GR ISSN 1105-2333

# PSYCHIATRIKI

Quarterly journal published by the Hellenic Psychiatric Association, Volume 32, No 1, January-March 2021

# ΨΥΧΙΑΤΡΙΚΗ

Τριμηνιαία έκδοση της Ελληνικής Ψυχιατρικής Εταιρείας, Τόμος 32, Τεύχος 1, Ιανουάριος-Μάρτιος 2021



*Καταχωρείται και περιλαμβάνεται στα MEDLINE/PubMed, Index Copernicus, PsychINFO, Scopus, SCImago, Google Scholar, EMBASE/Excerpta Medica, EBSCOhost™ και στο Iatrotek, (Scopus CiteScore 2019=1.0)*

*Καταχωρείται και περιλαμβάνεται στα MEDLINE/PubMed, Index Copernicus, PsychINFO, Scopus, SCImago, Google Scholar, EMBASE/Excerpta Medica, EBSCOhost™ και στο Iatrotek*

***Οδηγίες προς τους συγγραφείς και το συνοδευτικό έντυπο είναι διαθέσιμα στην ιστοσελίδα: http://www.psychiatriki-journal.gr***

***Εργασίες για δημοσίευση υποβάλλονται μέσω του παραπάνω ιστότοπου ή εναλλακτικά μέσω ηλεκτρονικού ταχυδρομείου στην ηλεκτρονική διεύθυνση editor@psychiatriki-journal.gr***

# ΨΥΧΙΑΤΡΙΚΗ

**Τριμηνιαία έκδοση**
**της Ελληνικής Ψυχιατρικής Εταιρείας**
Διονυσίου Αιγινήτου 17, 115 28 Αθήνα
Τηλ.: 210-77 58 410, Fax: 210-77 09 044

**Εκδότης:**
Ελληνική Ψυχιατρική Εταιρεία
Παπαδιαμαντοπούλου 11, 115 28 Αθήνα
Τηλ.: 210-72 14 184



*Indexed and included in MEDLINE/PubMed, Index Copernicus, PsychINFO, Scopus, SCImago, Google Scholar, EMBASE/Excerpta Medica, EBSCOhost™ and in Iatrotek*

***Instructions to contributors and the submission form are available at the webpage http://www.psychiatriki-journal.gr***

***Manuscripts should be submitted for publication through the above website or should be sent as an attachment by email to editor@psychiatriki-journal.gr***

# PSYCHIATRIKI

**Quarterly journal published**
**by the Hellenic Psychiatric Association**
17, Dionisiou Eginitou str., 115 28 Athens
Tel.: +30-210-77 58 410, Fax: +30-210-77 09 044

**Publisher:**
Hellenic Psychiatric Association
11, Papadiamantopoulou str., 115 28 Athens
Tel.: +30-210-72 14 184



**Γραμματεία Ελληνικής Ψυχιατρικής Εταιρείας:**
Υπεύθυνη: Ε. Γκρέτσα
Τηλ.: 210-72 14 184, Fax: 210-72 42 032
E-mail: psych@psych.gr, Ιστοσελίδα: www.psych.gr
FB: ΕΛΛΗΝΙΚΗ ΨΥΧΙΑΤΡΙΚΗ ΕΤΑΙΡΕΙΑ

**Ετήσιες συνδρομές του Περιοδικού:**
Εσωτερικού € 40,00
Εξωτερικού $ 80,00 + ταχυδρομικά
Μεμονωμένα τεύχη € 10,00
Καταβάλλονται με επιταγή στον ταμία της ΕΨΕ:
Παπαδιαμαντοπούλου 11, 115 28 Αθήνα
**Τα ταμειακώς εντάξει μέλη της Εταιρείας δεν υποχρεούνται σε καταβολή συνδρομής**

**Secretariat of Hellenic Psychiatric Association:**
Head: H. Gretsa
Tel.: (+30) 210-72 14 184, Fax: (+30) 210-72 42 032
E-mail: psych@psych.gr, Web-site: www.psych.gr

**Annual subscriptions of the Journal:**
€ 40.00 or $ 80.00 + postage – each separate issue € 10.00
are payable by check to the treasurer
of the Hellenic Psychiatric Association:
11, Papadiamantopoulou str., GR-115 28 Athens

**For the members of the Association in good standing subscription is free**

**ΕΠΙΜΕΛΕΙΑ ΕΚΔΟΣΗΣ**
**EN ISO 9001:2000**
ΒΗΤΑ Ιατρικές Εκδόσεις
ΜΟΝΟΠΡΟΣΩΠΗ ΕΠΕ
Αδριανείου 3 και Κατεχάκη, 115 25 Αθήνα (Ν. Ψυχικό)
Τηλ.: 210-67 14 371 – 210-67 14 340, Fax: 210-67 15 015
e-mail: betamedarts@otenet.gr
e-shop: www.betamedarts.gr
EN ISO 9001:2000

**Υπεύθυνος τυπογραφείου**
Α. Βασιλάκου, Αδριανείου 3 – 115 25 Αθήνα
Τηλ. 210-67 14 340

**EDITING**
**EN ISO 9001:2000**
BETA Medical Publications
3, Adrianiou str., GR-115 25 Athens-Greece
Tel.: (+30) 210-67 14 371 – (+30) 210-67 14 340,
Fax: (+30) 210-67 15 015
e-mail: betamedarts@otenet.gr, e-shop: www.betamedarts.gr
EN ISO 9001:2000

**Printing supervision**
A. Vassilakou, 3 Adrianiou str. – GR-115 25 Athens
Tel. (+30)-210-67 14 340

# ΕΛΛΗΝΙΚΗ ΨΥΧΙΑΤΡΙΚΗ ΕΤΑΙΡΕΙΑ

## ΔΙΟΙΚΗΤΙΚΟ ΣΥΜΒΟΥΛΙΟ

**Πρόεδρος:** Δ. Πλουμπίδης
**Αντιπρόεδρος:** Γ. Αλεβιζόπουλος
**Γεν. Γραμματέας:** Χρ. Τσόπελας
**Ταμίας:** Λ. Μαρκάκη
**Σύμβουλοι:** Στ. Κρασανάκης
Β.Π. Μποζίκας
Χ. Τουλούμης

## ΠΕΙΘΑΡΧΙΚΟ ΣΥΜΒΟΥΛΙΟ

**Μέλη:** Β. Αλεβίζος
Ι. Γκιουζέπας
Α. Σπυροπούλου

## ΕΞΕΛΕΓΚΤΙΚΗ ΕΠΙΤΡΟΠΗ

**Μέλη:** Β. Κονταξάκης
Ε. Σιούτη
Ν. Τζαβάρας

## ΕΠΙΤΙΜΟΙ ΠΡΟΕΔΡΟΙ

Γ.Ν. Χριστοδούλου, †Α. Παράσχος,
Ν. Τζαβάρας, Ι. Γκιουζέπας

## ΕΠΙΤΙΜΑ ΜΕΛΗ

†Σπ. Σκαρπαλέζος, †Ν. Ζαχαριάδης, †Ι. Πιτταράς

## ΠΕΡΙΦΕΡΕΙΑΚΑ ΤΜΗΜΑΤΑ

ΑΘΗΝΩΝ
**Πρόεδρος:** Κ. Κόντης
**Γραμματέας:** Σ. Θεοδωροπούλου
**Ταμίας:** Η. Τζαβέλλας

ΜΑΚΕΔΟΝΙΑΣ
**Πρόεδρος:** Ι. Νηματούδης
**Γραμματέας:** Ι. Διακογιάννης
**Ταμίας:** Π. Φωτιάδης

ΚΕΝΤΡΙΚΗΣ ΕΛΛΑΔΟΣ
**Πρόεδρος:** Π. Στοφόρος
**Γραμματέας:** Α. Θωμάς
**Ταμίας:** Α. Οικονόμου

ΒΟΡΕΙΟΔΥΤΙΚΗΣ ΕΛΛΑΔΟΣ & ΔΥΤΙΚΗΣ ΣΤΕΡΕΑΣ
**Πρόεδρος:** Α. Φωτιάδου
**Γραμματέας:** Λ. Ηλιοπούλου
**Ταμίας:** Π. Πετρίκης

ΠΕΛΟΠΟΝΝΗΣΟΥ
**Πρόεδρος:** Κ. Σωτηριάδου
**Γραμματέας:** Μ. Σκώκου
**Ταμίας:** Α. Κατριβάνου

ΜΕΓΑΛΗΣ ΒΡΕΤΤΑΝΙΑΣ
**Πρόεδρος:** Ε. Παλαζίδου
**Γραμματέας:** Κ. Κασιακόγια
**Ταμίας:** Π. Λέκκος

**ΤΟΜΕΑΣ ΝΕΩΝ ΨΥΧΙΑΤΡΩΝ**
**Πρόεδρος:** Θ. Κουτσομήτρος
**Α΄ Γραμματέας:** Ν. Παπαμιχαήλ
**Β΄ Γραμματέας:** Μ. Τζιαπούρας

**ΕΝΩΣΗ ΕΛΛΗΝΩΝ ΕΙΔΙΚΕΥΟΜΕΝΩΝ ΨΥΧΙΑΤΡΩΝ**
**Πρόεδρος:** Αν. Κλειδωνόπουλος
**Γραμματέας:** Δ. Ευθυμίου
**Ταμίας:** Γ. Τσιναρίδης

# HELLENIC PSYCHIATRIC ASSOCIATION

## EXECUTIVE COUNCIL

**Chairman:** D. Ploumpidis
**Vice-Chairman:** G. Alevizopoulos
**Secretary General:** Ch. Tsopelas
**Treasurer:** L. Markaki
**Consultants:** St. Krasanakis
V.P. Bozikas
Ch. Touloumis

## DISCIPLINARY COUNCIL

**Members:** V. Alevizos
J. Giouzepas
A. Spyropoulou

## FINANCIAL CONTROL COMMITTEE

**Members:** V. Kontaxakis
Ir. Siouti
N. Tzavaras

## HONORARY PRESIDENTS

G.N. Christodoulou, †A. Paraschos,
N. Tzavaras, J. Giouzepas

## HONORARY MEMBERS

†S. Scarpalezos, †N. Zachariadis, †I. Pittaras

## DIVISIONS

ATHENS
**Chairman:** C. Kontis
**Secretary:** S. Theodoropoulou
**Treasurer:** E. Tzavellas

MACEDONIA
**Chairman:** J. Nimatoudis
**Secretary:** J. Diakoyiannis
**Treasurer:** P. Fotiadis

CENTRAL GREECE
**Chairman:** P. Stoforos
**Secretary:** A. Thomas
**Treasurer:** A. Oikonomou

NORTHWESTERN GREECE
**Chairman:** A. Fotiadou
**Secretary:** L. Iliopoulou
**Treasurer:** P. Petrikis

PELOPONNESE
**Chairman:** K. Sotiriadou
**Secretary:** M. Skokou
**Treasurer:** A. Katrivanou

GREAT BRITAIN
**Chairman:** H. Palazidou
**Secretary:** K. Kasiakogia
**Treasurer:** P. Lekkos

**SECTOR OF YOUNG PSYCHIATRISTS**
**Chairman:** Th. Koutsomitros
**Secretary A΄:** N. Papamichael
**Secretary B΄:** M. Tziapouras

**UNION OF GREEK PSYCHIATRIC TRAINEES**
**Chairman:** A. Kleidonopoulos
**Secretary:** D. Efthymiou
**Treasurer:** G. Tsinaridis

## ΚΛΑΔΟΙ

**ΑΥΤΟΚΑΤΑΣΤΡΟΦΙΚΩΝ ΣΥΜΠΕΡΙΦΟΡΩΝ**
*Πρόεδρος:* Κ. Παπλός
*Γραμματείς:* Θ. Παπασλάνης, Δ. Καραΐσκος

**ΒΙΑΙΩΝ ΣΥΜΠΕΡΙΦΟΡΩΝ**
*Πρόεδρος:* Χ. Τσόπελας
*Γραμματείς:* Μ. Δημητρακά, Δ. Πέτσας

**ΒΙΟΛΟΓΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Π. Σακκάς
*Γραμματείς:* Α. Μπότσης, Κ. Ψάρρος

**ΔΙΑΠΟΛΙΤΙΣΜΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Σ. Καπρίνης
*Γραμματείς:* Σ. Μπουφίδης, Ε. Παρλαπάνη

**ΔΙΑΤΑΡΑΧΕΣ ΠΡΟΣΛΗΨΗΣ ΤΡΟΦΗΣ**
*Πρόεδρος:* Ε. Βάρσου
*Γραμματείς:* Γ. Μιχόπουλος, Φ. Γονιδάκης

**ΔΙΠΛΗ ΔΙΑΓΝΩΣΗ**
*Πρόεδρος:* Γ. Τζεφεράκος
*Γραμματείς:* Αθ. Αποστολόπουλος, Κ. Κοκκώλης

**ΕΓΚΑΙΡΗ ΠΑΡΕΜΒΑΣΗ ΣΤΗΝ ΨΥΧΩΣΗ**
*Πρόεδρος:* Ν. Στεφανής
*Γραμματείς:* Β.Π. Μποζίκας, Κ. Κόλλιας

**ΙΔΙΩΤΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Λ. Μαρκάκη
*Γραμματείς:* Φ. Μωρόγιαννης, Π. Γκίκας

**ΙΣΤΟΡΙΑΣ ΤΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Δ. Πλουμπίδης
*Γραμματείς:* Αθ. Καράβατος, Ι. Πολυχρονίδης

**ΚΛΙΝΙΚΗΣ ΨΥΧΟΦΑΡΜΑΚΟΛΟΓΙΑΣ**
*Πρόεδρος:* Β. Αλεβίζος
*Γραμματείς:* Χ. Τουλούμης, Ειρ. Σιούτη

**ΚΟΙΝΩΝΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Α. Μιχοπούλου
*Γραμματείς:* Γ. Γαρυφαλλος, Μ. Οικονόμου

**ΜΕΛΕΤΗΣ ΤΗΣ ΕΠΑΓΓΕΛΜΑΤΙΚΗΣ ΠΡΟΑΣΠΙΣΗΣ ΤΟΥ ΨΥΧΙΑΤΡΟΥ**
*Πρόεδρος:* Γ. Αλεβιζόπουλος
*Γραμματείς:* Μ. Σκόνδρας, Γ. Καραμπουτάκης

**ΝΕΥΡΟΑΝΑΠΤΥΞΙΑΚΕΣ ΔΙΑΤΑΡΑΧΕΣ ΔΙΑ ΒΙΟΥ**
*Πρόεδρος:* Α. Πεχλιβανίδης
*Γραμματείς* Δ. Παππά, Ε. Καλαντζή

**ΟΥΣΙΟΕΞΑΡΤΗΣΕΩΝ**
*Πρόεδρος:* Ι. Διακογιάννης
*Γραμματείς:* Θ. Παπαρρηγόπουλος, Ελ. Μέλλος

**ΠΑΙΔΟΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Δ. Αναστασόπουλος
*Γραμματείς:* Δ. Αναγνωστόπουλος, Κ. Κανελλέα

**ΠΛΗΡΟΦΟΡΙΚΗ & ΚΑΙΝΟΤΟΜΕΣ ΤΕΧΝΟΛΟΓΙΕΣ ΣΤΗΝ ΨΥΧΙΑΤΡΙΚΗ**
*Πρόεδρος: Ν. Γκούβας*
*Γραμματείς: Α. Δουζένης, Π. Φωτιάδης*

**ΠΡΟΛΗΠΤΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Β. Κονταξάκης
*Γραμματείς:* Δ. Κόντης, Η. Τζαβέλλας

**ΣΕΞΟΥΑΛΙΚΟΤΗΤΑΣ ΚΑΙ ΔΙΑΠΡΟΣΩΠΙΚΩΝ ΣΧΕΣΕΩΝ**
*Πρόεδρος:* Λ. Αθανασιάδης
*Γραμματείς:* Κ. Παπασταμάτης, Η. Μουρίκης

**ΣΤΡΑΤΙΩΤΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Π. Φωτιάδης
*Γραμματείς:* Ι. Νηματούδης, Δ. Μοσχονάς

**ΣΥΜΒΟΥΛΕΥΤΙΚΗΣ - ΔΙΑΣΥΝΔΕΤΙΚΗΣ ΨΥΧΙΑΤΡΙΚΗΣ & ΨΥΧΟΣΩΜΑΤΙΚΗΣ**
*Πρόεδρος:* Θ. Υφαντής
*Γραμματείς:* Α. Καρκανιάς, Μ. Διαλλινά

**ΤΕΧΝΗΣ & ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Σ. Κρασανάκης
*Γραμματείς:* Η. Βλάχος, Χ. Γιαννουλάκη

**ΤΗΛΕΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Κ. Κατσαδώρος
*Γραμματείς:* Ι. Χατζιδάκης, Ι. Αποστολόπουλος

**ΦΙΛΟΣΟΦΙΑΣ & ΨΥΧΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Ι. Ηλιόπουλος
*Γραμματείς:* Γ. Νικολαΐδης, Α. Κομπορόζος

**ΨΥΧΙΑΤΡΙΚΗΣ ΗΘΙΚΗΣ & ΔΕΟΝΤΟΛΟΠΑΣ**
*Πρόεδρος:* Γ. Χριστοδούλου
*Γραμματείς:* Ι. Γκιουζέπας, Α. Δουζένης

**ΨΥΧΙΑΤΡΙΚΗΣ & ΘΡΗΣΚΕΙΑΣ**
*Πρόεδρος:* Στ. Κούλης
*Γραμματείς:* Κ. Εμμανουηλίδης, Λ. Μαρκάκη

**ΨΥΧΙΚΗΣ ΥΓΕΙΑΣ ΓΥΝΑΙΚΩΝ & ΨΥΧΙΑΤΡΙΚΗΣ ΤΗΣ ΑΝΑΠΑΡΑΓΩΓΗΣ**
*Πρόεδρος:* Ι. Ζέρβας
*Γραμματείς:* Ε. Λαζαράτου, Α. Λεονάρδου

**ΨΥΧΙΑΤΡΟΔΙΚΑΣΤΙΚΗΣ**
*Πρόεδρος:* Γ. Τζεφεράκος
*Γραμματείς:* Δ. Τσακλακίδου, Ι. Γιαννοπούλου

**ΨΥΧΟΘΕΡΑΠΕΙΑΣ**
*Πρόεδρος:* Α. Πεχλιβανίδης
*Γραμματείς:* Σ. Τουρνής, Ρ. Γουρνέλλης

**ΨΥΧΟΓΗΡΙΑΤΡΙΚΗΣ**
*Πρόεδρος:* Ν. Δέγλερης
*Γραμματείς:* Α. Κώνστα, Θ. Βορβολάκος

**ΨΥΧΟΜΕΤΡΙΚΩΝ & ΝΕΥΡΟΨΥΧΟΛΟΓΙΚΩΝ ΜΕΤΡΗΣΕΩΝ**
*Πρόεδρος:* Β.Π. Μποζίκας
*Γραμματείς:* Ι. Νηματούδης, Κ. Κόλλιας

**ΨΥΧΟΟΓΚΟΛΟΓΙΑΣ**
*Πρόεδρος:* Αθ. Καρκανιάς
*Γραμματείς:* Κ. Παπλός, Μ. Συγγελάκης

**ΨΥΧΟΠΑΘΟΛΟΓΙΑΣ**
*Πρόεδρος:* Ν. Τζαβάρας
*Γραμματείς:* [1]Γ. Καπρίνης, Μ. Διαλλινά

**ΨΥΧΟΦΥΣΙΟΛΟΓΙΑΣ**
*Πρόεδρος:* Ι. Λιάππας
*Γραμματείς:* Ι. Νηματούδης, Χ. Παπαγεωργίου

## SECTIONS

**SELF-DESTRUCTIVE BEHAVIORS**
*Chairman*: K. Paplos
*Secretaries*: Th. Papaslanis, D. Karaiskos

**VIOLENT BEHAVIORS**
*Chairman*: Ch. Tsopelas
*Secretaries*: M. Dimitraka, D. Petsas

**BIOLOGICAL PSYCHIATRY**
*Chairman*: P. Sakkas
*Secretaries*: A. Botsis, C. Psarros

**CROSS-CULTURAL PSYCHIATRY**
*Chairman*: S. Kaprinis
*Secretaries*: S. Boufidis, H. Parlapani

**EATING DISORDERS**
*Chairman*: E. Varsou
*Secretaries*: J. Michopoulos, F. Gonidakis

**DUAL DIAGNOSIS**
*Chairman*: G. Tzeferakos
*Secretaries*: Ath. Apostolopoulos, K. Kokkolis

**EARLY INTERVENTION IN PSYCHOSIS**
*Chairman*: N. Stefanis
*Secretaries*: V.P. Bozikas, K. Kollias

**PRIVATE PRACTICE PSYCHIATRY**
*Chairman*: L. Markaki
*Secretaries*: F. Morogiannis, P. Gkikas

**HISTORY OF PSYCHIATRY**
*Chairman*: D. Ploumpidis
*Secretaries*: Ath. Karavatos, J. Polyhronidis

**PSYCHOPHARMACOLOGY**
*Chairman*: V. Alevizos
*Secretaries*: C. Touloumis, I. Siouti

**SOCIAL PSYCHIATRY**
*Chairman*: A. Michopoulou
*Secretaries*: G. Garyfallos, M. Economou

**ADVOCACY OF PSYCHIATRIC PRACTICE**
*Chairman: G. Alevizopoulos*
*Secretaries: M. Skondras, G. Karampoutakis*

**NEURODEVELOPMENTAL DISORDERS ACROSS THE LIFESPAN**
*Chairman*: A. Pechlivanidis
*Secretaries*: D. Pappa, E. Kalantzi

**SUBSTANCE ABUSE**
*Chairman*: J. Diakoyiannis
*Secretaries*: Th. Paparrigopoulos, El. Mellos

**CHILD PSYCHIATRY**
*Chairman*: D. Anastasopoulos
*Secretaries*: D. Anagnostopoulos, K. Kanellea

**INFORMATICS & INNOVATIVE TECHNOLOGIES IN PSYCHIATRY**
*Chairman*: N. Gouvas
*Secretaries*: A. Douzenis, P. Fotiadis

**PREVENTIVE PSYCHIATRY**
*Chairman*: V. Kontaxakis
*Secretaries*: D. Kontis, E. Tzavellas

**SEXUALITY AND INTERPERSONAL RELATIONSHIPS**
*Chairman*: L. Athanasiadis
*Secretaries*: K. Papastamatis, H. Mourikis

**MILITARY PSYCHIATRY**
*Chairman*: P. Fotiadis
*Secretaries*: J. Nimatoudis, D. Moschonas

**CONSULTATION-LIAISON PSYCHIATRY & PSYCHOSOMATICS**
*Chairman*: T. Hyphantis
*Secretaries*: A. Karkanias, M. Diallina

**ART & PSYCHIATRY**
*Chairman*: S. Krasanakis
*Secretaries*: E. Vlachos, C. Giannoulaki

**TELEPSYCHIATRY**
*Chairman*: K. Katsadoros
*Secretaries*: J. Chatzidakis, J. Apostolopoulos

**PHILOSOPHY & PSYCHIATRY**
*Chairman*: J. Iliopoulos
*Secretaries*: G. Nikolaidis, A. Komborozos

**PSYCHIATRY & ETHICS**
*Chairman*: G. Christodoulou
*Secretaries*: J. Giouzepas, A. Douzenis

**PSYCHIATRY & RELIGION**
*Chairman*: S. Koulis
*Secretaries*: K. Emmanouilidis, L. Markaki

**WOMEN'S MENTAL HEALTH & REPRODUCTIVE PSYCHIATRY**
*Chairman*: J. Zervas
*Secretaries*: H. Lazaratou, A. Leonardou

**FORENSIC PSYCHIATRY**
*Chairman*: G. Tzeferakos
*Secretaries*: D. Tsaklakidou, J. Giannopoulou

**PSYCHOTHERAPY**
*Chairman*: A. Pechlivanidis
*Secretaries*: S. Tournis, R. Gournellis

**PSYCHOGERIATRICS**
*Chairman*: N. Degleris
*Secretaries*: A. Konsta, Th. Vorvolakos

**PSYCHOMETRIC & NEUROPSYCHOLOGICAL MEASUREMENTS**
*Chairman*: V.P. Bozikas
*Secretaries*: J. Nimatoudis, K. Kollias

**PSYCHO-ONCOLOGY**
*Chairman*: A. Karkanias
*Secretaries*: K. Paplos, M. Syngelakis

**PSYCHOPATHOLOGY**
*Chairman*: N. Tzavaras
*Secretaries*: [1]G. Kaprinis, M. Diallina

**PSYCHOPHYSIOLOGY**
*Chairman*: J. Liappas
*Secretaries*: J. Nimatoudis, C. Papageorgiou

# PSYCHIATRIKI

**Quarterly journal published by the Hellenic Psychiatric Association**


## CONTENTS

ΨΥΧΙΑΤΡΙΚΗ

Τριμηνιαία έκδοση της Ελληνικής Ψυχιατρικής Εταιρείας

## ΠΕΡΙΕΧΟΜΕΝΑ

https://doi.org/10.22365/jpsych.2021.010 / Psychiatriki 2021, 32:15–18

Editorial

# The need for holistic, longitudinal and comparable, real-time assessment of the emotional, behavioral and societal impact of the COVID-19 pandemic across nations

**ARTICLE HISTORY:** Received 5 March 2021/Revised 7 March 2021/Published Online 17 March 2021

As of the end of 2020, the COVID-19 pandemic has led to over 82 million verified infections and almost 1.8 million COVID-19-related deaths worldwide,[1] resulting to an unprecedented public health response around the globe. The COVID-19 pandemic, together with the applied multi-level restrictive measures, has generated a unique combination of an unpredictable and stressful biomedical and socioeconomic environment (i.e., syndemic),[2] introducing real-life threat, involuntary and drastic every-day lifestyle changes with uncertain financial and future prospects, alongside with minimized coping and stress management possibilities.[3] This combination of so many different and vital stressors may lead to acute as well as long-term, direct, indirect and even transgenerational unfavourable effects on physical and mental health and functioning, which might even represent the most precarious and still unpredictable public-health-related part of the pandemic.[4] Thereby, specific population groups could be at particular risk of poor health outcomes in relation to applied public health measures.[4,5]

However, not every individual will experience the same level of negative impact on health and well-being during the pandemic, as several additional national, socioeconomic, environmental, behavioural, emotional and cognitive factors can moderate individual resilience and coping.[6] Pandemic-related research should, thus, assess as many multidimensional risk and protective factors as possible in a longitudinal, large-scale and multi-national manner, enabling a profound and comprehensive understanding of the complex health and societal impact of the pandemic worldwide.[7]

Nevertheless, to date, most research findings are cross-sectional, report on small and non-representative samples from individual countries, or on specific population groups (e.g., health care workers, students, clinical populations) and usually assess only a very restricted set of outcomes and time-points. Thereby, only few studies assess coping strategies, medical history or detailed socioeconomic, demographic and environmental data. In addition, most studies leave behind linguistic differences, being available in one or at best two different languages. Such investigations of small outcome subsets within a narrow framework preclude a broader and clear understanding of the multifaceted pandemic impact on the general population and specific subgroups. Acknowledging these gaps in the existing literature, large-scale, collaborative research prospectively collecting and monitoring a broad range of real-time, multi-dimensional health-related, societal and behavioural outcome data from countries across the globe is currently explicitly needed.

The Collaborative Outcomes study on Health and Functioning during Infection Times (COH-FIT) envisions to fill this gap. Based on an easy-to-access webpage (www.coh-fit.com), COH-FIT is the currently largest-scale known international collaborative study of over 200 researchers around the globe, prospectively collecting the biggest set of multi-dimensional and multi-disciplinary data from 150 high, middle, and low-income countries in over 30 languages and in three different age groups (adults, adolescents, children) of the general population, focusing also on relevant at-risk subgroups. Albeit being a cross-sectional anonymous survey on an individual level, it is a longitudinal study on a population level, as data are collected continuously since April 2020 and until the WHO declares the end of the pandemic. In addition to snowball recruitment, this project also collects information from nationally representative samples. Furthermore, COH-FIT is the first study of this scale investigating pandemic effects on health and functioning measures between family members, while it also specifically assesses a large list of behavioral and coping factors (e.g., screen time, social media usage, physical activity, social interaction, religious practices, etc.) on outcomes of interest. COH-FIT also monitors changes in public health restrictive measures to enhance data harmonization across nations and time, and to better investigate their impact on physical and mental health, while it also collects information on changes in healthcare systems functioning. The COH-FIT project was worldwide first initiated in Greece after the ethics committee approval of the School of Medicine of the Aristotle University of Thessaloniki and is officially supported by the Hellenic Psychiatric Association, European Psychiatric Association, World Association of Social Psychiatry, ECNP Network on the Prevention of Mental Disorders and Mental Health Promotion, among many other national and international scientific associations. To date, COH-FIT has already collected

>127,000 participations worldwide (>8,900 in Greece), but more participants are still needed, both during the second and third wave of the pandemic, as in the future, after the pandemic has ended.

Currently, the COH-FIT survey actively collects the largest sample on multifactorial data on the impact of the COVD-19 pandemic on health and functioning not only in Greece, but around the globe. The elaborated design of COH-FIT and similar studies may allow a better identification of key parameters and population groups at increased risk during the pandemic, as well as potential targets for acute and long-term prevention or intervention strategies in the current as in possible future pandemics. A profound understanding of the health and societal impact of the pandemic could facilitate an optimized governmental, social and individual health preparedness during infection times[8] and the bridging of individuals', societal and systemic needs and actions through multi-level guideline development with the aim to improve mental health outcomes globally.

**Agorastos Agorastos**
*Assistant Professor of Psychiatry*
*2nd Department of Psychiatry, School of Medicine, Aristotle Univers*ity of Thessaloniki, Greece

**Konstantinos Tsamakis**
*Research Associate*
*Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK*

**Marco Solmi**
*Assistant Professor of Psychiatry*
*Department of Neuroscience, University of Padua, Italy*

**Christoph U. Correll**
*Professor of Child and Adolescent Psychiatry*
*Department of Child & Adolescent Psychiatry, Psychotherapy and Psychosomatics,*
*Charité University Medical Center Berlin, Germany*
*Professor of Psychiatry and Molecular Medicine*
*Donald and Barbara Zucker School of Medicine at Hofstra/Northwell Hempstead, NY, USA*

**Vasilis P. Bozikas**
*Professor of Psychiatry*
*2nd Department of Psychiatry, School of Medicine, Aristotle University of Thessaloniki, Greece*

## References

1. COVID-19 Dashboard Center for Systems Science and Engineering, Johns Hopkins University. Available from: https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6. Accessed 31.12.2020
2. Horton R. Offline: COVID-19 is not a pandemic. *Lancet* 2020, 396:874, doi: 10.1016/S0140-6736(20)32000-6
3. Taylor S, Landry CA, Paluszek MM, Fergus TA, McKay D, Asmundson GJG. COVID stress syndrome: Concept, structure, and correlates. *Depress Anxiety* 2020, 37:706-714, doi: 10.1002/da.23071
4. Luo Y, Chua CR, Xiong Z, Ho RC, Ho CSH. A Systematic Review of the Impact of Viral Respiratory Epidemics on Mental Health: An Implication on the Coronavirus Disease 2019 Pandemic. *Front Psychiatry* 2020, 11:565098, doi: 10.3389/fpsyt.2020.565098
5. Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A, Arango C, Moreno C, Ferre F et al. Impact of coronavirus syndromes on physical and mental health of health care workers: Systematic review and meta-analysis. *J Affect Disord* 2020, 275:48–57, doi: 10.1016/j.jad.2020.06.022
6. Kuntz JC. Resilience in times of global pandemic: Steering recovery and thriving trajectories. *Appl Psychol* 2020, Online ahead of print, doi: 10.1111/apps.12296
7. Tsamakis K, Dimitrakakis G, Stefanadi E, Tsiptsios DA, Dimitrakaki I, Mueller C et al (Comment) The challenges of planetary mental health in the COVID-19 era. *Exp Ther Med* 2020, 20:1843–1844, doi: 10.3892/etm.2020.8927
8. Ahmad A, Mueller C, Tsamakis K. Covid-19 pandemic: a public and global mental health opportunity for social transformation? *BMJ* 2020, 369:1383, doi: 10.1136/bmj.m1383

Άρθρο σύνταξης

# Η ανάγκη για ολιστική, μακροχρόνια και συγκρίσιμη, σε πραγματικό χρόνο, αξιολόγηση της συναισθηματικής, συμπεριφορικής και κοινωνικής επίδρασης της πανδημίας COVID-19 διεθνώς

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 5 Μαρτίου 2021/Αναθεωρήθηκε 7 Μαρτίου 2021/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

Μέχρι τα τέλη του 2020, η πανδημία COVID-19 προκάλεσε πάνω από 82 εκατομμύρια επιβεβαιωμένες μολύνσεις και περίπου 1,8 εκατομμύρια θανάτους σχετιζόμενους με COVID-19 παγκοσμίως,[1] οδηγώντας σε μία μια άνευ προηγουμένου απάντηση πρόκληση για τα συστήματα και τις δομές δημόσιας υγείας. Η πανδημία COVID-19, σε συνδυασμό με τα εφαρμοζόμενα πολυεπίπεδα μέτρα περιορισμού, έχει δημιουργήσει έναν μοναδικό συνδυασμό απρόβλεπτων και στρεσογόνων βιολογικών και κοινωνικο-οικονομικών περιβαλλοντικών παραγόντων (δηλ. συνδημία),[2] οι οποίοι συνιστούν μία πραγματική υπαρξιακή απειλή με αβέβαιες οικονομικές και μελλοντικές προοπτικές για όλους τους ανθρώπους και εισάγουν δραστικές και ακούσιες αλλαγές στην καθημερινότητα σε συνδυασμό με ελαχιστοποιημένες δυνατότητες αντιμετώπισης και διαχείρισης του στρες.[3] Αυτός ο συνδυασμός τόσων διαφορετικών και ζωτικής σημασίας στρεσογόνων παραγόντων μπορεί να οδηγήσει σε οξείες, αλλά και μακροπρόθεσμες, άμεσες και έμμεσες, ακόμη και διαγενεακές δυσμενείς επιπτώσεις, στη σωματική και ψυχική υγεία και λειτουργικότητα. Οι επιπτώσεις αυτές πιθανώς αντιπροσωπεύουν την πιο μακροχρόνια και απρόβλεπτη συνιστώσα της πανδημίας που, η οποία θα κορυφωθεί αργότερα.[4] Επίσης, ειδικές πληθυσμιακές ομάδες ενδέχεται να διατρέχουν ιδιαίτερο κίνδυνο δυσμενών επιδράσεων στην υγεία.[4,5]

Ωστόσο, δεν θα βιώσουν όλα τα άτομα το ίδιο επίπεδο αρνητικού αντίκτυπου στην υγεία και λειτουργικότητα κατά τη διάρκεια της πανδημίας, καθώς πολλοί πρόσθετοι ατομικοί, συστημικοί, κοινωνικο-οικονομικοί, περιβαλλοντικοί, συμπεριφορικοί, συναισθηματικοί και γνωστικοί παράγοντες μπορούν να τροποποιήσουν την ατομική πρόσληψη του στρες, την ανθεκτικότητα και ικανότητα αντιμετώπισης δυσμενών καταστάσεων.[6] Συνεπώς, η έρευνα που σχετίζεται με την πανδημία θα πρέπει να αξιολογεί, όσο το δυνατόν περισσότερους πολυδιάστατους παράγοντες κινδύνου αλλά και προστατευτικούς παράγοντες, με έναν προοπτικό, μεγάλης κλίμακας και πολυεθνικό τρόπο, που θα επιτρέψει τη βαθύτερη, ολοκληρωμένη και συγκρίσιμη κατανόηση των πολύπλοκων επιπτώσεων της πανδημίας στην υγεία και την κοινωνία παγκοσμίως.[7]

Εντούτοις, μέχρι σήμερα, τα περισσότερα ερευνητικά ευρήματα βασίζονται σε μελέτες διατομής, αναφέρονται σε μικρά και μη αντιπροσωπευτικά δείγματα από μεμονωμένες χώρες ή αφορούν συγκεκριμένες πληθυσμιακές ομάδες (π.χ. εργαζόμενοι στον τομέα της υγείας, φοιτητές, κλινικοί πληθυσμοί) και συνήθως αξιολογούν μόνο έναν πολύ περιορισμένο αριθμό παραγόντων και χρονικών σημείων. Ελάχιστες μόνο μελέτες αξιολογούν συνδυαστικά στρατηγικές αντιμετώπισης, το ιατρικό ιστορικό ή λεπτομερή κοινωνικο-οικονομικά, δημογραφικά και περιβαλλοντικά δεδομένα. Επιπλέον, οι περισσότερες μελέτες αγνοούν τις ιδιαίτερες γλωσσικές ανάγκες πολυεθνικών πληθυσμών, όντας διαθέσιμες σε μία ή στην καλύτερη περίπτωση σε δύο διαφορετικές γλώσσες. Τέτοιου είδους έρευνες με μικρό αριθμό ερευνόμενων παραγόντων, εντός ενός στενού πλαισίου, αποκλείουν μια ευρύτερη και σαφή κατανόηση των πολύπλευρων επιπτώσεων πανδημίας στον γενικό πληθυσμό και σε συγκεκριμένες υποομάδες. Αναγνωρίζοντας τα κενά στην υπάρχουσα βιβλιογραφία, μία μεγάλης κλίμακας, συνεργατική έρευνα που συλλέγει και παρακολουθεί μακροπρόθεσμα, σε πραγματικό χρόνο, ένα ευρύ φάσμα πολυδιάστατων δεδομένων για την υγεία, την κοινωνία και τη συμπεριφορά από χώρες σε όλο τον κόσμο, είναι επί του παρόντος αναμφισβήτητα αναγκαία.

