaesthesiology & Intensive Care, Rion, Patras,

⁴Faculty of Medicine, University of Crete, Anaesthesia Department of University Hospital of Heraklion, Crete,

⁵School of Medicine, Democritus University of Thrace, Department of Anaesthesiology, Alexandroupolis,

⁶George Papanikolaou Hospital, Department of Anaesthesiology, Thessaloniki,

⁷2nd Department of Anaesthesiology, School of Medicine, National and Kapodistrian, University of Athens, "Attikon" University Hospital, Athens,

⁸Research Laboratory Psychology of Patients, Families & Health Professionals, University of Ioannina, Ioannina, Greece

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ABSTRACT

Anaesthesiologists actively involved with COVID-19 are at increased risk for post-traumatic stress syndrome (PTSS). We assessed the PTSD and possible determinants of anaesthesiologists in COVID-19 referral hospitals in the post-COVID-19 era with the validated PTSD Checklist for DSM-5 (PCL-5) and the Eysenck Personality Questionnaire (EPQ). A multicenter cross-sectional survey was conducted among anaesthesiologists working in the 7 COVID-19 referral university/tertiary hospitals during November 2022 (post-COVID-19 era) in Greece. PCL-5 is a 20-item, 5-point Likert scale self-report measure, scored in two different ways to ensure a provisional diagnosis of PTSS. Eysenck Personality Questionnaire (EPQ) explores 3 main dimensions of personality, whereas the Lie (L) scale serves as a measure of "dishonesty". Multivariate logistic regression analysis was performed to identify predicting factors of PTSS using the stepwise forward method. One hundred doctors (response rate 85%) from 7 hospitals (72% females, median age 46 [33–51.5] years) participated. The overall Cronbach's alpha for PCL-5 was 0.946. According to each scoring, 18% and 23% of responders were diagnosed with PTSS, respectively, while 7% were classified as suffering from probable PTSD. Interestingly, children (OR=0.17, $p=0.048$) and the satisfaction with job position (OR=0.211, $p=0.024$) exhibited a protective effect against PTSS. On the other hand, family obligations were identified as an aggravating factor (OR=4.274, $p=0.026$). Concerning personality traits, only neuroticism was identified as a statistically significant independent factor predicting PTSS (OR=1.524, $p=0.001$). Finally, job ranking was also a statistically significant independent factor predicting PTSS, with a 3 times risk augmentation for each level in the job hierarchy (from Residents towards Academics) (OR=3.034, $p=0.022$). In the post-COVID-19 era, up to 23% of Greek anaesthesiologists working in referral hospitals suffered from PTSS. Children and job satisfaction exhibited a protective role in contrast to higher ranks of the job hierarchy.

KEYWORDS: Post-traumatic stress disorder syndrome, COVID-19, pandemics, patient safety, quality.

Introduction

The COVID-19 outbreak originated in China (December 2019) and was soon declared an international public health emergency by the World Health Organization (WHO).^{1,2} The first case in Greece was registered in February 2020, when Greek anaesthesiologists were under high stress and considerable pressure due to critical staff shortages and strenuous working hours.³

Anaesthesiology is a specialty with high stress due to various factors such as an increased risk of burnout, irregular working hours, and high occupational stress.² According to current literature, the mental health of anaesthesiologists is often poor compared to other physicians.³ In addition, anaesthesiologists all around the world have been exposed to severe biological and psychological risks during the pandemic and have faced unprecedented physical and psychological challenges.^{2,4,5} According to the current literature, it seems that the COVID-19 epidemic should be considered as a psychological (emotional) trauma that has led to a long-term psychological epidemic, characterized mainly by post-traumatic stress syndrome (PTSS), among healthcare professionals working in operating theaters and frontline, including anaesthesiologists.⁶

PTSS is a mental health problem that some people develop after experiencing or witnessing a life-threatening event. It has been defined as “an anxiety and memory disorder characterized by the person’s inability to “integrate” the traumatic event into consciousness”.^{7,8} It manifests with dramatic symptoms of hyperarousal, intrusive memorial recollections, nightmares, and somatosensory flashbacks.⁸ Overall, the symptoms are summarized in a four-dimensional structure: (i) intrusion/re-experiencing (criterion B), (ii) avoidance (criterion C), (iii) negative alterations in cognition and mood (criterion D), and (iv) alterations in arousal and reactivity (criterion E).⁷ PTSS can cause significant distress and problems in coping with everyday function and can last for more than one month and up to several years. It may also be associated with anxiety, depression, or substance use disorder.⁶ Several studies have shown that healthcare workers suffered from high levels of anxiety, including PTSS, after previous pandemics, such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), as well as during the COVID-19 pandemic.⁹ During the COVID-19 pandemic, PTSS among healthcare workers ranged from 4.4% to 49.38%. Frontline health workers, female gender, long working hours, and low social support were identified as risk factors for PTSS.⁹

Currently, data on the prevalence of PTSS and possible predictors or contributors among anaesthesiologists in Greece are lacking. Hence, we ought to: (1) Assess the PTSS levels of anaesthesiologists working in COVID-19, university/tertiary referral hospitals, one year after the fourth and most severe peak of the pandemic in Greece, (2) Identify possible sociodemographic- and personality-related determinants of PTSS.

Materials and Method

Participants and procedures

Reporting conforms to the STROBE (Strengthening The Reporting of Observational Studies in Epidemiology) statement for observational, cross-sectional studies.¹⁰ This was a voluntary, purely observational, and non-interventional study with anonymized data.

A cross-sectional study was conducted one year after the 4th peak of the COVID-19 pandemic, the most severe peak, in Greece (November 2022). Anaesthesiologists working in COVID-19 referral, university/tertiary hospitals deemed eligible to participate. An anonymous self-reported questionnaire was distributed by pre-specified colleagues in each hospital, after the consent of the heads of the departments. In addition, the invitation letter included a note on the first page of our questionnaire, stating that by continuing to browse and complete the questionnaire, participants were giving their consent to take part in this survey. Colleagues who were not involved in the care of COVID-19 patients (e.g., residents during their first month of training) for certain reasons and those who refused to participate were excluded from participation. All colleagues were informed that their participation was voluntary and anonymous and that all information provided would be treated confidentially. Permission to conduct the study was also obtained from each hospital director.

Measures

The survey consisted of 4 parts. The first part consisted of 9 questions regarding basic sociodemographic, medical, and occupational information, including gender, age, marital status, number of children, smoking and alcohol use, cardiovascular, malignant, or autoimmune comorbidities, and current working rank (resident, locum consultant, junior consultant, senior consultant, director consultant, coordinating director, and academic consultant).

The second part consisted of questions about satisfaction and how family interferes with job demands and vice versa.

The third part was the Post-Traumatic Stress Disorder Checklist for DSM-5 (PCL-5) validated for the Greek population.⁷ The PCL-5 is a 20-item self-reported psychometric instrument, scored on a 5-point Likert scale that measures and assesses PTSS symptoms.⁶ Responses are categorized as 0 (not at all), 1 (a little), 2 (moderately), 3 (quite), and 4 (extremely), concerning traumatic life experiences.⁷ The scale consists of the following factors: Intrusion/re-experiencing, avoidance, negative changes in cognition and mood, and arousal and reactivity. The PCL-5 can be scored and determine a PTSS diagnosis in different ways. Firstly, by summing all 20 items (range 0–80), implementing a total symptom severity score (range 0–80), and using a cut-point score of 31–33. Moreover, by treating each item rated as 2 (“moderately”) or higher as a symptom endorsed, then following the DSM-5 diagnostic rule, which requires at least a score of one or more in the categories of criteria B (items 1–5) and C (items 6–7) and two or more in categories D (items 8–14) and E (items 15–20). Of note, if the score for each item is 2 or more (range 0 to 4) a provisional PTSS diagnosis can be made.⁷

For the fourth part of the study, the Eysenck Personality Questionnaire (EPQ) validated for the Greek population was used.^{11,12} The EPQ explores three main aspects of personality: neuroticism, psychoticism, and extraversion. It consists of 84 statements to be answered with “yes” or “no”. Each participant is assigned a different score for each personality, as there are no cut-off points.^{11–13}

Following the study by Che et al² that examined the extent of PTSD and burnout in Chinese anaesthesiologists, we further categorized participants based on their working rank into the following 4 groups for our analysis: residents, junior consultants (specialists with less than 8 years of clinical experience), senior consultants (specialists with more than 8 years of clinical experience), and academic staff. Nevertheless, all coordinating directors are academic staff in our study sample.

Statistical analysis

The Shapiro-Wilk test was performed to test the normal distribution of the continuous variables. Results for all quantitative variables are presented as mean and standard deviation (SD) or median and interquartile range [IQR], according to the normal distribution. All qualitative variables are reported as absolute and/or relative frequencies. For comparison of continuous variables with two or more degrees of freedom T-test and one factor ANOVA, or their nonparametric equivalents, Mann-Whitney U and Kruskal-Wallis tests, were used. Fisher’s exact test was used for the comparison of cate-

gorical variables. The integral reliability for all questionnaires was examined by Cronbach’s alpha calculation. Spearman’s rank correlation coefficients were estimated to examine relationships between continuous variables. The Bonferroni correction was applied for multiple comparisons.

Finally, a multivariate logistic regression analysis was conducted to identify predictive factors of PTSS. The multivariate logistic regression model was created using the forward stepwise method. The assumptions for the application of multivariate logistic regression were met. In particular, model validation was performed by applying the Hosmer-Lemeshow test (goodness of fit, $p > 0.05$). In addition, after applying Spearman’s correlation test between the independent variables, no correlation exceeded 0.5, thus no multicollinearity was recognized. All tests were two-tailed and statistical significance was set at 5% ($p < 0.05$). Data were analyzed using Stata™ (Version 10.1 MP, Stata Corporation, College Station, TX 77845, USA).

Results

A total of 100 anaesthesiologists working in the 7 COVID-19 referral, university/tertiary hospitals participated in the study (response rate 85%). The majority were female (72%), and the median age of all participants was 46 years, with an IQR of 33 to 51.5 years. The detailed characteristics of the participants are shown in table 1. The groups were similar in terms of demographics and medical history, except for age and marital status/children, which differed between groups as expected (table 2).

The satisfaction levels according to job ranking showed no statistically significant differences (table 3). However, differences were found when comparisons were made by gender (table 4). In particular, when participants were asked, “Do the demands of your job negatively affect the time and energy you devote to your family?” women gave higher percentages on the 5-item Likert scale (worse response) compared to men ($p = 0.016$, table 4).

For the PCL-5, the overall Cronbach’s alpha was 0.946, and the integral reliability was considered good and was > 0.8 . The PTSS diagnosis was based on two different interpretations of the PCL-5 as described in the methods. After the two evaluations, 18% and 23% of respondents were diagnosed with PTSS, respectively, while 7% were classified as probably suffering from PTSS.

Table 5 summarizes the results of the multivariate logistic regression analysis. PTSS was converted to a binary variable and served as the dependent variable, while gender, age, job ranking, marital status, children,

Table 1. Cohort description.

Age (ys)	46 [32–51.5]
Marital status	
Single	36 (36%)
Married/Cohabitation	57 (57%)
Divorced	6 (6%)
Widowed	
Children (yes/no)	28 (28%)/72 (72%)
Number of children	1 [0–1]
Smoking (yes/no)	35 (35%)/65 (65%)
Alcohol	
None/rarely	53 (53%)
Once or twice weekly	34 (34%)
Three to four times weekly	9 (9%)
More than four times weekly	4 (4%)
History of cardiac disease or cancer (yes/no)	7 (7%)/93 (93%)
History of cancer (yes/no)	5 (5%)/95 (95%)
History of autoimmune disease (yes/no)	9 (9%)/91 (91%)
Job characteristics - Rank	
Resident	27 (27%)
Locum consultant	2 (2%)
Consultant B	17 (17%)
Consultant A	16 (16%)
Director consultant	26 (26%)
Coordinating Director*	4 (4%)
Academic consultant	7 (7%)

Results are presented as median [IQR] and as absolute and relative frequencies accordingly.

* All coordinating directors are academics (as all participating hospitals are University Hospitals).

habits (smoking, alcohol consumption), medical history (history of cardiac disease, cancer, autoimmune disease), satisfaction level (as depicted in tables 3 and 4) and all four dimensions of the EPQ served as independent variables in the forward stepwise procedure. The 5-point Likert scales on satisfaction level and “job ranking”, were treated as continuous variables in the model construction. Concerning the dimensions of the EPQ, only neuroticism was identified as a statistically significant independent factor predicting PTSS (OR=1.524, p=0.001). Interestingly, children exhibited a protective effect against PTSS (OR=0.17, p=0.048), as did “satisfaction with job position”. For the latter, there was a risk reduction of almost 80% for each level on the Likert scale in the direction of “best answer/very satisfied”. On the other hand, the statement “Family obligations are negatively affecting the time and energy you devote to your work” was identified as an aggravating factor, with a more than 4-fold increase in risk for each level of

Table 2. Baseline participant characteristics by job rankin.

	Resident (n=27)	Junior Consultant (n=19)	Senior consultant (n=42)	Academic staff (n=11)	p value
Gender (m/f)	9 (33.33%)/18 (66.67%)	5 (26.32%)/14 (73.68%)	12 (28.57%)/30 (71.43%)	1 (9.09%)/10 (90.91%)	0.534
Age (ys)	28 [26–30]	44 [40.5–49]	51 [47–56]	49 [46–52]	0.0001
Marital status (married/cohabitation vs single/divorced)	6 (22.22%)/21 (77.78%)	12 (63.16%)/7 (36.84%)	30 (71.43%)/12 (28.57%)	9 (81.82%)/2 (18.18%)	<0.001
Children (yes/no)	3 (11.11%)/24 (88.89%)	12 (66.67%)/6 (33.33%)	31 (77.5%)/9 (22.5%)	9 (81.82%)/2 (18.18%)	<0.001
Number of children	1 [1–1]	1.5 [1–2]	2 [1–2]	2 [1–2]	0.27
Smoking (yes/no)	6 (22.22%)/21 (77.78%)	6 (31.58%)/13 (68.42%)	18 (42.86%)/24 (57.14%)	4 (36.36%)/7 (63.64%)	0.363
Alcohol (none to twice weekly vs more than 3 times weekly)	22 (81.48%)/5 (18.52%)	19 (100%)/-	37 (88.1%)/5 (11.9%)	9 (81.82%)/2 (18.18%)	0.197
History of cardiac disease (yes/no)	1 (3.7%)/26 (96.3%)	1 (5.26%)/18 (94.74%)	4 (9.52%)/38 (90.48%)	-/11 (100%)	0.817
History of cancer (yes/no)	1 (3.7%)/26 (96.3%)	1 (5.26%)/18 (94.74%)	1 (2.38%)/41 (97.62%)	1 (9.09%)/10 (90.91%)	0.578
History of autoimmune disease (yes/no)	-/27 (100%)	3 (15.79%)/16 (84.21%)	3 (7.14%)/39 (92.86%)	2 (18.18%)/9 (81.82%)	0.067

Results are presented as median [IQR] and as absolute and relative frequencies, accordingly