Παγκόσμια Μελέτη για την Υγεία και τη Λειτουργικότητα σε περιόδους Μεταδοτικών Λοιμώξεων (COH-FIT) φιλοδοξεί να καλύψει αυτό το κενό. Με βάση μια εύκολα προσβάσιμη ιστοσελίδα (www.coh-fit.com), η COH-FIT αποτελεί την επί του παρόντος μεγαλύτερης κλίμακας διεθνή συνεργατική μελέτη. Σε αυτήν συνεργάζονται πάνω από 200 ερευνητές σε όλο τον κόσμο, συλλέγοντας προοπτικά το μεγαλύτερο σύνολο πολυδιάστατων και διεπιστημονικών δεδομένων από >150 χώρες υψηλού, μεσαίου και χαμηλού εισοδήματος, σε περισσότερες από 30 γλώσσες και σε τρεις διαφορετικές ηλικιακές ομάδες (ενήλικοι, έφηβοι, παιδιά) του γενικού πληθυσμού, εστιάζοντας, επίσης, σε σχετικές υποομάδες κινδύνου. Αν και πρόκειται για μια ανώνυμη έρευνα διατομής σε ατομικό επίπεδο, είναι μια μακροχρόνια μελέτη σε επίπεδο πληθυσμού, καθώς τα δεδομένα συλλέγονται συνεχώς από τον Απρίλιο του 2020 και έως ότου ο ΠΟΥ κηρύξει το τέλος της πανδημίας. Εκτός από τη δειγματοληψία χιονοστιβάδας,

συλλέγονται επίσης στοιχεία από εθνικά αντιπροσωπευτικά δείγματα. Επιπλέον, η COH-FIT είναι η πρώτη μελέτη αυτής της κλίμακας που ερευνά τις επιπτώσεις της πανδημίας στην υγεία και τη λειτουργικότητα μεταξύ των μελών της οικογένειας. Αξιολογεί ενδελεχώς, επίσης, μία πλειάδα παραγόντων συμπεριφοράς και διαχείρισης (π.χ. χρόνος μπροστά στην οθόνη, χρήση μέσων κοινωνικής δικτύωσης, σωματική δραστηριότητα, κοινωνική αλληλεπίδραση, θρησκευτικές πρακτικές κ.λπ.) και την επίδρασή τους στις υπό διερεύνηση εκβάσεις. Η COH-FIT παρακολουθεί τις αλλαγές στα περιοριστικά μέτρα για τη δημόσια υγεία, προκειμένου να εναρμονίσει τα δεδομένα μεταξύ χωρών, και να διερευνήσει καλύτερα τον αντίκτυπό τους στη σωματική και ψυχική υγεία. Επιπρόσθετα, συλλέγει πληροφορίες σχετικά με τις αλλαγές στη λειτουργία των συστημάτων υγειονομικής περίθαλψης στις διάφορες χώρες. Η μελέτη COH-FIT ξεκίνησε για πρώτη φορά παγκοσμίως στην Ελλάδα, μετά την έγκριση της επιτροπής δεοντολογίας του Τμήματος Ιατρικής του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης και υποστηρίζεται επίσημα από την Ελληνική Ψυχιατρική Εταιρεία, την Ευρωπαϊκή Ψυχιατρική Εταιρεία, την Παγκόσμια Εταιρεία Κοινωνικής Ψυχιατρικής, το Δίκτυο για την Πρόληψη Ψυχικών Διαταραχών και την Προαγωγή Ψυχικής Υγείας του Ευρωπαϊκού Κολεγίου Νευροψυχοφαρμακολογίας, μεταξύ πολλών άλλων εθνικών και διεθνών επιστημονικών συλλόγων. Μέχρι σήμερα, η COH-FIT έχει ήδη συγκεντρώσει >127.000 συμμετέχοντες σε όλο τον κόσμο (>8.900 στην Ελλάδα), αλλά χρειάζονται ακόμη περισσότεροι, τόσο κατά τη διάρκεια του δεύτερου όσο και του τρίτου κύματος της πανδημίας, όπως και στο μέλλον, μετά το τέλος της πανδημίας.

Επί του παρόντος, η έρευνα COH-FIT συλλέγει ενεργά το μεγαλύτερο δείγμα πολυπαραγοντικών δεδομένων σχετικά με τις επιπτώσεις της πανδημίας COVD-19 στην υγεία και τη λειτουργικότητα όχι μόνο στην Ελλάδα, αλλά σε όλο τον κόσμο. Ο διεξοδικός σχεδιασμός της COH-FIT και παρόμοιων μελετών, μπορεί να διευκολύνει την αναγνώριση βασικών παραμέτρων και πληθυσμιακών ομάδων υψηλού κινδύνου κατά τη διάρκεια της πανδημίας, καθώς και πιθανούς στόχους για άμεσες και μακροπρόθεσμες στρατηγικές πρόληψης ή παρέμβασης, τόσο στην τρέχουσα όσο και σε πιθανές μελλοντικές πανδημίες. Μια βαθύτερη κατανόηση των επιπτώσεων της πανδημίας στην υγεία και την κοινωνία θα μπορούσε να συμβάλει στη βελτιστοποίηση της κυβερνητικής, κοινωνικής και ατομικής υγειονομικής ετοιμότητας, κατά τη διάρκεια περιόδων μεταδοτικών λοιμώξεων,[8] καθώς και τη γεφύρωση των ατομικών, των κοινωνικών και συστημικών αναγκών και δράσεων, μέσω της ανάπτυξης πολυεπίπεδων κατευθυντήριων οδηγιών που θα στοχεύουν στη βελτίωση των παραμέτρων της ψυχικής και συνολικής υγείας σε παγκόσμιο επίπεδο.

**Αγοραστός Αγοραστός**
*Επίκουρος Καθηγητής Ψυχιατρικής*
*Β' Ψυχιατρική Κλινική, Τμήμα Ιατρικής, Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης, Θεσσαλονίκη*

**Κωνσταντίνος Τσαμάκης**
*Research Associate*
*Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK.*

**Marco Solmi**
*Assistant Professor of Psychiatry*
*Department of Neuroscience, University of Padua, Italy*

**Christoph U. Correll**
*Professor of Child and Adolescent Psychiatry*
*Department of Child & Adolescent Psychiatry, Psychotherapy and Psychosomatics,*
*Charité University Medical Center Berlin, Germany*
*Professor of Psychiatry and Molecular Medicine*
*Donald and Barbara Zucker School of Medicine at Hofstra/Northwell Hempstead, NY, USA*

**Βασίλειος-Παντελεήμων Μποζίκας**
*Καθηγητής Ψυχιατρικής*
*Β' Ψυχιατρική Κλινική, Τμήμα Ιατρικής, Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης, Θεσσαλονίκη*

## References

1. COVID-19 Dashboard Center for Systems Science and Engineering, Johns Hopkins University. Available from: https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6. Accessed 31.12.2020
2. Horton R. Offline: COVID-19 is not a pandemic. *Lancet* 2020, 396:874, doi: 10.1016/S0140-6736(20)32000-6
3. Taylor S, Landry CA, Paluszek MM, Fergus TA, McKay D, Asmundson GJG. COVID stress syndrome: Concept, structure, and correlates. *Depress Anxiety* 2020, 37:706-714, doi: 10.1002/da.23071
4. Luo Y, Chua CR, Xiong Z, Ho RC, Ho CSH. A Systematic Review of the Impact of Viral Respiratory Epidemics on Mental Health: An Implication on the Coronavirus Disease 2019 Pandemic. *Front Psychiatry* 2020, 11:565098, doi: 10.3389/fpsyt.2020.565098
5. Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A, Arango C, Moreno C, Ferre F et al. Impact of coronavirus syndromes on physical and mental health of health care workers: Systematic review and meta-analysis. *J Affect Disord* 2020, 275:48–57, doi: 10.1016/j.jad.2020.06.022
6. Kuntz JC. Resilience in times of global pandemic: Steering recovery and thriving trajectories. *Appl Psychol* 2020, Online ahead of print, doi: 10.1111/apps.12296
7. Tsamakis K, Dimitrakakis G, Stefanadi E, Tsiptsios DA, Dimitrakaki I, Mueller C et al (Comment) The challenges of planetary mental health in the COVID-19 era. *Exp Ther Med* 2020, 20:1843–1844, doi: 10.3892/etm.2020.8927
8. Ahmad A, Mueller C, Tsamakis K. Covid-19 pandemic: a public and global mental health opportunity for social transformation? *BMJ* 2020, 369:1383, doi: 10.1136/bmj.m1383

https://doi.org/10.22365/jpsych.2021.001 / Psychiatriki 2021, 32:19–25

Research article

# Secondary traumatic stress and vicarious posttraumatic growth in healthcare workers during the first COVID-19 lockdown in Greece: The role of resilience and coping strategies

Argyroula Kalaitzaki, Michael Rovithis

*Laboratory of Interdisciplinary Approaches to the Enhancement of Quality of Life, Social Work Department, Hellenic Mediterranean University, Heraklion, Crete, Greece*

**ARTICLE HISTORY:** Received 2 October 2020/Revised 20 December 2020/Published Online 17 March 2021

**ABSTRACT**

Despite the indisputable negative psychosocial consequences of the COVID-19 pandemic, positive consequences are also possible. Resilience and coping strategies have been assumed to contribute to these outcomes. However, findings are still scarce and inconclusive. The study aimed to examine the role of resilience and coping strategies in the secondary stress for the Greek healthcare workers (HCWs) and in the posttraumatic growth following the COVID-19 lockdown in Greece. A sample of 673 HCWs coming from Greece were recruited. A convenience and snowball mixed sampling procedure were used. A questionnaire was distributed through social networking sites, webpages, and personal contacts of the author. Participants were asked to distribute it to their own contacts. Recruitment occurred during April 5–30, 2000, amid the lockdown (March 23–May 03), when people were asked to follow the stringent lockdown constraint enforced by the Greek government. Sociodemographic data were collected. The Secondary Traumatic Stress Scale measured secondary traumatic stress (STS) for the HCWs. The Post-Traumatic Growth Inventory, the Brief Resilience Scale, and the Coping Orientation to Problems Experienced Inventory measured posttraumatic growth, resilience, and coping strategies, respectively. Regression analyses demonstrated that resilience and coping strategies were differentially associated with positive and negative (stress/growth) lockdown outcomes. Resilience and mostly maladaptive coping strategies predicted STS. A mixture of adaptive and maladaptive coping strategies predicted PTG. The so-called "second wave" of the outbreak that started in August 2020 indicates that the study of the psychosocial impact of the COVID-19 pandemic and lockdown and of the internal resources (resilience and coping) to deal with, is necessary. The findings contribute to a more comprehensive understanding of the coping strategies used by population subgroups (e.g., HCWs) in dealing with the COVID-19 lockdown in Greece. Enhancing internal resources through supportive services will ameliorate HCWs ability to withstand, recover, and thrive with benefits in their psychological health and well-being.

**KEYWORDS:** Coronavirus, vicarious traumatization, vicarious posttraumatic growth, coping responses to stress, Greece.

## Introduction

COVID-19 unexpectedly and rapidly resulted in extremely high rates of infected people worldwide and therefore, soon after its first onset (December 2019) WHO declared COVID-19 a pandemic on March 11, 2020. Governments worldwide imposed measures to limit its spread ranging from social distance to severe lockdown. Greece early enough enforced severe social constraints to prevent the spread of the virus (e.g., cancellation of all cultural/artistic events and cessation of schools), which eventually resulted in lockdown and extreme social distancing ("Stay Home"

*Corresponding author:* Argyroula Kalaitzaki, Social Work Department, Health Sciences Faculty, Hellenic Mediterranean University, GR-714 10 Estavromenos, Heraklion, Crete, Greece • e-mail: akalaitzaki@hmu.gr

measure) on March 23, 2020, with gradual de-escalation on May 4, 2020.[1]

Facing a life-threatening disease may have both negative and positive effects. Vicarious Traumatization (or Secondary Traumatic Stress; STS) refers to the symptoms of intrusion, avoidance, and arousal resulted from one's [e.g., healthcare workers' (HCWs')], indirect exposure to traumatic events experienced by traumatized patients.[2] Similarly, the positive response or the psychological benefits that HCWs may have from the indirect exposure is called Vicarious Post Traumatic Growth (VPTG).[3,4] Being constantly exposed to the COVID-19 and its consequences, HCWs are a high-risk group.[4] Although studies have mostly emphasized the adverse mental and emotional outcomes of the COVID-19 pandemic among HCWs such as anxiety, depression, stress, post-traumatic stress, insomnia, psychological distress, and burnout (see recent meta-analysis),[5] there is a shortage of research to date on STS, which may profoundly affect wellbeing and quality of life.

Even less is known about VPTG. VPTG is an indication that a traumatic experience does not necessarily result solely in negative consequences, since there are people that cope well.[6] Mancini[7] has argued that the pandemic may have some social and mental health benefits for certain groups of people as acute stress may trigger positive responses. Although, a number of authors[8,9] have suggested the significance of studying PTG among HCWs, only scarce attempts can be found.[10,11] Thus, any positive outcomes of the COVID-19 pandemic remain to be studied.

Within the limited literature on the resources that may help individuals combat the detrimental consequences of the COVID-19 outbreak, coping strategies and psychological resilience are undoubtedly among the most studied ones.[12] Problem-focused coping strategies have been considered the most effective responses.[13,14] Seeking social support, avoidance, and positive appraisal of the situation have also been reported.[13] Higher resilience and use of humor have been associated with less anxiety, while mental disengagement with higher anxiety in Israelian nursing students.[15] It has also been found that resilience, adaptive coping strategies, and social support mediates the relationship between COVID-19 stressful experience and acute stress disorder in Chinese students.[12] However, findings are still scarce and inconclusive. Besides, to the author knowledge, none study as yet has examined the relationship of the coping strategies and resilience with VPTG during the COVID-19 outbreak.

The aim of this study was to examine the association of the personal resources, such as resilience and coping responses, with the positive and negative (VPTG and STS) mental health impact of the COVID-19 lockdown in HCWs in Greece. We hypothesized that resilience and adaptive coping strategies will increase the likelihood of a positive outcome (VPTG), whereas maladaptive coping strategies will be associated with a greater risk of a negative outcome (STS).

By the time of writing this paper and to authors' knowledge, the association of the coping strategies and resilience with the positive and negative psychological outcomes of the COVID-19 lockdown in the HCWs has not yet been reported by any other study in Greece. Hopefully, the study findings will contribute to the accumulating evidence on the use of personal resources to combat the current pandemic, failure of which –in the long run– may have a catastrophic impact on mental health, wellbeing, and quality of life. Since the pandemic's long-term impact may be unforeseen, safeguarding the HCWs who are at increased risk with constructive coping responses to deal with the crisis is of paramount importance.

## Material and Method

### Sample

After excluding two persons (not residing in Greece), the final sample included 673 HCWs, coming from all nine geographical regions of Greece. HCWs were all employed (100%) in the healthcare sector, mostly females (74.7%), well-educated (tertiary education 56.9%), and residing in Crete (47.9%). They were 43.4 years old (SD=9.8) and mostly with a partner (62.3%). They were recruited from the primary (e.g., community health centers, Help at Home) and secondary healthcare system (i.e., hospitals) and were physicians and nurses (77.1%) or social workers and psychologists (22.9%). A number of demographic variables correlated with the outcome variables (table 1). Given that this goes beyond the aims of this study, detailed correlations of the demographics with the outcome measures can be found elsewhere.[16]

### Procedure

The data were collected during April 5–30, 2000, amid the lockdown in Greece (March 23–May 03). A convenience and snowball mixed sampling procedure were used. The link of the google forms questionnaire was posted in social networking sites (e.g., Facebook, LinkedIn) and webpages, and participants were asked to distribute it to their contacts. The informed consent notified about the aim of the study and participants' rights. The study abides with the ethical principles of the Helsinki Declaration of 1964 and it was approved by the University Ethics Committee, in which the author is affiliated.

### Measures

Demographic data was collected, and a number of questions asked participants' experience with the traumatic event of COVID-19. HCWs were asked about their level of contact with infected and/or diagnosed patients at work (Yes. No, Likely, Don't know), and responses were coded as 'exposure' (Yes/Likely) or 'no exposure'.

The following measures were also administered: Outcome Measures. The 17-item Secondary Traumatic Stress Scale (STS)[2] was administered to measure secondary traumatic stress (Cronbach's α=0.914). Items are scored from 1 (Never) to 5 (Very Often). A cumulative score of 3 or greater is considered to be positive for at least a moderate level of STS. The 21-item Post-Traumatic Growth Inventory (PTGI)[6] assessed the degree of personal growth (Cronbach's α=0.956). Items are scored from 0 (I did not experience this change as a result of the COVID-19 lockdown) to 5 (I experienced this change to a very great degree as a result of the COVID-19 lockdown). Five subscale scores are produced: relating to others, new possibilities, personal strength, religion, and appreciation of life.

*Personal resources/Predictors*. The 6-item Brief Resilience Scale (BRS)[17] assessed one's ability to bounce back or recover from stress (Cronbach's α=0.794). Items are scored from 1 (strongly disagree) to 5 (strongly agree). Items 2, 4, and 6 were reverse scored. The higher scores indicate higher resilience. The 28-item Coping Orientation to Problems Experienced Inventory (Brief COPE)[18] assessed the frequency of emotion-focused (e.g., acceptance, emotional support, humor, positive reframing, and religion), problem-focused (e.g., active coping, instrumental support, and planning), and dysfunctional coping strategies (e.g., behavioral disengagement, denial, self-distraction, self-blame, substance use, and venting) (Cronbach's α=0.842). Items are scored from 1 (I have not been doing this at all) to 4 (I have been doing this a lot). For the scales that there was not a Greek version, a translation into Greek and back forth was completed, and results have been published.[16]

Instructions guided participants to respond to all items concerning their exposure to the COVID-19 traumatic event.

### Statistical analyses

Descriptive statistics presented the sample sociodemographics. Cronbach's alpha assessed the internal consistency of the scales. Nearly all the study and outcome variables were not normally distributed (K-S: STS=1.729, p=0.005; PTG= 1,085, p=0.190) and Mann-Whitney U was used to examined differences between genders and levels of exposure to COVID-19. Correlation analyses were performed between a number of demographic variables, predictors and outcome variables with Spearman's rho. All significant correlations were entered in the regression analysis (stepwise method). All analyses with p-value <0.05 were considered significant and were performed with IBM SPSS 21.0.

## Results

The majority of the HCWs reported that they have contact with infected patients (93.8%) and/or diagnosed patients with COVID-19 (76%) at work. A high percentage (79.3%) reported at least moderate STS. HCWs had relatively low VPTG (M=46.60, SD=24.61, score range: 0–105) but high resilience (M=21.65, SD=4.14, score range: 8–30). No differences were found neither for STS nor VPTG between levels of exposure (definitely being exposed or not exposed) to COVID-19 infected patients (STS: U=6131.5, p=0.258; VPTG: U=5777, p=0.099), and COVID diagnosed patients (STS: U=11224, p=0.632; VPTG: U=11260, p=0.666). Resilience correlated with STS, age with VPTG, education and nearly all coping strategies with both STS and VPTG (table 1). Women had significantly higher scores than the men in the STS and VPTG (U=32663, p<0.001 and U=32208, p<0.001, respectively).

**Table 1.** Spearman's rho correlation coefficients between the outcome variables, resilience, and coping strategies among the healthcare workers (N=673).

| | STS | VPTG |
|---|---|---|
| Age | –0.017 | –0.087* |
| Marital situation | 0.032 | –0.016 |
| Education | –0.120** | –0.137** |
| Self-distraction | 0.463** | 0.283** |
| Active coping | 0.190** | 0.298** |
| Denial | 0.550** | 0.207** |
| Substance use | 0.152** | –0.107** |
| Use emotional support | 0.184** | 0.249** |
| Use instrumental support | 0.164** | 0.308** |
| Behavioral disengagement | 0.352** | –0.006 |
| Venting | 0.418** | 0.227** |
| Positive reframing | 0.003 | 0.330** |
| Planning | 0.138** | 0.208** |
| Humor | 0.068 | 0.093* |
| Acceptance | –0.038 | 0.115** |
| Religion | 0.187** | 0.373** |
| Self-blame | 0.244** | 0.172** |
| Resilience | –0.287** | 0.038 |

Note: STS=Secondary Traumatic Stress; VPTG= Vicarious Post-Traumatic Growth, **p<0.01, *p<0.05

Only HCWs that had contact with infected patients were included in the subsequent analyses (HCWs=633). Regression analyses (table 2) showed that STS was associated with one adaptive and three maladaptive coping strategies, explaining 40.6% of the variance. VPTG was associated with resilience, three adaptive and three maladaptive coping strategies, explaining 27.2% of the variance.

## Discussion

The COVID-19 lockdown imposed a potentially more severe challenge than that of other mass crises, disasters, or infectious diseases that did not necessitate forced isolation. Despite the initial small numbers of confirmed cases and deaths in Greece, an upsurge occurred in August 2020. This reportedly "second wave" resulted in gradually imposing social distancing constraints. By the time of the last revision of this manuscript (January 11, 2020) the exponential rise of confirmed cases and deaths in Greece (shorturl.at/rELYZ) leaded to a second lockdown. Finding the resources to withstand, respond effectively, recover, and move forward is of paramount importance. Therefore, this study examined the association of resilience and coping strategies with the positive and negative psychological effects of the COVID-19 first lockdown in a sample of HCWs in Greece.

Adequate evidence has shown that adaptive coping strategies are associated with lower rates of anxiety and PTSD, and maladaptive ones with increased risk.[15,19] Avoidance (e.g., denial), a dysfunctional coping, has been associated with increased distress, especially during epidemics.[19,20] In line with these findings, it was shown that dysfunctional coping strategies contributed to a higher risk of STS. The more the HCWs give up trying to deal with (behavioral disengagement), refuse to believe what is happening (denial) and turn to other activities not to think about it (self-distraction), the more STS. It has been suggested that when an outbreak is perceived as a severe life-threatening situation, then maladaptive coping strategies may be employed.[12] Interestingly, a problem-focused strategy (i.e., planning) contributed to higher STS for HCWs. A possible explanation is that the COVID-19 outbreak was perceived as an uncontrollable disease, which caused feelings of inadequacy and helplessness. Given that no prevention or treatment means (e.g., vaccines) against COVID-19 had been developed during the first lockdown, being required to come up with a solution (e.g., planning) may go beyond the problem-solving abilities of the HCWs and cause them extremely high stress and frustration.[20]

In line with other studies that have shown that higher resilience was associated with lower anxiety levels[21] and positive outcomes,[3,22] it was found that higher resilience was associated with lower STS levels (although the association was not retained in the regression analysis) and contributed to more VPTG (although the association was not initially significant in the bivariate correlations). Although one could expect that an acute stressor/trauma experience initially would decrease resilience and recovery would follow the wake

**Table 2.** Regression analyses ('stepwise') for predicting STS and VPTG for the healthcare workers who had contact with infected patients (N=633), with coping strategies and resilience as predictors.

| Variables in the models | β | t | $R^2$ | Adjusted $R^2$ | $R^2$ Change |
|---|---|---|---|---|---|
| I. STS (dependent)[a] | | | | | |
| Denial | 0.412 | 11.454*** | 0.317 | 0.316 | 0.317 |
| Self-distraction | 0.227 | 6.521*** | 0.381 | 0.379 | 0.064 |
| Behavioral disengagement | 0.160 | 4.597*** | 0.400 | 0.397 | 0.019 |
| Planning | 0.103 | 3.162** | 0.410 | 0.406 | 0.010 |
| II. VPTG (dependent)[b] | | | | | |
| Religion | 0.225 | 6055*** | 0.132 | 0.131 | 0.132 |
| Positive reframing | 0.188 | 4.861*** | 0.204 | 0.201 | 0.072 |
| Self-distraction | 0.145 | 3.742*** | 0.236 | 0.232 | 0.032 |
| Use instrumental support | 0.161 | 4.195*** | 0.256 | 0.251 | 0.020 |
| Substance use | –0.116 | –3.264*** | 0.267 | 0.260 | 0.011 |
| Denial | 0.119 | 3.043** | 0.275 | 0.267 | 0.008 |
| Resilience | 0.083 | 2.199* | 0.280 | 0.272 | 0.006 |

Note: STS=Secondary Traumatic Stress; VPTG=Vicarious Post-Traumatic Growth; **p<0.01; *p<0.05; [a]F=103.961<0.001; [b]F=33.068, p<0.001

of adversity,[20] this seems not to be the case with the HCWs. Abruptly being required to undertake the caring of the patients and breathlessly struggling with the infectious disease may have resulted in enhancement of their internal resources (e.g., rapid increase of their resilience), which in turn, may have resulted in more VPTG. However, this assumption needs to be examined. Long-term assessments could have given a clearer idea of this process.

As expected, PTG was associated with a number of adaptive coping strategies. The more they pray and meditate for stress relief (turn to religion), reconsider the situation (positive reframing), rely on their social networks for instrumental support, the more likely is VPTG to emerge. Indeed, religion and social support have been considered adaptive coping strategies in dealing with major life events.[20,23]

Substance use has been considered a risk factor for the deterioration of the mental health among trauma-exposed individuals to the pandemic.[24] In line with these findings, substance use was expectedly associated with decreased VPTG. Another two maladaptive strategies (i.e., self-distraction and denial) that were associated with STS, also contributed to VPTG. Both distracting themselves to avoid thinking (self-distraction) and denying the situation (denial) seem to be beneficial. These findings are consistent with others, suggesting that avoidance and mainly emotional-focused strategies positively correlate with PTG.[3] It seems that the so-called maladaptive coping strategies contribute to STS (behavioral disengagement, self-distraction, and denial) and PTG (self-distraction and denial). They may induce stress relief and thus, be equally effective in reducing negative outcomes and/or inducing positive ones. This may be especially true in traumatic situations of extreme threat, uncertainty, uncontrollability, feelings of hopelessness, and helplessness. Based on this assumption, it might be reasonable to assume that there are individually, subjective, responses depending on various factors, such as previous trauma exposure, perceived risk, and threat. Future studies should examine which strategies are successful responses to stress, no matter of their theoretical allocation to adaptive or maladaptive. Inter-specialty differences (physicians/nurses vs. psychologists/social workers) also merit further research.

The limitations of this study should be acknowledged. The cross-sectional nature of this study does not allow one to say that these coping strategies were adaptive responses to lockdown or whether they were used before that. The convenience sampling and the underrepresentation of certain subgroups (e.g., men, older) does not permit the generalizability of the findings. The web-based self-administered questionnaire might have produced social desirability and selection bias (since primarily young and familiar with computers/cell phones were likely to respond). Not assessing symptoms of anxiety and depression, which have high comorbidity with PTSD,[25] was also a serious limitation.

Considering the ongoing COVID-19 outbreak, safeguarding population subgroups with the tools to deal with would be of outmost importance. Enhancing resilience and encouraging successful coping strategies could be important targets by the stakeholders in developing efficient and effective prevention and intervention programs to safeguard those at risk and promote their posttraumatic growth.

## References


1. Ploumpidis D. Living with covid-19. *Psychiatriki* 2020, 31:197, doi: 10.22365/jpsych.2020.313.197
2. Bride BE, Robinson MR, Yegidis B, Figley CR. Development and validation of the Secondary Traumatic Stress Scale. *Res Soc Work Pract* 2004, 14:27–35, doi: 10.1177/1049731503254106
3. Ogińska-Bulik N, Zadworna-Cieślak M. The role of resiliency and coping strategies in occurrence of positive changes in medical rescue workers. *Intern Emerg Nursing* 2018, 39:40–45, doi: 10.1016/j.ienj.2018.02.004
4. Kalaitzaki A, Tamiolaki A, Rovithis M. The healthcare professionals amidst COVID-19 pandemic: A perspective of resilience and post-traumatic growth. *Asian J Psychiatr* 2020, 52:102172, doi: 10.1016/j.ajp.2020. 102172
5. Batra K, Singh TP, Sharma M, Batra R, Schvaneveldt N. Investigating the psychological impact of COVID-19 among healthcare workers: A meta-analysis. *Int J Environ Res Public Health* 2020, 17:1–33, doi: 10.3390/ijerph17239096
6. Tedeschi RG, Calhoun LG. The Posttraumatic Growth Inventory: Measuring the Positive Legacy of Trauma. *J Trauma Stress* 1996, 9:455-471, doi: 10.1007/BF02103658
7. Mancini AD. Heterogeneous mental health consequences of COVID-19: Costs and benefits. *Psychol Trauma* 2020, 12:S15–S16, doi: 10.1037/tra0000894
8. Huecker M, Shreffler J, Danzl D. COVID-19: Optimizing healthcare provider wellness and posttraumatic growth. *Am J Emerg Med* 2020, doi: 10.1016/j.ajem.2020.08.066
9. Shakespeare-Finch J, Bowen-Salter H, Cashin M, Badawi A, Wells R, Rosenbaum S et al. COVID-19: An Australian perspective. *J Loss Trauma* 2020, 25:662–672, doi: 10.1080/15325024.2020.1780748
10. Chen R, Sun C, Chen J, Jen H, Kang XL, Kao C et al. A large-scale survey on trauma, burnout, and posttraumatic growth among nurses during the COVID-19 pandemic. *Int J Ment Health Nurs* 2020, 30:102–116, doi: 10.1111/inm.12796

11. Chew QH, Wei KC, Vasoo S, Sim K. Psychological and coping responses of health care workers toward emerging infectious disease outbreaks: A rapid review and practical implications for the COVID-19 pandemic. *J Clin Psychiatry* 2020, 81:20r13450, doi: 10.4088/JCP.20r13450
12. Ye Z, Yang X, Zeng C, Wang Y, Shen Z, Li X et al. Resilience, social support, and coping as mediators between COVID-19-elated stressful experiences and acute stress disorder among college students in China. *Appl Psychol Health Well Being* 2020, 12:1074–1094, doi: 10.1111/aphw.12211.
13. Chew QH, Wei KC, Vasoo S, Chua HC, Sim K. Narrative synthesis of psychological and coping responses towards emerging infectious disease outbreaks in the general population: Practical considerations for the COVID-19 pandemic. *Singapore Med J* 2020, 61:350–356, doi: 10.11622/smedj.2020046
14. Cerami C, Santi G, Galandra C, Dodich A, Cappa S, Vecchi T et al. Covid-19 Outbreak in Italy: Are we ready for the psychosocial and economic crisis? Baseline findings from the Psycovid study. *Front Psychiatry* 2020, 11:556, doi: 10.3389/fpsyt.2020.00556
15. Savitsky B, Findling Y, Ereli A, Hendel T. Anxiety and coping strategies among nursing students during the covid-19 pandemic. *Nurse Educ Pract* 2020, 46:102809, doi: 10.1016/j.nepr.2020.102809
16. Kalaitzaki A. Posttraumatic symptoms, posttraumatic growth, and internal resources among the general population in Greece: A nation-wide survey amid COVID-19 first lockdown. *Int J Psychol* (accepted). Preprint, doi: 31234/osf.io/g29eb
17. Leontopoulou S. Resilience of Greek youth at an educational transition point: The role of locus of control and coping strategies as resources. *Soc Ind Res* 2006, 76: 95–126, doi: 10.1007/s11205-005-4858-3
18. Kapsou M, Panayiotou G, Kokkinos CM, Demetriou AG. Dimensionality of Coping. *J Health Psychol* 2010, 15:215–229, doi: 10.2466/pr0.1988.62.3.763
19. Flesia L, Fietta V, Colicino E, Segatto B, Monaro M. *Stable psychological traits predict perceived stress related to the COVID-19 outbreak*. 2020, 9:3350, doi: 10.31234/osf.io/yb2h8
20. Babore A, Lombardi L, Viceconti ML, Pignataro S, Marino V, Crudele M et al. Psychological effects of the COVID-2019 pandemic: Perceived stress and coping strategies among healthcare professionals. *Psychiatry Res* 2020, 293:113366, doi: 10.1016/j.psychres.2020.113366
21. Savitsky B, Findling Y, Ereli A, Hendel T. Anxiety and coping strategies among nursing students during the covid-19 pandemic. *Nurse Educ Pract* 2020, 46:102809, doi: 10.1016/j.nepr.2020.102809
22. Breda AV. A critical review of resilience theory and its relevance for social work. *Soc Work* 2018, 54, doi: 10.15270/54-1-611
23. Imperatori C, Bersani FS, Massullo C, Carbone GA, Salvati A, Mazzi G et al. Neurophysiological correlates of religious coping to stress: a preliminary eeg power spectra investigation. *Neurosci Lett* 2020, 728:34956, doi: 10.1016/j.neulet.2020.134956
24. Talarowska M, Chodkiewicz J, Biliński P, Nawrocka N, Miniszewska J. Mental health and the SARS-CoV-2 epidemic—Polish research study. *Int J Environ Res Public Health* 2020, 17:1–11, doi: 10.3390/ijerph 17197015
25. Seto MC, Rodrigues NC, Ham E, Kirsh B, Hilton NZ. Post-traumatic stress disorder, depression, anxiety symptoms and help seeking in psychiatric staff: Trouble de stress post-traumatique, dépression, symptômes d'anxiété et recherche d'aide chez le personnel psychiatrique. *Can J Psychiatry* 2020, 65:577–583, doi: 10.1177/0706743720916356

Ερευνητική εργασία

# Δευτερογενές τραυματικό στρες και δευτερογενής μετατραυματική ανάπτυξη στους εργαζόμενους στον τομέα της υγειονομικής περίθαλψης κατά τη διάρκεια της πρώτης απαγόρευσης κυκλοφορίας λόγω του COVID-19 στην Ελλάδα: Ο ρόλος της ψυχικής ανθεκτικότητας και των στρατηγικών αντιμετώπισης

Αργυρούλα Καλαϊτζάκη, Μιχαήλ Ροβίθης

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

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 2 Οκτωβρίου 2020/Αναθεωρήθηκε 20 Δεκεμβρίου 2020/Δημοσιεύθηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Παρά τις αδιαμφισβήτητες αρνητικές ψυχοκοινωνικές συνέπειες της πανδημίας COVID-19, είναι επίσης πιθανές οι θετικές συνέπειες. Η ψυχική ανθεκτικότητα και οι στρατηγικές αντιμετώπισης έχουν μελετηθεί ως παράγοντες που συμβάλλουν σε αυτά τα αποτελέσματα, αλλά τα ευρήματα είναι ακόμη ασαφή. Ο σκοπός της παρούσας έρευνας ήταν η εξέταση του ρόλου της ψυχικής ανθεκτικότητας και των στρατηγικών αντιμετώπισης στο δευτερογενές τραυματικό στρες στους εργαζόμενους στον τομέα της υγειονομικής περίθαλψης, αλλά και στην πιθανή μετατραυματική τους ανάπτυξη, κατά τη διάρκεια της απαγόρευσης της κυκλοφορίας λόγω COVID-19 στην Ελλάδα. Ένα δείγμα 673 εργαζομένων στον τομέα της υγείας από την Ελλάδα συμμετείχαν. Ένα ερωτηματολόγιο διανεμήθηκε διαδικτυακά μέσω ιστότοπων κοινωνικής δικτύωσης, ιστοσελίδων και προσωπικών επαφών της συγγραφέως και στη συνέχεια ζητήθηκε από τους συμμετέχοντες να το διανείμουν και στις δικές τους επαφές. Η δειγματοληψία ευκολίας και χιονόμπαλας πραγματοποιήθηκε το χρονικό διάστημα 5–30 Απριλίου 2000, όταν οι άνθρωποι κλήθηκαν να συμμορφωθούν με το μέτρο απαγόρευσης της κυκλοφορίας (Lockdown) που επέβαλε η Ελληνική Κυβέρνηση (23 Μαρτίου–03 Μαΐου). Συλλέχθηκαν κοινωνιοδημογραφικά δεδομένα και επίσης χορηγήθηκε το Secondary Traumatic Stress Scale για την αξιο_ λόγηση των συμπτωμάτων δευτερογενούς τραυματικού στρες στους εργαζόμενους στον τομέα της υγειονομικής περίθαλψης. Το Post-Traumatic Growth Inventory, το Brief Resilience Scale, και το Coping Orientation to Problems Experienced Inventory αξιολόγησαν τη μετατραυματική ανάπτυξη, την ψυχική ανθεκτικότητα και τις στρατηγικές αντιμετώπισης αντίστοιχα. Οι αναλύσεις παλινδρόμησης έδειξαν ότι η ψυχική ανθεκτικότητα και οι στρατηγικές αντιμετώπισης συνδέονταν με διαφορετικό τρόπο με τα θετικά και αρνητικά αποτελέσματα (στρες/ανάπτυξη) της απαγόρευσης κυκλοφορίας. Η ψυχική ανθεκτικότητα και κυρίως οι μη προσαρμοστικές στρατηγικές προέβλεψαν το δευτερογενές τραυματικό στρες. Προσαρμοστικές και μη προσαρμοστικές στρατηγικές προέβλεψαν τη μετατραυματική ανάπτυξη. Το λεγόμενο «δεύτερο κύμα» της επιδημίας που ξεκίνησε τον Αύγουστο του 2020 δείχνει ότι η μελέτη των ψυχοκοινωνικών επιπτώσεων της απαγόρευσης της κυκλοφορίας λόγω της πανδημίας COVID-19 και των εσωτερικών πόρων (π.χ. ψυχική ανθεκτικότητα και στρατηγικές αντιμετώπισης) για την αντιμετώπισή τους, είναι απαραίτητη. Τα ευρήματα συμβάλλουν σε μια πιο ολοκληρωμένη κατανόηση των στρατηγικών αντιμετώπισης που χρησιμοποιούνται από υποομάδες πληθυσμού για την αντιμετώπιση της απαγόρευσης κυκλοφορίας λόγω COVID-19 στην Ελλάδα. Η ενίσχυση των εσωτερικών πόρων μέσω υποστηρικτικών υπηρεσιών θα βελτιώσει την ικανότητα των εργαζομένων στον τομέα της υγειονομικής περίθαλψης να αντέχουν, να ανακάμπτουν και να ευδοκιμούν με οφέλη στην ψυχολογική τους υγεία και ευεξία.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Κορωνοϊός, δευτερογενής τραυματισμός, δευτερογενής μετατραυματική ανάπτυξη, απαντήσεις αντιμετώπισης στο στρες, Ελλάδα.

*Συγγραφέας επικοινωνίας:* Αργυρούλα Καλαϊτζάκη, Τμήμα Κοινωνικής Εργασίας, Σχολή Επιστημών Υγείας, Ελληνικό Μεσογειακό Πανεπιστήμιο, 714 10 Ηράκλειο, Κρήτη, Διεύθυνση e-mail: akalaitzaki@hmu.gr

https://doi.org/ 10.22365/jpsych.2021.002 / Psychiatriki 2021, 32:26–33

Research article

# The role of self-esteem in the relationship between anxiety and depression of Albanian and Indian immigrants in Greece

Evangelia V. Kateri,[1] Argyroula Kalaitzaki,[2] Evangelos C. Karademas[1]

[1]*Department of Psychology, University of Crete, Rethymno, Crete*

[2]*Social Work Department, Laboratory of Interdisciplinary Approaches for the Enhancement of Quality of Life, University Research Centre "Institute of AgriFood and Life Sciences" Hellenic Mediterranean University, Heraklion, Crete, Greece*

**ARTICLE HISTORY:** Received 14 September 2020/Revised 5 October 2020/Published Online 17 March 2021

**ABSTRACT**

Immigrants' psychological health has been the focus of many studies as it is a timely subject due to the increasing numbers of immigrants and refugees who enter Greece the recent decades, and the resulting anxiety that this process brings about to the individual. The aim of the present study was to examine the relationship between immigrants' and Greeks' anxiety, self-esteem and depression. In addition, the present study aimed to compare the psychological health between immigrants and Greeks. The participants were 115 Albanian, 118 Indian immigrants, and 116 Greeks. The Rosenberg Self-Esteem Scale, the CES-D Scale, and the State Anxiety Inventory were administrated for measuring self-esteem, depression, and anxiety, respectively. To test the bivariate relationships between the study variables, Pearson product-moment correlation coefficients were calculated. The potential differences of psychological health between immigrant groups were examined with ANOVA, and multiple linear regression was used to predict the variance of depression by self-esteem and anxiety, after controlling for ethnicity and demographics. Moreover, moderation analysis was used to examine the moderation role of self-esteem in the relationship between anxiety and depression and possible differences between ethnic groups. In line with our hypotheses, immigrants had higher levels of depression and lower self-esteem scores, compared to Greeks. However, Indians reported the lower levels of anxiety compared to both Albanians and Greeks. Differences were also observed between the two immigrant groups, with Albanians experiencing more mental health problems than Indians. Both self-esteem and anxiety explained a large proportion of the variance of depression in immigrants (45%), thus substantiating our theoretical model (i.e., depression depends on individuals' anxiety and self-esteem). Consistent to our expectations too, self-esteem was a moderator in the relationship between anxiety and depression; no differences between ethnic groups were observed though (e.g., the level of self-esteem acted protectively in the same way in Albanians, Indians, and Greeks). Despite the limitations, the findings of this study could be particularly useful to clinicians working with immigrants. Coping effectively with anxiety and enhancing immigrants' self-esteem could be tailored-based targets for both prevention and intervention programs.

**KEYWORDS:** Anxiety, self-esteem, depression, immigrants, Greece.

## Introduction

During the recent decades, many immigrants, from both the Balkans and several Asian and African countries, have moved to Greece. Immigrants are regarded as a high-risk group for increased levels of depression and anxiety, as they are confronted with many stressors related to their adaptation to a new society.[1,2] Major stressors are related to age, socioeconomic and educational status, years of residence in the host country, acculturation difficulties, and social exclusion.[3,4] Cognitive theories assume that anxiety levels are high when a threat is perceived as potential, while depression levels are high when a threat is perceived as certain. Based on this assumption, anxiety and depression

*Corresponding author:* Evangelia V. Kateri, Department of Psychology, University of Crete, Gallos Campus, GR-741 00 Rethymno, Crete, Greece • e-mail: ekateri@gmail.com

are hierarchically arranged, in that when the threat becomes imminent and certain the individual ends up in depression.[5,6]

Many studies indicate that the prevalence of depression and anxiety among immigrants is higher than the general population.[7,8] Low educational level, old age, and few years of residence in the host country are regarded as risk factors for depression.[7] Furthermore many studies examined the relationship between stressors, self-esteem, and health outcomes. Health outcomes vary between individuals and groups and self-esteem has a central role in this relationship- with both direct and indirect effects- and is regarded as a successful psychologically coping resource for stress.[8] However, these findings are inconclusive as some studies have indicated that sociodemographic factors are unrelated to psychological health and immigrants not always report higher levels of anxiety and depression.[8,9]

Depression and anxiety have been associated with decreased self-esteem and impaired functioning in various domains of life.[5] Terror management theory suggests that self-esteem protects individuals from anxiety that arises from the awareness of their vulnerability and mortality,[10] whereas Becks' cognitive theory of depression asserts that individuals with low self-esteem are more vulnerable to depression as they tend to focus on the negative aspects of the self, others, and the world.[5] Previous studies suggest, also, that immigrants' self-esteem can protect them against anxious-depressed symptoms.[11] However, self-esteem has also been linked with arrogance and narcissism, which are behaviors that many cultures discourage.[12]

Cultural differences in self-esteem have been found due to differences in the construction of the self. In more individualistic countries (e.g. usually western countries), individuals are primarily characterized by independent self-construal, perceiving themselves to be separate from others and autonomous, while in more collectivistic countries (e.g. usually non-western countries) individuals are primarily characterized by interdependent self-construal, perceiving themselves to be defined by their relations to others.[13–15] Several cross-cultural studies have shown that in individualistic cultures, people engage in self-enhancement strategies, perceiving their superiority over the others and aiming at accomplishing personal goals[8] whereas in collectivistic countries, the self is interrelated to significant others and people are motivated to perceive themselves as inferior to others, aiming at being accepted by the in-group.[13,16] Therefore, lower self-esteem rates for people coming from collectivistic countries compared to people coming from individualistic countries have been found in many studies.[16] Furthermore, self-esteem ameliorates the negative effects of immigrants' stress[17,18] by interpreting daily stressors more positively, seeking for social support, and trying harder to adapt to the host country.[19,20] Indian self is characterized mainly by values of interdependence,[21–23] while the Greek self is characterized by both interdependence and independence[24] or by both individualistic and collectivistic values[25] and these values affect self-esteem.[13]

Based on the controversial evidence on the relationship between immigration, depression, anxiety and self-esteem,[8,9,12,16] the present study aimed to examine whether the high levels of anxiety result in depression and whether the relationship between anxiety and depression is moderated by self-esteem in two groups of immigrants (Albanians and Indians) and compare them with a Greek sample of similar sociodemographic characteristics (see figure 1). To the authors' knowledge no other studies have examined the interrelationship of these variables in three ethnicity groups, immigrants and hosts.

Given that immigration is a stressful condition,[1,2,7] it was hypothesized that immigrants (both Albanian and Indians) would present higher levels of anxiety and depression compared to Greeks. Longer residence in Greece, higher education level, and younger age, were expected to correlate negatively with anxiety and depression.[3,4,7]

Self-esteem was expected to be a moderator in the relationship between anxiety and depression.[10] Significant differences in self-esteem were expected between the three ethnic groups (e.g., Albanians, Indians, Greeks). Given that self-esteem rates are lower for people coming from collectivistic countries,[13,16,23] Indians were expected to have low levels of self-esteem, Greeks high levels[24] and Albanians moderate levels.[25,26] Although no previous study has examined cultural values in Albanians, they are considered to be culturally closer to Greeks than immigrants coming from Asian and African countries,[27] suggesting also that their self-esteem level would probably lie somewhere between Greeks and Indians.

Since Albanians have been integrated or/and assimilated to Greek society,[2,27] while Indians are more separated[22] and integrated or/and assimilated immigrants usually report higher levels of self-esteem than sep-

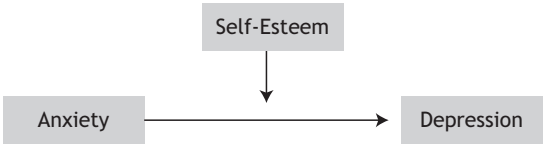


**Figure 1.** The theoretical model of the present study.

arated ones,[12,28] it was expected that, the higher levels of self-esteem would act protectively for Greeks, the medium levels for Albanians and the lower levels for Indians. Possible differences in anxiety and depression of Albanians and Indians were also examined, given that culture affect mental health.[13] It was expected that Indians will present less anxiety and depression symptoms compared to Albanians, because of Indians interdependence[23] and their commitment to their heritage culture group that increase in-group social support.[29]

## Material and Method

### Participants

*Immigrants*. Two hundred and thirty-three immigrants living in Greece (M=33.0, SD=8.0 years old) participated in the study. One hundred and fifteen five of them were Indians and one hundred and eighteen were Albanians. Their average age was 33.0 years for Indians (SD=8.0) and 35.0 years for Albanians (SD=8.0). Their average years of education were 11.2 years (SD=2.7) for Indians and 11.8 years (SD=2.4) for Albanians. Indians and Albanians were residing in Greece 7.7 (SD=3.9) and 10.7 (SD=4.2) years, respectively.

*Greeks*. One hundred and sixteen were Greeks. Their average age was 39.0 (SD=9) and their average years of education were 12.0 (SD=2.8).

### Measures

A number of demographic information, including gender, age, educational level, ethnicity, years of residence in Greece (only for immigrants) were collected. Cronbach's alpha coefficients for all scales are presented in table 1.

*Self-Esteem*. Self-esteem was measured with the Self-Esteem Scale.[30] It consists of 10 items that assess the global personal self-esteem (e.g., "Sometimes I feel totally usefulness"). Participants respond on a Likert-type scale ranging from "totally disagree" (1) to "totally agree" (7).

*Depression symptoms*. Depression was measured with the Center for Epidemiological Studies-Depression scale (CES-D).[31] It consists of 20 items (e.g., "I felt hopeful about the future") that cover affective, psychological, and somatic symptoms of depression. Participants respond on a Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (5).

*Anxiety symptoms*. Anxiety was measured with the State Anxiety Inventory[32] which evaluates the anxiety the person feels at the moment of measurement. It consists of 20 items (e.g., "I feel calm") and participants respond on a Likert-type scale ranging from "not at all" (1) to "very much" (4).

### Procedure and analyses

Participants were recruited at their workplace. Indians were also recruited in a building that they use for their religious ceremonies. A convenience sampling technique was used. Participation in the study was voluntary. Each measure was translated from English to Punjab and Albanian and back-translated to English.[33] All analyses were carried out with SPSS 24.0 and the moderation analysis with PROCESS, which is a freely available computational tool for SPSS and SAS.[34] The moderation effects were considered significant at $p<0.05$ for the 95% bootstrap confidence intervals when the derived intervals do not include values of zero.[34]

## Results

Albanians had lived statistical significantly ($t(219)=-5.38$, $p<0.001$) more years in Greece (M=10.7, SD=4.2) compared to Indians (M=7.7, SD=3.9). Years of education did not differentiate the three ethnic groups (Albanians, Indians, and Greeks) ($F2,325=2.39$, $p>0.05$). The difference between Indians' mean age (M=33, SD=8) and Albanians' (M=35, SD=8) was not statistically significant ($t(223)=-1,23$, $p>0.05$), but it was between immigrants and Greeks (M=39, SD=9) ($F2,337=14.12$, $p<0.001$).

**Table 1.** Bivariate Correlations among immigrants' anxiety, depression, self-esteem, age, education, and years of tesidence.

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Anxiety | | 1 | | | | | |
| Depression | | 0.58** | 1 | | | | |
| Self-Esteem | | –0.23** | –0.49** | 1 | | | |
| Age | | 0.05 | –0.02 | 0.00 | 1 | | |
| Education | | –0.03 | –0.02 | 0.17** | 0.10 | 1 | |
| Years of Residence | | 0.11 | 0.02 | 0.23** | 0.49** | 0.31** | 1 |
| *Cronbach's alpha* | Greeks | 0.90 | 0.90 | 0.77 | | | |
| | Albanians | 0.83 | 0.83 | 0.72 | | | |
| | Indians | 0.88 | 0.82 | 0.55 | | | |

*p<0.05; ** p<0.01

One-way ANOVAs indicated statistically significant differences between the three ethnic groups (i.e., Albanians, Indians, and Greeks) regarding anxiety (F2,249=5.611, p<0.01), depression (F2,297=4.59, p<0.05), and self-esteem (F2,314=20.27, p<0.00). Albanians had higher levels of anxiety (M=47.16, SD=10.70), followed by Greeks (M=44.30, SD=11.88) and Indians (M=41.52, SD=8.27). Albanians had, also, higher levels of depression symptoms (M=20.42, SD=9.75), followed by Indians (M=17.42, SD=9.64) and Greeks (M=16.12, SD=10.75). Greeks had higher self-esteem scores (M=54.81, SD=7.93), followed by Albanians (M=52.45, SD=8.67) and Indians (M=47.0, SD=7.72).

Table 1 presents the bivariate correlations among immigrants' age, education, years of residence in Greece, self-esteem, anxiety, and depression. Education was statistically significant positively correlated with self-esteem (r=0.17, p<0.005). Anxiety was statistically significant correlated positively with depression (r=0.58, p<0.005) and negatively with self-esteem (r=–0.23, p<0.005), and self-esteem was negatively correlated with both anxiety and depression (r=–0.23, p<0.005 and r=–0.49, p<0.005, respectively).

Subsequently, a hierarchical multiple regression analysis was carried out, aiming to examine the degree that ethnicity, age, education, and years of residence (step1), and self-esteem and anxiety (step 2) predict depression symptoms in immigrants. Step 1 predicted 0.04% of variance, F (4,112)=2.19, p>0.05. According to Beta values, only ethnicity was a significant predictor of depression. When self-esteem and anxiety were added, the variance of depression changed 0.40% (F (2,110)=42.72, p<0.00). Both variables predicted 45% of the variance of the outcome variable (see table 2).

Model 1 of PROCESS was then performed to test whether self-esteem moderates the relationship between anxiety and depression, separately for Greeks, Albanians, and Indians. As shown in table 3, the correlation between anxiety and depression was statistically significant at the higher (+1 SD), at the medium (M), and at the lower levels of self-esteem (–1 SD) for all ethnic groups. However, for Indians, the high level of self-esteem was less significant than that of Greeks and Albanians (B=0.44, SE=0.20, p<0.05, CI=0.03 to 0.86, B=0.54, SE=0.11, p<0.01, CI=0.32 to 0.76, and B=0.33, SE=0.08, p<0.01, CI=0.16 to 0.50, respectively).

## Discussion

In line with our hypothesis, both Albanian and Indian immigrants, compared to Greeks, reported higher rates of depression and lower rates of self-esteem. Interestingly, Albanians also reported higher rates of anxiety compared to Greeks, but Indians reported lower levels of anxiety from Greeks, contrary to our expectations. These results suggest that immigration could be a risk factor for health decline.[3,4] However, cultural differences in anxiety have been reported worldwide[35] as well as coping mechanisms (that were not examined in this study). Indians obtain meaning in life through their belief in Gods or other spirits, and religion is a typical and effective coping mechanism to deal with anxiety.[36,23] Albanians reported higher anxiety and depression compared to Indians, supporting our hypothesis. Immigrants in Greece experience discrimination and are generally perceived as a threat to Greek cultural identity, social security and welfare systems.[37] However, when immigrants emotionally invest in their ethnic group and maintain their original cultural traits, they seem to be more protected from discrimination than the immigrant groups who strive to be incorporated to the host society.[29,38] Previous findings indicate that Indians' separation from hosts was related to more social support, ending, in turn, to fewer depressive symptoms.[22]

Contrary to our expectations, demographics, such as years of residence in Greece, education, and age did not correlate nor were they predictors of anxiety and depression. A possible explanation is that immigrant's mental health might be more complicated than expect-

**Table 2.** Hierarchical regression analysis for the prediction of depression in Albanian and Indian immigrants.

| | Beta | t | Adj. $R^2$ | $R^2$ Change | F Change | DF |
|---|---|---|---|---|---|---|
| *Step 1* | | | 0.04 | 0.07 | 2.19 | 4,112 |
| Ethnicity | 0.27 | 0.27** | | | | |
| Age | –0.08 | –0.81 | | | | |
| Education | –0.05 | –0.05 | | | | |
| Years of residence | –0.04 | –0.35 | | | | |
| *Step 2* | | | 0.45 | 0.40 | 42.72*** | 2,110 |
| Self-Esteem | –0.41 | –5.32*** | | | | |
| Anxiety | 0.39 | 4.8*** | | | | |

** p<0.01; *** p<0.001

**Table 3.** Bootstrapping Results for moderation effects of self-esteem on the relationship of anxiety to depression for Greeks, Indians, and Albanians.

| | B | SE | t | p | 95% CI† | |
|---|---|---|---|---|---|---|
| Self-esteem | | | | | Lower | Upper |
| *Greeks* | | | | | | |
| Low (-1SD) | 0.52*** | 0.12*** | 4.15 | <0.01 | 0.27 | 0.77 |
| Mean | 0.53*** | 0.09*** | 5.39 | <0.01 | 0.33 | 0.73 |
| High (+1SD) | 0.54*** | 0.11*** | 4.95 | <0.01 | 0.32 | 0.76 |
| *Indians* | | | | <0.01 | | |
| Low (-1SD) | 0.59*** | 0.18*** | 3.14 | <0.01 | 0.21 | 0.97 |
| Mean | 0.52*** | 0.14*** | 3.65 | <0.01 | 0.23 | 0.80 |
| High (+1SD) | 0.44* | 0.20* | 2.18 | 0.03 | 0.03 | 0.86 |
| *Albanians* | | | | | | |
| Low (-1SD) | 0.37*** | 0.13*** | 2.87 | <0.01 | 0.11 | 0.64 |
| Mean | 0.35*** | 0.08*** | 3.97 | <0.01 | 0.17 | 0.53 |
| High (+1SD) | 0.33*** | 0.08*** | 3.95 | <0.01 | 0.16 | 0.50 |

†Bootstrapping bias corrected and accelerated (5000 bootstrap samples). Intervals that do not contain zero are deemed to be significant. Note: SD=standard deviation. CI=confidence intervals, * p<0.05, *** p<0.001.

ed; many factors other than demographics may affect their mental health or act as mediators or moderators in this relationship.[39] Education, for example, may offer more resources (cognitive, economic, and social) to deal with changes,[26] while longer residence in the host country possibly extents social networks[7,40] which boost their self-esteem. Future studies need to test these assumptions.

As expected, immigrants' self-esteem and anxiety explained a high proportion of the variance of depression, suggesting that the relationship of anxiety, self-esteem and depression[5,6,10] could be etic or universal. In line with previous studies,[16] Indians reported the lowest rates of self-esteem, Greeks the highest ones, and Albanians moderate rates, supporting our hypothesis. This finding is indicative of the cultural differences (independence/interdependence) related to self-esteem. The higher the independent values, the higher the self-esteem.[26] The results also provided support to the moderating role of self-esteem in the relationship between anxiety and depression in the three sampling groups, indicating that self-esteem protects individuals from depression,[17,11] no matter if the individual is an immigrant or host. Previous studies found small differences in the protective role of self-esteem between immigrants and no immigrants as well.[28]

Contrary to our expectations, no differences in self-esteem were found between ethnic groups in the levels of self-esteem that act protectively. It was expected, for example, Indians low self-esteem would act protectively, compatible with their collectivistic values of modesty and inferiority.[13] The only indication in line with this hypothesis was that Indians high self-esteem was less statistically significant than that of Greeks and Albanians. A crucial question is if these results represent incompetency of the measures. Self-esteem can be measured as an overall index or comprising of two factors: personal abilities that are reported more in individualistic cultures and the desirability of the individuals' behavior to significant others that is reported more in collectivistic cultures.[41] Indians' self-esteem may be more related to social worth and feelings of interrelatedness with significant others or collective self-esteem[42] than to intrapersonal feelings and intrapersonal evaluations of success (i.e. abilities), that the Rosenberg Self-Esteem Scale measures.[40,43] Cultural values of independence and interdependence must be measured in future studies and not ascribed a priori to ethnicity.[44] The measurement of collective self-esteem is also suggested in future studies.

The limitations of this study should be acknowledged. The most important limitations are the cross-sectional nature of the study[45] and the use of a small convenient sample, which limit the generalizability of the findings. The reliability of the self-esteem scale was also low for Indians, raising concerns about the cross-cultural validity of this scale in non-Western cultures.[46] A prospective study should be carried out in many immigrant groups and in both clinical and non-clinical samples.

Despite the limitations, the implications of the present study are noteworthy. The present findings make a unique theoretical contribution to the protective

role of self-esteem in immigrants and hosts. Although self-esteem is a protective factor for depression, the Indians lower self-esteem levels, compared to Greeks and Albanians, might be more compatible with their cultural values. Clinicians must be cautious with generalizations and interpret behavior in line with the clients' cultural context. Indisputably, immigrants are one of the most vulnerable population subgroups that face significant difficulties and stressors. Being already severely stressed and experiencing also the COVID-19 pandemic may be very risky for their psychological health. Although many of the stressors they face cannot be prevented, these populations need urgently to be safeguarded from the negative consequences they experience in the host country. Clinicians and other stakeholders can target modifiable factors such as enhancing their self-esteem with long-term benefits in minimizing the risk of depression.[17]

## References


1. Berry JW, Sabatier C. Variations in the assessment of acculturation attitudes: Their relationships with psychological wellbeing. *Int J Intercult Rel* 2011, 35:658–669, doi: 10.1016/j.ijintrel.2011.02.002
2. Besevegis E, Pavlopoulos V. Acculturation patterns and adaptation of immigrants in Greece. In: Finklestein M, Dent- Brown K (eds) *Psychosocial stress in immigrants and in members of minority groups as a factor of terrorist behaviour.* IOS Press, 2008, doi: 10. 3233/978-1-58603-872-4-23
3. Madianos M. Immigration and repatriation: A continuum effect of mental disorders. In: Papastylianou A (ed) *Cross-Cultural Routes*. Ellinika Grammata, Athens, 2005 (In Greek)
4. Mpilanakis N. Immigration and repatriation: A continuum effect of mental disorders. In: Papastylianou A (ed) *Cross-Cultural Routes*. Ellinika Grammata, Athens, 2005 (In Greek)
5. Sowislo JF, Orth U. Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies. *Psychol Bull* 2013, 139: 213–240, doi: 10.1037/a0028931
6. Dobson KS. The relationship between anxiety and depression. *Clin Psychol Rev* 1985, 5:307–324, doi: 10.1016/0272-7358(85)90010-8
7. Berry JW. Immigration, acculturation and adaptation. *Appl Psychol-Int Rev* 1997, 46:5–34, doi: 10.1111/j.1464-0597.1997.tb01087.x
8. Noh S, Avison WR. Asian Immigrants and the Stress Process: A Study of Koreans in Canada. *J Health Soc Beh* 1996, 37:192–206, doi: 10.2307/2137273
9. Koneru VK, Weisman de Mamani AG, Flynn PM, Betancourt H. Acculturation and mental health: Current findings and recommendations for future research. *Appl Prev Psychol* 2007, 12:76–96, doi: 10.1016/j.appsy.2007.07.016
10. Greenberg J, Simon L, Solomon S, Chatel D, Pyszczynski T. Terror Management and Tolerance: Does Mortality Salience Always Intensify Negative Reactions to Others Who Threaten One's Worldview. *J Pers Soc Psychol* 1992, 63:212–220, doi: 0022-3514/92/S3.00
11. Okazaki S, Ryce P, Sirin SR. The Role of Collective Self-Esteem on Anxious-Depressed Symptoms for Asian and Latino Children of Immigrants. *Cultural Diversity and Ethnic Minority Psychology* 2014, 20:220–230, doi: 10.1037/a0035022
12. Konrath S. Self-esteem, culturally defined. In: Scull A (ed) *Cultural Sociology of Mental Illness: An A-to-Z Guide*. Sage, 2014, doi: 10.4135/9781483346342
13. Markus HR, Kitayama S. Culture and the self: Implications for cognition, emotion and motivation. *Psychol Rev* 1991, 98:224–253, doi: 10.1037/0033-295X.98.2.224
14. Singelis TM. The measurement of independent and interdependent self-construals. *Pers Soc Psychol Bull* 1994, 20:580–591, doi: 10.1177/0146167294205014
15. Smith PB, Bond MH. *Social psychology across cultures*. Prentice Hall, London, 1998
16. Tsai JL, Ying YW, Lee PA. Cultural predictors of self-esteem: A study of Chinese American female and male young adults. *Cult Divers Ethn Min Psychol* 2001, 7:284–297, doi: 10.1037/1099-9809.7.3.284
17. Hovey J, Magana S. Acculturative Stress, Anxiety, and Depression among Mexican Immigrant Farmworkers in the Midwest United States. *J Immigr Health* 2000, 2:119–131, doi: 1096-4045/00/0700-011918.00/0
18. Nesdale D, Mak AS. Ethnic identification, self-esteem and immigrant psychological health. *Int J Intercult Rels* 2003, 27:23–40, doi: 10.1016/S0147-1767(02)00062-7
19. Cross SE, Gore JS, Morris ML. The relational-interdependent self-construal, self-concept consistency, and well-being. *J Pers Soc Psychol* 2003, 85:933–944, doi: 10.1037/0022-3514.85.5.933
20. Kosic A. Personality and individual factors in acculturation. In: Sam D, Berry JW (eds) *The Cambridge Handbook of Acculturation Psychology*. University Press, Cambridge, 2006
21. Kapoor S, Hughes PC, Baldwin JR, Blue J. The relationship of individualism-collectivism and self-construals to communication styles in India and the United States. *J Intercult Relat* 2003, 27:683–700, doi: 10.1016/j.ijintrel.2003.08.002
22. Kateri E, Tzouvelas G, Karademas E. The role of acculturation attitudes and social support in anxiety and depression of Indian immigrants in Greece. *Psychiatriki* 2019, 30:311–319, doi: 10.22365/jpsych.2019.304.311
23. Kateri E, Karademas E. The interplay between self-construal, social support, and psychological adaptation of Indian immigrants' in Greece. *Eur J Couns Psychol* 2018, 7:148–164, doi: 10.5964/ejcop.v7i1.148
24. Green EG, Deschamps JC, Paez D. Variation of individualism and collectivism within and between 20 countries: A typological analysis. *J Cross Cult Psychol* 2005, 36:321–339, doi: 10.1177/0022022104273654
25. Kafetsios K, Nezlek JB. Attachment and wellbeing: A study of emotion and social support in everyday interaction. Paper presented at the Biannual Conference of the International Association for Relationship Research, University of Madison Wisconsin, Madison, 2004
26. Diener E, Diener M. Cross-Cultural Correlates of Life Satisfaction and Self-Esteem. *Pers Processes Individ Dif* 1995, 68:653–666, doi: 10.1037//0022-3514.68.4.653
27. Tsouvelas G, Pavlopoulos V. Greek host community acculturation expectations towards immigrants from Albania and Pakistan: The role of existential parameters. *Eur J Couns Psychol* 2018, 7:181–199, doi: 10.5964/ejcop.v7i1.151
28. Portes PR, Zady MF. Self-Esteem in the Adaptation of Spanish-Speaking Adolescents: The Role of Immigration, Family Conflict, and Depression. *Hispanic J Behav Sci* 2002, 24:296–318, doi: 10.1177/0739986302024003003
29. Gungor D. The interplay between values, acculturation and adaptation: A study on Turkish- Belgian adolescents. *Int J Psych* 2007, 42:380–392, doi: 10.1080/00207590600878657
30. Rosenberg M. *Society and the adolescent self-image*. Princeton University Press, Princeton, 1965

31. Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Appl Psych Meas* 1977, 1:385–401, doi: 10.1177/014662167700100306
32. Spielberger GD, Gorush RL, Lushene RE. *The State-Trait Anxiety Inventory*. CA: Consulting Psychologists Press, Palo Alto, 1970
33. Brislin RW. Back-translation for cross-cultural research. *J Cross Cult Psychol* 1970, 1:185–216, doi: 10.1177/135910457000100301
34. Hayes E. *An introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press, New York, 2013
35. Shiraev EB, Levy DA. *Cross-Cultural Psychology: Critical Thinking and Contemporary Applications*. Sixth ed. Routledge, New York and London, 2017
36. Kateri E, Pourkos M. Epistemological considerations about the psycho-educational and psychotherapeutic approach of the cultural other. In: Pourkos M (ed) *Socio- Historical-Cultural Approaches in Psychology and Education*. Atrapos Publications, Athens, 2006 (In Greek)
37. Triantafyllidou A. The political discourse on immigration in southern Europe: A critical analysis. *J Community Appl Soc Psychol* 2000, 10:373–389, doi: 10.1002/1099-1298
38. Jasinskaja-Lahti I, Liebkind K, Horenczyk G, Schmitz P. The interactive nature of acculturation: perceived discrimination, acculturation attitudes and stress among young ethnic repatriates in Finland, Israel and Germany. *Int J Intercult Rel* 2003, 27:79–97, doi: 10.1016/S0147-1767(02)000061-5
39. Salant T, Lauderdale DS. Measuring Culture: A critical review of acculturation and health in Asian immigrant populations. *Soc Sci Med* 2003, 35:1–20, doi: 10.1016/S0277-9536(02)00300-3
40. Jasinskaja-Lahti I, Liebkind K, Jaakkola M, Reuter A. Perceived discrimination, social support networks, and psychological well-being in three immigrant groups. *J Cross Cult Psychol* 2006, 37:293–311, doi: 10.1177/0022022106286925
41. Tafarodi RW, Lang JM, Smith AJ. Self-esteem and the cultural trade-off: Evidence for the role of individualism collectivism. *J Cross Cult Psychol* 1999, 30:620–640, doi: 10.1177/0022022199030005
42. Branscombe NR, Wann DL. Collective self-esteem consequences of outgroup derogation when a valued social identity is on trial. *Eur J Soc Psychol* 1994, 24:641–657, doi: 10.1002/ejsp.2420240603
43. Mesquita B. Emotions in collectivist and individualist contexts. *J Pers Soc Psychol* 2001, 80:68–74, doi:10.1037/0022-3514.80.1.68
44. Triandis HC. *Culture and social behavior*. McGraw- Hill, Inc, New York, 1994
45. Maxwell SE, Cole DA. Bias in cross-sectional analyses of longitudinal mediation. *Psychol Methods* 2007, 12: 23–44, doi: 10.1037/1082-989X.12.1.2
46. Oyserman D, Lee SW. Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychol Bull* 2008, 134: 311–342, doi: 10.1037/0033-2909.13

Ερευνητική εργασία

# Ο ρόλος της αυτοεκτίμησης στη σχέση άγχους και κατάθλιψης μεταναστών από την Αλβανία και την Ινδία στην Ελλάδα

Ευαγγελία Β. Κατέρη,[1] Αργυρούλα Καλαϊτζάκη,[2] Ευάγγελος Χ. Καραδήμας[1]

[1]*Τμήμα Ψυχολογίας, Πανεπιστήμιο Κρήτης, Πανεπιστημιούπολη Γάλλου, Ρέθυμνο, Κρήτη*

[2]*Εργαστήριο Διεπιστημονικής Προσέγγισης για τη Βελτίωση της Ποιότητας Ζωής, Τμήμα Κοινωνικής Εργασίας, Σχολή Επιστημών Υγείας, Συνεργαζόμενη ερευνήτρια του Ινστιτούτου Αγροδιατροφής και Επιστημών Ζωής, Ελληνικό Μεσογειακό Πανεπιστήμιο, Ηράκλειο, Κρήτη*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 14 Σεπτεμβρίου 2020/Αναθεωρήθηκε 5 Οκτωβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Η ψυχική υγεία των μεταναστών αποτέλεσε το επίκεντρο πολλών ερευνών και αποτελεί ένα επίκαιρο θέμα εξαιτίας του αυξανόμενου αριθμού μεταναστών και προσφύγων που εισέρχονται στην Ελλάδα τα τελευταία χρόνια, και του στρες που η διαδικασία της μετανάστευσης επιφέρει στο άτομο. Σκοπός της παρούσας έρευνας ήταν η διερεύνηση της σχέσης μεταξύ του άγχους, της αυτοεκτίμησης και της κατάθλιψης σε μετανάστες και Έλληνες. Επιπλέον στόχο αποτέλεσε η σύγκριση της ψυχικής υγείας μεταναστών και Ελλήνων. Οι συμμετέχοντες της έρευνας ήταν 115 Αλβανοί, 118 Ινδοί μετανάστες και 116 Έλληνες στους οποίους χορηγήθηκαν κλίμακες αυτοεκτίμησης (Rosenberg Self-Esteem Scale), κατάθλιψης (CES-D Scale) και άγχους (State Anxiety Inventory). Για τις αναλύσεις των αποτελεσμάτων χρησιμοποιήθηκε ο συντελεστής γραμμικής συσχέτισης του Pearson, για τις συσχετίσεις των υπό μελέτη μεταβλητών, αναλύσεις διακύμανσης, για τις συγκρίσεις των δεικτών ψυχικής υγείας ως προς την εθνικότητα, και ιεραρχική πολλαπλή παλινδρόμηση για τη μελέτη της συμβολής της αυτοεκτίμησης και του άγχους, στην πρόβλεψη της κατάθλιψης, ελέγχοντας για την εθνικότητα και για δημογραφικά χαρακτηριστικά των μεταναστών. Επιπλέον, διερευνήθηκε αν η αυτοεκτίμηση ρυθμίζει τη σχέση άγχους και κατάθλιψης και εξετάστηκαν πιθανές διαφορές μεταξύ των εθνικών ομάδων. Σε συμφωνία με τις υποθέσεις μας, οι μετανάστες παρουσίασαν υψηλότερα επίπεδα κατάθλιψης και χαμηλότερη αυτοεκτίμηση, συγκριτικά με τους Έλληνες. Ωστόσο, οι Ινδοί παρουσίασαν χαμηλότερα επίπεδα άγχους, συγκριτικά τόσο με τους Έλληνες όσο και με τους Αλβανούς. Διαφορές παρουσιάστηκαν, επίσης, μεταξύ των δύο υπό μελέτη μεταναστευτικών ομάδων, με τους Αλβανούς να παρουσιάζουν περισσότερα προβλήματα ψυχικής υγείας από τους Ινδούς. Τόσο η αυτοεκτίμηση όσο και το άγχος φάνηκε να εξηγούν ένα μεγάλο ποσοστό της διακύμανσης της κατάθλιψης στους μετανάστες (45%), προσδίδοντας στο θεωρητικό μας μοντέλο (ότι η κατάθλιψη εξαρτάται από το άγχος και την αυτοεκτίμηση του ατόμου) ικανοποιητική εγκυρότητα. Επίσης, επιβεβαιώθηκε ο ρυθμιστικός ρόλος της αυτοεκτίμησης μεταξύ άγχους και κατάθλιψης, αλλά χωρίς διαφορές μεταξύ των εθνικών ομάδων (δηλαδή το επίπεδο της αυτοεκτίμησης δρούσε προστατευτικά, παρομοίως σε Αλβανούς, Ινδούς, και Έλληνες). Παρά τους περιορισμούς της συγκεκριμένης έρευνας, τα ευρήματα μπορούν να φανούν ιδιαίτερα χρήσιμα σε ειδικούς ψυχικής υγείας που εργάζονται με μετανάστες. Η διαχείριση του στρες και η διατήρηση της αυτοεκτίμησης των μεταναστών μπορούν να αποτελέσουν τόσο ψυχοθεραπευτικούς στόχους όσο και στόχους προγραμμάτων προαγωγής υγείας.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Άγχος, αυτοεκτίμηση, κατάθλιψη, μετανάστες, Ελλάδα.