Table 3. Satisfaction levels by job ranking

	Total (n=100)	Resident (n=27)	Junior Consultant (n=19)	Senior Consultant (n=42)	Academic staff (n=11)	p value
Are you satisfied with your job?						
Not at all	2 (2%)	-	1 (5.26%)	-	-	
Partly satisfied	-	-	-	-	-	
Satisfied	14 (14%)	3 (11.11%)	1 (5.26%)	10 (23.81%)	-	0.089
More than satisfied	31 (31%)	8 (29.63%)	3 (15.79%)	15 (35.71%)	5 (45.45%)	
Very satisfied	53 (53%)	16 (59.26%)	14 (73.68%)	17 (40.48%)	6 (54.55%)	
Are you satisfied with your position?						
Not at all	5 (5%)	1 (3.7%)	2 (10.53%)	1 (2.38%)	-	
Partly satisfied	4 (4%)	2 (7.41%)	1 (5.26%)	-	1 (9.09%)	
Satisfied	15 (15%)	3 (11.11%)	-	11 (26.19%)	1 (9.09%)	0.079
More than satisfied	42 (42%)	13 (48.15%)	6 (31.58%)	19 (45.24%)	4 (36.36%)	
Very satisfied	34 (34%)	8 (29.63%)	10 (52.63%)	11 (26.19%)	5 (45.45%)	
You feel that the demands of your job are negatively affecting the time and energy you devote to yourself.						
Not at all	8 (8%)	1 (3.7%)	1 (5.26%)	6 (14.63%)	-	
Partly	6 (6%)	4 (14.81%)	1 (5.26%)	1 (2.44%)	-	
Neither affects nor does not affect	21 (21%)	7 (25.93%)	5 (26.32%)	6 (14.63%)	3 (27.27%)	0.2
Somewhat	31 (31%)	9 (33.33%)	5 (26.32%)	16 (39.02%)	1 (9.09%)	
Very	33 (33%)	6 (22.22%)	7 (36.84%)	12 (29.27%)	7 (63.64%)	
You feel that the demands of your job are negatively affecting the time and energy you devote to your family.						
Not at all	8 (8%)	2 (7.41%)	3 (15.79%)	3 (7.14%)	-	
Partly	17 (17%)	5 (18.52%)	3 (15.79%)	8 (19.05%)	1 (9.09%)	
Neither affects nor does not affect	21 (21%)	11 (40.74%)	3 (15.79%)	5 (11.9%)	2 (18.18%)	0.108
Somewhat	24 (24%)	6 (22.22%)	4 (21.05%)	13 (30.95%)	1 (9.09%)	
Very	30 (30%)	3 (11.11%)	6 (31.58%)	13 (30.95%)	7 (63.64%)	
You feel that your family obligations are negatively affecting the time and energy you devote to work.						
Not at all	50 (50%)	17 (62.96%)	9 (47.37%)	19 (45.24%)	4 (36.36%)	
Partly	24 (24%)	6 (22.22%)	6 (31.58%)	9 (21.43%)	3 (27.27%)	
Neither affects nor does not affect	14 (14%)	2 (7.41%)	2 (10.53%)	8 (19.05%)	2 (18.18%)	0.537
Somewhat	8 (8%)	2 (7.41%)	-	5 (11.9%)	1 (9.09%)	
Very	4 (4%)	-	2 (10.53%)	1 (2.38%)	1 (9.09%)	
Family loss (yes/no)	55 (55%)/44 (44%)	12 (44.44%)/15 (55.56%)	11 (57.89%)/8 (42.11%)	25 (60.98%)/16 (39.02%)	6 (54.55%)/5 (45.45%)	0.62

Results are presented as absolute and relative frequencies

Table 4. Satisfaction levels by sex.

	Males (n=28)	Females (n=72)	p value
Are you satisfied with your job?			
Not at all	2 (7.14%)	–	0.069
Partly satisfied	–	–	
Satisfied	6 (21.43%)	8 (11.11%)	
More than satisfied	8 (28.57%)	23 (31.94%)	
Very satisfied	12 (42.86%)	41 (56.94%)	
Are you satisfied with your position?			
Not at all	3 (10.71%)	2 (2.78%)	0.456
Partly satisfied	1 (3.57%)	3 (4.17%)	
Satisfied	3 (10.71%)	12 (16.67%)	
More than satisfied	10 (35.71%)	32 (44.44%)	
Very satisfied	11 (39.29%)	23 (31.94%)	
You feel that the demands of your job are negatively affecting the time and energy you devote to yourself.			
Not at all	5 (18.52%)	3 (4.17%)	0.055
Partly	3 (11.11%)	3 (4.17%)	
Neither affects nor does not affect	5 (18.52%)	16 (22.22%)	
Somewhat	9 (33.33%)	22 (30.56%)	
Very	5 (18.52%)	28 (38.89%)	
You feel that the demands of your job are negatively affecting the time and energy you devote to your family.			
Not at all	3 (10.71%)	5 (6.94%)	0.016
Partly	8 (28.57%)	9 (12.5%)	
Neither affects nor does not affect	4 (14.29%)	17 (23.61%)	
Somewhat	10 (35.71%)	14 (19.44%)	
Very	3 (10.71%)	27 (37.5%)	
You feel that your family obligations are negatively affecting the time and energy you devote to work.			
Not at all	17 (60.71%)	33 (45.83%)	0.252
Partly	8 (28.57%)	16 (22.22%)	
Neither affects nor does not affect	1 (3.57%)	13 (18.06%)	
Somewhat	1 (3.57%)	7 (9.72%)	
Very	1 (3.57%)	3 (4.17%)	
Family loss (yes/no)	17 (60.71%)/11 (39.29%)	38 (53.52%)/33 (46.48%)	0.654

Results are presented as absolute and relative frequencies.

the 5-point Likert scale towards the “worst answer/very” (OR=4.274, $p=0.026$). Finally, job ranking was also identified as a statistically significant independent factor predicting PTSS, with a 3-fold increase in risk for each level in the job hierarchy (from residents to academics) (OR=3.034, $p=0.022$).

Discussion

To our knowledge, this is the first study to examine the PTSS level of Greek anaesthesiologists in the post-pandemic period. According to our results, 18–23% of Greek

anaesthesiologists suffer from PTSS one year after the most severe COVID-19 wave in Greece, while 7% of them suffer from probable PTSS. PTSS scores did not differ between male and female anaesthesiologists, however, most women reported that “the demands of their job negatively impact the time and energy they devote to their family”. Interestingly, children and “job satisfaction” were identified as protective factors against PTSS, while working rank (from residents to academics) and neuroticism were identified as independent risk factors for the occurrence of PTSS.

Table 5. Multivariate logistic regression model of factors predicting PTSD.

Independent variables	OR	SE	p value	95% CI
Children (yes vs no)	0.171	0.152	0.048	0.029–0.981
History of autoimmune disease (yes vs no)	0.061	0.096	0.076	0.0028–1.335
Are you satisfied with your job position?	0.211	0.146	0.024	0.055–0.819
You feel that your family obligations are negatively affecting the time and energy you devote to your work.	4.274	2.785	0.026	1.192–15.33
Job ranking	3.034	1.475	0.022	1.169–7.868
Neuroticism	1.524	0.198	0.001	1.181–1.968

PTSD: Post Traumatic Stress Disorder (diagnosis based on the 2nd interpretation of the PCL-5, see text)

Guo et al⁴ investigated the extent of PTSD in the post-COVID era among Chinese anaesthesiologists and came to very similar results as we did (PTSD 19.9%). According to this study, longer working hours, chronic comorbidities, and COVID-19 exposure were risk factors for PTSD development, while vaccination, older age, and married status were protective factors.⁴ In our study, children and job satisfaction were the most important protective factors against PTSD, while neuroticism was found to be an independent risk factor for the occurrence of PTSD. Several in-hospital and out-of-hospital studies have found that neuroticism may be a precipitating factor for PTSD.¹⁴

According to 14 selected studies, rates of PTSS during the pandemic, among healthcare workers dealing with COVID-19, ranged from 2.1% to 73.4%.^{15–28} However, a pooled analysis of nine studies found that moderate rates of PTSD were found in 21.5% (95% CI, 10.5–34.9%) of healthcare workers during the pandemic.²⁹ Piacentini et al³⁰ found that the rate of PTSD among anaesthesiologists was 22.35% within two months of the declaration of the pandemic in Italy. Thus, it appears that the prevalence of PTSD among anaesthesiologists in the post-COVID-19 era was almost as high as during the COVID pandemic and that anaesthesiologists were still under increasing pressure of psychological symptoms in the post-COVID era.

PTSD can cause significant distress and problems functioning in daily life and can last for more than a month to many years.⁶ It can often coexist with several other psychological disorders, such as anxiety, depression, or substance abuse disorder.⁶ Experts point out that the experience of a global pandemic such as COVID-19 has the potential to be considered a mass traumatic event leading to an unprecedented global psychological impact, including PTSD, burnout syndrome, severe depression, and anxiety.⁶ However, not all individuals will experience PTSD in the same way;

this will vary across hospitals depending on the degree of exposure.⁶ Furthermore, different individuals have different psychological baselines and a distinct preventive function based on the mental health tools developed.⁶ Social and peer support are recognized to be important protective factors against the development of trauma.⁶ Routine support processes, such as adequate preparation for the expected psychological impact and other forms of psychoeducational seminars, are of paramount importance.⁶

On the other hand, it should be emphasized that PTSD has a clear and identifiable onset and a well-defined symptom profile, which makes it amenable to early diagnosis and intervention.³¹ Cognitive behavioral therapy is a well-described therapeutic option for PTSD. Other therapeutic options that have also been shown to be successful for PTSD include mindfulness, gratitude practices, imagination and trauma work, eclectic therapy, and reading.⁵ Hospitals should provide onsite psychological support to healthcare workers in a comfortable environment and offer trauma-informed care to try to prevent and/or treat PTSD.

Our study has certain limitations. To begin with, the lack of data on the pre-pandemic PTSS levels in our sample is an important limitation. However, the role of the pandemic in the exacerbating challenges inside and outside of the hospital, in addition to the prolonged shortage of critical workers, should not be overlooked. Although we used validated questionnaires for the Greek population, these were self-reported instruments. A more thorough psychological assessment therefore seems essential. However, to the best of our knowledge, this is the first study that attempts to investigate the PTSS among anaesthesiologists in the post-pandemic period in Greece, and therefore it should be considered as one of the first steps in the development of a strategy to mitigate PTSS in anaesthesiology.

In summary, our study found that the Greek anaesthesiologists' PTSS levels in the post-COVID-19 era were within the highest reported levels and were not significantly different from those reported during the

pandemic. With the advent of the post-pandemic era, the prevention of PTSS and the creation of a culture of well-being in the workplace seem to be imperative to reverse this trend in the speciality of anaesthesiology.

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Ερευνητική εργασία

Σύνδρομο μετατραυματικού άγχους στους Έλληνες αναισθησιολόγους στη μετά COVID-19 εποχή: Μία πολυκεντρική, συγχρονική μελέτη παρατήρησης από τα πανεπιστημιακά/τριτοβάθμια νοσοκομεία αναφοράς

Μαρία Π. Νταλούκα,¹ Αγαθή Καρακώστα,² Διαμάντω Αρέθα,³ Αλεξάνδρα Παπαϊωάννου,⁴ Βασιλεία Νύκταρη,⁴ Πελαγία Χλωροπούλου,⁵ Ελένη Κοράκη,⁶ Ευσταθία Πιστιώλη,⁷ Παρασκευή Κ. Ματσώτα,⁷ Πέτρος Τζίμας,² Μαίρη Γκούβα,⁸ Ελένη Μ. Αρναούτογλου¹

¹Αναισθησιολογική Κλινική, Τμήμα Ιατρικής, Πανεπιστήμιο Θεσσαλίας, Πανεπιστημιακό Νοσοκομείο Λάρισας, Λάρισα,

²Κλινική Αναισθησιολογίας και Μετεγχειρητικής Εντατικής Θεραπείας, Τμήμα Ιατρικής, Πανεπιστήμιο Ιωαννίνων, Ιωάννινα,

³Πανεπιστημιακό Νοσοκομείο Πατρών, Κλινική Αναισθησιολογίας και Εντατικής Θεραπείας, Πάτρα,

⁴Τμήμα Ιατρικής, Πανεπιστήμιο Κρήτης, Αναισθησιολογική Κλινική Πανεπιστημιακού Νοσοκομείου Ηρακλείου, Κρήτη,

⁵Τμήμα Ιατρικής, Δημοκρίτειο Πανεπιστήμιο Θράκης, Κλινική Αναισθησιολογίας, Αλεξανδρούπολη,

⁶Νοσοκομείο Γεώργιος Παπανικολάου, Κλινική Αναισθησιολογίας, Θεσσαλονίκη,

⁷2η Αναισθησιολογική Κλινική, Τμήμα Ιατρικής, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, «Αττικό» Πανεπιστημιακό Νοσοκομείο, Αθήνα,

⁸Ερευνητικό Εργαστήριο Ψυχολογίας Ασθενών Οικογενειών και Επαγγελματιών Υγείας, Πανεπιστήμιο Ιωαννίνων, Ιωάννινα,

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ΠΕΡΙΛΗΨΗ

Οι αναισθησιολόγοι που συμμετείχαν ενεργά στη φροντίδα των ασθενών με COVID-19 παρουσιάζουν αυξημένο κίνδυνο για σύνδρομο μετατραυματικού άγχους (PTSS). Στην παρούσα μελέτη αξιολογήθηκαν το σύνδρομο μετατραυματικού άγχους και οι πιθανοί προδιαθεσικοί παράγοντες των αναισθησιολόγων των Πανεπιστημιακών/Τριτοβάθμιων νοσοκομείων αναφοράς για τον COVID-19 στην Ελλάδα, στην εποχή μετά την πανδημία με τα σταθμισμένα ερωτηματολόγια PTSD Checklist for DSM-5 (PCL-5) και Eysenck Personality Questionnaire (EPQ). Πρόκειται για μία πολυπαραγοντική, συγχρονική μελέτη στην οποία συμπεριλήφθηκαν οι αναισθησιολόγοι που συμμετείχαν στη φροντίδα των ασθενών με λοίμωξη COVID-19 στα 7 νοσοκομεία αναφοράς της Ελλάδας το Νοέμβριο του 2022 (εποχή μετά την πανδημία). Το PCL-5 είναι ένα εργαλείο αυτοαξιολόγησης, 20 ερωτήσεων και 5-βαθμών στην κλίμακα Likert, η βαθμολογία του οποίου γίνεται με δύο διαφορετικούς τρόπους με σκοπό να διασφαλίσει τη διάγνωση του PTSD. Το ερωτηματολόγιο EPQ αξιολογεί τις τρεις βασικές διαστάσεις της προσωπικότητας, ενώ η κλίμακα ψεύδους (Lie scale) χρησιμεύει για την μέτρηση της απάτης. Για την αναγνώριση προδιαθεσικών παραγόντων ανάπτυξης PTSS εφαρμόστηκε μοντέλο πολυπαραγοντικής λογιστικής παλινδρόμησης με τη μέθοδο stepwise forward. Συνολικά 100 ιατροί (ποσοστό απόκρισης 85%) από 7 νοσοκομεία (72% γυναίκες, μέση ηλικία 46 [33-51,1] έτη) συμμετείχαν. Ο συντελεστής Cronbach's alpha για το PCL-5 υπολογίστηκε στο 0,946. Σύμφωνα με τους δύο προτεινόμενους τρόπους βαθμολόγησης του PCL-5 18% και 23% των συμμετεχόντων διαγνώστηκαν με PTSS, αντίστοιχα, ενώ 7% διαγνώστηκαν με πιθανό PTSD. Ενδιαφέρον αποτελεί το γεγονός ότι τα παιδιά (OR=0,17, p=0,048) και η ικανοποίηση με τη θέση εργασίας (OR=0,211, p=0,024) φαίνεται να λειτουργούν προστατευτικά έναντι του PTSD. Αντίθετα, οι οικογενειακές υποχρεώσεις αναγνωρίστηκαν σαν επιβαρυντικός παράγοντας (OR=4,274, p=0,026). Όσον αφορά τα χαρακτηριστικά της προσωπικότητας μόνο ο νευρωτισμός αναγνωρίστηκε σαν στατιστικά σημαντικός ανεξάρτητος παράγοντας για PTSS (OR=1,524, p=0,001). Τέλος, η εργασιακή κατάσταση αναγνωρίστηκε επίσης σαν ανεξάρτητος προγνωστικός παράγοντας για PTSS, με τριπλάσιο κίνδυνο για κάθε επίπεδο της εργασιακής ιεραρχίας (ειδικευόμενοι προς ακαδημαϊκοί) (OR=3,034, p=0,022). Στην εποχή μετά την πανδημία COVID-19 έως και 23% των Ελλήνων αναισθησιολόγων που εργάζονται στα νοσοκομεία αναφοράς εμφάνισαν PTSS. Τα παιδιά και η ικανοποίηση με τη θέση εργασίας φαίνεται να λειτουργούν προστατευτικά, σε αντίθεση με τους ανώτερους βαθμούς στην εργασιακή ιεραρχία.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Σύνδρομο διαταραχής μετατραυματικού στρες COVID-19, πανδημία, ασφάλεια ασθενών, ποιότητα.

Research article

Validation of the Greek version of the Binge Eating Scale in a sample of binge eating disorder patients

Maria Karapatsia,¹ Maria Evangelia Antoniadou,¹ Chara Tzavara,¹ Ioannis Michopoulos,² Fragiskos Gonidakis¹

¹First Department of Psychiatry, Eginition Hospital, National and Kapodistrian University of Athens, Athens,

²Second Department of Psychiatry, Attikon Hospital, National and Kapodistrian University of Athens, Athens, Greece

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ABSTRACT

Binge eating disorder (BED), the most prevalent eating disorder, carries significant physical and psychological consequences. Therefore, there is a continuous need to assess binge eating symptomatology and evaluate the effectiveness of various therapeutic interventions. The Binge Eating Scale (BES), which is a self-administered questionnaire, is widely used to assess binge eating in obese people. It examines the person's experience of binge eating and the emotional, cognitive, and behavioral symptoms associated with it. The purpose of the present study was to translate and adapt BES in Greek, as well as to assess the factorial structure of BES and evaluate its psychometric properties. A sample of 160 participants (90% females) with a mean age of 40.7 years ($SD=11.5$ years) and a mean body mass index (BMI) of 37.5 kg/m² ($SD=9.2$ kg/m²) completed the BES and the Eating Disorder Examination Questionnaire (EDE-Q). An exploratory factor analysis (EFA) was carried out to assess the construct validity of the BES in a sample of patients with BED according to DSM-5 who came for therapy at the Eating Disorders Unit at Eginition Hospital and the day center "Anasa". The two-factor structure fits the data best. Regarding internal consistency, the results were acceptable, with Cronbach's alpha equal to 0.78. The BES has high significant correlations with the Eating Concern, Weight Concern, and Shape Concern subscales and the Global Score of EDE-Q, but not with the Restrain subscale. Also, BES has correlations with the specific EDE-Q questions about the frequency of objective and subjective binge eating episodes. A high correlation was obtained with the measure of BMI too. The Greek version of BES is a valid and reliable scale to evaluate binge eating in a clinical population diagnosed with BED.

KEYWORDS: Binge eating, validity, internal consistency, factor analysis, Binge Eating Scale.

Introduction

Binge eating disorder (BED) is the most common eating disorder (ED).^{1,2} BED according to DSM-5 is characterized by recurrent episodes of binge eating during which an individual experiences a profound sense of loss of control and consumes an amount of food significantly larger than what most people would eat within a similar timeframe and under comparable circumstances. Although after the episodes the individual experiences intense negative emotions

such as guilt and shame, does not use unhealthy compensatory measures.³ A large study, which included data from 14 countries, found a lifetime prevalence average of 1.9%.⁴ BED affects 3.5% of women and 2% of men at some point in their lives.¹ Individuals exhibiting clinical and subclinical symptoms suffer from several comorbid health problems and mental disorders.^{5–8} Although it is argued that there is enough data to include BED in the Global Burden of Disease Study (GBD),^{9,10} BED is often undiagnosed and only a minority of patients receive therapy.¹¹

One thing that has arisen from the recent literature is the necessity for valid instruments for both BED and binge eating behaviors assessment. DSM-5 criteria are widely used by clinicians to diagnose BED.³ Also, the semi-structured clinical interview Eating Disorder Examination (EDE) has been widely used as an assessment tool for BED. EDE is considered the “gold standard” measure of ED psychopathology and includes questions about binge eating behavior, its frequency, and its severity.¹² Apart from the clinical interviews, which need trained clinicians and are time-consuming, self-reported questionnaires have been developed and used to measure the symptomatology and severity of BED. The Eating Disorder Examination Questionnaire (EDE-Q),¹³ the Eating Disorder Inventory (EDI-3),¹⁴ the Loss of Control Over Eating Scale (LOCES),¹⁵ the Three Factor Eating Questionnaire (TFEQ-R18),¹⁶ the Eating Disorder Diagnostic Scale (EDDS),¹⁷ the Yale-Brown obsessive compulsive scale modified for binge eating (YBOCS-BE),¹⁸ the 7-item Binge-Eating Disorder Screener (BEDS-7),¹⁹ the Emotional Eating Scale (EES),²⁰ and the Positive-Negative Emotional Eating Scale (PNEES)²¹ are among those that find application both in clinical practice and research studies, enabling the assessment of binge eating behaviors.

The Binge Eating Scale (BES), a widely utilized tool in both clinical practice and BED research, was developed by Gormally et al.²² BES is a self-administered questionnaire that examines the individual’s experience concerning binge eating and measures the behavioral and emotional/cognitive symptoms associated with binge eating.²² According to the work of Gormally et al²² and as cited by Marcus et al., binge eating symptomatology can be classified into three levels of severity: a score above 27 implies severe binge eating, a score between 18 and 26 indicates moderate binge eating, and a score of 17 or less suggests a lack of binge eating symptomatology.²³

BES demonstrated good validity and internal consistency in the original study, and several studies evaluated its factor structure, validity, and internal consistency in different populations and languages.^{24–28} Although Gormally et al originally proposed a two-factor structure, one describing the emotional/cognitive aspects and the other behaviors related to BES,²² its factor structure is controversial. Marek et al, based on previous results by Hood et al,²⁹ in a sample of bariatric surgery candidates, found a two-factor structure.³⁰ Also, Ziedan et al and Kusbiantrari et al found a two-factor structure in the Lebanese general population and undergraduate Indonesian students, respec-

tively.^{31,32} Robert et al using a sample from a medical outpatient clinic, medical students, and staff, found that the two-factor structure fitted their data best, although when they tested the sensitivity and specificity, they found a unidimensional structure.³³ Yan et al also identified a two-factor structure in a sample of overweight students from five universities.³⁴

On the other hand, some studies have found that a one-factor structure fitted their data best. In the Duarte et al study in a sample of women from the general population and in the Brunault et al study in a clinical sample of morbidly obese patients who were eligible for bariatric surgery and a non-clinical sample, a one-factor structure was found.^{35,36} Similarly, Imperatori et al and Escriva- Martinez et al found a one-factor structure in a sample of obese and overweight patients attending low-energy diet therapy and in a sample consisting of college students, respectively.^{37,38}

BES has been used as a screening tool for BED in various studies. Frietas et al and Ricca et al conducted studies focusing on BES’s sensitivity and specificity and found that it is a valuable screening tool for distinguishing compulsive and non-compulsive eaters.^{24,39} Grupski et al assessed the utility of the BES as a measure of BED in patients seeking bariatric surgery and found that it is a valid screener of BED for these patients.²⁶ Dezhkam et al studied the adaptation of BES in an Iranian obese population and they also found that it can be a valid instrument for screening BED in this population.⁴⁰ Celio et al using a sample from the initial screening phase of a multisite, randomized, controlled trial for the effectiveness of sibutramine in the treatment of BED, found that BES performed satisfactorily as an initial screening tool for BED measurement, but was less accurate in identifying non-BED individuals.²⁵

The BES total score is commonly used in clinical practice as a measure of binge eating severity,^{28,29,37} as well as an instrument to measure the effectiveness of various therapeutic interventions.⁴¹

BES measures not only the severity but also the behavioral and emotional/ cognitive aspects of binge eating behavior. Therefore, it was chosen to measure the changes in binge eating behavior in a therapeutic intervention study in BED patients. Since BES has not been validated in Greek and its psychometric properties have not been assessed in the BED population, the purpose of the present study was to adapt BES into the Greek language and assess the psychometric properties of the Greek version of BES.

Materials and Method

Participants

Participants were 160 adults who applied for treatment at the Eating Disorders Unit, Eginition Hospital, and the Day Centre "Anasa". Initial assessments were conducted by psychologists or psychiatrists to confirm the diagnosis of BED. Furthermore, because the participants were also screened during the initial assessment, to participate in a BED group intervention study, certain exclusion criteria were applied: body mass index (BMI) less than 18.5, active suicidal ideation or psychosis, active use of psychoactive substances or alcohol, attendance at another therapeutic or weight loss program, less than 3 months' treatment with a fixed dose of antidepressants, pregnancy or breast-feeding, and serious health problems. The BMI criterion was applied to exclude remitted Anorexia Nervosa (AN) patients who have recently started to binge. All other exclusion criteria were mainly related to behaviors or patients' characteristics that would prohibit them from effectively participating in a group intervention study. All participants provided the researchers with written informed consent to be included in the study, according to the Helsinki Declaration.

Procedure

Dr. Gormally was approached, and permission was granted to translate BES in Greek and test the validity of the Greek version. The English version of BES was translated into Greek by two independent Greek and English native-speaking translators, following a forward-backward-forward procedure. The translation process adhered to the guidelines outlined by the World Health Organization for the translation and adaptation of instruments.⁴² The questionnaire was originally administered to 10 participants to identify and correct any misconceptions and difficulties in the comprehension of the scale's items.

The questionnaires were administered during the initial assessment and prior to any therapeutic intervention. The research was approved by the Bioethics Committee of the Medical School of the National and Kapodistrian University of Athens (5993/5.62018).

Measures

The Binge Eating Scale (BES), developed by Gormally et al, was used to assess the presence and severity of binge eating.²² It is a self-completed questionnaire that consists of 16 items. Eight items measure the behavioral symptoms, and eight items measure the emotional/cognitive symptoms of BED.

The Eating Disorder Examination Questionnaire (EDE-Q), developed by Fairburn and Beglin, was used to assess ED psychopathology.¹³ It consists of 28 questions on eating behavior during the last 28 days before the examination, with twenty-two of the questions measuring eating psychopathology and 6 measuring the frequency of maladaptive eating behaviors. The questions are clustered into four subscales: restrain eating, eating concern, shape concern, and weight concern. The EDE-Q cannot be used for the diagnosis of BED because it does not assess the full range of the DSM-5 criteria for the disorder over three months. However, it is considered the "gold standard" questionnaire to measure eating psychopathology and it has been validated in the Greek language.^{28,29} EDE-Q was used to assess general eating psychopathology and as a measure of comparison for the assessment of BES. Also, it should be noted that in EDE-Q are included three questions that assess the objective and subjective binge-eating episodes.

A demographics questionnaire was employed to collect data, including age, sex, socioeconomic, family, and educational status, the onset of binge eating behavior, health problems, history of therapy seeking, medication use, and suicidal ideation or attempts.

Anthropometric measures, including weight, height, and BMI, were calculated.

Statistical analysis

Exploratory factor analysis was carried out to evaluate the construct validity of the BES, disclose underlying structures, and reduce the number of variables. Principal component analysis (PCA) was chosen as the extraction method using Quartimax rotation. The Kaiser-Meyer-Olkin procedure for measuring sample adequacy was applied. The cut-off point for factor loadings was 0.40 and for eigenvalues, it was 1.00. Internal consistency was determined by the calculation of Cronbach's alpha coefficient. Scales with alphas equal to or greater than 0.70 were considered acceptable. We tested the extent to which the BES scale was correlated with the EDE-Q and BMI via Pearson's correlation coefficient. The Student's t-test was utilized to examine possible differences in BES score between EDE-Q high and low scorers (cut-off point of 2.6 for females and 3.1 for males, according to the Greek validation of EDE-Q 6.0. 43). Receiver Operating Characteristic curves (ROC) were used to estimate the discriminative capability of the BES total score between participants with more severe ED symptomatology (EDE-Q high score) and those with lower EDE-Q scores. Sensitivity and specificity were calculated for the optimal cut-off. The area under the curve (AUC) was also calculated. All reported p

values are two-tailed. Statistical significance was set at $p < 0.05$ and analyses were conducted using SPSS statistical software (version 26.0).

Results

Sample characteristics

The sample characteristics are presented in table 1. A total of 160 participants took part in the study, with 90% being female. The participants had a mean age of 40.7 years ($SD=11.5$ years). The average BMI was 37.5 kg/m^2 ($SD=9.2 \text{ kg/m}^2$), with 80% of the participants falling into the obese category. The mean age at the onset of the eating disorder was 19.7 years ($SD=11.5$ years).

Factor analysis and internal consistency

Participants' answers to BES questions are presented in detail in table 2. EFA was conducted to examine the construct validity of the BES scale. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were conducted before EFA to evaluate the factorability. The KMO measure of sampling adequacy was 0.823, and the significance of Bartlett's test of sphericity was equal to <0.001 , meaning that EFA can be applied. After Quartimax rotation and having the criterion of eigenvalues >1 as an extract method, two factors emerged, whose loadings are presented in table 3. The scree plot supported the finding of the two-factor solution (figure 1). The total variance explained was 34.2%. The first factor (named Behavior) contained 8 items and explained 21.1% of the variance, and the second factor (named Feelings/Cognitions) also contained 8 items and explained 13.1% of the variance. All items had loadings greater than 0.4 and no secondary loadings were present; thus, all items were loaded on a factor. Also, internal consistency was acceptable, with a total Cronbach's alpha of 0.78. The mean BES total score was 31.5 ($SD=7.8$, range=12–47), the mean Behavior total score was 14.5 ($SD=4.0$, range=3–22), and the mean Feelings/cognitions total score was 17.0 ($SD=4.8$, range=6–26). Cronbach's alpha if item deleted and item-total correlations are presented in table S1. All items had item-total correlations greater than 0.30. Also, Cronbach's alpha if the item deleted was similar to the overall alpha, so there is no need to remove an item.

BES correlation with EDE-Q and BMI

BES scores were significantly positively associated with all EDE-Q subscales except for Restraint (table 4). In terms of convergent validity, EDE-Q was correlated with binge-eating related items (table 4) and the associations were significant. Also, greater BMI was significantly associated with greater total BES score ($r=0.32$;

Table 1. Sample characteristics.