*Συγγραφέας επικοινωνίας:* Ευαγγελία Β. Κατέρη, Τμήμα Ψυχολογίας, Πανεπιστήμιο Κρήτης, Πανεπιστημιούπολη Γάλλου, 741 00 Ρέθυμνο, Κρήτη, Διεύθυνση e-mail: ekateri@gmail.com

https://doi.org/ 10.22365/jpsych.2021.006 / Psychiatriki 2021, 32:34–42

Research article

# Gambling in adolescents during the financial crisis in Greece

Assimina P. Paleologou,[1,2] Helen Lazaratou,[3] Dimitris K. Anagnostopoulos,[2] Afroditi Trimpouki,[4] Marina Economou,[1] Melpomeni Malliori,[1] Charalampos Papageorgiou[1]

[1]*First Department of Psychiatry, Medical School, National and Kapodistrian University of Athens, Athens*

[2]*Department of Child Psychiatry, Medical School, National and Kapodistrian University of Athens, Athens*

[3]*Byron Kessariani Community Mental Health Centre, Medical School, National and Kapodistrian University of Athens, Athens*

[4]*Substitution Treatment Unit, Organisation Against Drugs (OKANA,) General Hospital of Kalamata, Kalamata, Greece*

**ARTICLE HISTORY:** Received 9 August 2020/Revised 17 October 2020/Published Online 17 March 2021

**ABSTRACT**

Problem gambling emerges as a serious and ever growing problem of modern societies, largely affecting adolescents as well. The etiology of gambling disorder is complex and multifaceted as it is governed by multiple and interrelated factors. In this context and in light of the pervasive financial crisis in Greece, we conducted a study in order to explore adolescents' gambling involvement in Athens region and also to identify the socio-economic characteristics of adolescents who have engaged into gambling activities. Students were recruited from a sample of schools in Athens area. For the assessment of gambling involvement in adolescents, the Diagnostic and Statistical Manual of Mental Disorders-IV Multiple Response Adapted for Juveniles Questionnaire (DSM-IV-MR-J) was administered. Additional self-constructed questions enquired about students' socio-demographic and economic characteristics. Our results indicate that adolescents that had problem with gambling or had at least one pathological item on DSM were more likely to be boys and to have been born in a country other than Greece. Additionally, the proportion of those having at least one pathological item on DSM was greater in those with low school grades. The lack of food in the household due to inability of providing food during the last month was significantly associated with both having problem with gambling and having at least one pathological item on DSM. Furthermore, having been worried that there would not be enough food during the last month and having been fed with a restrained variety of food due to lack of recourses were associated with at least one pathological item on DSM. These findings are congruent with the literature suggesting that youth living under poverty often resort to gambling. In conclusion, our results point out the adverse effects of the financial crisis on the development of problem gambling in adolescents within the Greek society. Problem gambling may have developed in response to the ubiquitous insecurity characterizing the Greek society during this rough time period. Interventions should prioritize endowing adolescents with the necessary coping skills for dealing with daily obstacles or life adversities productively and without losing their self-control.

**KEYWORDS:** Problem gambling, financial crisis, poverty, adolescents.

## Introduction

Adolescent problem gambling has emerged as a pressing public health issue and concern worldwide.[1] According to the American Psychiatric Association,[2] gambling disorder is defined as a persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress. Gambling is a popular activity among adolescents worldwide and 0.2–12.3% of youth meet criteria for problem gambling. Gambling behaviour among adolescents, constitutes a problem in Europe and in Greece.[3] The etiology of gambling disorder is complex and multifaceted as it is governed by a complex set of interrelated factors. The interaction between bio-psycho-social determinants, including cognitive and

*Corresponding author:* Assimina P. Paleologou, Hellenic Centre for Mental Health and Research, 77 Notara str., GR-185 35 Piraeus, Greece • e-mail: mina.palaiologou@yahoo.gr

behavioral components, social, genetic and familial influences is crucial and should be taken into consideration.[4]

Adolescents with gambling-related problems experience a wide range of negative consequences on their physical and mental health, their financial and legal status and their family and interpersonal relationships.[5] Adolescents who meet criteria for pathological gambling display higher rates of emotional symptoms, conduct problems, attention/hyperactivity and social dysfunction.[6] Most of research on gambling problems among adolescents and young adult has been focused on measuring prevalence. Research on the social nature of gambling and on the influence of environmental and cultural settings remains scarce.

Socioeconomic inequality has an increasing impact on adolescent health.[7] Social factors strongly affect adolescents' health. The strongest determinants of adolescent health worldwide are national wealth, income inequality, and access to education.[8–10] At an individual level, studies have indicated that adolescents who report poorer health status and poorer health behaviors (e.g., substance use) live often in areas of high unemployment and come from low family affluence.[11] People who face financial poverty are more likely to take risks, including gambling, in an endeavor to overcome daily stresses and to reduce negative affect. Gambling is deemed as an easy way to gain money.[12]

The European Psychiatric Association (EPA) guidance paper mention the consequences of economic crises in Europe: uunemployment, indebtedness, precarious working conditions, inequalities, lack of social connectedness, and housing instability influence mental health. Male gender and stigmatized populations could be particularly at risk.[13] The effects of the declining financial conditions on mental health include depression, anxiety, substance abuse, suicide and psychological distress. Already vulnerable population groups, such as people with mental disorders, children, migrants, uneducated, ethnic minorities, or socially/economically deprived demonstrate these particularly negative outcomes. Specific factors, such as unemployment, debts, or housing instability, may play an important role in the onset or persistence of mental disorders or behavioral problems.[11,12,14–17]

Since 2009 Greece has experienced a grave and enduring financial crisis, which has impinged on children's and adolescents' mental health.[14,15] Many factors such as job insecurity, unemployment, increasing social inequalities, poverty, social exclusion (especially for vulnerable groups in society), the inability to control one's own life, and uncertainty about the future have led the majority of the Greek population to conditions of experiencing deep psychological pain and distress.[16,17] Gross domestic product has fallen, the income and employment have decreased, and the public health and welfare sectors have been affected.[15] There is evidence suggesting a link between financial crises and vulnerability to various forms of addictions including gambling disorder.[18,19]

A cross-sectional survey was carried out in Greece to explore socio-economic and demographic differences among gamblers with a special interest in the influence of the recession. Low to zero income was found to constitute a risk factor for the development of a gambling disorder. Having started gambling during the recession increased the possibility of having gambling related problems.[18] A similar survey has not been conducted within an adolescent population before.

Against this background, the present study sought to explore adolescents' gambling involvement within the Athens region and to identify the socio-economic characteristics of adolescents who had engaged into the gambling activities.

## Material and Method

### Sample

A total of 339 students was recruited from 6 schools in Athens area. A random sample of public schools was selected from the pertinent list of the Ministry of Education. In each school unit, a random sample of classrooms was chosen.

### Assessment

The following personal and family data were recorded: gender, age, nationality, living arrangement (both parents, one parent, neither parent), parental involvement with gambling activities, (yes-no), type of school (public, private).

For the assessment of gambling involvement in adolescents, the Diagnostic and Statistical Manual of Mental Disorders-IV Multiple Response Adapted for Juveniles Questionnaire (DSM-IV-MR-J) was employed.[20] This is a self-report questionnaire consisting of 12 items (9 categories) which tap the pertinent DSM-IV[21] criteria for problem gambling (PG) in adolescents. The majority of items are rated on a four-point scale: (a) never, (b) once or twice, (c) sometimes and (d) often. However, answers are transformed into binary responses (presence-absence of the criterion). A positive answer to more than 4 categories corresponds to the presence of problem gambling. The DSM's clinical description of gambling disorders has been diversified from DSM-IV-TR to DSM-5 in order to achieve higher classification accuracy and to minimize the false negative rate. Specifically, the inclusionary criteria were reduced to 4 out of 9 (instead of 5 out of 10), with the engagement into illegal activities as a means to finance gambling being eliminated.[22] This questionnaire, which has been extensively used in studies exploring PG in ad-

olescents,[23–25] assesses a number of important variables related to PG: progression and preoccupation, tolerance, withdrawal and loss of control, escape, chasing, lies and deception, illegal activities and family/school disruption.[20] The instrument was used for the first time in Greece in a cross-sectional study conducted by the First Department of Psychiatry in the University of Athens.[26]

### Procedure

Data were collected in the form of a self-report questionnaire during one school hour. The research was approved by the Ministry of Education. For this study, approval was also obtained by the Eginition Hospital Ethics Committee. Informed consent was obtained from parents prior to participation in the study. Members of the research team visited each school in order to inform the School Principal, the staff and the Parents' Association about the project. In agreement with the School Principal they entered the classrooms and introduced themselves and the study to the students, while they distributed the informed consent forms. One week after the first visit, members of the research team visited the classrooms for a second time, in order to administer the questionnaires to the students who had previously provided a signed informed consent for participation by their parents.

### Statistical analysis

The chi-square and the Fisher's exact tests were used for comparisons. Multiple stepwise logistic regression analysis was used (p for removal was set at 0.1 and p for entry was set at.05) in order to find independent factors associated with having problem with gambling and having at least one pathological item on DSM. Odds ratios (OR) with 95% confidence intervals (95% CI) were computed from the results of the logistic regression analyses. Gender, age, nationality, place of birth, living with both parents, last year's school grades, worrying that there would be not enough food in their home, being fed with restrained variety of food due to lack of resources and having complete lack of food in their household due to inability of providing food in any way, were used as independent variables. All reported p values are two-tailed. Statistical significance was set at $p<0.05$ and analyses were conducted using SPSS statistical software (version 19.0).

## Results

The sample consisted of 141 boys and 198 girls, 53.7% of whom were 16 years old. Sample characteristics are presented in table 1. The majority of them were Greek (89.4%) and 82.3% lived with both parents. During last month 8.6% of the sample stated that they had been worried that there would not be enough food in their home, while 7.1% stated that there was a limited variety of food in their household due to lack of recourses. Ten adolescents (2.9%) remarked that during the last month there had been a time when there was no food at all in their household due to financial hardship.

Univariate associations of having problem with gambling and of having at least one pathological item on DSM with demographics and economic crisis related characteristics are also shown in table 1. Adolescents that had problem with gambling or had at least one pathological item on DSM were more likely to be boys. Also, there were more likely to have been born in countries other than Greece. A significantly lower proportion of participants having problem with gambling was found among adolescents with Greek nationality. Additionally, the proportion of those having at least one pathological item on DSM was greater in those with low school grades. The existence of a time during the last month, when there was no food at all in the household due to financial was significantly associated with both having problem with gambling and having at least one pathological item on DSM. Furthermore, having been worried that there would not be enough food in their home during the last month and having been fed with a limited variety of foods due to lack of recourses was associated with greater proportions of having at least one pathological item on DSM.

In the multiple logistic regression analysis with a stepwise method and the presence of problem with gambling as dependent variable (table 2), it was found that gender, place of birth and the existence of a time during the last month when there was no food at all in the household due to financial hardship were independently associated with problem gambling. Specifically, girls were less likely to have problem with gambling, while those that had been born in another country and those who recounted a time during the last month with no food at all in their household had 27.56 and 15.57 times respectively, greater odds for having problem with gambling. Multiple logistic regression analysis for having at least one pathological item on DSM revealed again a significant association with gender and place of birth (table 3). Additionally, having been worried that there would not be enough food in their home was found to be associated with 2.94 times greater likelihood for having at least one pathological item on DSM.

## Discussion

Existing evidence indicates the presence of pathological gambling in adolescents despite the differences among assessment instruments and timeframes. There is wide variation in problem gambling prevalence rates across different countries. In Europe, 0.2–12.3% of youth meet

**Table 1.** Sample characteristics and their association with having problem with gambling and with having at least one pathological item on DSM.

| | | Problem Gambler | | | At least one pathological item on DSM | | |
|---|---|---|---|---|---|---|---|
| | | No | Yes | | No | Yes | |
| | Total sample (N=339; 100%) | (N=326; 96.2%) | (N=13; 3.8%) | | (N=288; 85.0%) | (N=51; 15.0%) | |
| | N (%) | N (%) | N (%) | p | N (%) | N (%) | p |
| Gender | | | | | | | |
| Boys | 141 (41.6) | 129 (91.5) | 12 (8.5) | <0.001* | 105 (74.5) | 36 (25.5) | <0.001* |
| Girls | 198 (58.4) | 197 (99.5) | 1 (0.5) | | 183 (92.4) | 15 (7.6) | |
| Age | | | | | | | |
| 16 | 182 (53.7) | 176 (96.7) | 6 (3.3) | 0.5798* | 159 (87.4) | 23 (12.6) | 0.182* |
| 17–19 | 157 (46.3) | 150 (95.5) | 7 (4.5) | | 129 (82.2) | 28 (17.8) | |
| Nationality | | | | | | | |
| Greek | 303 (89.4) | 295 (97.4) | 8 (2.6) | 0.007** | 260 (85.8) | 43 (14.2) | 0.203* |
| Other | 36 (10.6) | 31 (86.1) | 5 (13.9) | | 28 (77.8) | 8 (22.2) | |
| Place of birth | | | | | | | |
| Greece | 325 (95.9) | 316 (97.2) | 9 (2.8) | 0.001** | 279 (85.8) | 46 (14.2) | 0.044** |
| Other country | 14 (4.1) | 10 (71.4) | 4 (28.6) | | 9 (64.3) | 5 (35.7) | |
| Living with both parents? | | | | | | | |
| No | 60 (17.7) | 56 (93.3) | 4 (6.7) | 0.257** | 50 (83.3) | 10 (16.7) | 0.698* |
| Yes | 279 (82.3) | 270 (96.8) | 9 (3.2) | | 238 (85.3) | 41 (14.7) | |
| Last year's school grades | | | | | | | |
| Fail/ Fair/ Pass | 23 (6.8) | 20 (87.0) | 3 (13.0) | 0.053** | 16 (69.6) | 7 (30.4) | 0.041* |
| Good/ Very good | 208 (61.4) | 200 (96.2) | 8 (3.8) | | 175 (84.1) | 33 (15.9) | |
| Excellent | 108 (31.9) | 106 (98.1) | 2 (1.9) | | 97 (89.8) | 11 (10.2) | |
| During last month, did you worry that there would be not enough food in your home? | | | | | | | |
| No | 310 (91.4) | 300 (96.8) | 10 (3.2) | 0.090** | 268 (86.5) | 42 (13.5) | 0.025** |
| Yes | 29 (8.6) | 26 (89.7) | 3 (10.3) | | 20 (69.0) | 9 (31.0) | |
| If yes, how often did it happen? | | | | | | | |
| Rarely | 16 (55.2) | 15 (93.8) | 1 (6.3) | 0.573** | 12 (75.0) | 4 (25.0) | 0.688** |
| Sometimes/ Often | 13 (44.8) | 11 (84.6) | 2 (15.4) | | 8 (61.5) | 5 (38.5) | |
| During last month, did you or anyone else were fed with restrained variety of food due to lack of resources? | | | | | | | |
| No | 315 (92.9) | 304 (96.5) | 11 (3.5) | 0.233** | 272 (86.3) | 43 (13.7) | 0.016** |
| Yes | 24 (7.1) | 22 (91.7) | 2 (8.3) | | 16 (66.7) | 8 (33.3) | |
| If yes, how often did it happen? | | | | | | | |
| Rarely | 18 (75.0) | 17 (94.4) | 1 (5.6) | 0.446** | 13 (72.2) | 5 (27.8) | 0.362** |
| Sometimes/ Often | 6 (25.0) | 5 (83.3) | 1 (16.7) | | 3 (50.0) | 3 (50.0) | |

*Continues*

**Table 1.** *(Continued).*

| | | Problem Gambler | | | At least one pathological item on DSM | | |
|---|---|---|---|---|---|---|---|
| | | No | Yes | | No | Yes | |
| | Total sample (N=339; 100%) | (N=326; 96.2%) | (N=13; 3.8%) | | (N=288; 85.0%) | (N=51; 15.0%) | |
| | N (%) | N (%) | N (%) | p | N (%) | N (%) | p |
| During last month, was there a time with complete lack of food in your household due to inability of providing food in any way? | | | | | | | |
| No | 329 (97.1) | 318 (96.7) | 11 (3.3) | 0.050** | 282 (85.7) | 47 (14.3) | 0.048** |
| Yes | 10 (2.9) | 8 (80.0) | 2 (20.0) | | 6 (60.0) | 4 (40.0) | |
| If yes, how often did it happen? | | | | | | | |
| Rarely | 5 (50.0) | 4 (80.0) | 1 (20.0) | 1.000** | 3 (60.0) | 2 (40.0) | 1.000** |
| Sometimes/ Often | 5 (50.0) | 4 (80.0) | 1 (20.0) | | 3 (60.0) | 2 (40.0) | |

Note: *Pearson's chi square test; **Fisher's exact test

**Table 2.** Results from multiple logistic regression analysis in a stepwise method with dependent variable the presence of problem with gambling.

| | β | SE | OR (95% CI)* | p |
|---|---|---|---|---|
| Gender | | | | |
| Boys | | | 1.00** | |
| Girls | –3.25 | 1.10 | 0.04 (0.004–0.33) | 0.003 |
| Place of birth | | | | |
| Greece | | | 1.00 | |
| Other country | 3.32 | 0.85 | 27.56 (5.22–145.63) | <0.001 |
| During last month, was there a time with complete lack of food in your household due to inability of providing food in any way? | | | | |
| No | | | 1.00 | |
| Yes | 2.75 | 1.01 | 15.57 (2.16–112.07) | 0.006 |

Note: $R^2$=0.34; $x^2(3)$=33.76; p<0.001; *Odds ratio (95% Confidence interval); **indicates reference category

**Table 3.** Results from multiple logistic regression analysis in a stepwise method with dependent variable having at least one pathological item on DSM.

| | β | SE | OR (95% CI)* | p |
|---|---|---|---|---|
| Gender | | | | |
| Boys | | | 1.00** | |
| Girls | –1.47 | 0.34 | 0.23 (0.12–0.45) | <0.001 |
| Place of birth | | | | |
| Greece | | | 1.00 | |
| Other country | 1.28 | 0.61 | 3.61 (1.09–11.96) | 0.036 |
| During last month, did you worry that there would be not enough food in your home? | | | | |
| No | | | 1.00 | |
| Yes | 1.08 | 0.46 | 2.94 (1.20–7.22) | 0.018 |

Note: $R^2$=0.15; $x^2(3)$=29.79; p<0.001; *Odds ratio (95% Confidence interval); **indicates reference category

criteria for problem gambling. In North America problem gambling prevalence rates range from 2.1 to 2.6%.[3,27]

In Greece, the prevalence of problem gambling in adolescents in the greater area of Athens is 5.6%, according to a study conducted by the First Department of Psychiatry in the University of Athens.[26] Additionally, findings from two other studies assessing internet addictive behaviors have documented that the prevalence of engagement into internet gaming and/or gambling behaviors was 15.1% while 37.2% of adolescents reported having had some experience with internet gambling. Moreover, 4.1% of the participants were classified as problem gamblers.[28,29]

The primary aim of the present study was to advance knowledge on adolescent gambling research by examining the association between sociodemographic correlates of adolescent gambling in a sample of adolescent students living in Athens. Our results indicate a significant link between the existence of a time with complete lack of food in the household due to inability of providing food in any way during the last month and both having problem with gambling and having at least one pathological item on DSM. Additionally, a greater proportion of pathological gamblers was found among adolescents who reported frequent concern over the availability of food in the household.

These results are congruent with the literature suggesting that youth living under poverty, often results to gambling.[3] Adolescents who face financial difficulties may view gambling as a possible solution to a dead-end created by the financial hardship and/or they try to escape reality. Findings from the United States, England, Australia and Canada provide further support to the claim that poverty serves as an important risk factor for problem gambling. Prevalence rates are higher in populations living in poverty as compared to the general population.[30,31] More specifically, previous studies have indicated that the strength of association between anxiety disorders and problem gambling varied as a function of one's income. Specifically, people with anxiety disorders had more severe gambling problems if they had lower socioeconomic status.[32,33] Adolescents who perceive their financial family situation as low are more likely to become risk gamblers than those who perceive it as medium/high.[34] According to a study that investigated problem gambling among a Canadian homeless youth sample, the percentage of youth who exhibited gambling-related risk behavior was 12,6%.[35] Findings from a large-scale Italian representative survey stressed the importance of structural determinants in adolescent gambling, with prevalence rates being higher among adolescents who lived in more disadvantaged regions in Italy.[36]

Our results also indicate that adolescent problem gamblers were more likely to have been born in a country other than Greece. A significantly lower proportion of participants having problem with gambling was found among adolescents with Greek nationality and there was a significant association of the place of birth with problem gambling. High prevalence of gambling disorder has been found among racial and ethnic minorities in previous studies held in various countries.[37] Greece, during the last years has been a central host country for immigrants. For the refugees, the living conditions in Greece are poor and they experience changes both at an individual and family level. Economic crisis in combination with migrant crisis expose adolescents to multiple sources of stressors.[38,39]

Refugees confront not only poverty but also racism. There is evidence that discrimination constitutes a risk factor for problem gambling too.[40] Economic and migrant crises are two contexts that may interact in a collaborative way. Therefore, it may be assumed that trauma and negative incidents in life constitute the mediating factor between the economic recession, the refugee/immigration crisis and problem gambling. There are actually many reports in the international bibliography connecting problem gambling with traumatic life incidents.[41–44] Within the context of financial insecurity and immigration crises, gambling could constitute a pathological solution.

In conclusion, on the grounds of these results, there is indication about the adverse effects of the financial crisis on the development of problem gambling in adolescents within the Greek society. Concomitantly, it should not be overlooked that the financial crisis promotes feelings of uncertainty and insecurity. Such feelings impinge on individual and social group adult behaviors, resulting in the establishment of an adverse environment for the psychological and emotional development of adolescents. Adolescents' worries about the sufficiency of food in the household showed a clear link with problem gambling, supporting the view that problem gambling may have developed in response to the ubiquitous insecurity characterizing the Greek society.

In this regard, any intervention aiming to reduce this rate should concentrate on raising awareness about pathological gambling in people who surround adolescents (e.g. parents, teachers) as well as in people who work at venues where adolescents may engage into gambling activities. At the same time, interventions should prioritize endowing adolescents with the necessary coping skills for dealing with daily obstacles or life adversities productively and without losing their self-control.

## References


1. St-Pierre R, Derevensky JL. Youth Gambling behavior: Novel Approaches to Prevention and Intervention. *Curr Addict Rep* 2016, 3:157–164, doi: 10.1007/s40429-016-0104-0
2. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. American Psychiatric Publishing, Arlington, VA, 2013, doi: 10.1176/appi.books.9780890425596
3. Blinn-Pike L, Worthy LS, Jonkman JN. Adolescent gambling: A review of an emerging field of research. *J Adolesc Health* 2010, 47:223–236, doi: 10.1016/j.jadohealth.2010.05.003
4. Messerlian C, Derevensky J, Gupta R. Youth Gambling problems: a public health perspective. *Health Promot Int* 2005, 20:69–79, doi: 10.1093/heapro/dah509
5. Derevensky JL. Youth Gambling: Some current misconceptions. *Austin J Psychiatry Behav Sci* 2015, 2:1039. Available from https://austinpublishinggroup.com/psychiatry-behavioral-sciences/full-text/ajpbs-v2-id1039.php
6. Paleologou A, Lazaratou H, Anagnostopoulos D, Economou M, Malliori M, Papadimitriou G et al. Problem gambling and concurrent emotional/behavioral problems among Greek adolescents. *Turk Pediatri Ars* 2019, 54:166–172, doi: 10.14744/TurkPediatriArs.2019.56254
7. Elgar FJ, Pfortner TK, Moor I, De Clercq B, Stevens GW, Currie C. Socioeconomic inequalities in adolescent health 2020–20210: A time-series analysis of 34 countries participating in the Health Behaviour in School-aged Children Study. *Lancet* 2015, 385:2088–2095, doi: 10.1016/S0140-6736(14)61460-4
8. Viner RM, Ozer EM, Denny S, Marmot M, Resnick M, Fatusi A et al. Adolescence and the social determinants of health. *Lancet* 2012, 379:1641–1652, doi: 10.1016/S0140-6736(12)60149-4
9. Henkel D, Zemlin U. Social Inequality and Substance Use and Problematic Gambling Among Adolescent and Young Adults: A Review of Epidemiological Surveys in Germany. *Curr Drug Abus Rev* 2016, 9:26–48, PMID: 26647784
10. Molinaro S, Canale N, Vieno A, Lenzi M, Siciliano V, Gori M et al. Country and individual –level determinants of problematic gambling in adolescence: a multi –level cross national comparison. *Addiction* 2014, 109:2089–2097, doi: org/10.1111/add.12719
11. Elgar FJ, Roberts C, Parry-Langdon N, Boyce W. Income inequality and alcohol use: a multilevel analysis of drinking and drunkenness in adolescents in 34 countries. *Eur J Public Health* 2005, 15:245–250, doi: 10.1093/eurpub/cki093
12. Wiliams RJ, Rehm J, Stevens RM. *The social and economic impacts of gambling*. Lethbridge, Canadian Consortium for Gambling Research, 2011
13. Martin Carrasco M, Evans Lacko S, Dom G, Christodoulou NG, Samochowiec J, González Fraile E et al. Guidance on mental health and economic crises in Europe. *Eur Arch Psychiatry Clin Neurosci* 2016, 266:89–124, doi: 10.1007/s00406-016-0681-x EPA
14. Anagnostopoulos DC, Soumaki E. The state of child and adolescent psychiatry in Greece during the international financial crisis: a brief report. *Eur Child Adolesc Psychiatry* 2013, 22:131–134, doi: 10.1007/s00787-013-03777-y
15. Hellenic Statistical Authority. Unemployment rate at 23.6in 3rd Quarter of 2016. Piraeus: Hellenic Statistical Authority, 2016. Available from www.statistics.gr/the-greek-economy
16. Kentikelenis A, Karanikolos M, Papanicolas I, Basu S, McKee M, Stuckler D. Health effects of financial crisis: omens of a Greek tragedy. *Lancet* 2011, 378:1457–1458, doi: 10.1016/S0140-6736(11)61556-0
17. Triantafyllou K, Angeletopoulou C. IMF and European co-workers attack public health in Greece. *Lancet* 2011, 278:1459–1460, doi: 10.1016/ S0140-6736(11)61639-5
18. Economou M, Souliotis K, Malliori M, Peppou LE, Kontoangelos K, Lazaratou H et al. Problem Gambling in Greece: Prevalence and Risk Factors During the Financial Crisis. *J Gambl Stud* 2019, 35:1193–1210, doi: 10.1007/s10899-019-09843-2
19. Dom G, Samochowiec J, Evans-Lacko S, Wahlbeck K, Van Hal G, McDaid D. The Impact of the 2008 Economic Crisis on Substance Use Patterns in the Countries of the European Union. *Int J Environ Res Public Health* 2016, 13:122, doi: 10.3390/ijerph13010122
20. Fisher SE. Developing the DSM-IV-MR-J criteria to identify adolescent problem gambling in non clinical populations. *J Gambl Stud* 2000, 16:253–273, PMID: 14634315
21. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fourth Edition-Test Revision. American Psychiatric Association, Washington, DC: 2000
22. Yau YH, Potenza MN. Gambling disorder and other behavioral addictions: recognition and treatment. *Harv Rev Psychiatry* 2015, 23:134–146, doi: 10.1097/HRP.0000000000000051.
23. Calado F, Alexandre J, Griffiths MD. Validation of the Portuguese DSM-IV-MR-J. *Int J Ment Health Addict* 2016, 14:1096–1106, doi: 10.1007/ s11469-016-9708-9
24. Castrén S, Grainger M, Lahti T, Alho H, Salonen AH. At-risk and problem gambling among adolescents: a convenience sample of first-year junior high school students in Finland. *Subst Abuse Treat Prev Policy* 2015, 10:9, doi: 10.1186/s13011-015-0003-8
25. Stinchfield R.A Critical review of adolescent problem gambling assessment instruments. *Int J Adolesc Med Health* 2010, 22:77–93, PMID: 20491419
26. Anagnostopoulos DC, Lazaratou H, Paleologou MP, Peppou LE, Economou M, Malliori M et al. Adolescent gambling in greater Athens area: a cross-sectional study. *Soc Psychiatry Psychiatr Epidemiol* 2017, 52:1345–1351, doi: 10.1007/s00127-017-1431-8
27. Calado F, Alexandre J, Griffiths MD. Prevalence of Adolescent Problem Gambling: A Systematic Review of Recent Research. *J Gambl Stud* 2017, 33:397–424, doi: 10.1007/s10899-016-9627-5
28. Tsitsika A, Janikian M, Tzavela EC, Schoenmakers TM, Olaffson K et al. *Internet use and internet addictive behaviour among European adolescents: a cross-sectional study, 2013*. Available from www.nivel.nl/nl/publicaties/1002689
29. Floros GD, Siomos K, Fisoun V, Geroukalis D. Adolescent online gambling: The impact of parental practices and correlates with online activities. *J Gambl Studies* 2013, 29:131–150, doi: 10.1007/s10899-011-9291-8
30. Holdsworth L, Tiyce M. Exploring the hidden nature of gambling problems among people who are homeless. *Australian Social Work* 2012, 65:474–489, doi: 10.1080/0312407X.2012.689309
31. Sharman S, Dreyer J, Clark L, Bowden-Jones H. Down and out in London: addictive behaviors in homelessness. *J Behav Addict* 2016, 5:318–324, doi: 10.1556/2006.5.2016.037
32. Van der Maas M. Problem gambling, anxiety and poverty: An examination of the relationship between poor mental health and gambling problems across socio-economic status. *International Gambl Stud* 2016, 16:281–295, doi:10.1080/14459795.2016.1172651
33. Sanacora RL, Whiting SW, Hoff RA, Potenza MN. Relationships between problem-gambling severity and psychopathology as moderated by income. *J Behav Addict* 2016, 5:429–438, doi:10.1556/2006.5.2016.045

34. Canale N, Vieno A, terBogt T, Pastore M, Siciliano V, Molinaro S. Adolescent gambling-oriented attitudes mediate the relationship between perceived parental knowledge and adolescent gambling: Implications for prevention. *Prev Sci* 2016, 17:970–980, doi: 10.1007/s11121-016-0683-y

35. Dufour M, Roy E, Boivin JF, Boudreau JF, Robert M. Correlates of at-risk gambling behaviors of homeless youth. *J Addiction Res Ther* 2014, S10:007, doi: 10.4172/2155-6105.S10-007

36. Canale N, Vieno A, Lenzi M, Griffiths MD, Borraccino A, Lazzeri G et al. Income inequality and adolescent gambling severity: Findings from large-scale Italian representative survey. *Front Psychol* 2017, 8:1318, doi: 10.3389/fpsyg.2017.01318

37. Alegría AA, Petry NM, Hasin DS, Liu S-M, Grant BF, Blanco C. Disordered gambling among racial and ethnic groups in the US: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *CNS Spectr* 2009, 14:132–142, PMID: 19407710

38. Anagnostopoulos DC, Giannakopoulos G, Christodoulou NG. The synergy of the refugee crisis and the financial crisis in Greece: Impact on mental health. *Int J Soc Psychiatry* 2017, 63:352–358 doi: 10.1177/0020764017700444

39. Giannakopoulos G, Anagnostopoulos DC. Child health, the refugees crisis, and economic recession in Greece. *Lancet* 2016, 387:1271, doi: 10.1016/S0140-6736(16)30016-2

40. Currie CL, Wild TC, Schopflocher DP, Laing L, Veugelers P, Parlee B. Racial discrimination, post traumatic stress, and gambling problems among urban Aboriginal adults in Canada. *J Gambl Stud* 2013, 29:393–415, doi: 10.1007/s10899-012-9323-z

41. Horak NS, Eagle G, Stein DJ, Lochner C. Gambling Disorder and Childhood Trauma: A Complex Association. *J Gambl Stud* 2020, doi: 10.1007/s10899-020-09983-w

42. Roberts A, Sharman S, Coid J, Murphy R, Bowden-Jones H, Cowlishaw S et al. Gambling and negative life events in a nationally representative sample of UK men. *Addict Behav* 2017, 75:95–102, doi: 10.1016/j.addbeh.2017.07.002

43. Storr CL, Lee GP, Derevensky JL, Ialongo NS, Martins SS. Gambling and adverse life events among urban adolescents. *J Gambl Stud* 2012, 28:325–36, doi: 10.1007/s10899-011-9254

44. Miller KK, Brown CR, Shramko M, Svetaz MV. Applying Trauma-Informed Practices to the Care of Refugee and Immigrant Youth: 10 Clinical Pearls. *Children* (Basel) 2019, 6:94, doi: 10.3390/children6080094

## APPENDIX
## Ερωτηματολόγιο DSM-IV-MR-J

Παρακαλώ σημείωσε με "X" σε κάθε ερώτηση.

1. Κατά τον τελευταίο χρόνο πόσο συχνά έπιασες τον εαυτό σου να σκέφτεται τον τζόγο ή να προγραμματίζει να τζογάρει;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

2. Κατά τη διάρκεια του τελευταίου χρόνου, ένιωσες την ανάγκη να τζογάρεις με όλο και περισσότερα χρήματα για να αποκτήσεις το ποσό που θα σε συναρπάσει;
   Ναι Όχι

3. Κατά τον τελευταίο χρόνο ξόδεψες για τον τζόγο πολύ περισσότερο από το ποσό που είχες προγραμματίσει να ξοδέψεις;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

4. Κατά τον τελευταίο χρόνο ένιωσες άσχημα ή αγανάκτησες όταν προσπαθούσες να διακόψεις/σταματήσεις τον τζόγο;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά Ποτέ δεν προσπάθησα να διακόψω

5. Κατά τον τελευταίο χρόνο πόσο συχνά ο τζόγος σε βοήθησε στο να ξεφύγεις από προβλήματα ή από το να αισθάνεσαι άσχημα;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

6. Κατά τον τελευταίο χρόνο, αφού έχασες χρήματα, ξαναπήγες την επόμενη ημέρα για να προσπαθήσεις να ξανακερδίσεις τα χρήματα που έχασες την προηγούμενη;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

7. Κατά τον τελευταίο χρόνο, ο τζόγος σε οδήγησε ποτέ στο να λες ψέματα στην οικογένειά σου;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

8. Κατά τον τελευταίο χρόνο, πήρες ποτέ χρήματα από τα ακόλουθα χωρίς άδεια, για να τα ξοδέψεις στον τζόγο: χρήματα για φαγητό στο σχολείο ή χρήματα εισιτηρίου; Χρήματα της οικογένειάς σου; Χρήματα από άτομα εκτός της οικογένειάς σου;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

9. Κατά τον τελευταίο χρόνο σε οδήγησε ποτέ ο τζόγος: σε καβγάδες με την οικογένειά σου, με φίλους ή με άλλους; Στο να κάνεις απουσία στο σχολείο;
   Ποτέ Μία ή δύο φορές Μερικές φορές Συχνά

Ερευνητική εργασία

# Στοιχηματοπαιξία στην εφηβεία και οικονομική κρίση στην Ελλάδα

Ασημίνα Π. Παλαιολόγου,[1,2] Ελένη Λαζαράτου,[3] Δημήτριος Κ. Αναγνωστόπουλος,[2] Αφροδίτη Τριμπούκη,[4] Μαρίνα Οικονόμου,[1] Μελπομένη Μαλλιώρη,[1] Χαράλαμπος Παπαγεωργίου[1]

[1]*Α΄ Ψυχιατρική Κλινική, Ιατρική σχολή, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αθήνα*

[2]*Παιδοψυχιατρική Κλινική, Ιατρική Σχολή, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αθήνα*

[3]*Κοινοτικό Κέντρο Ψυχικής Υγιεινής Βύρωνα-Καισαριανής, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αθήνα*

[4]*Μονάδα Υποκατάστασης, Οργανισμός Κατά των Ναρκωτικών (ΟΚΑΝΑ), Γενικό Νοσοκομείο Καλαμάτας, Καλαμάτα*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 9 Αυγούστου 2020/Αναθεωρήθηκε 17 Οκτωβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Η προβληματική στοιχηματοπαιξία αποτελεί ένα σοβαρό και διαρκώς επιδεινούμενο πρόβλημα των σύγχρονων δυτικών κοινωνιών. Το πρόβλημα δυστυχώς είναι υπαρκτό και στον εφηβικό πληθυσμό. Η αιτιοπαθογένεια της διαταραχής τζόγου είναι σύνθετη καθώς πολλοί και αλληλοδιαπλεκόμενοι παράγοντες, συμπεριλαμβανομένων των κοινωνικο-οικονομικών παραγόντων, μπορεί να συμβάλουν στη γένεσή της. Σε αυτό το πλαίσιο και δεδομένης της οικονομικής κρίσης στην Ελλάδα κατά τα τελευταία έτη, πραγματοποιήσαμε μια μελέτη προκειμένου να διερευνήσουμε την ενασχόληση με τον τζόγο στην ευρύτερη περιοχή της Αττικής, αλλά και να εντοπίσουμε πιθανές συσχετίσεις με τα κοινωνικο-οικονομικά χαρακτηριστικά των εφήβων που εμπλέκονται με δραστηριότητες τζόγου. Συγκεντρώσαμε δείγμα μαθητών σχολείων από την ευρύτερη περιοχή της Αττικής. Για τη διερεύνηση της ενασχόλησης με τον τζόγο χορηγήσαμε το πολλαπλών απαντήσεων διαγνωστικό και στατιστικό εγχειρίδιο ψυχικών διαταραχών IV, διαμορφωμένο για τους νέους: DSM-IV-MR-J. Επιπλέον αντλήσαμε πληροφορίες για τα κοινωνικο-δημογραφικά και οικονομικά χαρακτηριστικά του δείγματος. Σύμφωνα με τα αποτελέσματά μας, οι έφηβοι που βρέθηκαν με τουλάχιστον ένα κριτήριο τζόγου σύμφωνα με το DSM, ήταν πιο πιθανό να είναι αγόρια και πιο πιθανόν να είναι αλλοδαποί. Επίσης, το ποσοστό των εφήβων με τουλάχιστον ένα κριτήριο στο DSM ήταν μεγαλύτερο στους εφήβους που είχαν χαμηλές σχολικές επιδόσεις. Η έλλειψη φαγητού στο νοικοκυριό του εφήβου, λόγω της οικονομικής αδυναμίας της οικογένειας να προμηθεύσει το σπίτι με φαγητό, σχετιζόταν σημαντικά τόσο με τον προβληματικό τζόγο, όσο και με την ύπαρξη τουλάχιστον ενός κριτηρίου διαταραχής τζόγου στο DSM. Επιπρόσθετα, η ανησυχία σε σχέση με την επάρκεια του φαγητού στο νοικοκυριό κατά τον τελευταίο μήνα λόγω των οικονομικών δυσκολιών της οικογένειας, σχετιζόταν επίσης με την ύπαρξη τουλάχιστον ενός κριτηρίου διαταραχής τζόγου στο DSM. Τα παραπάνω αποτελέσματα αναδεικνύουν ότι οι έφηβοι που ζουν υπό το καθεστώς της φτώχειας, συχνά έχουν ενασχόληση με τον τζόγο. Το εύρημα αυτό είναι συμβατό και με τη διεθνή βιβλιογραφία. Συμπερασματικά, σύμφωνα με τα αποτελέσματα της παρούσας έρευνας, η οικονομική κρίση επηρεάζει σημαντικά την ανάπτυξη του προβληματικού τζόγου στους Έλληνες εφήβους. Η στοιχηματοπαιξία μπορεί να αποτελεί μία διέξοδο απέναντι στην ανασφάλεια που χαρακτηρίζει την ελληνική κοινωνία κατά τη διάρκεια της δύσκολης αυτής περιόδου της οικονομικής κρίσης. Είναι σημαντικό να δρομολογηθούν παρεμβάσεις στους εφήβους, που να δίνουν προτεραιότητα στην ανάπτυξη δεξιοτήτων αντιμετώπισης των δυσκολιών κατά τρόπο παραγωγικό ώστε να μη χάνουν τον αυτο-έλεγχό τους και να μην οδηγούνται στην εξάρτηση.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Προβληματική στοιχηματοπαιξία, οικονομική κρίση, φτώχεια, εφηβεία.