	N	%
Gender		
Females	144	90.0
Males	16	10.0
Age, mean (SD)	40.7 (11.5)	
Occupation		
Full-time employed	99	61.9
Part-time employed	13	8.1
Unemployed	28	17.5
Student	13	8.1
Other	7	4.4
Family status		
Unmarried	83	51.9
Married	48	30.0
Divorced - Widowed	15	9.4
Living with partner	14	8.8
Educational status		
Middle school graduate	2	1.3
High school graduate	46	28.8
University alumni	39	24.4
Technical university alumni	18	11.3
Post-graduate degree	38	23.8
Other	17	10.6
Ever visited a specialist for mental issues	131	81.9
Age of eating disorder onset, mean (SD)	19.7 (11.5)	
Greater weight ever, mean (SD)	112.9 (29)	
Lowest weight ever, mean (SD)	66 (14.8)	
Current BMI, mean (SD)	37.5 (9.2)	
Current BMI		
Normal	11	6.9
Overweight	21	13.1
Obese	128	80.0
Ever been hospitalized for serious adverse events of your eating disorder	5	3.1
Under treatment (now or in the past)	104	65.0
Ever had an attempt at suicide	20	12.5
Suicidal thoughts	11	6.9
Substance/ Alcohol abuse	6	3.8
Sexual abuse	5	3.1
Physical abuse	10	6.3
Borderline personality disorder	10	6.3
Restraint (EDE-Q), mean (SD)	2.15 (1.54)	
Eating concern (EDE-Q), mean (SD)	3.1 (1.44)	
Shape concern (EDE-Q), mean (SD)	4.38 (1.18)	
Weight concern (EDE-Q), mean (SD)	4.09 (1.24)	
Global score (EDE-Q), mean (SD)	3.43 (1)	
Eating disorder	122 (76.3)	

Table 2. Participants' answers in BES items.

Item	N	%
1	12	7.5
I don't feel self-conscious about my weight or body size when I'm with others.		
I feel concerned about how I look to others, but it normally does not make me feel disappointed with myself.	26	16.3
I do get self-conscious about my appearance and weight which makes me feel disappointed in myself.	76	47.5
I feel very self-conscious about my weight and frequently, I feel intense shame and disgust for myself. I try to avoid social contacts because of my self consciousness.	46	28.8
2	19	11.9
I don't have any difficulty eating slowly in the proper manner.		
Although I seem to "gobble down" foods, I don't end up feeling stuffed because of eating too much.	24	15.0
At times, I tend to eat quickly and then, I feel uncomfortably full afterwards.	49	30.6
I have the habit of bolting down my food, without really chewing it. When this happens, I usually feel uncomfortably stuffed because I've eaten too much.	68	42.5
3	4	2.5
I feel capable to control my eating urges when I want to.		
I feel like I have failed to control my eating more than the average person.	55	34.4
I feel utterly helpless when it comes to feeling in control of my eating urges.	44	27.5
Because I feel so helpless about controlling my eating I have become very desperate about trying to get in control.	57	35.6
4	8	5.0
I don't have the habit of eating when I'm bored.		
I sometimes eat when I'm bored, but often I'm able to "get busy" and get my mind off food.	23	14.4
I have a regular habit of eating when I'm bored, but occasionally, I can use some other activity to get my mind off eating.	57	35.6
I have a strong habit of eating when I'm bored. Nothing seems to help me break the habit.	72	45.0
5	6	3.8
I'm usually physically hungry when I eat something.		
Occasionally, I eat something on impulse even though I am not hungry.	37	23.3
I have the regular habit of eating foods, that I might not enjoy, to satisfy a hungry feeling even though physically, I don't need the food.	89	56.0
Even though I'm not physically hungry, I get a hungry feeling in my mouth that only seems to be satisfied when I eat food, like a sandwich, that fills my mouth. Sometimes, when I eat the food to satisfy my mouth hunger, I then spit the food out so I won't gain weight.	27	17.0
6	9	5.6
I don't feel any guilt or self-hate after I overeat.		
After I overeat, occasionally I feel guilt or self-hate.	67	41.9
Almost all the time I experience strong guilt or self-hate after I overeat.	84	52.5
7	9	5.6
I don't lose total control of my eating when dieting even after periods when I overeat.		
Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.	31	19.4
Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens I eat even more.	70	43.8
I have a regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or "famine."	50	31.3
8	6	3.8
I rarely eat so much food that I feel uncomfortably stuffed afterward.		
Usually, about once a month, I eat such a quantity of food, that I end up feeling very stuffed.	14	8.8
I have regular periods during the month when I eat large amounts of food, either at mealtime or at snacks.	93	58.1
I eat so much food that I regularly feel quite uncomfortable after eating and sometimes a bit nauseous.	47	29.4
9	30	18.8
My level of calorie intake does not go up very high or go down very low regularly.		
Sometimes after I overeat, I will try to reduce my caloric intake to almost nothing to compensate for the excess calories I've eaten.	29	18.1
I have a regular habit of overeating during the night. It seems that my routine is not to be hungry in the morning but to overeat in the evening.	74	46.3
In my adult years, I have had week-long periods where I practically starve myself. This follows periods when I overeat. It seems I live a life of either "feast or famine."	27	16.9

Continues

Table 2. Continued.

Item	N	%
10	1	0.6
I usually stop eating when I want to. I know when "enough is enough."		
Every so often, I experience a compulsion to eat which I can't seem to control.	9	5.6
Frequently, I experience strong urges to eat which I seem unable to control, but at other times I can control my eating urges.	86	53.8
I feel incapable of controlling my urges to eat. I have a fear of not being able to stop eating voluntarily.	64	40.0
11	5	3.1
I don't have any problem stopping eating when I feel full.		
I usually can stop eating when I feel full but occasionally overeat leaving me feeling uncomfortably stuffed.	54	34.0
I have a problem stopping eating once I start and usually, I feel uncomfortably stuffed after I eat a meal.	86	54.1
Because I have a problem not being able to stop eating when I want, I sometimes have to induce vomiting to relieve my stuffed feeling.	14	8.8
12	36	22.5
I seem to eat just as much when I'm with others (family, social gatherings) as when I'm by myself.		
Sometimes, when I'm with other people, I don't eat as much as I want to eat because I'm self-conscious about my eating.	42	26.3
Frequently, I eat only a small amount of food when others are present because I'm very embarrassed about my eating.	26	16.3
I feel so ashamed about overeating that I pick times to overeat when I know no one will see me. I feel like a "closet eater."	56	35.0
13	14	8.8
I eat three meals a day with only an occasional between-meal snack.		
I eat 3 meals a day, but I also normally snack between meals.	35	21.9
When I am snacking heavily, I get in the habit of skipping regular meals.	25	15.6
There are regular periods when I seem to be continually eating, with no planned meals.	86	53.8
14	8	5.0
I don't think much about trying to control unwanted eating urges.		
At least some of the time, I feel my thoughts are pre-occupied with trying to control my eating urges.	39	24.4
I feel that frequently I spend much time thinking about how much I ate or about trying not to eat anymore.	56	35.0
It seems to me that most of my waking hours are preoccupied by thoughts about eating or not eating.	57	35.6
I feel like I'm constantly struggling not to eat.		
15	5	3.1
I don't think about food a great deal.		
I have strong cravings for food but they last only for brief periods.	46	28.8
I have days when I can't seem to think about anything else but food.	58	36.3
Most of my days seem to be preoccupied with thoughts about food. I feel like I live to eat.	51	31.9
16	7	4.4
I usually know whether or not I'm physically hungry. I take the right portion of food to satisfy me.		
Occasionally, I feel uncertain about knowing whether or not I'm physically hungry. At these times it's hard to know how much food I should take to satisfy me.	109	68.1
Even though I might know how many calories I should eat, I don't have any idea what is a "normal" amount of food for me.	44	27.5

$p=0.17$). As mentioned above, EDE-Q cannot be used for the diagnosis of BED because it does not assess the full range of the DSM-V criteria for BED over six months. But as the "gold standard" questionnaire to measure eating psychopathology, we also used it as a measure of comparison for the assessment of BES. Participants with EDE-Q high scores had significantly greater BES scores compared to those with EDE-Q low scores [mean (SD): 33.3 (7.5) vs. 25.6 (5.5), $p<.001$, respectively].

ROC analysis showed that BES score significantly discriminates between patients with EDE-Q high scores

and those with EDE-Q low scores (AUC=0.79; 95% CI=0.72-0.86; $p<0.001$; figure 2). The optimal cut-off found was 27.5, with a sensitivity of 77.7% and a specificity of 67.6%.

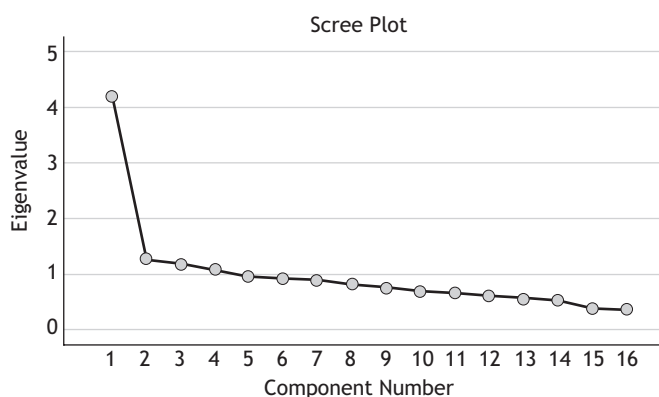
Discussion

This is the first study that evaluates the validity and internal consistency of the Greek version of BES. Also, this is the first study that evaluates the psychometric properties of BES within a BED population. In our study, the two-factor structure fitted the data best. Regarding

Table 3. Exploratory factor analysis results for BES.

Item	Factor	
	Behavior	Feelings/Cognitions
1		0.44
2	0.40	
3		0.48
4	0.63	
5	0.63	
6		0.44
7		0.41
8	0.71	
9	0.45	
10	0.64	
11	0.65	
12		0.51
13	0.48	
14		0.64
15		0.55
16		0.41
% Variance explained	21.1	13.1

Note: Factor loading are presented in the table

**Figure 1.** Scree plot.

internal consistency, the results were acceptable, with Cronbach's alpha equal to 0.78. The optimal cut-off point was 27.5; the 95% confidence interval of AUC was adequate at 0.79 (0.72–0.86), with sensitivity in identifying individuals with binge eating behavior of 77.7% and specificity in identifying individuals without binge eating behavior at 67.6%. Celio et al, also using a score of ≥ 27 to indicate serious binge eating, found that BES had a sensitivity value of 0.85 and a specificity value of 0.20 in identifying individuals with severe binge eating.²⁵ Other studies found an optimal cut-off point of 17. The Portuguese version reported a sensitivity of

97.8% and a specificity of 47.7%,²⁷ the Malay version of the BES showed an 84.6% sensitivity and a 94.9% specificity.³³ The Italian version of the BES had a sensitivity of 84.8% and a specificity of 74.6%.³⁷ The differences between the various studies of BES could be due to the different sample populations and recruitment strategies. In our study, the sample consisted of individuals who applied to or were referred to specialized ED units seeking therapy and were screened for participation in a group therapeutic intervention.

Unfortunately, in the present study, it was not feasible to assess whether the scale was invariant across sexes due to the predominance of female participants (90%). In previous studies, women reported a higher BES total score than men.^{37,39} This is consistent with epidemiological data, which show a higher prevalence of BED in women than men.¹⁻³ It was also found that greater BMI was significantly associated with higher BES scores ($r=0.32$; $p=0.17$). This result is consistent with previous studies, which also found a significant correlation between BMI and BES.^{31,37,39} It is also in line with studies indicating that the most common consequence of binge eating is obesity.⁶ In our sample, 80% of the participants were classified as obese.

When correlating BES with EDE-Q, it was found that a higher EDE-Q score was significantly associated with a higher BES score. Also, BES had significant correlations with the three EDE-Q questions on binge eating behavior. BES has good converging validity. A significantly positive association with all EDE-Q subscales except the Restraint subscale was found. This is consistent with the symptomatology of the BED, as food restraint is not a characteristic of the psychopathology of the disorder. Wilfley et al, who compared BED patients with anorexia nervosa (AN) and bulimia nervosa (BN) patients using EDE-Q, reported that BED patients not only had significantly lower scores on the Restrain subscale but also scored lower on the majority of Restrain subscales compared to AN and BN patients.⁴⁴

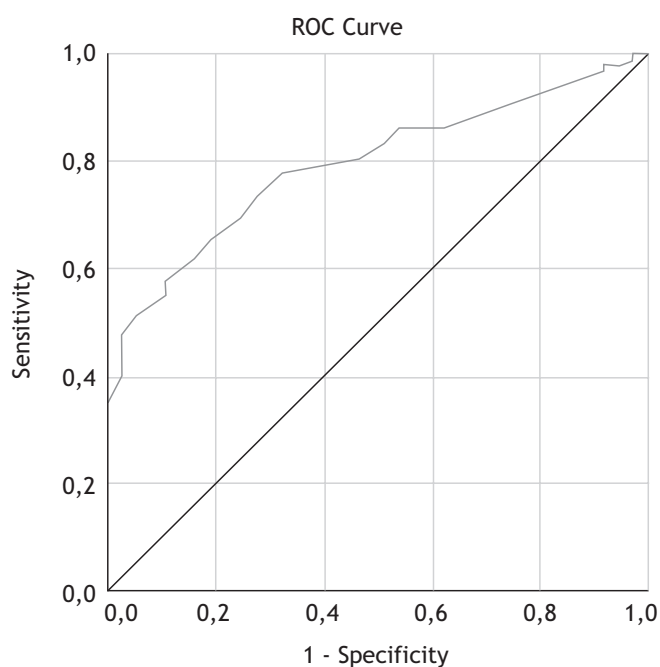
Our findings of a high correlation between BED and EDE-Q Eating Concern, Weight Concern, and Shape concern subscales are consistent with previous studies that have shown that obese binge eaters show high preoccupation with food and weight, as well as greater body dissatisfaction compared with obese non-binge eaters.⁴⁹ These findings are of significant importance because they provide data about the relationship between binge eating and eating, weight, and shape concerns of individuals applying for BED treatment. The above findings could contribute to BED therapy by add-

Table 4. Pearson's correlation coefficients with EDE-Q scales and binge-eating related items.

		Behavior	Feelings/Cognitions	Total BES score
Restraint (EDE-Q)	r	0.00	0.14	0.07
	P	0.982	0.085	0.903
Eating concern (EDE-Q)	r	0.41	0.47	0.52
	P	<0.001	<0.001	<0.001
Shape concern (EDE-Q)	r	0.40	0.50	0.52
	P	<0.001	<0.001	<0.001
Weight concern (EDE-Q)	r	0.37	0.49	0.49
	P	<0.001	<0.001	<0.001
Global score (EDE-Q)	r	0.38	0.52	0.52
	P	<0.001	<0.001	<0.001
EDE-Q item 13	r	0.16	0.22	0.87
	P	0.050	0.005	<0.001
EDE-Q item 14	r	0.22	0.28	0.75
	P	0.006	<0.001	<0.001
EDE-Q item 15	r	0.21	0.26	0.21
	P	0.007	0.001	0.010

Note:

1. Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?
2. On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?
3. Over the past 28 days, on how many DAYS have such episodes of overeating occurred?



AUC=0.79, 95% CI: 0.72-0.86, $p < .001$

Figure 2. ROC curve for BES score.

ing information about binge eating, treatment predictors, and relapse prevention.

The study's limitations include the absence of test-retest reliability assessment and the low representation of male participants. Finally, although the sample size was not large, it was proven adequate for the validation of the questionnaire.

Nonetheless, the present study confirms that the Greek version of the BES is a valid and reliable tool to be used in clinical practice for the evaluation of BED symptomatology in the treatment-seeking population.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi: <https://doi.org/10.22365/jpsych.2024.014>

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Ερευνητική εργασία

Μελέτη επικύρωσης της ελληνικής εκδοχής της Κλίμακας Επεισοδιακής Υπερφαγίας σε πληθυσμό πασχόντων από διαταραχή επεισοδιακής υπερφαγίας

Μαρία Καραπατσιά,¹ Μαρία Ευαγγελία Αντωνιάδου,¹ Χαρά Τζαβάρα,¹ Ιωάννης Μιχόπουλος,² Φραγκίσκος Γονιδάκης¹

¹Α΄ Ψυχιατρική Κλινική, Αιγινήτειο Νοσοκομείο, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών,

²Β΄ Ψυχιατρική Κλινική, Αιγινήτειο Νοσοκομείο, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αθήνα

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ΠΕΡΙΛΗΨΗ

Η Διαταραχή Επεισοδιακής Υπερφαγίας (ΔΕΥ), η οποία είναι η πιο συχνή Διαταραχή Πρόσληψης Τροφής (ΔΠΤ), έχει σημαντικές σωματικές και ψυχολογικές συνέπειες. Υπάρχει ανάγκη να αξιολογηθεί και να εκτιμηθεί η υπερφαγική συμπεριφορά και να προταθούν αποτελεσματικές θεραπευτικές παρεμβάσεις. Το αυτό-συμπληρούμενο ερωτηματολόγιο Κλίμακας Επεισοδιακής Υπερφαγίας (Binge Eating Scale, BES) χρησιμοποιείται ευρέως για την εκτίμηση της υπερφαγικής συμπεριφοράς σε άτομα με παχυσαρκία. Η BES εξετάζει την εμπειρία του ατόμου σχετικά με την υπερφαγία και τα συναισθηματικά, γνωσιακά και συμπεριφορικά συμπτώματα που σχετίζονται με την υπερφαγία. Δεν έχει μέχρι σήμερα εξεταστεί η εγκυρότητα και η αξιοπιστία της BES στον Ελληνικό πληθυσμό. Στόχος της παρούσας μελέτης ήταν να εξεταστεί η παραγοντική δομή της BES και να αξιολογηθούν οι ψυχομετρικές ιδιότητές της. Ένα δείγμα 160 συμμετεχόντων (90% γυναίκες) με μέσο όρο ηλικίας 40,7 χρόνια ($SD=11,5$ years) και μέσο όρο Δείκτη Μάζας Σώματος ($\Delta M \Sigma$) $37,5 \text{ kg/m}^2$ ($SD=9,2 \text{ kg/m}^2$) συμπλήρωσαν τη BES και το Ερωτηματολόγιο Εξέτασης των Διατροφικών Διαταραχών (Eating Disorder Examination Questionnaire, EDE-Q). Η διερευνητική παραγοντική ανάλυση (EFA) χρησιμοποιήθηκε για να επαληθευτεί η δομή της κλίμακας σε ένα δείγμα πασχόντων από ΔΕΥ σύμφωνα με το DSM-5, οι οποίοι προσήλθαν για θεραπεία στην Μονάδα Διαταραχών Πρόσληψης Τροφής στο Αιγινήτειο Νοσοκομείο και στο Κέντρο Ημέρας "ΑΝΑΣΑ". Το μοντέλο των δύο παραγόντων ταιριάζει καλύτερα στα δεδομένα. Όσον αφορά την αξιοπιστία, τα αποτελέσματα ήταν αποδεκτά με Cronbach's alpha ίσο του 0.78. Η BES είχε σημαντική συσχέτιση με τις υποκλίμακες Ανησυχία σχετικά με την Διατροφή, με το Βάρος και με το Σχήμα του σώματος και το Συνολικό Σκορ του EDE-Q, ενώ δεν βρέθηκε συσχέτιση με την υποκλίμακα Περιορισμός. Επίσης συσχέτιση βρέθηκε με τις ερωτήσεις του EDE-Q που αφορούν τη συχνότητα των αντικειμενικών και υποκειμενικών υπερφαγικών επεισοδίων. Υψηλή συσχέτιση υπήρξε και με τη μέτρηση του $\Delta M \Sigma$. Η Ελληνική εκδοχή της BES είναι έγκυρη και αξιόπιστη για να εκτιμήσει την υπερφαγική συμπεριφορά σε κλινικό πληθυσμό που πάσχει από ΔΕΥ.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Επεισοδιακή υπερφαγία, εγκυρότητα, αξιοπιστία, ανάλυση παραγόντων, Κλίμακα Επεισοδιακής Υπερφαγίας.

Research article

Dimensionality and psychometric properties of the Greek version of the Diabetes Impact and Device Satisfaction (DIDS) scale

Emmanouil S. Benioudakis,^{1,2} Argyroula Kalaitzaki,³ Eleni Karlafti,² Oxana Ahanov,⁴ Elisavet Kapageridou,⁵ Christos Savopoulos,² Triantafyllos Didangelos²

¹*Psychiatric Clinic, General Hospital of Chania, Chania, Crete,*

²*Diabetes Center, 1st Propaedeutic Department of Internal Medicine, Medical School, "AHEPA" University General Hospital, Aristotle University of Thessaloniki, Thessaloniki, Macedonia,*

³*Department of Social Work, Laboratory of Interdisciplinary Approaches to the Enhancement of Quality of Life, Health Sciences Faculty, Hellenic Mediterranean University, Heraklion, Crete,*

⁴*Department of Medicine, National and Kapodistrian University of Athens, Athens,*

⁵*Department of Medicine, Democritus University of Thrace, Thrace, Greece*

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ABSTRACT

Type 1 diabetes mellitus (T1D) is a chronic condition with rising prevalence. Exogenous insulin administration is the only treatment for individuals with T1D to prevent diabetes-related complications. Diabetes-related technology has significantly contributed to the management of T1D by reducing the burden of living with diabetes and providing greater flexibility in insulin management during daily activities. This study presents the psychometric properties of the Greek translation of the Diabetes Impact and Device Satisfaction (DIDS) Scale, which assesses satisfaction with the use of an insulin delivery device and the impact of diabetes management on individuals with T1D. A sample of 101 adults with T1D, mostly females (71.3%), with a mean age of 38.4 years (± 11.7), completed the translated Greek version of DIDS (DIDS-Gr). Exploratory factor analysis revealed three factors: 'Device Satisfaction', 'Diabetes Management Impact', and (new factor) 'Device Usability'. The internal consistency indices (Cronbach's alpha) for the subscales were 0.86, 0.71, and 0.60, respectively. Furthermore, convergent validity was demonstrated with moderate to high positive correlations between the DIDS-Grand the Diabetes Quality of Life Brief Clinical Inventory (DQoL-BCI) and its subscales, while divergent validity was also confirmed with weaker correlations with the depression subscale of the Hospital Anxiety and Depression Scale (HADS). Additionally, test-retest reliability and differential validity were present in our study. Therefore, DIDS-Gr is a valid and reliable measure for assessing the impact of diabetes on individuals with T1D and the satisfaction with the use of an insulin delivery device in Greece.

KEYWORDS: Type 1 diabetes mellitus, device satisfaction, diabetes impact, validity, reliability, factor analysis.

Introduction

Type 1 diabetes mellitus (T1D) is a chronic condition with rising prevalence, constituting 5% to 10% of all cases of diabetes mellitus (DM).¹ The main cause of T1D is the autoimmune destruction of β -pancreatic cells, and the only treatment for individuals with T1D is exogenous insulin administration.^{1,2} Lifelong glycaemic control constitutes a primary objective in the management of T1D to prevent diabetes-related complications, such as diabetic ketoacidosis, macrovascular and microvascular complications, and even premature death.^{3,4}

A chronic condition such as T1D requires constant monitoring and regulation to avoid chronic complications.⁵ Managing T1D is a complex task that requires multiple daily injections or the use of a Continuous Subcutaneous Insulin Infusion (CSII). Additionally, it entails regular testing through self-monitoring of blood glucose (SMBG) or continuous glucose monitoring (CGM).^{6,7} Diabetes-related technology has improved dramatically over the last few decades, particularly in the accuracy, reliability, and robustness of CGM devices. These advances now enable the adjustment of insulin dosage for basal insulin, premeal, and correction boluses without requiring additional confirmation from a blood glucose meter.⁶ Moreover, diabetes-related technology provides a sense of safety and security for individuals by avoiding severe hypoglycaemia, preventing diabetic ketoacidosis, and maintaining sugar levels within an appropriate range with minimal fluctuations.^{8,9} Recent reviews have shown that devices that are easy to operate, integrated with intuitive mobile applications, such as insulin pens or smart pens, and CSII therapy, have reduced the burden of living with diabetes and improved the quality of life (QoL).^{10–12} Moreover, in conjunction with pioneering Advanced Hybrid Closed-Loop systems (AHCL), the psychological impact of living with diabetes can be markedly reduced. Automating numerous aspects of insulin delivery results in effectively minimizing the risk of fluctuations, and therefore, in mitigating certain psychological symptoms, such as stress and anxiety of managing T1D, particularly for individuals leading active lifestyles.^{5,13}

Notwithstanding the diabetes-related technology advancements, few tools exist to assess patients' experience using these. However, balancing optimal health outcomes and satisfaction using such devices is crucial to increasing patients' acceptance, adoption, commitment/adherence rates, and satisfaction with their use. If not evaluating self-reported needs, priorities, and preferences before the design and development of such a

device, patients' perceived easiness, usefulness, and effectiveness of devices in decreasing any burden and improving their quality of life should be evaluated with validated tools.¹⁴ Martin-Delgado et al's (2023) scoping review identified two patient-reported experience measures (PREMs) and 32 patient-reported outcome measures (PROMs) related to type 1 and 2 diabetes. Among those, the Diabetes Injection Device Experience Questionnaire (DID-EQ) measures patients' experiences with using a medical device, and the Treatment Related Impact Measure for Diabetes Device (TRIM-DD) measures the impact of treatment on people with DM.^{15–17} In addition, other instruments such as the Insulin Delivery Satisfaction Survey and the INSPIRE assess either the psychosocial impact of diabetes on daily life or device-related satisfaction.^{18,19} To assess patient's experience related to insulin delivery device interaction (insulin pumps, pens, syringes, etc.), specifically device-related satisfaction, and the impact of diabetes management on an individual's life at the time of device use, Manning and his colleagues in 2020 developed the Diabetes Impact and Device Satisfaction (DIDS) Scale.²⁰ DIDS excels over the other instruments, as it was developed for use with any insulin delivery device and measures both patients' device-using satisfaction and the diabetes management impact on their lives. Moreover, the two-factor DIDS was shown to be a valid and reliable instrument with robust psychometric properties.²⁰

Given the importance of an instrument to measure both satisfaction with the use of a device and diabetes management impact on T1D patients' lives and that to date, there is no such instrument in Greek, the aim of this study was to translate and examine the dimensionality and the psychometric properties of the DIDS Scale in a Greek sample (hereafter referred to as DIDS-Gr).

Material and Method

Procedure

Initially, two independent native speakers translated the DIDS into Greek (forward translation). Subsequently, a bilingual individual performed a backward translation, after which all authors conducted a cultural adaptation of the final version of the questionnaire. A reconciled version of the DIDS was developed. Finally, a psychologist and a diabetologist, both experts in the field, conducted the face validity process. Based on their expertise, they examined the extent to which the DIDS-Gr reflected the constructs of diabetes impact and device satisfaction for people with T1D. Permission to access and use the DIDS was granted. The study has been ap-

proved by the Ethics Committee of Aristotle University of Thessaloniki and has been conducted following the Declaration of Helsinki.

Participants

Adults with T1D were invited to participate in the study by both the Diabetes Center of "AHEPA" General University Hospital of Thessaloniki and associations of individuals with T1D throughout Greece. The announcement described the project and included a Google Form link with additional study information. Participants provided online informed consent regarding their rights (e.g., voluntary participation and anonymity of the process). Exclusion criteria included T1D people under age 18, non-Greek-speaking T1D people, those with other types than T1D diabetes mellitus, and those with T1D duration of 12 months or less. One hundred and one adults with T1D aged between 18 and 57 years ($M=38.4 \pm 11.7$), completed the survey. The majority of the patients were females (71.3%), married (44.6%), employed (69.3%), and with high school or university education (68.3%). Finally, a random subsample of 19 T1D participants voluntarily underwent the cognitive debriefing stage and were retested four weeks later to assess the test-retest reliability of the scale. The detailed sociodemographic characteristics of the test and re-test samples are presented in table 1.

Measures

The Diabetes Impact and Device Satisfaction (DIDS) Scale is a self-report, two-dimensional questionnaire comprising 11 items. It was designed to assess satisfaction and the impact of diabetes management, specifically related to the interaction with insulin delivery devices, including insulin pumps and devices used for Multiple Daily Injection (MDI) therapy, such as pens, smart pens, and syringes. Respondents rate each item on a 10-point Likert scale ranging from 1 to 10, with items 5 and 7 being reverse scored. Seven of the items assess satisfaction related to the insulin delivery device and the remaining four assess the impact of diabetes management. The Cronbach's alpha coefficients of the original version of the DIDS were $\alpha_{\text{Device Satisfaction}}=0.86$ and $\alpha_{\text{Diabetes Impact}}=0.71$.²⁰ The Greek version of the DIDS is available in Supplementary 1.

The Diabetes Quality of Life Brief Clinical Inventory (DQoL-BCI) is a 15-item self-report questionnaire designed to assess the overall Health-Related Quality of Life (HRQoL) for individuals with both type 1 and type 2 diabetes. The DQoL-BCI includes two subscales: 'satisfac-

tion related to therapy and quality of life', which is evaluated on a scale from 1 (very satisfied) to 5 (very unsatisfied), and the "frequency of negative implications of diabetes therapy" which is evaluated on a scale from 1 (never) to 5 (constantly). Higher scores on DQoL-BCI indicate poorer QoL.²¹ The Greek translation of the DQoL-BCI has demonstrated both good reliability and validity.²² In this study, the DQoL-BCI Cronbach alpha coefficients were $\alpha_{\text{DQoL-BCI total}}=0.83$, $\alpha_{\text{satisfaction}}=0.79$, and $\alpha_{\text{negative implications}}=0.7$.

Hospital Anxiety and Depression Scale (HADS) is a self-report rating scale consisting of 14 items on a 4-point Likert scale. The scale comprises two subscales, "Anxiety" (HADS-A) and "Depression" (HADS-D), each one of which consists of seven items, with scores ranging from 0 to 21. Higher scores indicate higher levels of anxiety or depression.²³ The scale can be used in both hospitalized patients and the general population. The translation of HADS into Greek is both reliable and valid.²⁴ In this study, the HADS Cronbach alpha coefficients were $\alpha_{\text{HADS-A}}=0.84$ and $\alpha_{\text{HADS-D}}=0.81$.

Statistical analysis

Initially, face validity and Content Validity Index (CVI) were assessed. The Greek translation of the DIDS was submitted to a panel of three independent experts in diabetes mellitus, comprising an internist and two psychologists. These experts were tasked with evaluating the items of both scales for content equivalence, using a 3-point Likert scale: 1=necessary, 2=useful but not necessary, and 3 = unnecessary. The total CVI was then calculated by dividing the number of items ranked as 1 (necessary) by the total number of items in each scale (i.e.,11). An unforced exploratory factor analysis (EFA) was conducted using Principal Axis Factoring and both Oblimin and Varimax rotation with Kaiser Normalization to investigate the construct validity of the DIDS-Gr. Sampling adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) test, along with Bartlett's test of sphericity.²⁵ Test-retest reliability was assessed using the intraclass correlation coefficient (ICC) 2-way mixed-effects model for measurements (Type: Absolute Agreement), and internal consistency of the subscales of the DIDS-Gr was evaluated using Cronbach's alpha coefficients.²⁶ Construct validity was investigated by calculating two-tailed Pearson's correlation coefficients among the subscales of DIDS-Gr and the DQoL-BCI total score and its subscales "Satisfaction" and "Negative Impact", as well as the HADS "Anxiety" and "Depression" subscales. Medium-to-high correlations ($|r|>0.4$) were considered indicative of convergent validity, while weaker correlations were considered indicative of discriminant validity.²⁷ Finally, the differential validity

Table 1. Demographic characteristics of the participants.