*Συγγραφέας επικοινωνίας:* Ασημίνα Π. Παλαιολόγου, Ελληνικό Κέντρο Ψυχικής Υγιεινής και Ερευνών, Νοταρά 77, 185 35 Πειραιάς, Διεύθυνση e-mail: mina.palaiologou@yahoo.gr

https://doi.org/10.22365/jpsych.2021.008 Psychiatriki 2021, 32:43–50

Research article

# Validation of the Empathy Quotient (EQ) - Greek version

Artemios Pehlivanidis,[1] Konstantinos Tasios,[2] Katerina Papanikolaou,[3]
Athanassios Douzenis,[2] Ioannis Michopoulos[2]

[1]*First Department of Psychiatry, National and Kapodistrian University of Athens, Eginition Hospital, Athens*
[2]*Second Department of Psychiatry, National and Kapodistrian University of Athens, «Attikon» Hospital, Athens*
[3]*Department of Child Psychiatry, National and Kapodistrian University of Athens, Agia Sophia Children's Hospital, Athens, Greece*

**ARTICLE HISTORY:** Received 14 June 2020/Revised 11 October 2020/Published Online 17 March 2021

**ABSTRACT**

The original English language Empathy Quotient (EQ) is a self-reporting questionnaire that measures the construct of empathy in adults of normal intelligence. The EQ is sensitive to gender, and neurodevelopmental disorders. The EQ has been translated to many languages all over the world. The EQ – Greek version may be available through open access from www.autismresearch-centre.com. Aim of the present study was to validate the EQ- Greek version. The study took place in the 1st and 2nd Departments of Psychiatry of the National and Kapodistrian University of Athens (NKUA), "Eginition" and "Attikon" Hospitals respectively, and in the Korydallos Prison Psychiatric Clinic in Athens. Two groups completed the original 60 items version. One group consisted of general population and volunteer students from post graduate training programs (normal control group, N= 127) and the other group of patients recruited from the Adult Neurodevelopmental Disorders Unit of the 1st Department of Psychiatry of NKUA, the outpatients' clinic of the 2nd Department of Psychiatry of NKUA and the Korydallos Prison Psychiatric Clinic (patient group, N=196). Three versions of the EQ were examined: the EQ-40, EQ-28 and EQ-15. All versions showed very good internal validity: Cronbach's α value was 0.902, 0.892 and 0.793 respectively. They all showed good test-retest variability: the Intraclass Correlation Coefficient was 0.928, 0.924 and 0.855 respectively. Concurrent validity examined by the correlation analysis with the Interpersonal Reactivity Index (IRI) showed non-significant correlations between the EQ and the IRI. Exploratory Factor Analysis (EFA) indicated a one-factor structure for the three versions. Confirmatory Factor Analysis (CFA) for the one-factor structure showed a good fit for all the three versions. CFA for the three-factor structures (Cognitive Empathy, Emotional Empathy, Social Skills) showed also a good fit for EQ-28 and the EQ-15. When the EQ-40 was used as a measure of empathy in a single dimension in adults, the EQ discriminated the normal control group from the patients' group. The mean EQ score for the total sample was 35.84 with the lowest scoring being among Autism Spectrum Disorder (ASD) patients. As expected, females scored higher than males ($p<0.001$). To conclude, the Greek version of EQ showed good psychometric properties and could serve as a useful tool for clinicians to assess empathy in clinical populations and especially in subjects with ASD and other neurodevelopmental disorders.

**KEYWORDS:** Empathy Quotient, EQ, Greek, psychometric properties.

## Introduction

Baron-Cohen's work on Theory of Mind[1] and the neurocognitive model of empathy[2] identify key mechanisms through which empathy appears to develop. Principal amongst these are the "Emotion Detector", which allows individuals to recognize and represent affective states in others, and our own affective reactions in response (e.g. "I am sad – that you are distressed"); and the "Empathizing System", which allows individuals to mentally represent epistemic mental states (e.g. "my patient thinks that she is worthless").

The Empathy Quotient (EQ) is a well-validated self-reporting questionnaire[3] that was found to measure the construct of empathy in adults of normal intelligence both as a one-factor[4] and three-factor dimension.[5,6] The EQ is sensitive to gender, and neurodevelopmental disorders. Females on average have

*Corresponding author:* Artemios Pehlivanidis, First Department of Psychiatry, National and Kapodistrian University of Athens, Eginition Hospital, 72–74 Vas. Sophias Ave., GR-115 26 Athens, Greece • e-mail: apechlib@med.uoa.gr

higher scores than males[3] while individuals with an autism spectrum disorder (ASD) have reduced levels of EQ scores, relative to typical controls.[3,5,7–10] Recently Groen et al.[11] reported that adults with a subclinical Attention Deficit Hyperactivity Disorder (ADHD) diagnosis had reduced levels of the EQ scores compared to the control group.

The original English-language version of EQ has been translated to many other languages namely: Chinese,[12] Dutch,[13] French,[7] Italian,[14] Japanese,[9] Korean,[8] Portuguese,[15] Russian,[16] Serbian,[17] Turkish,[18] and Farsi.[19] It has been found that in the western countries the EQ scores are higher compared to translations from Asian countries.[13]

Across studies concurrent validity has been examined by correlations between EQ and other instruments measuring aspects of empathy. Among them the Interpersonal Reactivity Index[20] has shown moderate correlation with EQ,[8,12,17] and is the only one that has been validated in Greek.[21]

The EQ-Greek version may be freely downloaded from the site of the Autism Research Center founded by Baron-Cohen (www. autismresearchcentre.com).[22] It has been used in Greek patients with schizophrenia[23] and eating disorders,[24] but its validity and reliability have not been examined so far. The present study aims to assess the psychometric properties of the Greek translation of the EQ in adult patients with neurodevelopmental disorders, other psychiatric disorders and normal controls.

## Material and Method

### Subjects

The study took place in the 1st and 2nd Departments of Psychiatry of the National and Kapodistrian University of Athens (NKUA), "Eginition" and "Attikon" Hospitals respectively, and in the Korydallos Prison Psychiatric Clinic in Athens. All subjects consented to participate in the study which was approved by the Ethics Committee of the National and Kapodistrian University of Athens Medical School. A total of 323 subjects participated in the study. Subjects were divided in two groups. The first group consisted of general population participants and volunteers that were students in a post graduate training program (Normal Control group, N=127). The second group consisted of: (a) patients recruited from the Adult Neurodevelopmental Unit of the 1st Department of Psychiatry where EQ was administered among other self-report instruments as screeners before the clinical evaluation for diagnosis of Autism Spectrum Disorder (ASD) and/or Attention Deficit Hyperactivity Disorder (ADHD),[25] (b) patients from the outpatient clinic of the 2nd Department of Psychiatry ("Attikon" Hospital) and (c) patients from the Korydallos Prison Psychiatric Clinic (Athens) (Patient group, N=196). Test-retest variability was assessed by administering the EQ to 35 postgraduate students, randomly selected, on two occasions with a 30 days interval.

### Diagnostic procedure

Patients and controls gave informed consent in order to participate. They were both examined by a psychiatrist who used a semi-structured clinical interview for psychiatric diagnosis. The assessment procedure of the patients with neurodevelopmental disorders was built on a standard diagnostic routine and was carried out by a multi-disciplinary team. The DIVA[26] was administered to all patients while the ADOS[27,28] was administered to selected cases considered to be more complicated. The procedure is described in detail by Pehlivanidis et al.[29]

### Tools

a) EQ is a self-assessment instrument for measuring empathy in adults of normal intelligence, available from the www. autismresearchcentre.com. It was explicitly designed to be applied in a clinical context and to be sensitive to lack of empathy as a feature of psychopathology.[3] The EQ comprises 60 items , broken down into two types of questions: 40 questions tapping empathy (items 1, 4, 6, 8, 10, 11,12, 14, 15, 18, 19, 21, 22, 25, 26, 27, 28, 29, 32, 34,35, 36, 37, 38, 39, 41, 42, 43, 44, 46, 48, 49, 50, 52,54, 55, 57, 58, 59, and 60), and 20 filler items (items2, 3, 5, 7, 9, 13, 16, 17, 20, 23, 24, 30, 31, 33, 40, 45,47, 51, 53, and 56). The 20 filler items were included to distract the participant from a relentless focus on empathy. Responses are given on a 4-point Likert scale. Each of the items listed above scores 1 point if the respondent records the empathic behavior mildly, or 2 points if the respondent records the behavior strongly. The affective and cognitive components are mixed. Approximately half of the items were worded to produce a "disagree" response and half to produce an "agree" response for the empathic response. This was to avoid a response bias either way. Following this, items were randomized. The EQ has a forced choice format, can be self-administered, and is straightforward to score because it does not depend on any interpretation. It can be measured along a single dimension; therefore, it is acceptable to use a summed total EQ score. Scores can range from 0 to 80 points. In its initial validation EQ showed excellent internal consistency (Cronbach's a= 0.92) and test-retest reliability (r=0.97).[3] The EQ has also been used in two shorter versions, one with 28 items (1, 4, 6, 8, 12, 14, 19, 21, 22, 25, 26, 27, 29, 32, 35, 36, 41, 42, 43, 44, 48, 50, 52, 54, 55, 57, 58, 59) and one with 15 items (4, 6, 8, 12, 14, 25, 26, 27, 32, 35, 44, 50, 52, 54, 59) with good psychometric properties.[5,6,13,17]

b) International Reactivity Index (IRI) has been introduced by Davis.[20] It has been translated and validated in the Greek language by Tsitsas and Malikiosi-Loizou.[21] It consists of 28 questions answered on a 5-point Likert scale ranging from "Does not describe me well" to "Describes me very well», incorporating both cognitive and affective dimensions across four 7-item subscales:

1) Perspective Taking (PT) assesses the tendency to spontaneously adopt the psychological point of view of others, with higher scores suggesting higher cognitive and social functioning.
2) Fantasy (F) taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, films and plays.
3) Empathic Concern (EC) assesses "other-oriented" feelings of sympathy and concern for unfortunate others.
4) Personal Distress (PD) measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings.

### Statistical analysis

The following tests were used for the statistical analysis of the data: Kolmogorov-Smirnov and Shapiro-Wilk for assessing the Normal distribution of the variables; the Pearson $x^2$ test for comparison of percentages; t-test for comparison of means of variables; one-way ANOVA with Pairwise comparisons (Bonferroni correction) for the comparison of means for more than two groups and correlations were tested by the Pearson r coefficient. The psychometric properties of the three versions of the EQ (40, 28 and 15 items) were evaluated by the following: construct validity was assessed by inter-item and inter-total correlations; the internal consistency of the scale was calculated with Cronbach's alpha coefficient (minimum acceptable value for alpha was 0.7); factor structure was examined by exploratory factor analysis (principal components with varimax rotation). Furthermore, confirmatory factor analysis (CFA) was performed in order to check the one-factor model (40, 28, 15 items) and the three-factor model (15, 28 items). Since no factor structure has been previously proposed for the 40-item version the three factor models were tested only for the 28-item and 15-item versions. The Intraclass Correlation Coefficient was used to explore the test-retest reliability. Concurrent validity was assessed by calculating correlations between the EQ and the IRI. Statistical analysis was carried out using SPSS (Version 25.0) for Windows. CFA was done by the use of the Jamovi software (Jamovi 1.2.27).

## Results

### Participant characteristics

The subjects consisted of two subgroups: 196 patients and 127 controls. The demographic data for the participants and the mean scores in EQ are listed in table 1. The two groups did not differ in age. The differences in education and sex between groups were statistically significant. The mean EQ (EQ-40) score for the total sample was 35.84 (sd=12.2). Controls presented significantly greater values of empathy. This difference remained the same even when the controls were compared with the patients divided according to diagnosis for all groups: one-way ANOVA F=29.6, p<0.001, between groups Bonferroni correction (table 2). Females scored higher than males: 40.93 (sd=10.8) vs. 31.44 (sd=11.6), t=7.5 (p<0.001).

### Psychometric properties of EQ

The psychometric properties of the EQ were tested on the three versions of the scale, EQ-40, EQ-28 and EQ-15.

*Internal consistency*. The EQ Cronbach's α value for the EQ-40 was 0.902, the inter-item correlations ranged from 0.158 to 0538 and the inter-total correlations had a range from 0.008 to 0.610. Cronbach's α value if item deleted ranged from 0.897 to 0.905. The EQ Cronbach's α value for the EQ-28 was 0.892, the inter-item correlations ranged from 0.101 to 0.262 and the inter-total correlations had a range from 0.208 to 0.617. Cronbach's α value if item deleted ranged from 0.885 to 0.892. The EQ Cronbach's α value for the EQ-15 was 0.793, the inter-item correlations ranged from 0.036 to 0.538 and the inter-total correlations had a range from 0.196 to 0.529. Cronbach's α value if item deleted ranged from 0.771 to 0.797.

**Table 1.** Demographic data for the participants and the mean scores in EQ.

| | Patients (n=196) | Controls (n=127) | t-test | p |
|---|---|---|---|---|
| Sex (%female) | 31.1 | 69.8 | 46.2* | <0.001 |
| Age | 34.5 (11.3) | 33.04 (5.1) | –1.5 | 0.11 |
| Education (years) | 13.2 (2.6) | 16.6 (0.9) | 16.2 | <0.001 |
| EQ | 30.7 (11.6) | 43.6 (8.4) | 11.5 | <0.001 |

*$x^2$

**Table 2.** Differences in EQ between all groups (One-way ANOVA- Pairwise comparisons).

| | Mean (SD) | Control n=127 | ASD n=31 | ADHD n=85 | Depression n=20 | Psychosis n=30 | Other n=30 |
|---|---|---|---|---|---|---|---|
| Control | 43.6 (8.4) | – | <0.001 | <0.001 | 0.03 | <0.001 | <0.001 |
| ASD | 21.0 (7.7) | | – | <0.001 | 0.004 | <0.001 | 0.047 |
| ADHD | 33.1 (11.7) | | | – | 1.0 | 1.0 | 1.0 |
| Depression | 34.0 (13.9) | | | | – | 1.0 | 1.0 |
| Psychosis | 34.8 (10.4) | | | | | – | 0.54 |
| Other | 29.1 (8.6) | | | | | | – |

ASD: Autistic Spectrum Disorder, ADHD: Attention Deficit Hyperactivity Disorder

*Test-retest reliability*. The EQ showed high retest stability. The Intraclass Correlation Coefficient was for the EQ-40 0.928 (range 0.881-0.962), for the EQ-28 0.924 (range 0.884-0.955) and for the EQ-15 0.855 (range 0.779–0.915). There were not any statistically significant differences between test and retest. For the EQ-40: test mean=44.7 (sd=9.1), retest mean=43.6 (sd=9.3), t-test: t=1.1, p=0.2, correlation: r=0.81, p<0.001. For the EQ-28: test mean=44.7 (sd=9.1), retest mean=32.1 (sd=7.1), t-test: t=2, p=0.06, correlation: r=0.81, p<0.001. For the EQ-15: test mean=17.2 (sd=3.9), retest mean=16.7 (sd=3.8), t-test: t=1.04, p=0.3, correlation: r=0.72, p<0.001.

*Factor analysis*. Three separate Exploratory Factor Analyses (EFA) were performed, one for every version of the EQ: (a) The EQ-40 showed a ten-factor structure; 10 factors explained 57.548% of the variance. Thirty of the 40 items (75%) loaded on the first factor, supporting the one-factor structure of the scale. (b) The EQ-28 showed a six-factor structure; six factors explained 54.2% of the variance. Twenty-one of the 28 items (75%) loaded on the first factor, supporting the one-factor structure of the scale. (c) The EQ-15 showed a four-factor structure; four factors explained 53.5% of the variance. Eleven of the 15 items (75%) loaded on the first factor, supporting the one-factor structure of the scale.

Confirmatory Factor analyses (CFA) were performed for every version of the EQ. For the EQ-40 only for the one-factor structure, but for the EQ-28 and EQ-15 both for the one-factor and the three-factor structures (Cognitive Empathy, Emotional Empathy, Social Skills), following the model that has been proposed in earlier studies.[13] As it can be seen in table 3, all the five hypotheses produced a well-fit model. All models were acceptable. The three-factor models (EQ-28 and EQ-15) presented a good fit, with a Root Mean Squared Error of Approximation (RMSEA) of 0.057 and 0.052 respectively, while the RMSEA of the one-factor models was greater, indicating less fit. The Comparative Fit Index (CFI) produced similar results.

*Concurrent validity*. No significant association between the EQ and the IRI subscales was found. This was the case for the three versions of the EQ. The correlations between the EQ-40 and the IRI subscales were as follows: PT (r=0.14, p=0.5), F (r=0.01, p=0.9), EC (r=0.15, p=0.3), PD (r=–0.1, p=0.9). The correlations between the EQ-28 and the IRI subscales were: PT (r=0.24, p=0.1, F (r=0.07, p=0.6), EC (r=0.29, p=0.07), PD (r=v0.09, p=0.5). The correlations between the EQ-15 and the IRI subscales were: PT (r=0.23, p=0.1, F (r=0.12, p=0.4), EC (r=0.39, p=0.013), PD (r=-0.20, p=0.2). The only significant association was between the EQ-15 and the EC subscale of the IRI.

## Discussion

Our study provides psychometric properties for all three versions of the Greek translation of EQ namely EQ-40, EQ-28 and EQ-15. The study involved typical controls (students and normal population) as well as adults of normal intelligence diagnosed with a neurodevelopmental disorder (ASD and/or ADHD) or other psychiatric disorders.

When used as a measure of empathy in a single dimension in adults, EQ discriminated adults of the normal control group from all patients' groups, As expected the lowest scoring was noted among patients with ASD and the difference with all the other clinical groups was statistically significant. The scores of 21.0 (sd=7.7) in the ASD group and 43.6 (sd=8.4) in the healthy controls group are comparable with the scores found in the original study by Baron-Cohen: 20.6 (sd=11.6) and 42.1 (sd=10.6) respectively.[3] The finding that ADHD patients scored lower than healthy control is in line with Groen et al.[13] finding that adults with a subclinical ADHD diagnosis had reduced levels of the EQ scores compared to the control group. Moreover, empathy impairments have been reported in schizophrenia and other psychiatric disorders.[23,24,30] In line with the findings in other countries in Europe,[3–6,13,17] females scored higher than males (p<0.001). This is a consistent finding in Western countries but is reported to be less stable in eastern countries.[8,31,32]

The EQ showed very good internal validity for all versions with a Cronbach's α value of 0.902, 0.892 and 0.793

**Table 3.** Confirmatory factor analysis (CFA) of the EQ. Item loadings and goodness-of-fit.

| Item number | Three-factor (28-item) | Three-factor (15-item) | One-factor (40-item) | One-factor (28-item) | One-factor (15-item) |
|---|---|---|---|---|---|
| 1 | 0.61 (CE) | | 0.62 | 0.63 | |
| 19 | 0.56 (CE) | | 0.42 | 0.49 | |
| 25 | 0.67 (CE) | 0.69 (CE) | 0.55 | 0.61 | 0.59 |
| 26 | 0.69 (CE) | 0.70 (CE) | 0.60 | 0.65 | 0.63 |
| 36 | 0.69 (CE) | | 0.63 | 0.67 | |
| 41 | 0.61 (CE) | | 0.55 | 0.59 | |
| 44 | 0.45 (CE) | 0.43 (CE) | 0.37 | 0.41 | 0.39 |
| 52 | 0.70 (CE) | 0.69 (CE) | 0.61 | 0.66 | 0.63 |
| 54 | 0.63 (CE) | 0.63 (CE) | 0.54 | 0.59 | 0.59 |
| 55 | 0.51 (CE) | | 0.36 | 0.43 | |
| 58 | 0.60 (CE) | | 0.49 | 0.54 | |
| 6 | 0.37 (EE) | 0.38 (EE) | 0.34 | 0.35 | 0.37 |
| 21 | 0.57 (EE) | | 0.56 | 0.52 | |
| 22 | 0.38 (EE) | | 0.34 | 0.35 | |
| 27 | 0.36 (EE) | 0.33 (EE) | 0.30 | 0.22 | 0.22 |
| 29 | 0.49 (EE) | | 0.48 | 0.43 | |
| 32 | 0.50 (EE) | 0.56 (EE) | 0.38 | 0.35 | 0.35 |
| 42 | 0.37 (EE) | | 0.31 | 0.29 | |
| 43 | 0.59 (EE) | | 0.57 | 0.57 | |
| 48 | 0.62 (EE) | | 0.56 | 0.47 | |
| 50 | 0.35 (EE) | 0.47 (EE) | 0.31 | 0.29 | 0.33 |
| 59 | 0.25 (EE) | 0.33 (EE) | 0.17 | 0.19 | 0.21 |
| 4 | 0.56 (SS) | 0.57 (SS) | 0.48 | 0.45 | 0.46 |
| 8 | 0.56 (SS) | 0.60 (SS) | 0.45 | 0.42 | 0.46 |
| 12 | 0.59 (SS) | 0.62 (SS) | 0.53 | 0.48 | 0.21 |
| 14 | 0.68 (SS) | 0.63 (SS) | 0.64 | 0.60 | 0.56 |
| 35 | 0.51 (SS) | 0.45 (SS) | 0.39 | 0.36 | 0.35 |
| 57 | 0.73 (SS) | | 0.59 | 0.54 | |
| 10 | | | 0.34 | | |
| 11 | | | 0.24 | | |
| 15 | | | 0.56 | | |
| 18 | | | 0.24 | | |
| 28 | | | 0.22 | | |
| 34 | | | 0.51 | | |
| 37 | | | 0.01 | | |
| 38 | | | 0.29 | | |
| 39 | | | 0.16 | | |
| 46 | | | 0.32 | | |
| 49 | | | 0.55 | | |
| 60 | | | 0.43 | | |
| Fit statistics | | | | | |
| $x^2$(df) | 721 (347) | 163 (87) | 1941 (740) | 1055 (350) | 318 (90) |
| p | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| $x^2$/df | 2.07 | 1.87 | 2.62 | 3.01 | 3.53 |
| RMSEA | 0.057 | 0.052 | 0.071 | 0.079 | 0.087 |
| CI-RMSEA | 0.051–0.063 | 0.039–0.064 | 0.067–0.074 | 0.073–0.084 | 0.078v0.099 |
| CFI | 0.852 | 0.916 | 0.656 | 0.721 | 0.749 |

CE: Cognitive Empathy subscale; EE: Emootional Empathy subscale; SS: Social Skills subscale; RMSEA: Root Mean Squared Error of Approximation; CI-RMSEA: 90% confidence interval of RMSEA; CFI: Comparative Fit Index

for versions EQ-40, EQ-28 and EQ-15, respectively. The scale showed stability for all the items, if any of the items deleted. The value of the 40-item version (Cronbach's a=0.902) is among the highest established in studies so far. It is comparable to the results of the original validation study of EQ[3] on a group of 197 healthy control volunteers where EQ-40 showed excellent reliability (Cronbach's a=0.92). Most 40-item EQ translations also show high to acceptable Cronbach's α values: the Japanese[9] 0.86, the French[7] 0.81, the Korean[8] 0.78, the Serbian[17] 0.782, the Italian[14] 0.79, the Swiss[33] 0.86 the Russian[16] 0.85, the Dutch[13] 0.89. The EQ-28 showed a Cronbach's a of 0.892 which is higher than the one found in a British (Cronbach's a=0.85),[6] a Serbian (Cronbach's a= 0.805)[17] and a Croatian sample (Cronbach's a=0.871).[34] The Cronbach's a value of 0.793 obtained for the 15-item version is comparable to the 0.55–0.78 values reported in Muncer and Link study[6] who were the first to introduce this version and lower to the values reported in an Iranian (Cronbach's a=0.84)[19] and a Chinese version (Cronbach's a=0.86).[32]

The test-retest (1 month) reliability index (Pearson r) for the 40-item version was 0.928 indicating excellent test-retest reliability. In the original study,[3] Pearson r had a value of 0.97 while in the French version (1.5–6 months)[7] it was 0.93, in the Korean (1 month)[8] 0.84, in the Italian (1 month)[14] 0.85, and in the Dutch (15 months)[13] 0.78. Test-retest reliability remained high in the short forms in line with findings from previous studies.[5,13,19,32]

In confirmatory factor analysis (CFA) we examined the one factor model for all three versions and the three-factor model for the two short forms, namely the 28-item version suggested by Lawrence et al[5] and the 15-item version introduced by Muncer and Ling.[6] In our study all the five hypotheses produced a well-fit model with the multidimensional model showing an even better fit in the two short forms. The number of factors derived from EQ has been a controversial issue in the literature. A number of studies supported the unidimensional model[3,4] not only for the 40-item but also for the 28-item and the 15-item version. Specifically, Allison et al.[4] pointed out that factor analysis which is sensitive to direction of responses would not lead to reliable results since half of the questions of EQ are designed to produce agreement and the other half disagreement. Other studies supported the three-factors structure proposed by Lawrence[5,7,8,11,17] consisting of emotional empathy, cognitive empathy and social skills or the tripartite 15-item model suggested by Muncer and Ling.[6,8,13,15,19,32]

Across international studies, criterion validity of the EQ is indicated by correlation between the EQ and a range of other measures of empathy including IRI.[20] In our study, the correlations between the EQ and the IRI subscales were not of statistical significance in all three versions apart from a significant association between the EQ-15 and the EC subscale of the IRI. Although IRI has been used in many previous studies, its utility as a criterion validity of the EQ has been questioned. Weak, moderate and negative correlations between EQ and IRI were found in the Serbian,[17] the Korean[8] and a Chinese[31] translation. It might be that sympathy as measured in IRI does not coincide with empathy and personal distress is not necessarily related to empathetic concerns.[5] Also, our findings support the notion that the place of "social skills" in the concept and operationalization of empathy may need reexamination. Although it seems reasonable that social skills form a part of the concept of empathy, it might be more correct to consider empathy and social skills as interrelated but independent, than to subsume social skills under empathy.

Our study has some limitations. First, participants did not consist of a randomized representative sample. Second, the test retest validity was examined only in a students' population. Including clinical populations is probably important when testing for test-retest reliability since as already mentioned by other researchers[13] EQ may measure some state factors which might be less stable in subjects having some kind of psychopathology. Finally, EQ did not show an acceptable concurrent validity in relation to IRI. Since IRI is the only instrument supposed to tap empathy that has been validated in Greek,[21] we did not have the possibility to examine concurrent validity by using another instrument.

Apart from the above limitations when using EQ as assessment tool it is important to consider self-reflection or meta-cognitive skills in order to interpret self-reporting empathy. We should have in mind that the reliance on self-report of clinical and research characteristics of patients with ASD should be considered carefully, particularly with regard of autistic traits, as poor awareness of autism related traits may lead to an under-reporting of autism symptoms and over-reporting of social competency.[13,35] It may be due to the same mechanisms that underlie commonly reported difficulty of patients with ASD with understanding minds of others.

To conclude, the EQ-Greek version showed good psychometric properties and among adults of normal intelligence may discriminate normal controls from ASD patients. Therefore, although EQ is not considered to be a diagnostic tool it can be of help during the evaluation of empathy in clinical populations and especially in subjects with neurodevelopmental disorders.

## References


1. Baron-Cohen S, Jolliffe T, Mortimore C, Robertson M. Another advanced test of theory of mind: Evidence from very high functioning adults with autism or Asperger Syndrome. *J Child Psychol Psychiatry* 1997, 38:813–822, doi:10.1111/j.1469-7610.1997.tb01599.x
2. Baron-Cohen S, Wheelwright S, Robinson J, Woodbury-Smith M. The Adult Asperger Assessment (AAA): a diagnostic method. *J Autism Dev Disord* 2005, 35:807–819, doi: 10.1007/s10803-005-0026-5
3. Baron-Cohen S and Wheelwrigh S. The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *J Autism Dev Disord* 2004, 34:163–175, doi:10.1023/b:jadd.0000022607.19833.00
4. Allison AS, Baron-Cohen S, Wheelwright SJ, Stone MH, Muncer SJ. Psychometric analysis of the Empathy wQuotient (EQ). *Pers Individ Differ* 2011, 51:829–835, doi: 10.1016/j.paid.2011.07.005
5. Lawrence EJ, Shaw P, Baker D, Baron-Cohen S, David AS. Measuring empathy: Reliability and validity of the empathy quotient. *Psychol Med* 2004, 34: 911–919, doi: 10.1017/s0033291703001624
6. Muncer SJ and Ling J. Psychometric analysis of the Empathy Quotient (EQ) scale. *Pers Individ Differ* 2006, 40:1111–1119, doi:10.1016/j.paid.2005.09.020
7. Berthoz S, Wessa M, Kedia G, Wicker B, Grèzes J. Cross-cultural validation of the empathy quotient in a French speaking sample. *Can J Psychiatry* 2008, 53:469–477, doi: 10.1177/070674370805300712
8. Kim J, Lee SJ. Reliability and validity of the Korean version of the empathy quotient scale. *Psychiatry Investig* 2010, 7:24–30, doi: 10.4306/pi. 2010.7.1.24
9. Wakabayashi A, Baron-Cohen S, Uchiyama T, Yoshida Y, Kuroda M, Wheelwright S. Empathizing and systemizing in adults with and without autism spectrum conditions: Cross-cultural stability. *J Autism Dev Disord* 2007, 37:1823–1832, doi: 10.1007/s10803-006-0316-6
10. Wheelwright S. Empathizing and systemizing in adults with and without autism spectrum conditions: Cross-cultural stability. *J Autism Dev Disord* 2007, 37:1823–1832, doi: 10.1007/s10803-006-0316-6
11. Groen Y, den Heijer A, Fuermaier A, Althaus M, Tucha A. Reduced emotional empathy in adults with subclinical ADHD: evidence from the empathy and systemizing quotient. *Atten Defic Hyperact Disord* 2018, 10:141–150, doi: 10.1007/s12402-017-0236-7
12. Guan R, Jin L, Qian M. Validation of the empathy quotient–short form among Chinese healthcare professionals. *J Soc Behav Pers* 2012, 40:75–84, doi: 10.2224/sbp.2012.40.1.75
13. Groen Y, Fuermaie ABM, Den Heijer AE, Tucha O, Althaus M. The empathy and systemizing quotient: The psychometric properties of the Dutch version and a review of the cross-cultural stability. *J Autism Dev Disord* 2015, 45:2848–2864, doi: 10.1007/s10803-015-2448-z
14. Preti A, Vellante M, Baron-Cohen S, Zucca G, Petretto DR, Masala C. The empathy quotient: A cross-cultural comparison of the Italian version. *Cogn Neuropsychiatry* 2011, 16:50–70, doi: 10.1080/13546801003790982
15. Gouveia VV, Milfont TL, Gouveia RS, Neto JR, Galvão L. Brazilian-Portuguese empathy quotient: Evidences of its construct validity and reliability. *Span J Psychol* 2012, 15: 777–782, doi: 10.5209/rev_sjop.2012.v15.n2.38889
16. Kosonogov V. The psychometric properties of the Russian version of the empathy quotient. *Psychology in Russia: State of the Art* 2014, 7:96–104, doi: 10.11621/pir.2014.0110
17. Dimitrijević A, Hanak N, Vukosavljević-Gvozden T, Opačić G. Psychometric properties of the Serbian version of the empathy quotient (S-EQ). *Psihologija* 2012, 45:257–276, doi: 10.2298/PSI1203257D
18. Bora E and Baysan L. Psychometric features of Turkish version of empathy quotient in university students. *Bulletin of Clinical Psychopharmacology* (Klinik Psikofarmakol Bülteni) 2001, 19:39–47
19. Wind S, Yaghoubi P, Mansouri B. Exploring the psychometric properties of the empathy quotient for farsi speakers. *Curr Psychol* 2018, doi.org/10.1007/s12144-018-9938-z
20. Davis M. A *multidimensional approach to individual differences in empathy.* Catalog of Selected Documents in Psychology 1980, 10, 85
21 Tsitsas G, Theodosopoulou M, Malikiossi-Loizou M. Interpersonal Reactivity Scale. In A. Stalikas, S. Triliva, & P. Roussou (eds) *The psychometric tools in Greece*. Pedio, Athens, 2012 (In Greek)
22. Empathy Quotient (Adults), Greek version. Available from: http://www.autismresearchcentre.com
23. Konstantakopoulos G, Oulis P, Ploumpidis D, Patrikelis P, Nikitopoulou S, Papadimitriou GN, David AS. Self-rated and performance-based empathy in schizophrenia: the impact of cognitive deficits. *Soc Neurosci* 2014, 9:590–600, doi: 10.1080/17470919.2014.934395
24. Konstantakopoulos G, Ioannidi N, Patrikelis P, Gonidakis F. Empathy, mentalizing, and cognitive functioning in anorexia nervosa and bulimia nervosa. *Soc Neurosci* 2020, 15:477–488, doi: 10.1080/17470919.2020.1760131
25. Pehlivanidis A, Spyropoulou A, Galanopoulos A, Papachristou CA., Papadimitriou GN. Attention deficit hyperactivity disorder (ADHD) in adults: Clinical recognition, diagnosis and therapeutic interventions. *Arch Hell Med* 2012, 29:562–576
26. Kooij SJ, Francken MH, Bron TI. *Diagnostisch Interview Voor ADHD in Adults* (DIVA). Greek Version (A. Pehlivanidis, K. Papanikolaou). DIVA Foundation, The Hague, the Netherlands, 2010
27. Lord C, Rutter M, DiLavore PC, Risi S, Gotham K, Bishop SL. *Autism diagnostic observation schedule*. Second Edition, Torrance, CA: Western Psychological Services, 2012
28. Papanikolaou K, Paliokosta E, Houliaras G, Vgenopoulou S, Giouroukou E, Pehlivanidis A et al. Using the Autism Diagnostic Interview-Revised and the Autism Diagnostic Observation Schedule-Generic for the diagnosis of autism spectrum disorders in a Greek sample with a wide range of intellectual abilities. *J Autism Dev Disord* 2009, 39:414–20, doi: 10.1007/s10803-008-0639-6
29. Pehlivanidis A, Papanikolaou K, Mantas V, Kalantzi E, Korobili K, Xenaki LA et al. Lifetime co-occurring psychiatric disorders in newly diagnosed adults with attention deficit hyperactivity disorder (ADHD) or/and autism spectrum disorder (ASD). *BMC Psychiatry* 2020, 20:42, doi: 10.1186/s12888-020-02828-1
30. Pepper KL, Demetriou EA, Park SH, Boulton KA, Hickie IB, Thomas EE et al. Self-reported empathy in adults with autism, early psychosis, and social anxiety disorder. *Psychiatry Res* 2019, 281:112604, doi: 10.1016/j.psychres.2019.112604
31. Zhou N, Wang D, Chasson G, Xu X, Wang J, Lockwood MI. Psychometric properties of the Chinese Empathy and Systemizing Quotients in a non-clinical sample. *Curr Psychol* 2020, doi.org/10.1007/s12144-020-00653-z
32. Zhao Q, Ren Q, Sun Y, Wan L, Hu L. Impact Factors of Empathy in Mainland Chinese Youth. *Front Psychol* 2020, 11:688, doi: 10.3389/fpsyg.2020.00688
33. Zeyer A, Boelsterli K, Brovelli D, Odermatt F. Brain Type or Sex Differences? A structural equation model of the relation between brain type, sex, and motivation to learn science. *Int J Sci Educ* 2012, 34:779–802, doi: 10.1080/09500693.2011.635165
34. Wertag A and Hanzec I. Factor structure and psychometric properties of the Croatian short version of The Empathy Quotient. *Suvremena psihologija* 2016, 19:101–110, doi:10.21465/2016-SP-191-09
35. Johnson SA, Filliter JH, Murphy RR. Discrepancies between self- and parent-perceptions of autistic traits and empathy in high functioning children and adolescents on the autism spectrum. *J Autism Dev Disord* 2009, 39:1706–1714, doi: 10.1007/s10803-009-0809-1