Characteristics	Total sample (n=101) Mean±SD/N (%)	Re-test sample (n=19) Mean±SD/N (%)
Age (years)	38.4±11.7	35.3±13
Diabetes duration (years)	21.9±11.2	20.5±10
Gender		
Male	29 (28.7)	3 (15.8)
Female	72 (71.3)	16 (84.2)
Educational Level		
Primary and secondary	32 (31.7)	6 (31.6)
University	69 (68.3)	13 (68.4)
Family status		
Unmarried	37 (36.6)	10 (52.6)
Married	45 (44.6)	8 (42.1)
Divorced	5 (5)	1 (5.3)
Other	14 (13.9)	0 (0)
HbA1c (self-report)	7.2±1.4	6.9±1.4
CGM (use)	88 (87.1)	17 (89.5)
Treatment: insulin pump	60 (59.4)	13 (68.4)
Medtronic 640G	12 (20)	3 (23.1)
Medtronic 780G	33 (55)	8 (61.5)
Omnipod Dash	8 (13.3)	1 (7.7)
Other	7 (11.7)	1 (7.7)
Closed-loop	34 (33.7)	9 (47.4)
Employment		
Paid work (employed)	70 (69.3)	12 (63.2)
Unemployed	12 (11.9)	2 (10.5)
Retired	5 (5.0)	0 (0)
Other	14 (13.9)	5 (26.3)
Income status		
Low	21 (20.8)	5 (26.3)
Average	56 (55.4)	10 (52.6)
Good	24 (23.8)	4 (21.1)
Psychosocial characteristics		
DQoL-BCI (Total score)	32.1±8.8	N/A
DQoL- BCI (Satisfaction)	17.2±5.8	N/A
DQoL- BCI (Negative impact)	14.8±4.0	N/A
HADS Depression	4.3±3.5	N/A
HADS Anxiety	6.4±4	N/A

Note: HbA1c: hemoglobin A1c; CGM: Continuous Glucose Monitoring; DQoL-BCI (Total score): Diabetes Quality of Life Brief Clinical Inventory - Total score (15-75); DQoL-BCI (Satisfaction): Diabetes Quality of Life Brief Clinical Inventory - Satisfaction (8-40); DQoL-BCI (Negative impact): Diabetes Quality of Life Brief Clinical Inventory - Satisfaction (7-35); HADS Depression: Hospital Anxiety and Depression Scale - Depression (0-21); HADS Anxiety: Hospital Anxiety and Depression Scale - Anxiety (0-21); N/A: Not Applicable

(known groups method) was assessed by independent samples t-test between AHCL users and the rest of the sample (MDI or CSII users).²⁸ The effect size was calculated according to Cohen's guidelines.²⁹ The significance

level was set at $p < 0.05$. All analyses were conducted using SPSS version 26 (SPSS Inc., Chicago, IL, USA), while the parallel analysis was carried out using Monte Carlo PCA for Parallel Analysis.

Results

Translation, cultural adaptation, face validity, and cognitive debriefing

During the translation process, any discrepancies that arose were discussed and resolved, resulting in a consensus version in Greek, and the cultural adaptation process was reviewed by all authors. Following this, the panel of experts who conducted the face validity found that the DIDS-Gr scale reflected the diabetes impact and device satisfaction among people with DM. Cognitive debriefing was assessed through interviews with 19 volunteers. Participants first completed the DIDS-Gr and were then interviewed to assess the clarity and comprehensiveness of the scale instructions and items.

Content validity

An agreement of 90% was found among the panel of experts, which is an acceptable index.²⁰ Item No.10 "How often do you worry about going low?" was unanimously assessed as 'useful but not necessary'.

Structural validity

Initially, a Confirmatory Factor Analysis (CFA) was conducted to assess the proposed two-factor structure (Supplementary 2); however, two items (5 and 7) loaded below 0.4.31 Additionally, the model fit indices did not meet the acceptable criteria: $\chi^2(43)=100.9$, $p<0.001$, $\chi^2/df=2.346$, $GFI=0.853$, $TLI=0.801$, $CFI=0.845$, $RMSEA=0.116$, and $SRMR=0.0921$. Consequently, we proceeded with an Exploratory Factor Analysis (EFA) to further investigate the underlying structure of the data.

An unforced (EFA) was conducted using the Principal Axis Factoring method for factor extraction, employing both oblique rotation (Direct Oblimin) and orthogonal rotation (Varimax) rotation. Additionally, a cut-off of ≥ 0.45 was applied to identify meaningful factor loadings using the latent root criterion, retaining factors with Eigenvalues greater than 1.0. A three-factor structure was identified and confirmed by both rotations and the parallel analysis (Supplementary 2), with the extracted factors explaining 63.4% of the total variance. KMO coefficient was equal to 0.767 and Barlett χ^2 value was 408.5 ($p<0.001$). The final communality estimates after rotation were high for all items (>0.36) except items No.5 (0.27) and No.10 (0.23). All factor loadings exceeded 0.45, ranging from 0.45 to 0.80. The 11 items were allocated in three factors: "Device Satisfaction" (1,2,4,6); "Diabetes Management Impact" (8,9,10,11); and (new factor) "Device Usability" (3,5,7). The three-dimensional structure of the DIDS-Gr is presented in table 2.

Descriptive statistics of the DIDS-Gr and AHCL differences

The mean scores of the subscales "Device Satisfaction", "Diabetes Management Impact", and "Device Usability" of the DIDS-Gr were 33.7 (± 5.9), 14.8 (± 6.5), and 26.5 (± 4.3), respectively. Of the total sample, 34 participants (33.7%) used the pioneer AHCL technology. Statistically significant differences were found in favor of the AHCL users in the subscales "Device Satisfaction" (36.1 ± 4.9 vs 32.5 ± 6.0 ; $t(99) 2.99$, $p=0.003$, $d=0.65$) and the "Diabetes Management Impact" (12.6 ± 5.3 vs 15.9 ± 6.9 ; $t(99) -2.38$, $p=0.019$, $d=0.53$) compared to the rest of the sample.

Test-retest reliability

The ICC values for the 19 volunteers who were retested four weeks later were as follows: "Device Satisfaction" subscale: 0.88 ($p<0.001$); "Diabetes Management Impact" subscale: 0.81 ($p=0.001$); and Device Usability" (new subscale) >0.90 ($p<0.001$).

Internal consistency

The Cronbach's alpha coefficients for the subscales of the 11-item DIDS-Gr were as follows: "Device Satisfaction" 0.86; "Diabetes Management Impact" 0.71; and (new factor) "Device Usability" 0.60, whereas when calculated specifically for the sub-sample of those using insulin pump therapy ($n=60$), Cronbach's alpha coefficient increased to 0.69. Inter-items correlations, means, and standard deviations of the 11 items of the DIDS-Gr, as well as Cronbach's alpha if the item is deleted are presented in Supplementary 2.

Construct validity

Convergent validity was supported by positive correlations between the "Diabetes Management Impact" subscale of the DIDS-Gr and both the subscales and the total score of DQoL-BCI and by negative correlations between the "Device Satisfaction" subscale of the DIDS-Gr and the "Total score" and "Satisfaction" subscale of the DQoL-BCI (because low scores indicate greater satisfaction, a negative sign reflect a correlation between the variables). In addition, divergent validity was confirmed by weak negative correlations between the "Depression" subscale of the HADS and both the "Device Satisfaction" and "Device Usability" subscales of the DIDS-Gr. The correlations are presented in table 3.

Discussion

This study reports the translation, cultural adaptation, and psychometric properties of the DIDS in the Greek

Table 2. The three-factor solution extracted by the Exploratory factor analysis and the internal consistency reliability of the three factors of DIDS- Gr

	three-factor solution ^a		
	Device Satisfaction	Diabetes Management Impact	Device Usability
My current insulin delivery device helps me feel more in control of my diabetes ⁶	0.806		
How much do you trust your insulin delivery device? ²	0.773		
How satisfied are you with your insulin delivery device? ¹	0.731		
My current insulin delivery device helps me have good blood glucose control ⁴	0.708		
How often do you have a bad night sleep due to diabetes? ⁸		0.737	
How often do you wake up at night to treat a low blood glucose? ⁹		0.691	
How often do you worry about going low? ¹⁰		0.463	
How often do you miss work, school, chores, or other responsibilities due to diabetes? ¹¹		0.456	
My current insulin delivery device is too complicated ⁷			0.680
My current insulin delivery device is easy to use ³			0.602
My current insulin delivery device is a hassle to use ⁵			0.458
Score range	4–40	4–40	3–30
Mean±sd	33.7±5.9	14.8±6.5	26.5±4.3
Eigenvalue	4.2	1.5	1.27
% variance explained	38.21	13.7	11.56
Cronbach's alpha	0.86	0.71	0.6

Note: a Unforced three-factor solution with principal components analysis and Varimax rotation; Factor loadings ≥ 0.45 are presented

language (i.e., DIDS-Gr). The DIDS-Gr was validated, and the 11-item scale proved to be an acceptable, reliable, and valid tool for assessing satisfaction with the use of an insulin delivery device and the impact of diabetes on individuals with T1D in Greece.

Initially, we conducted a CFA to validate the original two-factor structure of the DIDS. However, the results were unsatisfactory, prompting us to perform two separate Exploratory Factor Analyses (EFA) using Varimax and Direct Oblimin rotations, in line with the approach used during the development of the DIDS.²⁰ As the differences between the two solutions were negligible, we presented the orthogonal rotation (Varimax), following Pedhazur and Schmelkin's strategy.^{20,32} Unlike the original DIDS, the EFA of our study identified three factors, two of which were similar to the original DIDS, and thus the original naming was retained. These were: "Device Satisfaction" (four items, in contrast to seven of the original DIDS) and "Diabetes Management Impact" (four items, same as the original). The new factor of the DIDS-Gr, consisting of three items (3: 'My current insulin delivery device is easy to use', 5: 'My current insulin delivery

device is a hassle to use', and 7: 'My current insulin delivery device is too complicated'), refers to the usability of the device, and it was named "Device Usability". We believe that the items of the 'new factor' refer primarily on insulin pump therapy users since there were no participants in our study using a smart pen device; the low factor loadings of these three items (i.e., 3, 5, and 7) when the EFA was conducted exclusively among MDI users in Manning's study and the increase of the Cronbach's alpha value in this study when calculated separately in the sub-group of pump therapy users ascertain this assertion.²⁰

The three-factor structure of the DIDS-Gr demonstrated satisfactory psychometric properties, as indicated by acceptable Cronbach's alphas and test-retest reliabilities. The alpha reliability for the "Diabetes Management Impact" subscale was comparable to that of the original version,²⁰ while the "new subscale" showed acceptable reliability among insulin pump users. The correlations between the DIDS-Gr and DQoL-BCI were consistent with expectations, supporting both the convergent and divergent validity of the DIDS-Gr. In the absence

Table 3. Correlations of the subscales of DIDS-Gr with validity measures.

	Device Satisfaction	Diabetes Management Impact	Device Usability ^a
DQoL-BCI (Total score)	-0.583**	0.673**	-0.458**
DQoL- BCI (Satisfaction)	-0.616**	0.519**	-0.397**
DQoL- BCI (Negative impact)	-0.381**	0.722**	-0.427**
HADS Depression	-0.214*	0.389**	-0.243*
HADS Anxiety	-0.363**	0.417**	-0.159

Note: a New subscale, * $p < 0.05$, ** $p < 0.01$

of similar analyses in the original article of its development, our findings align with existing literature, which demonstrates positive correlations between the use of advanced diabetes-related technology and (QoL).^{20,33,34} Divergent validity was as expected, as individuals with T1D are at a higher risk of depression compared to the general population, regardless of whether they use an MDI or an insulin pump therapy.^{35–37}

Furthermore, the DIDS-Gr showed differential validity between the AHCL users and non-AHCL users, such as MDI and CSII users. The AHCL system provides automated basal and bolus insulin correction. It utilizes a model-based adaptive algorithm with an insulin feedback module, delivering insulin micro boluses with additional safety features for the user. This results in an increase in the time users spend in euglycaemia.^{38,39} Thus, it was reasonable to expect differences in favor of the AHCL users in the “Device Satisfaction” and “Diabetes Management Impact” subscales of DIDS-Gr.

The findings of the present study suggest that the DIDS-Gr is a valid and reliable measure for assessing satisfaction with the use of an insulin delivery device and the impact of T1D management on individuals in Greece. Key strengths of the present study include the rigorous validation process, the longitudinal design that allowed for test-retest reliability, and the examination of convergent, discriminant, and differential validity. Having one instrument for assessing three aspects of device use is another strength of this study. There are, however, some limitations that need to be acknowledged, such as the relatively small sample size that did not allow for separated EFAs among MDI and CSII users, and the fact that more women with T1D than men responded to the survey. Future studies should confirm the three-factor mod-

el that emerged from this survey and compare it across samples using different insulin pump devices.

Conclusion and implications

This study resulted in the availability of a short, quick, and easy-to-use instrument in Greek for measuring T1D patients’ experiences and satisfaction with the use of an insulin delivery device and the impact of diabetes management on their lives, which is acceptable, valid, and reliable. The psychometric validation of the DIDS-Gr indicated a three-factor construct (“Device Satisfaction”, “Diabetes Management Impact”, and “Device Usability”) with high internal consistency reliability, and satisfactory convergent, discriminant, and differential validity. The implications of this study could guide the development of improved devices and tailored solutions taking into consideration patients’ perceptions and satisfaction with their use, whereas interventions could be also developed and implemented to promote device engagement, adherence, and satisfaction. Achieving optimal health outcomes and satisfaction with device use is the cornerstone of patient’s decrease of attrition in device use, an increase in engagement, and consequently, improve their quality of life and increase their well-being.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi: <https://doi.org/10.22365/jpsych.2024.017>

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Ερευνητική εργασία

Διαστάσεις και ψυχομετρικές ιδιότητες της ελληνικής έκδοσης της Κλίμακας των Επιπτώσεων του Διαβήτη και της Ικανοποίησης από τη Συσκευή Χορήγησης Ινσουλίνης

Εμμανουήλ Σ. Μπενιουδάκης,^{1,2} Αργυρούλα Καλαϊτζάκη,³ Ελένη Καρλάφτη,² Οξάνα Αχάνοβ,⁴ Ελισάβετ Καπαγερίδου,⁵ Χρήστος Σαββόπουλος,² Τριαντάφυλλος Διδάγγελος²

¹Ψυχιατρική Κλινική, Γενικό Νοσοκομείο Χανίων,

²Διαβητολογικό Κέντρο, Α΄ Προπαιδευτική Παθολογική Κλινική, Πανεπιστημιακό Γενικό Νοσοκομείο «ΑΧΕΠΑ», Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης, Θεσσαλονίκη, Μακεδονία,

³Εργαστήριο Διεπιστημονικής Προσέγγισης για τη Βελτίωση της Ποιότητας Ζωής, Τμήμα Κοινωνικής Εργασίας, Ελληνικό Μεσογειακό Πανεπιστήμιο, Ηράκλειο, Κρήτη,