Ερευνητική εργασία

# Ψυχομετρικές ιδιότητες του Πηλίκου Ενσυναίσθησης - Ελληνική Έκδοση

Αρτέμιος Πεχλιβανίδης,[1] Κωνσταντίνος Τάσιος,[2] Κατερίνα Παπανικολάου,[3] Αθανάσιος Δουζένης,[2] Ιωάννης Μιχόπουλος[2]

*[1]Α΄ Ψυχιατρική Κλινική, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αιγινήτειο Νοσοκομείο, Αθήνα*

*[2]Β΄ Ψυχιατρική Κλινική, Εθνικό και Καποδιστρικό Πανεπιστήμιο Αθηνών, ΠΓΝ «Αττικόν», Αθήνα*

*[3]Παιδοψυχιατρική Κλινική, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, ΓΝΠ «Η Αγία Σοφία», Αθήνα*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 14 Ιουνίου 2020/Αναθεωρήθηκε 11 Οκτωβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Η πρωτότυπη έκδοση του Πηλίκου Ενσυναίσθησης (ΠΕ) στην Αγγλική γλώσσα αποτελεί ένα αυτοσυμπληρούμενο ερωτηματολόγιο που μετρά την έννοια της ενσυναίσθησης σε ενηλίκους φυσιολογικής νοημοσύνης. Είναι ήδη γνωστό ότι το ΠΕ είναι ευαίσθητο ως προς το φύλο και τις νευροαναπτυξιακές διαταραχές, ιδιαίτερα τη Διαταραχή Αυτιστικού Φάσματος (ΔΑΦ). Έχει μεταφραστεί σε πολλές γλώσσες ανά τον κόσμο. Στόχος της παρούσας μελέτης ήταν η μελέτη των ψυχομετρικών ιδιοτήτων της ελληνικής έκδοσης του ΠΕ η οποία είναι ελεύθερα διαθέσιμη στο www.autismresearch.com. Η μελέτη πραγματοποιήθηκε στην Α΄ και Β΄ Ψυχιατρική Κλινική του Εθνικού και Καποδιστριακού Πανεπιστημίου Αθηνών, στα νοσοκομεία «Αιγινήτειο» και «Αττικόν» αντίστοιχα και στην Ψυχιατρική Κλινική του Ψυχιατρικού Νοσοκομείου Φυλακών Κορυδαλλού. Δύο ομάδες συμπλήρωσαν την πρωτότυπη έκδοση των 60 προτάσεων. Η μία ομάδα αποτελείτο από άτομα του γενικού πληθυσμού και εθελοντές μεταπτυχιακούς φοιτητές (ομάδα ελέγχου, N=127) και η δεύτερη από ασθενείς που παρακολουθούνται στη Μονάδα Νευροαναπτυξιακών Διαταραχών Ενηλίκων της Α΄ Ψυχιατρικής Κλινικής ΕΚΠΑ, τα Εξωτερικά Ιατρεία της Β΄ Ψυχιατρικής Κλινικής ΕΚΠΑ, και τη Ψυχιατρική Κλινική του των Φυλακών Κορυδαλλού (ομάδα ασθενών, N=196). Εξετάστηκαν και οι τρεις εκδοχές του ΠΕ, 40, 28 και 15 λημμάτων. Το ΠΕ επέδειξε πολύ καλή εσωτερική εγκυρότητα: η τιμή του Cronbach α ήταν 0,902, 0,892 και 0,793 αντίστοιχα. Το ΠΕ έδειξε πολύ καλή μεταβλητότητα εξέτασης-επανεξέτασης: ο Συντελεστής Ενδοταξικής Συσχέτισης ήταν 0.928, 0,924 και 0,855 αντίστοιχα. Η συγχρονική εγκυρότητα που εξετάστηκε μέσω ανάλυσης συσχέτισης με τον Δείκτη Διαπροσωπικής Αντιδραστικότητας (ΔΔΑ) δεν ανέδειξε σημαντικές συσχετίσεις ανάμεσα στο ΠΕ και τον ΔΔΑ. Το ΠΕ ανέδειξε μονοπαραγοντική δομή και στις 3 εκδόσεις του. Εξετάσθηκαν και οι τα μοντέλα τριών παραγόντων (Γνωσιακή Ενσυναίσθηση, Συναισθηματική Ενσυναίσθηση, Κοινωνικές Δεξιότητες) για τις εκδόσεις των 28 και 15 λημμάτων, τα οποία έδειξαν, επίσης, πολύ καλή εγκυρότητα. Όταν χρησιμοποιήθηκε ως μέτρο ενσυναίσθησης σε μία διάσταση στους ενηλίκους, διέκρινε την ομάδα ελέγχου από την ομάδα ασθενών. Η Μέση τιμή του για το συνολικό δείγμα ήταν 35,84 με τη χαμηλότερη βαθμολογία να παρατηρείται στους ασθενείς με ΔΑΦ. Όπως αναμενόταν οι γυναίκες είχαν υψηλότερη μέση τιμή από τους άνδρες ($p<0,001$). Συμπερασματικά, η ελληνική έκδοση του ΠΕ επέδειξε καλά ψυχομετρικά χαρακτηριστικά και θα μπορούσε να αξιοποιηθεί ως χρήσιμο κλινικό εργαλείο για την αξιολόγηση της ενσυναίσθησης σε κλινικούς πληθυσμούς και ιδιαίτερα σε πληθυσμούς με ΔΑΦ και άλλες νευροαναπτυξιακές διαταραχές.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Πηλίκο Ενσυναίσθησης, EQ, ελληνική γλώσσα, ψυχομετρικές ιδιότητες.

*Συγγραφέας επικοινωνίας:* Αρτέμιος Πεχλιβανίδης, Α΄ Ψυχιατρική Κλινική, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Αιγινήτειο Νοσοκομείο, Λεωφ. Βασιλίσσης Σοφίας 72–74, 115 26 Αθήνα • e-mail: apechlib@med.uoa.gr

https://doi.org/10.22365/jpsych.2021.003 / Psychiatriki 2021, 32:51–58

Review

# Communication-based suicide prevention after the first attempt: A systematic review

Cecilia Katsivarda,[1] Konstantinos Assimakopoulos,[2] Eleni Jelastopulu[3]

[1]*Medical School, National and Kapodistrian University of Athens, Athens*
[2]*Department of Psychiatry, Medical School, University of Patras, Patras*
[3]*Department of Public Health, Medical School, University of Patras, Patras, Greece*

**ARTICLE HISTORY:** Received 31 July 2020/Revised 2 October 2020/Published Online 17 March 2021

**ABSTRACT**

Previous suicide attempts are the strongest risk factor for a new suicide attempt, suicide death, the development of recurrent suicide behavior and even the development of suicidal ideation in the general population. Primary prevention aims to reduce new suicide attempts in the general population, while secondary prevention tries to reduce the chance of suicide attempts in patients with high risk. Tertiary interventions are targeted at individuals who have already made one or more suicide attempts and aim to prevent second or repetitive attempts and to suppress suicidal behavior. Communication with patients and family is a very effective way of preventing a second suicide attempt. The aim of this paper is to present an overview of tertiary suicide prevention interventions focusing on communication with the patient and their family and study their effectiveness. This systematic review was based on the PRISMA checklist and was conducted using the databases Pubmed, Scopus and Google Scholar for articles published between 2000 and 2020 focusing on communication with family and patient. All studies concerning at least one previous suicide attempt were included. The interventions described in the studies concerned: (1) face-to-face and telephone contacts, (2) communication with greeting cards and letters, (3) telephone contact with the patient and record keeping to facilitate the implementation of the action plan, (4) telephone contacts only, and (5) technology-based communication. Our investigation brought up 9 studies on interventions focusing on communication with the patient and their family. Family and patient communication interventions, with a particular emphasis on telephone and written communication, have shown a good level of effectiveness in the prevention of a new suicide attempt, especially if the intervention has been completed according to the schedule and the patient has not abandoned the treatment early. The generalization of the results is limited due to the inclusion of other types of studies jointly with randomized controlled trials and the variability among the samples of the studies. In conclusion, family and patient communication interventions have shown a positive effect on preventing a second suicide attempt. More studies are needed to investigate the effectiveness of different prevention approaches at hand and clarify in which patient populations each intervention could be more effective.

**KEYWORDS:** Second suicide attempt, prevention, interventions, family, communication.

## Introduction

Suicidal behavior includes suicidal ideation (frequent thoughts of ending one's life), suicide attempt (the actual event where the person attempts to end their life) and complete suicide (the suicide attempt that results in death).[1] It is estimated that more than 700,000 people die each year by suicide, with 79% of the cases being recorded in low- and middle-income countries.[2] Suicide is also the second most common cause of death among people aged 15–29[3] and the 20th most common cause of death in the general population.[4] In 2016, suicide was found to be the second or third most common cause of death among 15–19-year-olds, with regarding both girls and boys.[5]

*Corresponding author:* Cecilia Katsivarda, Medical School, University of Patras, Rio Campus, GR-265 00 Patras, Greece • e-mail: ceciliakatsivarda@gmail.com

Previous suicide attempts are the strongest risk factor for a new suicide attempt, suicide death, the development of recurrent suicide behavior and the development of suicidal ideation in the general population.[3–6] Suicide prevention can be primary, secondary or tertiary. Primary prevention aims to reduce the number of the new cases of suicide, while secondary prevention aims to reduce the likelihood of a suicide attempt in patients at high risk.[6] Tertiary prevention is targeted at individuals who have already made one or more suicide attempts.[7,8]

The way mental health professionals communicate with patients, family and caregivers has been shown to have a profound impact on the way prevention is implemented. Hegerl et al found that a one-year telephone intervention program was effective in reducing the proportion of patients who attempted a new suicide attempt by 8%.[9] In this study, about 50% of the people who attempted suicide and 90% of those who died by suicide did not complete the process of telephone monitoring from start to finish. Those who completed the telephone attendance were less likely to die from suicide. Communication with the family can concomitantly encourage hope and optimism – by boosting compliance with the intervention implemented, or instead can be perceived as promoting the stigma of the patient and his family.[10,11] For example, the use of many clinical terms can be confusing – as they can be misinterpreted, thus impeding the development of a positive relationship.[12] The use of 'labels' on the person who attempted suicide (e.g., mentally ill) can also enhance stigmatization. By providing better family education programs, the effectiveness of tertiary prevention interventions can be ensured when based on respect and communication between the family and the health professionals.[13]

The importance of communicating with the patient is also confirmed in a study by Vandewalle et al.[14] They evaluated communication with nurses in the case of suicidal ideation and showed that the patients found four important factors in the contact with nurses: (1) encountering a space to express suicidal thoughts and explore needs, (2) being recognized as a unique individual, (3) experiencing the nurses' availability, information-sharing practice and transparency of their expectations, and finally (4) trusting nurses with communicating issues and thoughts on suicidality.

The aim of the present work is to provide a systematic overview of the suicide prevention strategies after the first attempt, with emphasis on family and patient communication.

## Material and Method

The review was conducted in accordance to the preferred reporting items for systematic reviews and meta-analysis (PRISMA) statement.[15] This review includes articles referring to patients (female or male) with a history of at least one previous suicide attempt, published from 2000 to 2020 in English. There are neither age restrictions in this review nor other demographic constraints. Studies regarding interventions on patients with no history of previous suicide attempt were excluded from the review. Also, studies including interventions about the physical treatment of the patients as a result of suicide attempt were also ruled out.

The PubMed, Scopus and Google Scholar databases were searched to retrieve evidence, from 23 November 2018 to 23 December 2018 and an additional search was performed from 18 September of 2020 to 23 September 2020 with the following keywords: (suicid* OR deliberate self-harm* OR self- injur* OR suicidal behavio*) AND (re-attempt* OR multiple OR second OR repeat* OR recurren*) AND (patient OR family) AND (communication). In addition, forward citation and reverse citation tracking were conducted with regard to the articles. Throughout the process of the identification of articles on family and patient communication, the original search yielded 159 articles from the PubMed and Scopus databases, and 119 from Google Scholar. The duplicates were removed and eventually the remaining 95 papers published in scientific journals and conferences were selected. Subsequently, the title and abstract were checked for each one of the studies and the studies that did not meet the inclusion criteria were excluded. After examining the resulting work, 9 studies made it through the selection process. The flowchart of the search results and the final selection is shown in figure 1.

## Results

The search led to a total of 9 studies of suicide prevention interventions after the first attempt based on communication with family and patient. The classification of the studies based on their methodological framework showed that they encompass: (1) 4 randomized controlled trials, (2) 2 systematic reviews, (3) 1 semi-experimental study, (4) 1 literature review, (5) 1 cross-sectional survey.

The interventions described in the studies included: (1) face-to-face and telephone contacts, (2) communication with cards and letters, (3) telephone contact with the patient and log keeping to facilitate the implementation of the action plan, (4) telephone contacts only, and (5) technology-based communication.

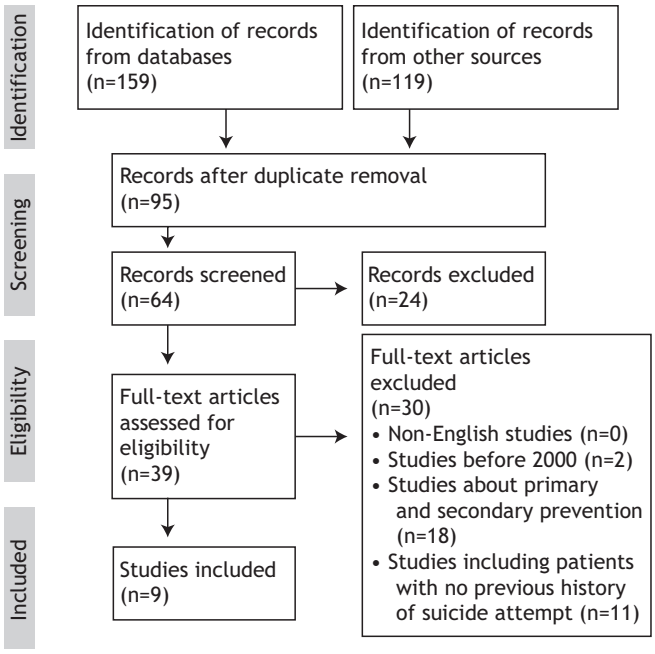


**Figure 1.** Flowchart of the selection of studies concerning communication-based interventions .

The findings of the four randomized controlled trials included in the systematic review are summarized in table 1.

## Randomized control trials

Fleischmann et al investigated whether a telephone-based intervention in combination with face-to-face contact with patients who attempted suicide, was effective at reducing the subsequent suicide mortality in a total of 1,867 individuals who were admitted to emergency units due to suicide attempt.[16] The intervention group (922 patients with mean age 23 years) received the intervention mentioned above, while the control group (945 patients with mean age 23 years) received usual care. The main outcome measured was death by suicide during an 18-month period. The results showed significantly fewer suicide deaths in the intervention group than in the control group (0.2% vs 2.2%) ($p < 0.001$), suggesting that this brief low-cost intervention may be a significant part of suicide prevention programs and may be applicable to patients in low- and middle-income countries because of its low cost.

In the second randomized controlled trial, Gysin-Maillart et al investigated the effectiveness of an intervention program on the basis of maintaining patient communication with cards and letters.[17] Patients who had been admitted to emergency departments in health units were randomized into two groups (n=60 in each group), one of which received intervention whereas the other group received usual care. In the intervention group, patients (mean age 37.8) received three treatment sessions followed by regular contact with personalized letters for 24 months. The participants completed a set of psychosocial and clinical questionnaires every 6 months for a 24-month follow-up period. The primary variable that was measured was new suicide attempts during the 24-month follow-up period. During that period, five patients made suicide attempts anew in the intervention group, while in the control group (mean age 39.2) the corresponding number was 41 (8.3% vs 26.7%) ($p<0.001$). Intervention was associated with an 80% reduced risk of a new suicide attempt ($p<0.001$), indicating that it may be effective as a means of preventing a second suicide attempt in people with a previous history.

In the third randomized controlled trial, King et al studied the effectiveness of a Teen Prevention Program (Teen Options for Change).[18] The study involved 49 adolescents (aged 14 to 19 years) who were assigned to two groups. One group received the prevention program (27 adolescents) and the control group received routine care (22 adolescents). Adolescents in the control group received a crisis management leaflet with emergency phone numbers which also contained written information on depression, suicide risk, fire protection and local mental health services. The adolescents in the intervention group received the same material, as well as personalized feedback on their exam responses, while they also participated in a customized motivation interview (approximately 35–45 minutes) with mental health professionals with a total duration of 40 hours. Depression (RADS-2: SF scale) and suicidal ideation (SIQ-JR scale) were assessed at the baseline and two months later. Adolescents in the intervention group showed greater decreases in depression rates than adolescents in the control group. Results showed a statistically significant decrease in depression rates ($p<0.01$) in the intervention group, but no significant effects were found for suicidal ideation. Although the intervention group scored better on the suicidal ideation scale, the differences with the control group were not statistically significant.

Finally, in the fourth randomized controlled trial, Miller et al examined the effectiveness of a telephone contact intervention in suppressing suicidal behavior.[19] The study involved 1,376 adults at the age of 26–47 who had a recent suicide attempt. Participants displaying suicidal ideation or having made a recent attempt were recruited from 8 Emergency Departments (ED) across 7 states in the United States, ranging from

**Table 1.** Summary of randomized controlled trials of suicide prevention interventions after first attempt and communication with family and patient.

| Study year | Country | Sample (I,C) | Age (years) | Gender (Male, Female) | Duration | Intervention (Intervention group: patients or family) | Primary outcome measures | Results | Long term monitoring |
|---|---|---|---|---|---|---|---|---|---|
| Fleischmann et al. (2008) | Brazil, India, Sri Lanka, Islamic Republic of Iran, China | 1867 (922, 945) | Mean age: 23 | M:43.4% F:56.6% | 18 months | Phone contacts combined with face to face contacts (Patients) | Suicide attempts (self-reported) | Intervention group had fewer suicides than control group (0.2% vs. 2.2%) ($p < 0.001$) | – |
| Gysin-Maillart et al. (2015) | Switzerland | 120 (60, 60) | Mean age: 37.8 (SD:14,4) | M:50% F:50% | 24 months | Communication with cards and letters (Patients) | Suicide attempts (self-reported) | The intervention group reported less suicide attempts than the control group (8.3% vs. 26.7%) ($p < 0.001$) | – |
| King et al. (2015) | United States | 49 (27,22) | 14–19 | M:51% F:49% | 2 months | Motivational Interview with Mental Health Professionals (Patients) | Suicide ideation (SIQ-JR) Depression (RADS-2:SF) | No statistically significant differences were found between the two groups in suicidal ideation Lower levels of depression were found in the intervention group compared to the control group ($p < 0.01$) | – |
| Miller et al. (2017) | United States | 1376 (497, 377, 502) | 26–47 | M:44.1% F:55.9% | 12 months | Only phone contacts (Patients) | Suicide attempts (self-reported) | The intervention group reported less suicide attempts than the control group (18.3% versus 22.9% respectively) ($p < 0.001$) | – |

I: Intervention Group; C: Control Group

small community hospitals to large academic centers. To increase generalization, no participating ED had any psychiatric services located within or adjacent to the ED. Patients were divided into three groups. The first group (497 patients) received usual care, the second group (377 patients) received a suicide risk assessment screening and the third group (502 patients) also received the screening intervention in addition to the intervention program with telephone contacts. The primary measure was new suicide attempts. A total of 288 participants (20.9%) had at least 1 suicide attempt, and a total of 548 suicide attempts were recorded among participants. There were no significant differences in the rates of new suicide attempts between the first two groups (23% in the usual treatment group versus 22% in the preventive control group). However, there were statistically significant differences in suicide rates between the first group and the intervention group (23% and 18% respectively), with a relative risk reduction of 20%. Participants in the intervention group scored 30% less overall suicide attempts than participants in the first group ($p<0.001$).

### Evidence on telephone and web-based interventions

The rest of the relevant research explores interventions based on online communication and other technologies. The emergence of information and communication technologies in recent years has offered a new dimension to human communication and, in this context, has also been tested in the field of suicide prevention.

Franco-Martin et al conducted a systematic review of research papers published in the years 2007–2017 in order to categorize the types of applications in existence for suicide prevention in this field.[20] A total of 30 studies were identified. Among the applications included, one can find web technologies (51.61%), mobile applications (22.58%), social networks (12.90%), learning applications (3.23%) and others technologies (9.68%).

In their systematic review, Kreuze et al explored how technology-based interventions can reduce the risk of suicide and protect the users.[21] The search yielded 16 studies that used state-of-the-art interventions to address the determinants of suicidal behavior. Interventions were provided through mobile applications (text messages), computer and the internet, as well as CD-ROM and video material. Studies on the effectiveness of these interventions have shown significant variability, but there have been several web-based technology applications that have shown statistically significant efficacy in reducing suicidal ideation and depressive symptoms. The effect of the studies under examination, as assessed by the Cohen coefficient, was moderate to high.

In addition, in a literature review, Khan and Costanza discussed how health-care mobile applications can be used by staff in emergency departments of health units as complementary tools to the existing suicide prevention strategies.[22] The researchers claimed that these applications can be considered as a part of prevention strategies in order to maintain patient communication, as they offer personalized planning and support for home security planning interventions, in addition to being designed to identify and manage the risk factors of suicide.

### Other studies

In a semi-experimental study, Larsen et al described the process they followed to create an electronic application that can be used in suicide prevention intervention programs for the communication between healthcare providers and their patients (aged from 18 to 65), who have attempted suicide.[23] The application that was created included brief messages sent to the patient, which also contained additional web-based therapeutic content, being targeted at key suicide risk factors. The researchers claimed that the designed application has the potential to reduce the number of recurrent suicide episodes and provide affordable and cost-effective support to people who cannot seek face-to-face treatment.

Finally, Leung et al studied the satisfaction of primary care clinical leaders with embedded mental health providers for a range of conditions, including suicide risk, and examined the association between overall satisfaction and technology.[24] The results showed that the use of technology was positively associated with satisfaction due to a decrease in the suicide risk that was identified ($p=0.002$).

## Discussion

The studies under consideration in the present work probe into providing information and counseling to people with suicidal ideation and with a history of attempted suicide, helping them to identify problems and factors related to their behavior, motivating them to participate in security planning and instigating them to seek help. However, among the studies exploring this issue, despite their common focus, one can find significant variations in the type of intervention and in the evaluation of the resulting variables measured. That makes the comparison difficult. Also, more

comparative studies are needed to determine what the optimal frequency of communication with the patient may be.

Prevention strategies based on new technologies have begun to gain ground in recent years, yet research is very limited in this area. It is quite important that such a strategy can be affordable. Therefore, more research is needed to prove their effectiveness and also research that will analyze the cost-effectiveness of their use in clinical practice and in reducing suicidal ideation. The utility of technology in suicide prevention is also facing an important challenge; to educate both health professionals (psychiatrists, therapists and nurses) and patients and their families in the use of these applications in order to gain the expected benefit for the patient.

We have to take in mind that every person who has made a suicide attempt is usually admitted to emergency departments, where they receive psychiatric and/or suicide risk assessment along with routine care. Therefore, the results of our research can be applied in mental health services regarding the evaluation and referral of patients with suicidal behaviors. It appears to be of great importance for mental health professionals to be trained to recognize the suitable intervention for each patient.

### Limitations

An important limitation in this review was the methodological framework of the included studies. Although the majority of studies were randomized controlled trials, studies that followed other methodological frameworks, such as semi-experimental studies, systematic reviews, meta-analyses, and a literature review were also included. Including these studies in our review was considered necessary because there were cases where randomization into two or more groups was not feasible (e.g., interventions given in the emergency departments). These studies were also included because they allowed us to report suicide prevention strategies after the first attempt, which were not identified in other articles, thus providing a more complete picture of the subject. Another limitation of the present research is the group of patients that were investigated in each study. There were no restrictions on the demographics of the patients who received the intervention. Therefore, the studies include a wide range of patients, such as adolescents as well as older patients. Consequently, the results cannot be generalized to the general population facing a high risk of a new suicide attempt. Additionally, there was no limitation in terms of comorbidity in the studies included in this review. Therefore, it is necessary for future research to investigate separately the interventions delivered to different patient groups, in order to clear out which intervention is more effective in each patient group.

## Conclusion

Since suicide-induced death is a major public health problem, this systematic review investigates the impact of suicide prevention interventions after the first attempt based on the communication between patient and therapist. More studies are needed to investigate the efficacy of different treatment approaches, their appropriate characteristics (intensity, duration, etc.) and the patient groups in which the former can be most effective. In light of this, the findings may be important in future clinical policy-making to prevent recurrent suicidal behavior.

## References


1. Castle K, Kreipe R. Suicidal Behavior. In: Garfunkel LC, Kaczorowski JM, Christy C (eds) *Pediatric Clinical Advisor: Instant Diagnosis and Treatment*. 2nd Edition, 2007, 18:544–545
2. WHO. *Practice manual for establishing and maintaining surveillance systems for suicide attempts and self-harm* (Cited September 16 2020). Available from www.who.int/mental_health/suicide-prevention/attempts_ surveillancesystems/en/
3. Värnik P. Suicide in the World. *Int J Environ Res Public Health* 2012, 9: 760–771, doi: 10.3390/ijerph9030760
4. Inagaki M, Kawashima Y, Kawanishi C, Yonemoto N, Sugimoto T, Furuno T et al. Interventions to prevent repeat suicidal behavior in patients admitted to an emergency department for a suicide attempt: a meta-analysis. *J Affect Disord* 2015, 175:66–78, doi: 10.1016/j.jad.2014.12.048
5. WHO. Suicide rates (per 100 000 population). (Cited September 21 2020), 2018. Available from www.who.int/mental_health/suicide-prevention/Global_AS_ suicide_rates bothsexes_2016.png?ua=1
6. Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *Br J Psychiatry* 2008, 192:98–105, doi: 10.1192/bjp.bp.107.040113
7. Nordentoft M. Crucial elements in suicide prevention strategies. *Prog Neuropsychopharmacol Biol Psychiatry* 2011, 35:848–853, doi:10.1016/j.pnpbp. 2010.11.038
8. Parra-Uribe I, Blasco-Fontecilla H, Garcia-Parés G, Martínez-Naval L, Valero-Coppin O, Cebrià-Meca A et al. Risk of re-attempts and suicide death after a suicide attempt: A survival analysis. *BMC Psychiatry* 2017, 17, doi: 10.1186/s12888-017-1317-z
9. Hegerl U, Mergl R, Havers I, Schmidtke A, Lehfeld H, Niklewski G et al. Sustainable effects on suicidality were found for the Nuremberg alliance against depression. *Eur Arch Psychiatry Clin Neurosci* 2010, 260:401–406, doi: 10.1007 /s00406-009-0088-z
10. Liu Y, Zhang J, Sun L. Who are likely to attempt suicide again? A comparative study between the first and multiple timers. *Compr Psychiatry* 2017, 78:54–60, doi: 10.1016/j.comppsych.2017.07.007

11. Ganz D, Braquehais M D, Sher L. Secondary Prevention of Suicide. *PLoS Med* 2010, 7:e1000271, doi: 10.1371/journal.pmed.1000271
12. Johansson L, Lindqvist P, Eriksson A. Teenage suicide cluster formation and contagion: Implications for primary care. *BMC Fam Pract* 2006, 32, doi: 10.1186/1471-2296-7-32
13. Cross S. Why the 'copycat' theory on suicide coverage is a 'conceptual red herring'. *Ethical Space: The International Journal of Communication Ethics* 2008, 4:19–23
14. Vandewalle J, Duprez V, Beeckman D, Van Hecke A, Verhaeghe S. Contact between patients with suicidal ideation and nurses in mental health wards: Development and psychometric evaluation of a questionnaire. *Int J Ment Health Nurs* 2020, 30:219–234, doi: 10.1111/inm.12776
15. Moher D, Liberati A, Tetzlaff J, Altman DG. The PRISMA Group Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Med* 2009, 6:264–269, doi: 10.1371/journal.pmed. 1000097
16. Fleischmann A, Bertolote JM, Wasserman D, De Leo D, Bolhari J, Botega NJ et al. Effectiveness of brief intervention and contact for suicide attempters: a randomized controlled trial in five countries. *Bull World Health Organizat* 2008, 86:703–709, doi: 10.2471/ blt.07.046995
17. Gysin-Maillart A, Schwab S, Soravia L, Megert M, Michel K. A Novel Brief Therapy for Patients Who Attempt Suicide: A 24-months Follow-Up Randomized Controlled Study of the Attempted Suicide Short Intervention Program (ASSIP). *PLOS Med* 2016, 13:e1001968 doi: 10.1371/journal.pmed.1001968
18. King CA, Eisenberg D, Zheng K, Czyz E, Kramer A, Horwitz A et al. Online suicide risk screening and intervention with college students: a pilot randomized controlled trial. *J Consult Clin Psychol* 2015, 83:630–636, doi: 10.1037/a0038805
19. Miller IW, Camargo CA Jr, Arias SA, Sullivan AF, Allen MH, Goldstein A et al. Suicide Prevention in an Emergency Department Population: The ED-SAFE Study. *JAMA Psychiatry* 2017, 74:563–570, doi: 10.1001/jamapsychiatry.2017.0678
20. Franco-Martín MA, Muñoz-Sánchez JL, Sainz-de-Abajo B, Castillo-Sánchez G, Hamrioui S, de la Torre-Díez I. A Systematic Literature Review of Technologies for Suicidal Behavior Prevention. *J Med Syst* 2018, 42:71, doi: 10.1007/s10916-018-0926-5
21. Kreuze E, Jenkins C, Gregoski M, York J, Mueller M, Lamis DA et al. Technology-enhanced suicide prevention interventions: A systematic review. *J Telemed Telecare* 2017, 23:605–617, doi: 10.1177/1357633X16657928
22. Khan R A, Costanza A M. Health Approaches in Suicide Prevention at the Emergency Department: Some Theoretical and Practical Considerations. *Int J Emerg Ment Health* 2018, 20:1–8, doi: 10.4172/1522-4821.1000401
23. Larsen M E, Shand F, Morley K, Batterham P J, Petrie K, Reda B et al. A Mobile Text Message Intervention to Reduce Repeat Suicidal Episodes: Design and Development of Reconnecting After a Suicide Attempt (RAFT). *JMIR mental health* 2017, 4:e56, doi: 10.2196/ mental.7500
24. Leung LB, Young AS, Heyworth L, Rose D, Stockdale S, Graaff AL et al. Do Collaborative Care Managers and Technology Enhance Primary Care Satisfaction with Care from Embedded Mental Health Providers? *J Gen Intern Med* 2020, 35:3458–3464, doi: 10.1007/s11606-020-05660-1

Ανασκόπηση

# Παρεμβάσεις πρόληψης αυτοκτονίας μετά την πρώτη απόπειρα, σχετιζόμενες με επικοινωνία με την οικογένεια και τον ασθενή: Μια συστηματική ανασκόπηση

Καικιλία Κατσιβαρδά,[1] Κωνσταντίνος Ασημακόπουλος,[2] Ελένη Γελαστοπούλου[3]

[1]*Ιατρική Σχολή, ΕΚΠΑ, Αθήνα*

[2]*Ψυχιατρική Κλινική, Ιατρική Σχολή, Πανεπιστήμιο Πατρών, Πάτρα*

[3]*Εργαστήριο Υγιεινής, Ιατρική Σχολή, Πανεπιστήμιο Πατρών, Πάτρα*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 31 Ιουλίου 2020/Αναθεωρήθηκε 2 Οκτωβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Οι προηγούμενες απόπειρες αυτοκτονίας είναι ο ισχυρότερος παράγοντας κινδύνου για μια νέα απόπειρα αυτοκτονίας, θάνατο από αυτοκτονία, ανάπτυξη επαναλαμβανόμενης συμπεριφοράς αυτοκτονίας και ανάπτυξη αυτοκτονικού ιδεασμού στον γενικό πληθυσμό. Η πρωτογενής πρόληψη στοχεύει στη μείωση νέων προσπαθειών αυτοκτονίας στον γενικό πληθυσμό, ενώ η δευτερογενής πρόληψη προσπαθεί να μειώσει την πιθανότητα απόπειρας αυτοκτονίας σε ασθενείς με υψηλό κίνδυνο. Τριτοβάθμιες παρεμβάσεις είναι εκείνες που στοχεύουν άτομα που έχουν ήδη μία ή περισσότερες απόπειρες αυτοκτονίας και στοχεύουν στην αποτροπή δεύτερων ή επαναλαμβανόμενων προσπαθειών και στην καταστολή της αυτοκτονικής συμπεριφοράς. Η επικοινωνία με τους ασθενείς και την οικογένεια είναι ένας πολύ αποτελεσματικός τρόπος πρόληψης μιας δεύτερης απόπειρας αυτοκτονίας. Ο σκοπός αυτής της ανασκόπησης είναι να παρουσιάσει τις τριτοβάθμιες παρεμβάσεις πρόληψης αυτοκτονίας και να μελετήσει την αποτελεσματικότητά τους, εστιάζοντας στην επικοινωνία με τους ασθενείς και τις οικογένειες των ασθενών. Για τη συστηματική ανασκόπηση, η οποία βασίστηκε στη λίστα ελέγχου PRISMA, έγινε αναζήτηση μελετών στις βάσεις δεδομένων Pubmed, Scopus και Google Scholar, για άρθρα που δημοσιεύθηκαν την περίοδο 2000–2020. Η αναζήτηση έγινε σχετικά με την επικοινωνία με οικογένεια και ασθενή. Συμπεριλήφθηκαν όλες οι μελέτες που αφορούσαν παρεμβάσεις σε άτομα που είχαν ιστορικό τουλάχιστον μίας προηγούμενης απόπειρας αυτοκτονίας. Οι παρεμβάσεις που περιγράφονται στις σχετικές μελέτες αφορούν: (1) πρόσωπο με πρόσωπο επικοινωνία και τηλεφωνικές επαφές, (2) επικοινωνία με κάρτες και γράμματα, (3) τηλεφωνική επαφή με τον ασθενή και τήρηση αρχείων για τη διευκόλυνση της εφαρμογής του σχεδίου δράσης, (4) τηλεφωνικές επαφές μόνο, (5) επικοινωνία με βάση την τεχνολογία. Η αναζήτηση επέφερε συνολικά 9 έρευνες που αφορούσαν παρεμβάσεις με έμφαση στην επικοινωνία με την οικογένεια και τον ασθενή. Οι παρεμβάσεις διατήρησης της επικοινωνίας με την οικογένεια και τον ασθενή μέσω τηλεφωνικής επικοινωνίας και επικοινωνίας με κάρτες έδειξαν ένα καλό επίπεδο αποτελεσματικότητας στην πρόληψη μιας νέας απόπειρας αυτοκτονίας, ειδικά εάν η παρέμβαση έχει ολοκληρωθεί σύμφωνα με το πρόγραμμα και ο ασθενής δεν εγκατέλειψε τη θεραπεία νωρίς. Η γενίκευση των αποτελεσμάτων περιορίζεται από τη συμπερίληψη όχι αποκλειστικά τυχαιοποιημένων ελεγχόμενων δοκιμών και από τη μεταβλητότητα μεταξύ των δειγμάτων των ερευνών. Συμπερασματικά, οι παρεμβάσεις επικοινωνίας με την οικογένεια και τον ασθενή, έδειξαν θετικό αποτέλεσμα στην πρόληψη μιας δεύτερης απόπειρας αυτοκτονίας. Απαιτούνται περισσότερες μελέτες διερεύνησης της αποτελεσματικότητας των διαφορετικών θεραπευτικών προσεγγίσεων και των πληθυσμών των ασθενών στους οποίους κάθε παρέμβαση θα μπορούσε να είναι περισσότερο αποτελεσματική.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Δεύτερη απόπειρα αυτοκτονίας, πρόληψη, παρεμβάσεις, οικογένεια, επικοινωνία.

*Συγγραφέας επικοινωνίας:* Καικιλία Κατσιβαρδά, Πανεπιστήμιο Πατρών, Ιατρική Σχολή, Πανεπιστημιούπολη Ρίο, 265 00 Πάτρα, Διεύθυνση e-mail: ceciliakatsivarda@gmail.com

https://doi.org/10.22365/jpsych.2021.009 / Psychiatriki 2021, 32:59–66

Review

# Social isolation and loneliness in old age: Exploring their role in mental and physical health

Panagiota Tragantzopoulou, Vaitsa Giannouli

*School of Psychology, Mediterranean College - University of Derby, Thessaloniki, Greece*

**ARTICLE HISTORY:** Received 9 July 2020/Revised 21 September 2020/Published Online 17 March 2021

**ABSTRACT**

The current review has the ultimate scope to accurately define social isolation and loneliness while highlighting the serious repercussions on health and behavior. Daily hundreds of people across the globe report suffering from social isolation and loneliness; an overwhelming feeling of emptiness, unworthiness and personal failure. Human beings are social species that have the need to nurture reliable and secure social settings to survive. Simultaneously, trustworthy social relationships are critical for mental and physical wellbeing whereas impaired social interactions can lead to social isolation and loneliness. In an attempt to tease out and elucidate salient problems and issues, we seek to critically compose studies, views and issues from a variety of perspectives by providing opposing standpoints and conversational voices instead of intensifying traditional narratives and dominant discourses. Few aspects of social isolation and loneliness are untouched by scientific attention. The role of these concepts in old age is no exception and arguably has a tremendous impact in multiple aspects of life. Social isolation and loneliness are two distinctive concepts that have been identified as risk factors for wellbeing, health and everyday functioning in profound ways. Therefore, we aimed to examine the associations with various psychiatric disorders for instance anxiety, depression, psychotic disorder and Alzheimer's disease as well as with a variety of physical disorders such as cardiovascular diseases, cholesterol and autoimmune diseases. Given the alarming records from healthcare which depict an almost two-fold rise in healthcare attendance, we attempt to assemble the proposed interventions through an in-depth review of the current literature available and provide the incentive for constructive and collective thought. To our theoretical understanding, in order to better comprehend these psychosocial concepts and deliver timely and more effective personalized interventions to those in need, it is of paramount importance to thoroughly examine the identified causal links. However, further research is required for the reduction or the deletion of the undesired effects.

**KEYWORDS:** Social isolation, emotional loneliness, Alzheimer's disease, psychosis, interventions.

## Social isolation and loneliness: Definitions, gender and cultural differences

It is, sometimes, very intricate to discern social isolation from loneliness since not all isolated individuals are lonely and not all who feel lonely are secluded. Social isolation is considered an objective, quantitative parameter that indicates the size of the individual's network and the frequency of contact.[1] Following definitions and approaches in sociology and psychology, isolation is segregated in two forms, objective and subjective isolation. Objective isolation can be described by situational factors for example lack or infrequent contact with network members and absence of participation in activities.[2] On the other side, subjective isolation can be determined by subjective factors such as shortfall of social network diversity and resources of partnership.[3] Similarly, when defining loneliness, most of the researchers emphasize on the actual or perceived deficits that social relation-

*Corresponding author:* Vaitsa Giannouli, Mediterranean College, School of Psychology, 2–4 Egnatia str., GR-546 26 Thessaloniki, Greece • e-mail: giannouliv@hotmail.com

ships project. It represents a qualitative, subjective parameter referencing the individual's expectancy and gratification with the periodicity and proximity of contacts.[4] Loneliness is conceptualized as emotional and social loneliness. Emotional loneliness represents the perceived lack of meaningful attachment whereas social loneliness represents the lack of membership to a group.[5]

It is hardly surprising that feelings of loneliness are associated with social isolation, albeit existing studies concluded that the association is weak to moderate.[6] Cornwell & Waite[7] suggest that the relationship between loneliness and social isolation in older adults may be 'decoupled' as a consequence of their expectation for, and as an extension of their preparation, transitions and declines in their social network. Evidence from twin studies reveal that loneliness can have a heritable cause and maintain a stable course, with findings attributing almost equal percentages to heritage and non-shared environmental factors in adulthood.[8] However, concrete situational factors augment the risk for experiencing loneliness. Based on several studies, these factors include deficiency in social relations, few social roles, incapacity to be vigorously involved in the local community activities, low socioeconomic status, physical health symptoms and poor marital status.[9,10] In the transitional process from middle age to older age, social roles are being disrupted and several alterations in both the individual and the family level supervene. Initially, this chronological stage is marked by their release from the labor force and their integration to the retired population. Accordingly, individuals experience the parenthood to 'empty nest' phase which tangles the possible attenuation of kinship attachments.[11] Literature reviews conclude that the empty-nest syndrome is a transitional period that can be characterized by negative effects such as depression, alcoholism, identity crisis, marital conflict and isolation.[12] Equally, they face the inevitable emotional pain resulting from the death of their loved ones and the loss of family and friendship ties.[13]

Gender differences have been identified depicting a higher prevalence in the female population. Researchers believe that although females are at risk of more ill-health conditions, they tend to outlive their partners.[14] Studies have also shown that women are widely integrated in social networks whereas men are to lesser degree recipients of social support.[15] Accordingly, an important aspect that should be mentioned is that women tend to have more social support exchanges and maintain more kinship ties and family connections compared to men, perhaps because childlessness is highly valued.[16] Cultural and cross-national differences were also evident. Tomaka et al[17] attempted to make comparisons between Caucasian and Hispanic samples. Based on their research, Hispanics are more prone to experience loneliness and develop health-related problems such as diabetes and hypertension. They, also, stated that having a sense of belonging somewhere and having a source of support could be protective and eliminate the risk of these illnesses. Hence, it is of fundamental importance to examine loneliness within specific cultures given that mental health can be acutely affected by culture.

## Social isolation and loneliness: Relations to mental health

The experience of feeling isolated and lonely can have detrimental effects on mental and physical wellbeing while it has been scientifically related to a heightened danger of unfolding serious health issues. High levels of loneliness and social isolation have been observed in individuals with mental health conditions, hearing and vision impairments, and chronic health problems and in neurodivergent groups such as autistic individuals.

### Anxiety

Studies have reported links between loneliness and social anxiety in older adults. As stated by Fry and Debats some elderly people with self-expectancies or internalized beliefs about their aging can experience severe anxiety connected with feelings of loneliness.[18] A longitudinal study with more than 1,100 adult participants which measured loneliness in a period of six months revealed that early state loneliness could predict later state social anxiety, paranoia and depression.[19] Further, a high-performance electroencephalographic (EEG) study that examined social stimuli in lonely and non- lonely older individuals supported the evolutionary theory of loneliness which denotes that lonely individuals are constantly alarmed and display heightened attention for social threat during the early stages of processing social stimuli, by reporting differences in the process of social and non- social threat stimuli in the first 116 ms of information processing.[20,21] Despite the irrefutable evidence associating loneliness with social anxiety among several age groups, links to other forms of anxiety remain largely underexplored.

### Depression

When referring to social isolation and loneliness in older populations, it is vital to take into account depression as another strong confounding factor that can

provoke serious behavioral and biological implications. According to WHO, depression among elderly has a prevalence of 10–20%.[22] As ubiquitous life-changing events and physical disablement evolve, demoralization and depression commonly accompany them. There are cases that overt depressive symptomatology for instance social withdrawal, distress, idleness and melancholy veil the widespread loneliness. Empirical studies determined that loneliness and depression are distinctive concepts both statistically and functionally,[23,24] with loneliness serving as a predicting factor for depression but not vice versa.[25] Previous research has confirmed that loneliness and social isolation are considerably associated with depression and operate as a pathway through which individual's health is being affected with recent meta-analyses concluding that loneliness has moderately significant effect on depression.[26] In fact, poorer health- related behaviors, risk for cardiovascular disease and higher levels of inflammatory markers are more likely to be reported by depressed individuals.[27,28]

Several studies suggest insecure attachment styles escalate susceptibility to social isolation, loneliness and depression. The susceptibility to depression can be caused due to the fact that insecurely attached individuals tend to have poor problem solving skills, an unstable self-concept, low self-esteem and difficulty in developing and maintaining relationships.[29] A mixed method study of chronic depression in older British Pakistani women found that the persistence of depression was partly explained by social isolation.[30] Interestingly, Wilby found that depressed older people were not socially isolated but were on the contrary more likely to report contacts than non-depressed respondents.[31] The discrepancy in findings could be better understood if the quality and meaning of different types of social relations in old age were explored. Although evidence about the association of loneliness and depression are well-established, several limitations were identified in the existing longitudinal studies. Firstly, there are other individual traits including objective social isolation, objective and perceived stress, and low social support that can be associated with loneliness and depression. However, it is not clear the extent to which each of these characteristics can affect depressive symptoms. Secondly, most prior studies relied on convenience samples without taking into consideration the potential implications of gender, ethnicity, education, psychiatric diagnosis, use of antidepressant medications, or physical functioning. Finally, their analyses relied on regression or latent growth models in which depressive symptomatology served as the criterion measure.[25]

## Alzheimer's disease

Across the years, sparse studies have attempted to connect social isolation and loneliness with the onset of Alzheimer's disease (AD), but this relationship in people with AD is relatively unknown. Previous research that looked into the relationship of social isolation and dementia has highlighted that quality is better than quantity. Amieva et al found that social interactions that provide the feelings of satisfaction and perceived reciprocity can serve as protective factors of dementia over 15 years whereas the size and nature of social networks was not associated with dementia risk.[32] Further, a 12-year cohort study confirmed that having a confidant can secure individuals from dementia symptomatology.[33] Other studies that explored the impact of loneliness on dementia onset found that older adults who felt lonely were more than twice as likely to develop an AD-like dementia syndrome, than those who were not lonely.[34] Holwerda et al found that healthy older adults were more likely to develop clinical dementia after 3 years if they felt lonely, rather than being lonely at baseline. Research exploring loneliness in people who already have dementia is rare, probably because it is difficult to ascertain whether someone with cognitive problems can accurately evaluate how lonely he is feeling.[35] Haj et al found that participants with AD were significantly lonelier than healthy controls, and this positively correlated with emotional deprivation.[36]

## Psychotic disorders

Independently of genetic or biological factors, evidence reveals that social isolation and loneliness are risk factors for developing psychosis. Interestingly, El Haj et al found in a sample of lonely participants that individuals with AD and healthy elderly controls presented a greater incidence of hallucinations.[36] This finding could possibly indicate that the onset of psychotic symptoms may be determined by loneliness even if underlying neurological or psychiatric conditions are absent. In accordance, studies have suggested that social isolation makes older individuals more susceptible to aberrant sensations across exteroceptive and proprioceptive dimensions, especially when the individual experiences self-disturbances and anomalous bodily experiences.[37] Quadt et al highlight interoception meaning the body-to-brain communication through distinct neural and humoral channels that can result in impaired cognitive and emotional processes when the external and internal needs are not met and social isolation and loneliness serve as social allostatic overloads.[21] While the effects of social isolation and loneli-

ness on depressive symptomatology and AD are widely recognized, the links among psychotic disorder, social isolation and loneliness remain vague and largely underexplored.

### Suicidal ideation

High levels of mortality have been observed in both social isolation and loneliness and it is significantly possible that suicidal behavior can play a vital role for these high scores. Suicidal behavior is a complex biopsychosocial process that is considered a world- wide epidemic with almost 800.000 people worldwide dying each year by suicide.[38] Research investigating the links among social isolation, loneliness and suicidal behavior is scarce with existing findings indicating that adolescents and elderly are vulnerable to both loneliness and suicidal behavior.[39] Lonely individuals are prone to perceiving life as stressful and unbearable, with chronic stress being also related with high levels of suicidal ideation.[40] A recent narrative meta- analysis found that having no partner, living alone, social isolated, feeling lonely, feeling alienated from others, and feeling not to belong are the main social constructs that can highly contribute to suicidal outcomes.[41] In this particular study, subjective loneliness had the greatest impact on both suicidal ideations and suicidal attempts. This outcome was reinforced by an integrative meta- analysis showing that the function and the quality of social relationships are more predictive of suicidal behavior.[42] In view of these findings, meaningful social relationships seemingly can constitute a protective factor against suicidal behavior.

### Physical health

The detrimental effects of social isolation and loneliness on physical health in old age are well-documented, with recent meta-analyses reporting a 30% increased levels of poorer quality of sleep, stress, and risk for stroke and myocardial infarction.[43] Academic literature has confirmed that these effects on individual's mortality are nearly identical to prime well-known health dangers for example smoking and alcohol consumption and surpass that of physical inaction and obesity.[43] Nonetheless, research focusing solely on loneliness and health-risk behaviors reported either no significant discrepancy in the health profile among a sample of both lonely and non-lonely subjects[44] or less physical activity and a higher tendency to smoke in lonely individuals,[45] concluding in ambiguous results. However, research on social isolation produced more consequent corollary. Adults with small social networks and less social contacts, frequently adopt an unhealthy diet with elements of heavy drinking and smoking.[46] Further, evidence revealed that social participation was a protective factor to frailty in older people who had a high risk of frailty over 14 years.[47] The value of significant others in adjusting and preserving healthy behavioral choices through the interchange of several social cues have been recognized by most social– cognition models of health behavior.[48]

Grant et al in a series of experimental studies where acute stressful challenges such as color-word interference and mirror tracing tasks were utilized, found that socially isolated old participants had poorer recovery of systolic blood pressure and greater increases in total: HDL cholesterol ratio. It was, also, reported that an increased fibrinogen and natural killer cell response to stress tasks was evident in lonely participants when compared to the non-lonely ones.[49] Marital status and quality of marriage seem to have a remarkable influence on blood pressure,[50] with a stronger effect on older males.[51] Finally, a recent systematic review in old individuals highlighted that social isolation and loneliness contribute to a poorer immune system, selective expansion of proinflammatory monocytes, enhanced expression of cytokines, and glucocorticoid resistance.[52] Mechanisms that are likely to increase the risk of coronary heart disease.[53] Nonetheless, only a third of the published studies use a longitudinal design and the fact that most studies are cross-sectional means that still relatively little is known about mechanisms and causal links.[54] Therefore, similar investigations should be carried out in order to obtain clearer insights on the prognosis of diverse health conditions.

## Interventions and future research

Wide and systematic reviews suggest that positive outcomes and wellbeing in elderly are attainable with social engagement;[55] however, the crucial question is which interventions are the most beneficial. There is a broadly accepted conviction that home visits can be effective for the bereaved and housebound adults as well as their care-givers. However, the conclusions from two systemic reviews were conflicting. Van Haastregt[56] deduced that no significant fact could predict the prevention of loneliness by home-based support whereas Elkan[57] concluded that home visits could prevent admission to institutional care and prolong survival. Further, a randomized control trial of a model of restorative home care on physical health and social support showed significant improvements in physical function but no changes in perceived levels of social support.[56] Regarding depression, interventions counteracting social withdrawal and enabling meaningful social contact

managed to alleviate depressive symptomatology with promising results for relapse prevention.[58] Even though the descent of fundamental functions such as learning, memory and focus is widely recognized, systematic research in social gerontology and aging psychology indicates that the occupation with a more intricate activity may restrict the negative functional declines.[59] A longitudinal study in a sample of US adults revealed that challenges in daily functioning such as dressing up, eating and bathing, decreased mobility and difficulty with climbing stairs over a 6-year period among lonely participants.[60]

Comparisons of different therapeutic approaches showed that cognitive behavioral therapy-based interventions which target maladaptive social cognition demonstrated the greatest reduction in loneliness scores.[61] Also, befriending, an active practice of therapist-client communication or jointly participation in activities, showed equal improvements in both positive and negativesymptoms.[62] One of these befriending programmes –focused on older women – reported success in attracting lonely older people but not in improving the well-being of participants.[63] Different results were found for a club targeting men in a care home, as participants reported a significant reduction in their depression and anxiety levels.[64]

While research on social isolation and loneliness with their consequent mental and physical aftermaths is growing, there are many aspects still to consider.[65] Several studies have confirmed the hypotheses that social isolation, loneliness, depression and other psychosocial distress may be risk factors for poor health outcomes. However, the exact mechanisms and the different types of social bonds by which social isolation and loneliness impact cardiovascular health remain elusive. Furthermore, the quantitative methodologies used to measure psychosocial distress may not adequately capture what individuals subjectively experience.[66] Equally, the majority of up-to-date research has utilized samples from single countries or regions rather that expanding their search cross-nationally in both neurotypical and neurodivergent individuals. Thus, more quantitative and qualitative studies should be pursued further. Additionally, prospective studies are necessary to determine if loneliness and social networks predict the prognosis of AD and to examine whether it is due to socio-structural reasons and how this relates to the increased vulnerability to health conditions. Finally, additional research is required to address whether employed interventions can have long- term positive effects and whether the potential damage that is already be done can be reversed by these interventions. The ongoing examination of social isolation and loneliness with the parallel focus on intervention evolvement is crucial for the implementation of effectual programs and for the obstruction of the vicious cycle of adverse health and psychological outcomes in elderly populations.

## Conclusion

Social isolation and loneliness in older adult populations represent crucial societal phenomena that originate a sequence of multiplex brain- body interactions which ultimately makes the whole organism more susceptible to mental and physical health conditions. Thus, it is of utter importance to elucidate the causal directions that occur among social isolation, feelings of loneliness, body and brain responses. Aging is a gradual and continuous process of natural change where roles, expectations and stereotypes play a crucial role in developing personal identity and maintaining a balanced emotional state. The present review discussed and reflected on these concepts in an attempt to further elucidate the contexts, merge studies and provide attention for the amelioration of these stressful conditions. There is, still, a paucity of relevant data and a pressing need for improvement and for numerous research opportunities. Increasing knowledge base will open the path for addressing the problem with more efficient interventions and for warranting an improved quality of life for the growing population of elderly.

## References


1. House JS. Social isolation kills, but how and why? *Psychosom Med* 2001, 63:273–274, doi: 10.1097/00006842-200103000-00011
2. Lauder W, Mummery K, Jones M, Caperchione C. A comparison of health behaviours in lonely and non-lonely populations. *Psychol Health Med* 2006, 11:233–245, doi: 10.1080/13548500500266607
3. Van Baarsen B, Snijders T, Smit JH, Van Duijn, M. Lonely but not alone: Emotional isolation and social isolation as two distinct dimensions of loneliness in older people. *Educational and Psychological Measurement* 2001, 61:119–135, doi: 10.1177/00131640121971103
4. De Jong Gierveld J, Havens B. Cross-national comparisons of social isolation and loneliness: introduction and overview. *Can J Aging* 2004, 23:109–113, doi:10.1353/cja.2004.0021
5. Weiss R. *Loneliness: The experience of emotional and social isolation*. MIT Press, Cambridge, MA, 1973
6. Cornwell EY, Waite LJ. Measuring social isolation among older adults using multiple indicators from the NSHAP study. *J Gerontol B Psychol Sci Soc Sci* 2009b, 64:38–46, doi: 10.1093/geronb/gbp037
7. Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. *J Health Soc Behav* 2009a, 50:31–48, doi: 10.1177/002214650905000103

8. Boomsma DI, Cacioppo JT, Muthén B, Asparouhov T, Clark S. Longitudinal genetic analysis for loneliness in Dutch twins. *Twin Res Hum Genet* 2007, 10:267–273, doi10.1375/twin.10.2.267
9. Hawkley LC, Hughes ME, Waite LJ, Masi CM, Thisted RA, Cacioppo JT. From social structural factors to perceptions of relationship quality and loneliness: the Chicago health, aging, and social relations study. *J Gerontol B Psychol Sci Soc Sci* 2008, 63:375–384, doi:10.1093/geronb/63.6.s375
10. Savikko N, Routasalo P, Tilvis RS, Strandberg TE, Pitkälä KH. Predictors and subjective causes of loneliness in an aged population. A*rch Gerontol Geriatr* 2005, 41:223–233, doi:10.1016/j.archger.2005.03.002
11. Bouchard, G. How do parents react when their children leave home? An integrative review. *J Adult Dev* 2014, 21:69–79, doi: 10.1007/s10804-013-9180-8
12. Bougea A, Despoti A, Vasilopoulos, E. Empty-nest-related psychosocial stress: Conceptual issues, future directions in economic crisis. *Psychiatriki* 2020, 30:329–338, doi:10.22365/jpsych.2019.304.329.
13. Charles ST. Strength and vulnerability integration: a model of emotional well-being across adulthood. *Psychol Bull* 2010, 136:1068–1091, doi: 10.1037/a0021232
14. McDonough P, Walters V. Gender and health: reassessing patterns and explanations. *Soc Sci Med* 2001, 52:547–559, doi: 10.1016/s0277-9536(00)00159-3
15. Rijken A, Liefbroer A. Differences in family norms for men and women across Europe: Differences in family norms for men and women. *Journal of Marriage and Family* 2016, 78:1097–1113, doi: 10.1111/jomf.12310
16. Holwerda TJ, et al. Increased risk of mortality associated with social isolation in older men: Only when feeling lonely? Results from the Amsterdam Study of the Elderly (AMSTEL). *Psychol Med* 2012, 42:843–853, doi: 10.1073/pnas.1219686110
17. Tomaka J, Thompson S, Palacios R. The relation of social isolation, loneliness, and social support to disease outcomes among the elderly. *J Aging Health* 2006, 18:359–384, doi:10.1177/0898264305280993
18. Fry PS, Debats DL. Self-efficacy beliefs as predictors of loneliness and psychological distress in older adults. *Int J Aging Hum Dev* 2002, 55:233–69, doi: 10.2190/KBVP-L2TE-2ERY-BH26.
19. Lim MH, Rodebaugh TL, Zyphur MJ, Gleeson JFM. Loneliness over time: the crucial role of social anxiety. *J Abnorm Psychol* 2016, 125:620–630, doi: 10.1037/abn0000162
20. Cacioppo JT, Cacioppo S, Cole SW, Capitanio JP, Goossens L, Boomsma DI. Loneliness across phylogeny and a call for comparative studies and animal models. Perspect Psychol Sci 2015, 10:202–212, doi: 10.1177/1745691614564876
21. Quadt L, Esposito G, Critchley HD, Garfinkel SN. Brain-body interactions underlying the association of loneliness with mental and physical health. *Neurosci Biobehav Rev* 2020, 116:283–300, doi:10.1016/j.neubiorev.2020.06.015.
22. Grover S, Malhotra N. Depression in elderly: A review of Indian research. *J Geriatr Ment Health* 2015, 2:4–15, doi: 10.4103/2348–9995.161376
23. Cacioppo JT, Hughes ME, Waite TJ, Hawkley LC, Thisted RA. Loneliness as a specific risk factor for depressive symptoms: Cross-Sectional and longitudinal analyses. *Psychol Aging* 2006, 21:140–151, doi: 10.1037/0882-7974.21.1.140
24. Hawkley LC, Masi CM, Berry JD, Cacioppo JT. Loneliness is a unique predictor of age-related differences in systolic blood pressure. *Psychol Aging* 2006, 21:152–164, doi: 10.1037/0882-7974.21.1.152
25. Cacioppo JT, Hawkley LC, Thisted RA. Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychol Aging* 2010, 25:453–463, doi: 10.1037/a0017216
26. Erzen E, Çikrikci Ö. The effect of loneliness on depression: A meta-analysis. *Int J Soc Psychiatry* 2018, 64:427–435, doi: 10.1177/0020764018776349.
27. Van der Kooy K, Van Hout H, Marwijk H, Marten H, Stenhouwer C, Beekman A. Depression and the risk for cardiovascular diseases: Systematic review and meta-analysis. *Int J Geriatr Psychiatry* 2007, 22:613–626, doi: 10.1002/gps.1723
28. Kop WJ, Kuhl EA, Barasch E, Jenny NS, Gottlieb SS, Gottdiener JS. Association between depressive symptoms and fibrosis markers: The Cardiovascular Health Study. *Brain Behav Immun* 2010, 24:229–235, doi: 10.1016/j.bbi.2009.09.017
29. Daniel K. Loneliness and Depression among University Students in Kenya? *Global Journal of Human Social Science* 2013, 4:11–18, doi: 10.1016/j.jad.2014.04.070
30. Gask L, Aseem S, Waquas A, Waheed W. Isolation, feeling 'stuck' and loss of control: understanding persistence of depression in British Pakistani women. *J Affect Disord* 2011, 128:49–55, doi: 10.1016/j.jad.2010.06.023
31. Wilby F. Depression and social networks in community dwelling elders: a descriptive study. *Journal of Gerontological Social Work* 2011, 54:246–259, doi: 10.1111/hsc.12311
32. Amieva H, Stoykova R, Matharan F, Helmer C, Antonucci TC, Dartigues JF. What aspects of social network are protective for dementia? Not the quantity but the quality of social interactions is protective up to 15 years later. *Psychosom Med* 2010, 72:905–911, doi: 10.1097/PSY.0b013e3181f5e121
33. Camozzato A, Godinho C, Varela J, Kohler C, Rinaldi J, Chaves ML. The complex role of having confidant on the development of Alzheimer's disease in a community-based cohort of older people in Brazil. *Neuroepidemiology* 2015, 44:78–82, doi: 10.1159/000371521
34. Wilson RS, Krueger KR, Arnold SE, Schneider JA, Kelly JF, Barnes LL, et al. Loneliness and risk of alzheimer disease. *Arch Gen Psychiatry* 2007, 64:234–240, doi: 10.1001/archpsyc.64.2.234
35. Holwerda TJ, Deeg DJ, Beekman AT, van Tilburg TG, Stek ML, Jonker C et al. Feelings of loneliness, but not social isolation, predict dementia onset: Results from the Amsterdam Study of the Elderly (AMSTEL). *J Neurol NeurosurgPsychiatry* 2012, 85:135–142, doi: 10.1136/jnnp-2012-302755
36. Haj ME, Jardri R, Larøi F, Antoine P. Hallucinations, loneliness, and social isolation in Alzheimer's disease. *Cogn Neuropsychiatry* 2016, 21:1–13, doi: 10.1080/13546805.2015.1121139
37. Michael J, Park S. Anomalous bodily experiences and perceived social isolation in schizophrenia: an extension of the social deafferentation hypothesis. *Schizophr Res* 2016, 176:392–397, doi: 10.1016/j.schres.2016.06.013
38. Naghavi M, Orpana HM, Marczak LB, Arora M, Abbasi N, Abdulkader RS et al. Global, regional, and national burden of suicide mortality 1990 to 2016: systematic analysis for the Global Burden of Disease Study 2016. *BMJ* 2019, 364:194, doi: 10.1136/bmj.l94
39. Li H, Xu L, Chi I. Factors related to Chinese older adults' suicidal thoughts and attempts. *Aging Ment Health* 2016, 20:752–761, doi: 10.1080/13607863.2015.1037242
40. Hawkley LC, Cacioppo JT. Loneliness and pathways to disease. *Brain Behav Immun* 2003, 17:98–105, doi: 10.1016/s0889-1591(02)00073-9
41. Calati R, Ferrari C, Marie B, Oasi O, Emilie O, Courteta CP, André F. Suicidal Thoughts and Behaviors and Social Isolation: A Narrative Review of the Literature. *J Affect Disord* 2019, 15:653–667, doi: 10.1016/j.jad.2018.11.022

42. Chang Q, Chan, CH. Yip PS. A meta-analytic review on social relationships and suicidal ideation among older adults. *Soc Sci Med* 2017, 191:65–76, doi: 10.1016/j.socscimed.2017.09.003
43. Valtorta NK, Kanaan M, Gilbody S, Ronzi S, Hanratty B. Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. *Heart* 2016, 102:1009–1016, doi: 10.1136/heartjnl-2015-308790
44. Steptoe A, Owen N, Kunz-Ebrecht SR, Brydon L. Loneliness and neuroendocrine, cardiovascular, and inflammatory stress responses in middle-aged men and women. *Psychoneuroendocrinology* 2004, 29:593–611, doi: 10.1016/S0306-4530(03)00086-6
45. Hawkley LC, Thisted RA, Cacioppo JT. Loneliness predicts reduced physical activity: cross-sectional & longitudinal analyses. *Health Psychol* 2009, 28:354–363, doi: 10.1037/a0014400
46. Kharicha K, Iliffe S, Harari D, Swift C, Gillmann G, Stuck AE. Health risk appraisal in older people 1: Are older people living alone an "at-risk" group? *Br J Gen Pract* 2007, 57:271–276, doi:10.1186/1471-2296-14-130
47. Mehrabi F, Béland F. Effects of social isolation, loneliness and frailty on health outcomes and their possible mediators and moderators in community-dwelling older adults: A scoping review. *Arch Gerontol Geriatr* 2020, 90:104–119, doi: 10.1016/j.archger.2020.104119
48. Conner M, Norman P. Predicting health behaviour: A social cognition approach. In: M. Conner, P. Norman (eds) *Predicting health behaviour: Research and practice with social cognition models*. Open University Press 2005, 385:1–27, doi: 10.1016/S0925-7535(97)81483-X
49. Grant N, Hamer M, Steptoe A. Social isolation and stress-related cardiovascular, lipid, and cortisol responses. *Ann Behav Med* 2009, 37:29–37, doi: 10.1007/s12160-009-9081-z
50. Holt-Lunstad J, Uchino BN, Smith TW, Hicks A. On the importance of relationship quality: The impact of ambivalence in friendships on cardiovascular functioning. *Ann Behav Med* 2007, 33:278–290, doi: 10.1007/bf02879910
51. Blomgren J, Martikainen P, Grundy E, Koskinen S. Marital history 1971–91 and mortality 1991–2004 in England & Wales and Finland. *J Epidemiol Community Health* 2010, 66:30–36, doi: 10.1136/jech.2010.110635
52. Xia N, Li H. Loneliness, Social Isolation, and Cardiovascular Health. *Antioxid Redox Signal* 2018, 28:837–851, doi: 10.1089/ars.2017.7312
53. Ong AD, Uchino BN, Wethington E. Loneliness and Health in Older Adults: A Mini-Review and Synthesis. *Gerontology* 2016, 62:443–9, doi: 10.1159/000441651
54. Courtin E, Knapp M. Social isolation, loneliness and health in old age: a scoping review. *Health Soc Care Community* 2017, 25:799–812, doi: 10.1111/hsc.12311
55. Mushtaq R, Shoib S, Shah T, Mushtaq S. Relationship between loneliness, psychiatric disorders and physical health? A review on the psychological aspects of loneliness. *J Clin Diagn Res* 2014, 8:1–4. doi: 10.7860/JCDR/2014/10077.4828
56. Van Haastregt JC,Diederiks JPM, Van Rossum E, de Witte P, Crebolder M. Effects of preventive home visits to elderly people living in the community: systematic review. *BMJ* 2000, 320:754–8, doi: 10.1136/bmj.320.7237.754
57. Elkan R, Kendrick D, Dewey M, Hewitt M, Robinson J, Blair M, Williams D, Brummell K. Effectiveness of home-based support for older people: systematic review and meta-analysis. *BMJ* 2001, 323:719–724, doi: 10.1136/bmj.323.7315.719
58. Parsons J, Sheridan N, Rouse P, Robinson E, Connolly M. A randomized controlled trial to determine the effect of a model of restorative home care on physical function and social support among older people. *Arch Phys Med Rehabil* 2013, 94: 1015–1022, doi: 10.1016/j.apmr.2013.02.003
59. Cruwys T, Haslam SA, Dingle GA, Jetten J, Hornsey MJ, Chong ED et al. Feeling connected again: interventions that increase social identification reducedepression symptoms in community and clinical settings. *J Affect Disord* 2014, 159:139–146, doi: 10.1016/j.jad.2014.02.019
60. Giddens A. *Sociology*, All Publishing House, Bucharest, 2010
61. Perissinotto CM, Stijacic Cenzer I, Covinsky KE. Loneliness in older persons: a predictor of functional decline and death. *ArchIntern Med* 2012, 172:1078–1083, doi: 10.1001/archinternmed.2012.1993
62. Masi CM, Chen HY, Hawkley LC, Cacioppo JT. A meta-analysis of interventions to reduce loneliness. Personal. *Soc Psychol Rev* 2011, 15:219–266, doi: 10.1177/1088868310377394
63. Jackson H, McGorry P, Killackey E, Bendall S, Allott K, Dudgeon P et al. Acute-phase and 1-year follow-up results of a randomized controlled trial of CBT versus Befriending for first-episode psychosis: the ACE project. *Psychol Med* 2008, 38:725–735, doi: 10.1017/S0033291707002061
64. Martina CM, Stevens NL. Breaking the cycle of loneliness? Psychological effects of a friendship enrichment program for older women. *Aging Ment Health* 2006, 10:467–475, doi: 10.1080/13607860600637893
65. Gleibs IH, Haslam C, Jones JM, Alexander Haslam S, McNeill J, Connolly H. No country for old men? The role of a 'Gentlemen's Club' in promoting social engagement and psychological well-being in residential care. *Aging Ment Health* 2011, 15:456–466, doi: 10.1080/13607863.2010.536137
66. Stoyanova SY, Giannouli V, Gergov TK. Sentimentality and nostalgia in elderly people in Bulgaria and Greece–Cross-validity of the questionnaire SNEP and cross-cultural comparison. *Eur J Psychol* 2017, 13:109–128, doi: 10.5964/ejop.v13i1.1202

Ανασκόπηση

# Κοινωνική απομόνωση και μοναξιά στην τρίτη ηλικία: Εξερευνώντας τον ρόλο τους στην ψυχική και σωματική υγεία

Παναγιώτα Τραγαντζοπούλου, Βαΐτσα Γιαννούλη

*Σχολή Ψυχολογίας, Mediterranean College - University of Derby, Θεσσαλονίκη*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 9 Ιουλίου 2020/Αναθεωρήθηκε 21 Σεπτεμβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Η παρούσα ανασκόπηση έχει ως απώτερο σκοπό τον ακριβή προσδιορισμό της κοινωνικής απομόνωσης και της μοναξιάς και την επισήμανση των σοβαρών επιπτώσεων στην υγεία και τη συμπεριφορά. Καθημερινά, εκατοντάδες άνθρωποι σε όλο τον κόσμο αναφέρουν ότι πάσχουν από κοινωνική απομόνωση και μοναξιά, ένα συντριπτικό αίσθημα κενού, αναξιότητας και προσωπικής αποτυχίας. Τα ανθρώπινα όντα είναι κοινωνικά είδη που έχουν την ανάγκη να καλλιεργούν αξιόπιστα και ασφαλή κοινωνικά περιβάλλοντα για να επιβιώσουν. Ταυτόχρονα, οι αξιόπιστες κοινωνικές σχέσεις είναι κρίσιμες για την ψυχική και σωματική ευεξία, ενώ οι προβληματικές κοινωνικές αλληλεπιδράσεις μπορούν να οδηγήσουν σε κοινωνική απομόνωση και μοναξιά. Σε μία προσπάθεια να δοθεί έμφαση και να διευκρινιστούν τα εμφανή προβλήματα και ζητήματα, προσπαθήσαμε να συνθέσουμε κριτικά μελέτες, απόψεις και ζητήματα από μια ποικιλία προοπτικών παρέχοντας αντίθετες απόψεις και συνομιλητικές φωνές παρά εντείνοντας τις παραδοσιακές αφηγήσεις και τις κυρίαρχες συζητήσεις. Λίγες πτυχές της κοινωνικής απομόνωσης και της μοναξιάς έχουν μείνει εκτός της επιστημονικής προσοχής. Ο ρόλος αυτών των εννοιών στα γηρατειά δεν αποτελεί εξαίρεση και αναμφισβήτητα έχει τεράστιο αντίκτυπο σε πολλούς τομείς της ζωής. Η κοινωνική απομόνωση και η μοναξιά είναι δύο ξεχωριστές έννοιες που έχουν αναγνωριστεί ως παράγοντες κινδύνου για την ευημερία, την υγεία και την καθημερινή λειτουργία με διάφορους τρόπους. Συνεπώς, επιδιώξαμε να εξετάσουμε τις σχέσεις με διάφορες ψυχιατρικές διαταραχές παραδείγματος χάριν άγχος, κατάθλιψη, ψύχωση και νόσος Αλτσχάιμερ καθώς και τις σχέσεις με ποικίλες σωματικές διαταραχές, όπως καρδιαγγειακές παθήσεις, διαβήτη και αυτοάνοσες νόσους. Έχοντας υπόψη τα ανησυχητικά στοιχεία της υγειονομικής περίθαλψης που απεικονίζουν μία σχεδόν διπλάσια αύξηση της υγειονομικής περίθαλψης, οι συγγραφείς προσπάθησαν να συγκεντρώσουν τις προτεινόμενες παρεμβάσεις μέσω μιας εμπεριστατωμένης επισκόπησης της τρέχουσας βιβλιογραφίας και να δώσουν το κίνητρο για εποικοδομητική και συλλογική σκέψη. Ως προς τη δική μας θεωρητική κατανόηση, προκειμένου να κατανοήσουμε καλύτερα αυτές τις ψυχοκοινωνικές έννοιες και να παρέχουμε έγκαιρες και αποτελεσματικότερες εξατομικευμένες παρεμβάσεις σε όσους έχουν ανάγκη, είναι υψίστης σημασίας η διεξοδική εξέταση των προσδιορισμένων αιτιωδών δεσμών. Ωστόσο, επιπλέον έρευνα απαιτείται για τη μείωση ή την απαλοιφή των ανεπιθύμητων ενεργειών.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Κοινωνική απομόνωση, συναισθηματική μοναξιά, νόσος Αλτσχάιμερ, ψύχωση, παρεμβάσεις.