⁴Τμήμα Ιατρικής, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αθήνα,

⁵Τμήμα Ιατρικής, Δημοκρίτειο Πανεπιστήμιο Θράκης, Θράκη

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ΠΕΡΙΛΗΨΗ

Ο σακχαρώδης διαβήτης τύπου 1 (ΣΔ1) είναι μια χρόνια πάθηση με διαρκώς αυξανόμενο επιπολασμό. Η μόνη θεραπεία για άτομα με ΣΔ1 για την πρόληψη πιθανών επιπλοκών που σχετίζονται με τον σακχαρώδη διαβήτη (ΣΔ) είναι η εξωγενής χορήγηση ινσουλίνης. Η τεχνολογία που συνδέεται με τον ΣΔ έχει συμβάλει σημαντικά στη διαχείρισή του, μειώνοντας την επιβάρυνση που συνδέεται με τον ΣΔ και παρέχοντας παράλληλα μεγαλύτερη ευελιξία στη διαχείριση της ινσουλίνης κατά τη διάρκεια των καθημερινών δραστηριοτήτων. Σε αυτή την εργασία παρουσιάζονται οι βασικές ψυχομετρικές ιδιότητες της ελληνικής μετάφρασης του ερωτηματολογίου Diabetes Impact and Device Satisfaction (DIDS), το οποίο αξιολογεί την ικανοποίηση των ατόμων με ΣΔ1 από τη χρήση μιας συσκευής χορήγησης ινσουλίνης και τις επιπτώσεις της διαχείρισης του ΣΔ. Ένα δείγμα 101 ενηλίκων με ΣΔ1, αποτελούμενο κυρίως από γυναίκες (71,3%), με μέση ηλικία τα 38,4 έτη ($\pm 11,7$), συμπλήρωσε τη μεταφρασμένη ελληνική έκδοση του DIDS (DIDS-Gr). Η διερευνητική παραγοντική ανάλυση αποκάλυψε ένα μοντέλο τριών παραγόντων: «ικανοποίηση από τη συσκευή», «Επιπτώσεις της διαχείρισης του διαβήτη» και «Χρησιμότητα της συσκευής». Οι δείκτες εσωτερικής συνοχής (Cronbach alpha) για τις υποκλίμακες ήταν 0,86, 0,72 και 0,60, αντίστοιχα. Επιπλέον, η συγκλίνουσα εγκυρότητα επιβεβαιώθηκε με μέτριες έως υψηλές θετικές συσχετίσεις μεταξύ του DIDS-Gr και του DQoL-BCI και των υποκλιμάκων του («ικανοποίηση» και «αρνητική επίδραση»), ενώ η αποκλίνουσα εγκυρότητα επιβεβαιώθηκε με χαμηλές συσχετίσεις με την υποκλίμακα της κατάθλιψης του HADS. Τέλος, μέσα από τη μελέτη αναδείχθηκε η αξιοπιστία των επαναληπτικών μετρήσεων και η διαφορική εγκυρότητα. Επομένως, το DIDS-Gr είναι ένα έγκυρο και αξιόπιστο εργαλείο για την αξιολόγηση της ικανοποίησης από τη χρήση συσκευής χορήγησης ινσουλίνης και των επιπτώσεων του διαβήτη σε άτομα με ΣΔ1 στην Ελλάδα.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Σακχαρώδης διαβήτης τύπου 1, επιπτώσεις του διαβήτη, ικανοποίηση από τη συσκευή, εγκυρότητα, αξιοπιστία, ανάλυση παραγόντων.

Research article

Mental health professionals' perceptions of health promotion needs among people with severe mental health disorders through the co-production approach

Konstantinos Tsoukas,^{1,2} Gerasimos Kolaitis,³ Areti Lagiou,^{1,2} Evanthia Sakellari^{1,2}

¹Department of Public and Community Health, Faculty of Public Health, University of West Attica, Athens,

²Laboratory of Hygiene and Epidemiology, Department of Public and Community Health, Faculty of Public Health, University of West Attica, Athens,

³School of Medicine, National and Kapodistrian University of Athens, Greece

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ABSTRACT

People who suffer from severe mental health disorders are also at high risk of developing other serious health problems. Unhealthy lifestyle behaviors combined with low self-care and low health literacy among people with severe mental health disorders highlight the need to design health promotion interventions in this population group. A qualitative study was carried out to investigate the perceptions among mental health professionals on the health promotion needs of people with severe mental health disorders through the co-production approach. Two focus groups were conducted with 20 mental health professionals working in mental health community settings in Attica, Greece. The data was analyzed using thematic analysis. Regarding health promotion needs, four major themes emerged: (1) psycho-education, (2) self-care skills, (3) institutional interventions, and (4) experiential education. Concerning co-production in health promotion, three main themes emerged: (1) participatory process, (2) services evaluation, and (3) co-production training. The findings of the study provide valuable insights into the perceptions of mental health professionals and can be taken into account in contributing to the design and implementation of health promotion programs for people with severe mental health disorders.

KEYWORDS: Health promotion needs, co-production, mental health professionals, people with severe mental health disorders.

Introduction

People who suffer from severe mental health disorders (i.e., schizophrenia, bipolar disorder, major depression) are also at higher risk of developing other serious health problems, such as coronary heart disease,¹ respiratory disease,² obesity,³ diabetes mellitus,⁴ and neoplasms.⁵ Due to this comorbidity, the risk of premature death is also significant, making this condition a major public health problem.⁶ It is important to note that individuals diagnosed with a severe mental disorder typically expe-

rience a reduction in life expectancy ranging from ten to twenty years when compared to the general population.^{7,8}

Unhealthy lifestyle behaviors (e.g., smoking, absence of physical exercise, poor dietary habits, etc.) combined with low self-care and low health literacy⁹ among people with severe mental health disorders highlight the need to design health promotion interventions in this population group.¹⁰ In addition, people with severe mental health disorders, despite their inability to take care of

their health autonomously and effectively, nevertheless express their concerns and the need to receive support and counseling for their health.¹¹ In contrast, health promotion and health education interventions for this population focus primarily on disease management¹² and rely on subjective perceptions of mental health professionals.¹³ Also, mental illness-related factors such as low self-esteem, lack of confidence, and lack of motivation (avolition) are additional barriers to lifestyle interventions.¹⁴ Research indicates that participatory lifestyle education interventions tend to enhance individuals' motivation to engage and are more efficacious, as they are grounded in the rapport and interactions established with mental health practitioners.^{15,16} Especially when these interventions take place in community mental health settings.¹⁷

Co-production is an approach that ensures the active and equal participation of individuals in the design, implementation, and evaluation of interventions and services.^{18,19} Co-production promotes an attitude of facilitation rather than passive service provision.²⁰ Through co-production, service users and mental health professionals work together as partners in an environment of sharing valuable knowledge and experience. Both the individuals' informal carers and members of the wider community can participate in this collaborative relationship.²¹

The existing literature provides scant references to health promotion programs and interventions targeting individuals with severe mental health disorders, especially within community settings, and uniform evaluation of such initiatives is lacking.¹³ Furthermore, the programs designed and implemented are not using participatory approaches.²² Therefore, this study aims to examine mental health professionals' perceptions of the health promotion needs of people with severe mental health disorders receiving services from community mental health centers in Greece. In addition, the goal was to explore professionals' perceptions regarding the concept of co-production. The research questions were (1) What needs should a health promotion program for people with severe mental health disorders address? (2) How do mental health professionals perceive co-production in health promotion?

Material and Method

Participants and setting

Study participants were mental health professionals from a variety of professional backgrounds (i.e., psychologists, occupational therapists, social workers, health visitors, and nurses) who provide services to people with severe mental health disorders in community

mental health settings (i.e., day centers, mobile units, and residential care) located in the region of Attica, Greece. They were recruited through a convenience sampling method, which is a non-probability technique where participants are included in the sample based on their ease of accessibility to the researcher.^{23,24} The researcher (KT), who is also a mental health professional, visited settings where he does not provide services and informed potential participants about the purpose and nature of the study in writing and verbally. The study was carried out in two-day centers that agreed to offer appropriate space for the study.

Data collection

Since we aimed to explore the mental health professionals' perceptions of health promotion needs among people with severe mental health disorders, we chose to use a qualitative approach. Two focus groups consisting of 8–10 participants were conducted between September and November of 2022. Through focus groups, people with common characteristics are asked about their perceptions, opinions, and beliefs regarding a subject under study. It is held in an interactive and engaging environment where participants are free to discuss with other group members.²⁵

The focus groups lasted 90–120 minutes each. The sessions were conducted in Greek. A semi-structured focus group guide was developed by the interdisciplinary research team to stimulate dialogue, promote interaction among participants, and make certain that all topics were covered. Initially, the facilitator (KT), who is also an experienced mental health professional and qualitative researcher, explained again the aims of the study and the focus group process. He emphasized the confidentiality of the discussion content, as well as their right to withdraw from the discussion at any time without giving any explanation or having any consequence. Before commencing, participants were asked to individually complete an anonymous brief form with some demographics (e.g., gender, age) as well as background information (e.g., work experience, education). The sessions were recorded using a digital voice recorder. In both focus groups, the following questions were asked: (1) How do you perceive a health promotion program for people with severe mental health disorders, and what needs would it address? (2) How do you perceive co-production, and what is your role in it? (3) How do you perceive a health promotion program with the characteristics of co-production? At the end of the sessions, the facilitator, summarizing, confirmed the responses with the participants while allowing them to add or clarify anything they wanted.

Data analysis

Audio recordings were transcribed verbatim into Greek and the results of the analysis were translated into English (KT). Saturation was achieved as no additional data were found after the second focus group. The data was analyzed manually. It was conducted by two members of the research team (KT and ES) who have experience in qualitative research. The most widely used thematic analysis approach described in the qualitative research methodology literature²⁶ was applied: (1) the transcripts were read several times to ensure familiarity with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes. The two researchers (KT and ES) independently coded the transcripts to verify the consistency of the framework.²⁷

Ethical considerations

Approval to conduct the study was obtained from the Research Ethics Committee of the University of West Attica (47060/13-05-2022). Another approval was obtained from the settings where the research took place. Potential participants were asked to voluntarily participate in the study by signing a consent form after being fully informed about the purpose and nature of the study. All the data were collected and accessed only by the researchers who didn't have any professional or personal relationship with the participants.

Results

A total of 20 mental health professionals participated in the study; 17 of them were women, and 3 were men. The average age was 37 years, and most of them (n=16) had completed postgraduate studies too. The majority (n=15) of participants had more than five years of professional experience in providing services in mental health community settings (i.e., day centers, residential care).

A summary of themes and sub-themes that emerged from the analysis is illustrated in table 1.

Health promotion needs

Concerning health promotion needs, four main themes emerged: (1) psycho-education, (2) self-care skills, (3) institutional interventions, and (4) experiential education.

1. Psycho-education

Participants perceive a health promotion program for people with severe mental health disorders mainly with psycho-educational content. They emphasize education

for disease acceptance and management, which should be provided not only to individuals but also to family members and informal carers. As they mentioned:

“People do not easily accept their situation; they have a denial about what they are facing. My idea is to organize a psychoeducational program for the acceptance of the disease at the first level and its gradual management. How and when to address it from the very first symptoms” (P1, p. 10, lines 11–15 (in the transcript).

“Health promotion should start from psychoeducation, not only of individuals but also of the family, with the goal of acceptance by the entire informal system that cares for the individual. It is the family that will even determine the prognosis of the disease itself” (P2, p. 11, lines 12–15 (in the transcript).

They refer to the need for medication education, highlighting the difficulties of medication adherence for people with serious mental health disorders. They describe the moment they are discharged, completing their hospitalization in a psychiatric clinic. For example:

“Psycho-educational interventions are generally necessary. A health promotion program should include psycho-educational interventions about the disease as well as medication management to ensure medication adherence. That's where the biggest issue seems to be and a vicious cycle begins that puts the person's health at risk each time” (P3, p. 10, lines 16–21 (in the transcript).

“I think it's another thing to promote health for a person starting to receive services and another when they're on a recovery path. Health promotion at the time of a person who has just been discharged should have as a priority the tailored education of the person and, above all, the consistent intake of medication. This is the base” (P4, p. 12, lines 22–26 (in the transcript).

In addition, they focus on addressing the stigma associated with the moment of diagnosis of mental illness. They mentioned the importance of supporting the individual and carers at the beginning of any intervention where personal stigma is quite strong and is a barrier to mobilization and participation in activities. They said:

“We should address the whole environment holistically. Health promotion concerns all family members, especially regarding the negative emotions that come from the disease. I could imagine a psycho-educational program that would aim at acceptance and destigmatization with a priority on the stigma experienced by the individual and the family” (P2, p. 13, lines 8–12 (in the transcript).

“Indeed, the period of onset of the disease is an extremely difficult and demanding phase that should be the starting point for such interventions. We need to

Table 1. Summary of themes and sub-themes.

	Themes	Sub-themes
Health promotion needs	Psycho-education	Disease acceptance & management Medication education Addressing stigma
	Self-care skills	Personal hygiene Disease prevention Smoking cessation Nutrition Vaccination information
	Institutional interventions	Common methodology School education
	Experiential education	Personal experiences Audio-visual media
	Participatory process	Treatment plan Activities
Co-production in health promotion	Services evaluation	Feedback Satisfaction degree
	Co-production training	Preparation

provide information initially to the individual and family members so that they are relieved after hearing the diagnosis. This determines the prognosis of the disease and the life of the individual and the entire family" (P4, p. 13, lines 13–17 (in the transcript)).

2. *Self-care skills*

Participants report that self-care skills development is another dimension that needs to be considered when designing a health promotion program for this population. They report that people with severe mental health disorders face great difficulty in taking care of themselves effectively and consistently. As they said:

"In this particular population, regardless of cognitive level, there are serious difficulties in self-care, which is ineffective. There is no consistency, especially during periods of relapse and drop-out, these skills show significant impairment" (P2, p. 15, lines 17–20 (in the transcript)).

During the discussions, almost all of the participants who reported reduced self-care mainly pointed out the difficulties they find in individuals taking adequate care of their physical hygiene. For example, the following were mentioned:

"I think we're all well aware that poor physical hygiene is the biggest and most common self-care issue we need to focus on. We cannot refer to a health promotion program that does not include, in principle, personal hygiene and physical care. Hygiene requires education on

a daily practical level" (P5, p. 16, lines 1–5 (in the transcript)).

"The inability to take adequate and constant care of physical hygiene is a common difficulty that we professionals identify in the majority of people with severe mental health disorders. Mostly, it is something we meet with people who are discharged after being hospitalized for quite a long time or have been ill and neglected themselves for years" (P6, p. 16, lines 9–13 (in the transcript)).

In addition, they mentioned the need to educate people about disease prevention and the need to avoid factors and behaviors that cause chronic diseases. Smoking and unhealthy eating habits were discussed. Since the sessions were held in the recent time of the COVID-19 pandemic, some participants pointed out the need for information about vaccination. They mentioned:

"We should expand to more holistic health issues. We have noticed that people with severe mental health disorders are usually heavy smokers and have poor eating habits. The prevalence of obesity and cardiovascular problems in this population is at much higher, I would say dramatic, rates" (P3, p. 16, lines 19–23 (in the transcript)).

"Many of the people we support also suffer from chronic obstructive pulmonary disease and, as is often mentioned, cardiovascular problems, diabetes, etc. Cancer is literally everywhere. In my mind, it's a self-care skills program that will promote a quality lifestyle with

healthy habits to reduce the risk of other serious illnesses" (P7, p. 12, lines 5–10 (in the transcript)).

"We saw in the pandemic how difficult it was for people to understand the risk and get vaccinated. Therefore, an example I'm thinking of, with the pandemic we've been through, is the need to provide information about the vaccine, just like the general population. That we would do for everyone without discrimination" (P2, p. 10, lines 23–27 (in the transcript)).

3. Institutional interventions

The majority of participants associate health promotion with programs provided by the state (e.g., Ministry of Health, municipalities). They consider that health promotion interventions should have an institutional character and follow a common methodology. Particular emphasis is placed on the role of education and the school as an early intervention environment to provide information and awareness regarding mental health issues. For example, they said:

"Something institutional comes to my mind. It is organized by someone "above", an authority, whether it is called a ministry or a municipality. At a horizontal, state level, if I understand. As a broader intervention. However, to function and be followed, it should be an institution" (P8, p. 4, lines 24–27 (in the transcript)).

"At some point, there should be legislation that includes awareness programs for mental health disorders and psychosocial difficulties at all levels of education. Children need to be informed early in school about these issues" (P6, p. 8, lines 18–21 (in the transcript)).

4. Experiential education

Participants report that health promotion should have elements of experiential education. A health promotion intervention will be more interactive when it allows people to talk about their personal experiences. The use of audio-visual media, which could include testimonials and personal narratives, could also be helpful. As they mentioned:

"It is not enough to be well structured or organized. It should definitely be experiential. To enable participants to talk about their personal experiences. The experiential approach is always more interesting. The other's living example will hold the user, motivating him/her to identify and feel that he/she can" (P1, p. 7, lines 18–22 (in the transcript)).

"To be based on the use of audio-visual media, on interaction. For example, a group could start by showing a video narrative by a person with psychiatric experience" (P3, p. 8, lines 3–5 (in the transcript)).

Co-production in health promotion

Regarding co-production in health promotion, three themes were identified: (1) participatory process, (2) services evaluation, and (3) co-production training

1. Participatory process

Most of the participants approached the concept of co-production as a condition of active participation of the person, who is facing a mental disorder, in his/her treatment plan. A participatory process that allows the individual to express his/her opinions and make decisions about his/her life. For example:

"I understand a participative dimension somewhat. To give the person the appropriate space to think, to express his/her opinion and his/her wishes, and to be able to decide on the goals we set together in his/her treatment plan. He/she can freely express the desires and needs that will define his/her life. And of course, to decide" (P9, p. 18, lines 8–12 (in the transcript)).

Some other participants referred to the active participation of individuals in groups, actions, and even conferences related to mental health. Some examples are the following:

"It is obviously not a co-production in a group that aims to promote health or anything: the simple and often passive presence. It is important that people actively participate in the groups and not just listen to the professional so that there is a common result" (P5, p. 28, lines 1–13 (in the transcript)).

"We often observe that excellent events are organized by mental health associations that aim at stigma, inform, and raise awareness, and we do not see the users themselves, I mean in the organization, with an active role. It is not possible, for example, on World Mental Health Day that the individuals themselves do not participate in the action together with the professionals" (P2, p. 21, lines 24–29 (in the transcript)).

"I agree with colleagues. As in scientific conferences, there should always be a table with the participation of both people facing mental health disorders and their families. They should be given the stage; they are the protagonists" (P7, p. 22, lines 6–9 (in the transcript)).

2. Services evaluation

According to the participants, evaluation is an important participatory process through which people can express their opinions about services they have received. This would help mental health professionals understand the degree of satisfaction and whether the initial design achieved its objectives. As participants reported:

"I certainly think there is no one picture of where we are. For example, after completing an activity, ask people to give feedback on how satisfied they are. Did they like the group they attended? Did they participate in it? Did it help at all? To know what we did" (P9, p. 30, lines 25–29 (in the transcript).

"Whatever example we think about co-production, I conclude that there should be feedback from them so that we can evaluate whether the objectives were achieved, whether we achieved the desired results, and what was finally done about our decided plan" (P3, p. 31, lines 8–11 (in the transcript).

3. Co-production training

It is important to mention that some participants mentioned that although they have received some information about co-production, they express the need for preparation and training for a better understanding of the concept before it is applied to services:

"Seems like something new that we need time to understand ourselves before suddenly 'giving' it to users. I don't think that only a positive attitude and initiative are enough. We have seen many times the beginning of something difficult for us to understand and ultimately causes more confusion" (P1, p. 17, lines 4–7 (in the transcript).

"It is not enough just to understand but also to organize properly. I feel it needs a lot of preparation before we implement it. What steps will we follow? What stages are necessary to get there?" (P4, p. 23, lines 5–7 (in the transcript).

"We can't go in "blindly". A theoretical training and perhaps a pilot implementation is necessary to be able to predict the process so that we are sure of what we end up following. And this will obviously help the users themselves" (P6, p. 23, lines 18–21 (in the transcript).

Discussion

As recognized in the literature, mental health professionals frequently implement health promotion programs without conducting a prior needs assessment, or in some cases, these needs are addressed through predefined topics.¹² The present study explored mental health professionals' perceptions of health promotion needs for people with severe mental health disorders. In addition, health promotion issues were explored through the approach of co-production.

Regarding health promotion, it needs participants focused on the psycho-education of individuals and informal carers. This focus on disease management is consistent with the findings of previous related studies demonstrating that mental health professionals' attitudes and

interventions are primarily disease-oriented.^{28,29} On a second level, they believe that a health promotion program should include topics related to physical health, focusing on self-care skills. This perception of mental health professionals meets the needs of people with severe mental health disorders, who are willing to adopt healthy habits and change their lifestyles.¹² In particular, studies highlight the expressed need of individuals to control their body weight and manage the side effects of medication.^{11,30}

For the participants, experiential education plays an important role in promoting the health of people with severe mental health disorders. The use of experience, especially as a peer support tool, is an important issue also highlighted by mental health service users.^{31,32} However, in the present study this experience appears to be of limited use in increasing the effectiveness of established and existing services and interventions. On the contrary, as found in a study conducted to explore the ideas and preferences of mental health service users in achieving a collaborative relationship in health promotion, participants expressed a desire to involve themselves in agenda-setting and setting health promotion activities and not just participating in predetermined activities.³³

Concerning co-production in health promotion, participants approached the concept as a form of active participation of the individual in his/her treatment plan and promoted his/her active involvement in activities. Moreover, the participation of people with mental health disorders in the evaluation of the activities they take part in was also a dimension highlighted. It has been found that people with lived experience participate in planning or evaluation processes but never as decision-makers.³⁴ Accordingly, in our study, mental health professionals refer to an active but partial participation of individuals by providing feedback and expressing their satisfaction in an existing framework. However, co-production is not limited to the active participation of individuals in pre-existing processes, nor is it an open discussion. It requires mental health professionals to work equally with people at all levels.²¹ Co-production focuses on a relationship in which service users and health professionals share power, recognizing that both bring vital expertise to work as equal partners to design and deliver services together, as well as to evaluate them with the aim of their continuous improvement.³⁵ Therefore, the responses of the participants could be said to refer more to an intermediate participatory process and not to co-production as reported in the literature.

Nevertheless, we should not ignore that participants expressed the need to become more familiar with the

concept of co-production and to be trained in the approach before being asked to implement it with individuals. Training, supervision, and support are important factors even in the case of a co-production relationship, especially at the beginning, in the first steps when staff have to come to terms with new priorities.³⁵ The need to train mental health professionals in participatory approaches has been expressed not only by them but also by people with mental health disorders as a high priority.³⁶

Some limitations should be taken into account when interpreting the findings of this study. The number of participants was small. This is due to the nature of qualitative research itself, as the aim of qualitative research is to explore and provide deeper insights into the experiences, perceptions, and behavior of participants.³⁷ In any case, saturation was reached, which indicates that collected data has reached a point where further data collection is unlikely to uncover new themes. Furthermore, the participants were all mental health professionals working exclusively in community mental health settings in Athens, Greece. Therefore, it is important to conduct future studies that consider the views of mental health professionals, representative of the entire country, including provincial areas. Finally, the present study took into account the health promotion needs expressed by mental health professionals, without consid-

ering the needs expressed by people with mental health disorders themselves. Thus, future studies with the participation of individuals would be useful.

In conclusion, the findings of this study provide useful information that could be used to design and implement health promotion programs for people with severe mental health disorders. A health promotion program for this population, as proposed by mental health professionals, should address psychoeducation needs, including informal carers, and the development of self-care skills, focusing on physical hygiene, disease prevention, smoking cessation, and nutrition advice. A common methodology should also be followed, in the context of developing health promotion policies, with elements of experiential education, incorporating the experience of individuals.

Finally, the findings regarding co-production in the context of health promotion demonstrate that while there is an intention to adopt it, it cannot be implemented properly. Participants are not equipped to work in the recommended way. Therefore, this approach should be included in the training of health professionals so that it is integrated into existing scientific knowledge and everyday practice, ensuring the equal participation of individuals in all aspects of the health promotion planning, implementation, and evaluation processes.

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Ερευνητική εργασία

Οι αντιλήψεις των επαγγελματιών ψυχικής υγείας για τις ανάγκες προαγωγής της υγείας των ατόμων με σοβαρές ψυχικές διαταραχές μέσω της προσέγγισης της συμπαράγωγής

Κωνσταντίνος Τσούκας,^{1,2} Γεράσιμος Κολαΐτης,³ Αρετή Λάγιου,^{1,2} Ευανθία Σακελλάρη^{1,2}

¹Τμήμα Δημόσιας και Κοινωνικής Υγείας, Σχολή Δημόσιας Υγείας, Πανεπιστήμιο Δυτικής Αττικής,

²Εργαστήριο Υγιεινής και Επιδημιολογίας, Τμήμα Δημόσιας και Κοινωνικής Υγείας, Σχολή Δημόσιας Υγείας, Πανεπιστήμιο Δυτικής Αττικής,

³Ιατρική Σχολή, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αθήνα

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ΠΕΡΙΛΗΨΗ

Τα άτομα που πάσχουν από σοβαρές ψυχικές διαταραχές διατρέχουν επίσης υψηλό κίνδυνο να αναπτύξουν άλλα σοβαρά προβλήματα υγείας. Ο ανθυγιεινός τρόπος ζωής σε συνδυασμό με τις μειωμένες δεξιότητες αυτοφροντίδας και η ανεπαρκής εγγραματοσύνη σε θέματα υγείας (health literacy) των ατόμων με σοβαρές ψυχικές διαταραχές υπογραμμίζουν την ανάγκη σχεδιασμού παρεμβάσεων προαγωγής της υγείας σε αυτήν την ομάδα πληθυσμού. Διενεργήθηκε μια ποιοτική μελέτη με στόχο τη διερεύνηση των αντιλήψεων των επαγγελματιών ψυχικής υγείας σχετικά με τις ανάγκες προαγωγής της υγείας ατόμων με σοβαρές ψυχικές διαταραχές, μέσω της προσέγγισης της συμπαράγωγής. Πραγματοποιήθηκαν δύο ομάδες εστίασης με 20 επαγγελματίες ψυχικής υγείας που εργάζονται σε κοινωνικές δομές ψυχικής υγείας στην Αττική, Ελλάδα. Τα δεδομένα αναλύθηκαν μέσω θεματικής ανάλυσης. Όσον αφορά τις ανάγκες προαγωγής της υγείας, προέκυψαν τέσσερα κύρια θέματα: (1) ψυχοεκπαίδευση, (2) δεξιότητες αυτοφροντίδας, (3) θεσμικές παρεμβάσεις και (4) βιωματική εκπαίδευση. Όσον αφορά τη συμπαράγωγή στην προαγωγή της υγείας, προέκυψαν τρία κύρια θέματα: (1) συμμετοχική διαδικασία, (2) αξιολόγηση υπηρεσιών και (3) εκπαίδευση στη συμπαράγωγή. Τα ευρήματα της μελέτης παρέχουν πολύτιμες γνώσεις για τις αντιλήψεις των επαγγελματιών ψυχικής υγείας και μπορούν να ληφθούν υπόψη, συμβάλλοντας στο σχεδιασμό και την εφαρμογή προγραμμάτων προαγωγής της υγείας για άτομα με σοβαρές ψυχικές διαταραχές.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Ανάγκες προαγωγής υγείας, συμπαράγωγή, επαγγελματίες ψυχικής υγείας, άτομα με σοβαρές ψυχικές διαταραχές.



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ΨΥΧΙΑΤΡΙΚΗ

Τριμηνιαία έκδοση της Ελληνικής Ψυχιατρικής Εταιρείας

ΤΟΜΟΣ 35

ΙΑΝΟΥΑΡΙΟΣ–ΔΕΚΕΜΒΡΙΟΣ 2024

Ευχαριστίες προς Κριτές

Η Συντακτική Επιτροπή της Ψυχιατρικής θα ήθελε να ευχαριστήσει όλους όσους συνέβαλαν στον 35ο τόμο και ειδικά τους παρακάτω ειδικούς κλινικούς και ερευνητές, που εργάστηκαν ως κριτές εργασιών του περιοδικού μας.

A

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Αλεβιζόπουλος Γεώργιος
Αλεξόπουλος Παναγιώτης
Ανδρεοπούλου Ουρανία
Ανδρούτσος Χρήστος
Ασημακόπουλος Λάμπρος
Ωρίων

B

Βασιλοπούλου Σοφία
Βασιλαματζής Γρηγόρης
Βλάχος Ηλίας
Βοϊτισίδης Παντελεήμων

Γ

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Γιαλούρης Αθανάσιος
Γιαννούλη Βαΐτσα
Γιωτάκος Ορέστης
Γιωτσιδή Βασιλική
Γκοτζαμάνης Βίκτωρας
Γονιδάκης Φραγκίσκος
Γουρζής Φίλιππος
Γουρνέλλης Ρωσσέτος
Γρίβα Φαίη
Γώγου Μαρία

Δ

Di Natale Chiara
Δημητρακόπουλος Στέφανος
Δουζένης Αθανάσιος

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Hassan, Sehar un Nisa

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Καλαϊτζάκη Αργυρούλα
Καράβατος Αθανάσιος
Καρακατσούλης Γρηγόριος
Κασελίμης Δημήτριος
Katarodi Maria
Κατέρη Ευαγγελία
Κιούλος Κανέλλος
Κόλλιας Κωνσταντίνος
Κοντοάγγελος Κωνσταντίνος
Κρασσανάκης Στέλιος
Kravariti, Eugenia
Κυριακόπουλος Μαρίνος
Κωνσταντινίδης Βασίλειος
Κωνσταντίνου Γεράσιμος
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Μαρούδα Κυριακή
Μαυρέας Βενετσάνος
Μητρόπουλος Γεώργιος
Michaloroulou, Panayiota
Mitelman Mijal
Μιχόπουλος Ιωάννης
Μούγιας Αντώνης
Μουρίκης Ηρακλής
Μπάστα Μαρία
Μπενιουδάκης Εμμανουήλ
Μποζίκας Βασίλειος
Μπουγέα Αναστασία

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Παναγιωτάκος Δημοσθένης
Παπαρρηγόπουλος Θωμάς
Πατρικέλης Παναγιώτης
Περιογιάννης Βάιος
Πετρικής Πέτρος
Πεχλιβανίδης Αρτέμιος
Πολίτης Αντώνιος
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Σαμαρά Μυρτώ
Σίμος Παναγιώτης
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Σιώμος Κωνσταντίνος
Σκουρτέλη Μαρίνα
Σταχτέας Παναγιώτης
Στεφανάτου Πενταγιώτισσα
Στυλιανίδης Στέλιος

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Τριανταφύλλου Ευγενία
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Τσαμάκης Κωνσταντίνος
Τσατάλη Μαριάννα
Τσιώνης Αντώνης
Τσόπελας Χρήστος
Τσουβέλας Γιώργος

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Φλώρος Γεώργιος
Φουντουλάκης Κωνσταντίνος
Φρανσις Κώστας

Χ

Χατζημανώλης Αλέξανδρος
Χατζούλης Μιχάλης
Χριστοδούλου Νίκος
Χριστοδούλου Χρήστος

Σας ευχαριστούμε από καρδιάς για την ανεκτίμητη βοήθειά σας!

Γιώργος Κωνσταντακόπουλος
Διευθυντής Σύνταξης