*Συγγραφέας επικοινωνίας:* Βαΐτσα Γιαννούλη, Mediterranean College, Εγνατία 2-4, 546 26 Θεσσαλονίκη, Διεύθυνση e-mail: giannouliv@hotmail.com

https://doi.org/10.22365/jpsych.2021.012 / Psychiatriki 2021, 32:67–74

Review

# Repetitive transcranial magnetic stimulation: An innovative medical therapy

Georgios Mikellides,[1] Panayiota Michael,[2] Marianna Tantele[3]

[1]*Faculty of Psychology and Neuroscience, Maastricht University, Netherlands*
[2]*Cyprus rTMS Centre, Larnaka, Cyprus*
[3]*Faculty of Medicine, University of Nicosia, Nicosia, Cyprus*

**ARTICLE HISTORY:** Received 6 August 2020/Revised 7 October 2020/Published Online 26 March 2021

**ABSTRACT**

Repetitive Transcranial Magnetic Stimulation (rTMS) is an innovative, non-invasive and well tolerated method that could be used as a treatment option for a variety of neuropsychiatric disorders. A large number of studies, for more than 30 years, have demonstrated that is a powerful neuroscience tool for diagnostic and therapeutic purposes. rTMS is based on the phenomenon of electromagnetic mutual induction, that firstly reported by Michael Faraday in 1831. Later, in 1985, Anthony Barker and his colleagues developed the first modern transcranial magnetic stimulation (TMS) device. rTMS uses brief electromagnetic pulses generated by an insulated coil, placed over the scalp. This technique has the ability to modulate the cortical activity of the brain. Daily rTMS stimulation for several weeks has been shown to be effective in reducing symptoms of many neuropsychiatric disorders. Moreover, studies have shown that dorsolateral prefrontal cortex (DLPFC) has a crucial role in improving cognitive performance and, as a result, is a commonly used target area for the treatment of many neuropsychiatric disorders such as depression. 2008 was a significant year for TMS history, as FDA approved for first time a TMS therapy device for the clinical treatment of depression. This approval as well as the National Institute for Health and Care Excellence (NICE) recommendation on TMS for the treatment of depression in 2015 lead to the establishment of rTMS as a first-line treatment for patients that failed in at least one prior antidepressant medication, followed by FDA approvals for the treatment of migraines and OCD. This paper aims to enhance further some of the clinical usefulness of rTMS.

**KEYWORDS:** rTMS, neuropsychiatry, depressive disorders, cognitive neuroscience, brain stimulation.

## Introduction

Repetitive Transcranial Magnetic Stimulation (rTMS) is a non-invasive medical therapy that is used as a treatment option for a variety of neuropsychiatric disorders. rTMS is a brain stimulation technique based on the production of short magnetic fields using an insulated coil placed over specific areas of the scalp.[1] These magnetic fields are of the same type as those used in magnetic resonance imaging (MRI). Magnetic pulses produce a weak electrical current over a targeted region of the brain that activates neuronal circuits.[1] This treatment has been shown to be a safe and well tolerated and can be effective in patients with depression[2] or other neuropsychiatric disorders. Depending on the stimulation frequency, rTMS may reduce or increase cortical excitability of specific areas of the cerebral cortex. In most people, Low Frequency rTMS (LF-rTMS) (≤1 Hz) has been shown to decrease cortical excitability and be inhibitory and on the other hand, High Frequency rTMS (HF-rTMS) (≥5 Hz) has been shown to increase cortical excitability and be excitatory.[3]

### The history of TMS

The history of transcranial magnetic stimulation seems to begin in the early 1830s. rTMS is based on the phenom-

*Corresponding author:* Georgios Mikellides, Faculty of Psychology and Neuroscience, Maastricht University, Oxfordlaan 55, 6229 EV Maastricht, Netherlands • e-mail: george.mikellides@gmail.com

enon of electromagnetic mutual induction, that firstly reported by Michael Faraday[4] in 1831. According to this phenomenon, there is a mutual relation between electrical current and magnetic fields. Later in 1896, D'Arsonval[5] reported flickers of lights (magnetophosphenes) after the placement of the coil.[6] Similarly in 1910, Silvanus P. Thompson[7] reported faint flickering illumination after the application of the coil. Some years later, in 1982, Polson et al[8] dealt with the stimulation of superficial peripheral nerves using time-varying magnetic fields. The first magnetic stimulator was developed in the Department of Medical Physics, Sheffield University, United Kingdom by Anthony Barker and colleagues[9] in 1985. It was a pivotal moment in the history of transcranial magnetic stimulation since they used for first time the TMS technique in an awake man and they demonstrated the effect of magnetic stimulation on motor cortex of the human brain. They reported that magnetic pulses produced induction of weak electrical current in the human brain, without causing pain or discomfort. Also, they proved that magnetic stimulation excites peripheral nervous system and that after the placement of the coil on the scalp (over contralateral motor cortex), movements of the opposite hand were produced.[10]

## Dorsolateral prefrontal cortex

Dorsolateral prefrontal cortex (DLPFC) is associated with many cognitive and behavioral processes like decision making, planning, reward processing, working memory.[11,12] Moreover, is considered as a perfect target for stimulation during rTMS treatment, as is an important part of the following circuits: mesocorticolimbic dopamine circuits (which are associated with mechanisms of motivation and reward) and serotonergic circuits (which are associated with emotional regulation).[12] Several studies reported the capacity of rTMS to alter the hypoactivity of DLPFC, after a successful treatment.[13] Application of rTMS over the DLPFC has been shown to be an effective treatment for many neuropsychiatric disorders and has a crucial role in improving cognitive performance. For example, after HF-rTMS over the DLPFC brain area, patients with depression were shown to receive antidepressant effects.[13]

### Neuroplasticity

According to Cramer et al, neuroplasticity (brain plasticity or neural plasticity) can be defined as "the ability of the nervous system to respond to intrinsic or extrinsic stimuli by reorganizing its structure, function and connections".[14] This capacity of the brain to change and adapt, may occurred as a result of the development process, learning, the environment, in response to disease or a therapy.[14] These changes in brain structure and function may appear throughout the life of a person. The presence of neuropsychiatric disorders is associated with changes in the structure and function of the brain. Particularly, people with mental and addictive disorders may have abnormalities in their limbic, prefrontal, and frontostriatal neural circuits. These circuits are associated with emotion regulation, perception, social interaction, etc.[14] Noninvasive therapies have the ability to alter brain activity in the cerebral cortex, which offers different treatment options of neuropsychiatric disorders.[14,15] rTMS is a therapy that promotes neuroplasticity, as it has the ability to reduce or increase cortical excitability of a specific area of the brain in patients with neuropsychiatric disorders such as depression.[13]

## Safety

### Precautions

During rTMS treatment it is of the utmost importance to take precautions for patients with electronic or magnetic implants such as cochlear implants, drug pumps, pacemakers because magnetic fields may alter the function of these devices.[16]

The most serious side effect of transcranial magnetic stimulation, during the treatment, is seizure. However, the occurrence of seizures is characterized as rare.16 According to a survey conducted about the risk of seizures, the risk of seizures in people without risk factors is less than 1 in 60,000 sessions.[17] Most of the seizures occurred in people with risk factors such as congenital epilepsies or anatomical/brain damages.[17] Regarding the stimulation frequency, seizures were no more likely to occur in HF-rTMS than in LF-TMS or single/paired-pulse TMS. In addition, seizures were more likely to occur within the first TMS sessions.[17] Therefore, precautions should be taken for patients with a history of seizures but also for people with increased risk factors.[16,17]

### Side effects

rTMS is a treatment option in cases where medication has not helped the patient sufficiently as well as when the person does not want to receive medication for any reason (due to the side effects of medication, pregnancy, etc). Compared with standard medication, rTMS seems to cause fewer side effects. Specifically, standard medication may cause side effects such as weight gain, sexual disorders, gastrointestinal disorders, sedation, blurred vision or dry mouth.[18] In contrast, the most common side effects of rTMS are: headaches (~ 5–23%), discomfort at the site of stimulation (~20–40%) and twitching of facial muscles. One uncommon side effect of rTMS are seizures (<0,1%).[16,19]

Rapid mechanical deformation of the TMS stimulation coil produces a broadband acoustic artifact that can ex-

ceed 140 dB, which in value exceeds the recommended safety levels for the auditory system.[16] However, only a small number of individuals experienced a hearing problem. In order to avoid hearing-related problems during TMS treatment, a number of measures are suggested such as the use of hearing protection (earplugs).[16]

## rTMS vs ECT

Many randomized studies examine the effectiveness of ECT (Electroconvulsive Therapy) compared to rTMS therapy. ECT is a convulsive therapy that requires anesthesia. In contrast with rTMS, which does not require anesthesia, patients that undergo ECT reported cognitive side effects and seizure induction.[20] rTMS therapy does not need to intentionally cause seizures, which is credited to the positives of the therapy in contrast with ECT.[21] Eranti et al studied the equivalence of rTMS with ECT. [22] At the end of the treatment, Hamilton Depression Rating Scale (HAM-D) in the ECT group were significantly lower that the rTMS group. However, no difference was reported between ECT and rTMS groups in HAM-D scores at the 6-month follow-up. They concluded that ECT is more effective than rTMS, especially in the short-term treatment of depression. A meta-analysis by Berlim et al has shown that ECT is more effective for the treatment of major depressive disorder (MDD) in contrast with HF-rTMS, although no difference reported on dropout rates.[20] Finally, a systematic review and meta-analysis by Chen et al studied the effects of ECT, Bilateral rTMS (B-rTMS), Left prefrontal rTMS (L-rTMS) and Right prefrontal rTMS (R-rTMS) on patients with MDD[23] and found that ECT was more effective, but least tolerated. Nevertheless, R-rTMS found to be the best tolerated treatment for patients with MDD and B-rTMS found to have the most beneficial balance in terms of efficacy and acceptability.

## rTMS and neuropsychiatric conditions

In more recent years, studies have looked at the effectiveness of rTMS in treating a variety of neuropsychiatric conditions such as depression, schizophrenia, bipolar disorder, anxiety disorders, obsessive-compulsive disorder, addiction disorders, post-traumatic stress disorder, chronic pain, fibromyalgia and dementia.

### Major Depressive Disorder

The most preferable and commonly used target area for the treatment of MDD is the DLPFC. Left DLPFC has been found to be hypoactive in depressed patients and this is associated with many depressive symptoms such as negative emotional bias, rumination, appetite changes and decreased energy level. HF-rTMS over the left DLPFC lead to activation of this brain area and produces antidepressant effects. Additionally, LF-rTMS over the right DLPFC leads to decrease local activity and as a result produces antidepressant effects.[2,24] In addition, results of a recent study in MDD patients showed that HF-rTMS (10 Hz) over the left DLPFC has beneficial effects on psychomotor speed and cognitive control.[25] It is noteworthy that rTMS is reported as a promising treatment option for patients that were not helped from antidepressant medication.[26] Moreover, according to a recent case study, rTMS is a promising treatment for patients with treatment-resistant depression who have been previously try ECT and did not respond.[27] However, these results cannot be generalized since they occur from an individual case study.

### Obsessive-compulsive disorder (OCD)

rTMS found to be an effective method in reducing some of the obsessive-compulsive (OC) symptoms. A recent meta-analysis suggested that, active rTMS lead to significant reduction of Yale-Brown Obsessive Compulsive Scale (Y-BOCS) scores compared with sham rTMS. Also, they determined that application of LF-rTMS was more effective when applied over the supplementary motor area. However, application of active rTMS over the DLPFC produced benefit improvements of OC symptoms in contrast with sham rTMS.[28]

### Schizophrenia

TMS demonstrated efficacy in decreasing negative symptoms and auditory hallucinations in schizophrenia. Schizophrenia patients that suffer from negative symptoms were found to have reduced activity in their prefrontal cortex (PFC). HF-rTMS over the PFC give rise in increasing local activation and causes significant improvements of the negative symptoms of schizophrenia.[29]

Kubera et al applied rTMS over superior temporal cortex (STC) in patients with auditory verbal hallucinations (AVH).[30] This brain area is associated with increased cortical activity in patients who suffer from the positive symptoms of schizophrenia such as AVH. A meta-analysis of Zhang et al suggested that LF-rTMS over the left temporoparietal cortex may be an effective treatment for patients with auditory hallucinations. [31] They noted reduction of severity of auditory hallucinations in patients with schizophrenia spectrum disorders after the application of the treatment. The combination of HF-rTMS over the left DLPFC with LF-rTMS over the Wernicke's area on the left temporoparietal cortex or over the right DLPFC was found to be effective in reducing negative symptoms, delusion and auditory hallucinations of schizophrenia patients.[32]

### Addictions

Barr et al reported that HF- rTMS over the DLPFC is a promising treatment option for addicted patients, as it

decreases craving levels in patients who are addicted in tobacco, alcohol and cocaine.[33] Specifically, regarding nicotine addiction, active HF-rTMS was found to decrease significantly the level of smoking craving, the number of cigarettes, cigarette consumption and nicotine dependence comparing with sham rTMS. In alcohol addiction, active HF-rTMS was found to decrease significantly the level of alcohol craving and alcohol consumption comparing with sham rTMS. Finally, in cocaine addiction, HF-rTMS was found to decrease the level of cocaine craving. DLPFC is the preferable rTMS target area for treating nicotine, alcohol and cocaine addiction, although for cocaine addiction is not sure yet whether rTMS over the right or left DLPFC is more effective.

According to a recent study, daily rTMS (MRI-guided) in the left DLPFC for 10 days may reduce cigarette consumption as well as the desire for up to a month and at the same time increases the likelihood of smoking cessation.[34] In addition, rTMS appears to be a promising treatment for cocaine use disorder, as it appears to have a therapeutic role in reducing cocaine use and associated symptoms such as sleep disturbance and other adverse symptoms.[35]

### Bipolar Disorder

rTMS is a promising treatment option for patients with both monopolar and bipolar depression.[36] Patients with bipolar disorder (BD) reported significant cognitive improvement after the application of HF-rTMS over their left DLPFC. This cognitive improvement was associated with significant improvement in their working memory and processing speed, without causing them any adverse side effects.[37]

Although studies indicate that rTMS is a well-tolerant and safe treatment for BD, its efficacy results are mixed for episodes of mania and depression as well as for mixed state.[38] These studies do not present an advantage of rTMS over sham stimulation.[38] Additional randomized controlled trials are needed in the future in order to determine the effectiveness of rTMS for BD.[38]

### Anxiety & Anxiety related disorders

rTMS is considered to be a promising treatment for anxiety symptoms. It is presented as an effective and safe treatment for generalized anxiety disorder without serious side effects.[39] Application of rTMS over the right DLPFC is an effective therapy for treating post-traumatic stress disorder (PTSD).[40] Patients reported reduction of PTSD, anxiety and depressive symptoms after 10 daily sessions.[11] LF-rTMS over the right DLPFC resulted in significant improvement of panic symptoms for patients with panic disorder.[41]

### Chronic Pain/Fibromyalgia

rTMS is a promising treatment for neuropathic pain of various origins, such as central pain, pain from peripheral nerve disorders, fibromyalgia, and migraine.[42] A recent study showed that four consecutive HF- rTMS sessions (20 Hz ) every 3 weeks in the primary motor cortex have as a result a sustained analgesic effect.[43]

HF-rTMS over the primary motor cortex in patients with fibromyalgia produce positive long-lasting improvements in their quality of life and reduction of chronic pain. rTMS is an effective treatment for fibromyalgia patients without adverse effects on pain and mood levels.[44,45]

### Dementia/Alzheimer's Disease

rTMS over the DLPFC improves behavioral and psychological symptoms of patients with dementia.[46] A recent meta-analysis of randomized controlled trials have shown that rTMS is an effective treatment for cognitive impairment in patients with Alzheimer's disease.[47] Patients with Alzheimer's disease reported significant improvement of their cognitive performance after the rTMS treatment.[48] Bilateral DLPFC stimulation in combination with long term treatment proved to have the greater effectiveness in improving the cognitive ability of patients with Alzheimer's disease.[49]

### Improvement of Cognition

Studies suggested that rTMS can be an effective and safe treatment for patients with mild cognitive impairment.[48] Application of HF-rTMS over the DLPFC in older patients has been shown to benefit their cognition without any serious adverse effects.[50] The stimulation of the DLPFC is associated with improvements in attention, verbal fluency, executive function and working memory.[51] A meta-analysis of Chou et al showed that HF-rTMS over the left DPLFC and LF-rTMS over the right DLPFC is effective in improving memory functions.[48]

Finally, rTMS is a promising treatment option for some neurological disorders such as Parkinson's disease,[52,53] migraines,[54,55] as well as for recovery after a stroke.[56,57]

## Approved TMS treatments

The Food and Drug Administration (FDA) approved TMS for depression, OCD and migraine. In October 2008, FDA approved Neuronetics NeuroStar TMS System as a treatment of MDD for adult patients that failed in at least one prior antidepressant medication. It was the first time that FDA approved a TMS device for the clinical treatment of depression (FDA approval K061053). FDA approval was based on study of O'Reardon et al in which 301 patients were divided into two groups (Active TMS group and Sham TMS group). [58] Significant improvements of de-

pressive symptoms in Active TMS group compared with Sham group were demonstrated. Patients reported mild adverse effects.

In December 2013, FDA approved the Cerena Transcranial Magnetic Stimulator (Cerena TMS) for treating migraine headaches preceded by an aura. Cerena TMS is a portable and hand-held device. This stimulation may stop or lessen migraines headaches with aura. FDA approval was based on a study in which 201 patients with moderate to strong migraine headaches divided into two groups (Cerena TMS group and Sham control group). Significant difference between the two groups regarding the effectiveness of the device was found. Specifically, the rate of patients in the Cerena TMS group who reported no pain 2 hours and 24 hours after the treatment were higher than the rate of the Sham control group. However, the study didn't support effectiveness in reducing other symptoms associated with migraine such as photophobia, phonophobia, nausea. Reported adverse effects were rare.[59]

In August 2018, FDA approved the Brainsway Deep TMS System for treating OCD. This FDA approval was based on a study in which 100 patients were divided into two groups (Brainsway Device group and Sham group). The results had shown that 38% of patients using Brainsway device reported reduction in YBOCS score compared with 11% of patients in the Sham group. Reported adverse effects were mild or moderate, except of headaches which were more frequent.[60]

The National Institute for Health and Care Excellence (NICE) in January 2014 approved TMS for the treatment and prevention of migraines[61] and approximately one year later, in December 2015, approved TMS as an effective and safe treatment for depression.[62]

### Theta Burst Stimulation

Theta Burst Stimulation (TBS) is one of the newer forms of rTMS protocols. TBS has the potential to cause long-term changes in cerebral cortex excitability in a much shorter stimulation period. Therefore, it has attracted research interest.[63] Different types of TBS protocols have been developed and can be used during rTMS therapy. The main types of TBS protocols are the intermittent Theta Burst Stimulation (iTBS) which is shown to increase cortical excitability and the continuous Theta Burst Stimualtion (cTBS) which reduce cortical excitability.[64] Additional types of TBS protocols that have been studied in recent years are accelerated iTBS,[65] intensive cerebellar iTBS (iCiTBS),[66] and cerebellar cTBS.[63]

According to a recent study by Blumberger et al in 2018, which compared the efficacy and safety of the standard depression protocol (lasting 30 minutes) with an iTBS protocol (lasting 3 minutes), TBS found to have similar if not better effects on brain activity compared with the standard rTMS protocol.[67] Based on this study, in August 2018 FDA approved MagVenture's TBS protocol for the treatment of depression.

## Conclusion

Over the past decades, many clinical studies have demonstrated the effectiveness of brain stimulation in treating neuropsychiatric disorders. rTMS is a promising brain stimulation therapy based on the production of short magnetic fields using an insulated coil placed over the scalp and has the ability to change the cortical excitability. It is a very challenging field for clinical research in neuroscience as it helps depressed patients who have not been helped sufficiently from medication[26] or patients who have not respond to ECT.[27] In contrast with standard medication and ECT, rTMS causes fewer side effects and is a safe and well tolerated treatment. The approvals of FDA in 2008 and NICE in 2015 for depression indicated that rTMS can be used as a first line treatment for depressed patients that failed in at least one prior antidepressant medication.

It has been shown that rTMS is promising treatment option for many neuropsychiatric conditions like depression,[2,24,25] OCD,[28] BD,[36,37] negative symptoms[29] and auditory hallucinations[30,31] in schizophrenia, addictions,[33–35] anxiety and anxiety related disorders,[39–41] fibromyalgia,[44,45] chronic pain,[42,43] and dementia/Alzheimer's disease.[46–49] It is also very important that many studies reported that rTMS causes significant improvement of cognition.[48,50,51] Furthermore, rTMS it's an important neuroscience research tool as it helps in understanding brain connectivity.[68]

However, rTMS is not used enough in neuropsychiatric practice. Future research regarding rTMS may focus in studying the ability of maintenance TMS treatment in preventing relapses with the creation of personalized treatment of each patient individually.[2] Moreover, the inclusion of neuronavigation in rTMS helps in the reduction of errors that may appear during the treatment. Neuronavigation is a novel method that includes an individual and exact image-guided navigation of the TMS coil for stimulating a specific brain area based on the brain anatomy and mapping of spatial brain areas for each patient individually.[69,70] Therefore, additional well-designed randomized controlled trials in larger populations are necessary in order to generalize these results, to assess how the potential positive effects of this treatment are maintained over time, to understand better the pathology of neuropsychiatric disorders as well as to improve both therapeutic stimulation protocols and increase the effectiveness of the treatment.

## References


1. Mikellides G. RTMS (Repetitive Transcranial Magnetic Stimulation) could be used as a First Line Treatment for Depression. *Glob J Intellect Dev Disabil* 2018, 5:555655, doi:10.19080/GJIDD.2018.05.555655
2. Baeken C, Brem AK, Arns M, Brunoni AR, Filipčić I, Ganho-Ávila A et al. Repetitive transcranial magnetic stimulation treatment for depressive disorders: current knowledge and future directions. *Curr Opin Psychiatry* 2019, 32:409–415, doi: 10.1097/YCO.0000000000000533
3. Maeda F, Keenan JP, Tormos JM, Topka H, Pascual-Leone A. Interindividual variability of the modulatory effects of repetitive transcranial magnetic stimulation on cortical excitability. *Exp Brain Res* 2000, 133:425–430, doi:10.1007/s002210000432
4. Faraday F. *Experimental research in electricity*. Volume 1. Taylor and Francis, London, 1839
5. D' Arsonval. Dispositifs pour la mesure des courants alternatifs de toutes frequencies. *CR Soc Biol* (Paris) 1896, 3:450–451
6. Geddes LA. History of Magnetic Stimulation of the Nervous System. *J Clin Neurophysiol* 1991, 8:3–9, doi:10.1097/00004691-199101000-00003
7. Thompson SP. A Physiological Effect of an Alternating Magnetic Field. *Proc R Soc Lond* 1910, 82:396–398, doi:10.1098/rspb.1910.0032
8. Polson MJ, Barker AT, Freeston IL .Stimulation of nerve trunks with time-varying magnetic fields. *Medical & Biological engineering & computing* 1982, 20:243–244, doi:10.1007/BF02441362
9. Barker AT, Jalinousm R, Freeston IL. Non-invasive magnetic stimulation of human motor cortex. *Lancet* 1985, 1:1106–1107, doi: 10.1016/s0140-6736(85)92413-4
10. Barker AT. An introduction to the basic principles of magnetic nerve stimulation. *J Clin Neurophysiol* 1991, 8:26–37, doi: 10.1097/00004691-199101000-00005
11. Berlim MT, Van den Eynde F. Repetitive Transcranial Magnetic Stimulation Over the Dorsolateral Prefrontal Cortex for Treating Posttraumatic Stress Disorder: An Exploratory Meta-Analysis of Randomized, Double-Blind and Sham-Controlled Trials. *Can J Psychiatry* 2014, 59:487–496, doi: 10.1177/070674371405900905
12. Tik M, Hoffmann A, Sladky R, Tomova L, Hummer A, Navarro de Lara L et al. Towards understanding rTMS mechanism of action: Stimulation of the DLPFC Causes Network-specific Increase in Functional Connectivity. *Neuroimage* 2017, 162:289–296, doi:10.1016/j.neuroimage.2017.09.022
13. Kumar S, Singh S, Kumar N, Verma R. The Effects of Repetitive Transcranial Magnetic Stimulation at Dorsolateral Prefrontal Cortex in the Treatment of Migraine Comorbid with Depression: A Retrospective Open Study. *Clin Psychopharmacol Neurosci* 2018, 16:62-66, doi: 10.9758/cpn.2018.16.1.62
14. Cramer SC, Sur M, Dobkin BH, O'Brien C, Sanger TD, Trojanowski JQ et al. Harnessing neuroplasticity for clinical applications. *Brain* 2011, 134:1591–1609, doi:10.1093/brain/awr039
15. Gulyaeva NV. Molecular Mechanisms of Neuroplasticity: An Expanding Universe. *Biochemistry* (Mosc) 2017, 82:237–242, doi: 10.1134/S0006297917030014
16. Rossi S, Hallett M, Rossini PM, Pascual-Leone A, Safety of TMS Consensus Group. Safety, ethical considerations, and application guidelines for the use of transcranial magnetic stimulation in clinical practice and research. *Clin Neurophysiol* 2009, 120:2008–2039, doi: 10.1016/j.clinph.2009.08.016
17. Lerner AJ, Wassermann EM, Tamir DI. Seizures from transcranial magnetic stimulation 2012-2016: Results of a survey of active laboratories and clinics. *Clin Neurophysiol* 2019, 130:1409–1416, doi:10.1016/j.clinph.2019.03.016
18. Khawam EA, Laurencic G, Malone DA Jr. Side effects of antidepressants: an overview. *Cleve Clin J Med* 2006, 73:351–361, doi:10.3949/ccjm.73.4.351
19. Dobek CE, Blumberger DM, Downar J, Daskalakis ZJ, Vila-Rodriguez F. Risk of seizures in transcranial magnetic stimulation: a clinical review to inform consent process focused on bupropion. *Neuropsychiatr Dis Treat* 2015, 11:2975–2987, doi: 10.2147/NDT.S91126
20. Berlim MT, Van den Eynde F, Daskalakis ZJ. Efficacy and acceptability of high frequency repetitive transcranial magnetic stimulation (rTMS) versus electroconvulsive therapy (ECT) for major depression: a systematic review and meta-analysis of randomized trials. *Depress Anxiety* 2013, 30:614–623, doi: 10.1002/da.22060
21. Micallef-Trigona B. Comparing the effects of repetitive transcranial magnetic stimulation and electroconvulsive therapy in the treatment of depression: a systematic review and meta-analysis. *Depress Res Treat* 2014, 2014:135049, doi:10.1155/2014/135049
22. Eranti S, Mogg A, Pluck G, Landau S, Purvis R, Brown RG et al. A Randomized, Controlled Trial With 6-Month Follow-Up of Repetitive Transcranial Magnetic Stimulation and Electroconvulsive Therapy for Severe Depression. *Am J Psychiatry* 2007, 164:73–81, doi:10.1176/ajp.2007.164.1.73
23. Chen JJ, Zhao LB, Liu YY, Fan SH, Xie P. Comparative efficacy and acceptability of electroconvulsive therapy versus repetitive transcranial magnetic stimulation for major depression: A systematic review and multiple-treatments meta-analysis. *Behav Brain Res* 2017, 320:30–36, doi: 10.1016/j.bbr.2016.11.028.
24. Janicak PG, Dokucu ME. Transcranial magnetic stimulation for the treatment of major depression. *Neuropsychiatr Dis Treat* 2015, 11:1549–1560, doi: 10.2147/NDT.S67477
25. Corlier J, Burnette E, Wilson AC, Lou JJ, Landeros A, Minzenberg MJ et al. Effect of repetitive transcranial magnetic stimulation (rTMS) treatment of major depressive disorder (MDD) on cognitive control. *J Affect Disord* 2020, 265:272–277, doi: 10.1016/j.jad.2020.01.068
26. Carpenter LL, Janicak PG, Aaronson ST, Boyadjis T, Brock DG, Cook IA et al. Transcranial magnetic stimulation (TMS) for major depression: a multisite, naturalistic, observational study of acute treatment outcomes in clinical practice. *Depress Anxiety* 2012, 29:587–596, doi: 10.1002/da.21969
27. Mikellides G, Tantele M. A Case of Treatment Resistant Depression Who Did Not Respond to ECT (Electroconvulsive Therapy) and Responded to rTMS (Repetitive Transcranial Magnetic Stimulation). *Biomed J Sci & Tech Res* 2018, 8, doi: 10.26717/BJSTR.2018.08.001582
28. Rehn S, Elsick GD, Brakoulias V. A Meta-Analysis of the Effectiveness of Different Cortical Targets Used in Repetitive Transcranial Magnetic Stimulation (rTMS) for the Treatment of Obsessive Compulsive Disorder (OCD). *Psychiatr Q* 2018, 89:645-665, doi:10.1007/s11126-018-9566-7
29. Linsambarth S, Jeria A, Avirame K, Todder D, Riquelme R, Stehberg J. Deep Transcranial Magnetic Stimulation for the Treatment of Negative Symptoms in Schizophrenia: Beyond an Antidepressant Effect. *J ECT* 2019, 35:e46–e54, doi: 10.1097/YCT.0000000000000592
30. Kubera KM, Barth A, Hirjak D, Thomann PA, Wolf RC. Noninvasive brain stimulation for the treatment of auditory verbal hallucinations in schizophrenia: methods, effects and challenges. *Front Syst Neurosci* 2015, 9:131, doi: 10.3389/fnsys.2015.00131
31. Zhang Y, Liang W, Yang S, Dai P, Shen L, Wang C. Repetitive transcranial magnetic stimulation for hallucination in schizophrenia spectrum disorders: A meta-analysis. *Neural Regen Res* 2013, 8:2666–2676, doi: 10.3969/j.issn.1673-5374.2013.28.009
32. Mikellides G, Tantele M. rTMS for Treatment Resistant Schizophrenia. EC *Psychology Psychiatry* 2020, 9:1–4, doi: 10.31080/ecpp.2020.09.00656
33. Barr MS, Farzan F, Wing VC, George TP, Fitzgerald PB, Daskalakis ZJ. Repetitive transcranial magnetic stimulation and drug addiction. *Int Rev Psychiatry* 2011, 23:454–466, doi:10.3109/09540261.2011.618827
34. Li X, Hartwell KJ, Henderson S, Badran BW, Brady KT, George MS. Two weeks of image-guided left dorsolateral prefrontal cortex repetitive transcranial magnetic stimulation improves smoking cessation: A double-blind, sham-controlled, randomized clinical trial. *Brain Stimul* 2020, 13:1271–1279, doi: 10.1016/j.brs.2020.06.007
35. Gómez Pérez LJ, Cardullo S, Cellini N, Sarlo M, Monteanni T, Bonci A et al. Sleep quality improves during treatment with repetitive transcranial magnetic stimulation (rTMS) in patients with cocaine use disorder: a retrospective observational study. *BMC Psychiatry* 2020, 20:153, doi: 10.1186/s12888-020-02568-2
36. Phillips AL, Burr RL, Dunner DL. Repetitive Transcranial Magnetic Stimulation in the Treatment of Bipolar Depression: Experience From a Clinical Setting. *J Psychiatr Pract* 2020, 26:37–45, doi: 10.1097/PRA.0000000000000447

37. Yang LL, Zhao D, Kong LL, Sun YQ, Wang ZY, Gao YY et al. High-frequency repetitive transcranial magnetic stimulation (rTMS) improves neurocognitive function in bipolar disorder. *J Affect Disord* 2019, 246:851–856, doi: 10.1016/j.jad.2018.12.102
38. Kozel FA. Clinical Repetitive Transcranial Magnetic Stimulation for Posttraumatic Stress Disorder, Generalized Anxiety Disorder, and Bipolar Disorder. *Psychiatr Clin North Am* 2018, 41:433–446, doi: 10.1016/j.psc.2018.04.007
39. Cui H, Jiang L, Wei Y, Li W, Li H, Zhu J et al. Efficacy and safety of repetitive transcranial magnetic stimulation for generalized anxiety disorder: A meta-analysis. *Gen Psychiatr* 2019, 32:e100051, doi: 10.1136/gpsych-2019-100051
40. Kan RLD, Zhang BBB, Zhang JJQ, Kranz GS. Non-invasive brain stimulation for posttraumatic stress disorder: a systematic review and meta-analysis. *Transl Psychiatry* 2020, 10:168, doi:10.1038/s41398-020-0851-5
41. Mantovani A, Lisanby SH, Pieraccini F, Ulivelli M, Castrogiovanni P, Rossi S. Repetitive Transcranial Magnetic Stimulation (rTMS) in the treatment of Panic Disorder (PD) with comorbid major depression. *J Affect Disord* 2007, 102:277–280, doi:10.1016/j.jad.2006.11.027
42. Yang S, Chang MC. Effect of Repetitive Transcranial Magnetic Stimulation on Pain Management: A Systematic Narrative Review. *Front Neurol* 2020, 11:114, doi: 10.3389/fneur.2020.00114
43. Quesada C, Pommier B, Fauchon C, Bradley C, Créac'h C, Murat M et al. New procedure of high-frequency repetitive transcranial magnetic stimulation for central neuropathic pain: a placebo-controlled randomized crossover study. *Pain* 2020, 161:718–728, doi:10.1097/j.pain.0000000000001760
44. Boyer L, Dousset A, Roussel P, Dossetto N, Cammilleri S, Piano V et al. rTMS in fibromyalgia: a randomized trial evaluating QoL and its brain metabolic substrate. *Neurology* 2014, 82:1231–1238, doi:10.1212/WNL.0000000000000280
45. Passard A, Attal N, Benadhira R, Brasseur L, Saba G, Sichere P et al. Effects of unilateral repetitive transcranial magnetic stimulation of the motor cortex on chronic widespread pain in fibromyalgia. *Brain* 2007, 130:2661–2670, doi: 10.1093/brain/awm189
46. Wang X, Mao Z, Yu X. The role of noninvasive brain stimulation for behavioral and psychological symptoms of dementia: a systematic review and meta-analysis. *Neurol Sci* 2020, 41:1063–1074, doi: 10.1007/s10072-020-04245-4
47. Wang X, Mao Z, Ling Z, Yu X. Repetitive transcranial magnetic stimulation for cognitive impairment in Alzheimer's disease: a meta-analysis of randomized controlled trials. *J Neurol* 2020, 267:791–801, doi: 10.1007/s00415-019-09644-y
48. Chou YH, Ton That V, Sundman M. A Systematic Review and Meta-Analysis of rTMS Effects on Cognitive Enhancement in Mild Cognitive Impairment and Alzheimer's disease. *Neurobiol Aging* 2020, 86:1–10, doi: 10.1016/j.neurobiolaging.2019.08.020
49. Lin Y, Jiang WJ, Shan PY, Lu M, Wang T, Li RH et al. The role of repetitive transcranial magnetic stimulation (rTMS) in the treatment of cognitive impairment in patients with Alzheimer's disease: A systematic review and meta-analysis. *J Neurol Sci* 2019, 398:184–191, doi:10.1016/j.jns.2019.01.038
50. Cheng CPW, Wong CSM, Lee KK, Chan APK, Yeung JWF, Chan WC. Effects of repetitive transcranial magnetic stimulation on improvement of cognition in elderly patients with cognitive impairment: a systematic review and meta-analysis. *Int J Geriatr Psychiatry* 2018, 33:e1–e13, doi: 10.1002/gps.4726
51. Serafini G, Pompili M, Belvederi Murri M, Respino M, Ghio L, Girardi P et al. The Effects of Repetitive Transcranial Magnetic Stimulation on Cognitive Performance in Treatment-Resistant Depression. A Systematic Review. *Neuropsychobiology* 2015, 71:125–139, doi: 10.1159/000381351
52. Lefaucheur JP, Drouot X, Von Raison F, Ménard-Lefaucheur I, Cesaro P, Nguyen JP. Improvement of motor performance and modulation of cortical excitability by repetitive transcranial magnetic stimulation of the motor cortex in Parkinson's disease. *Clin Neurophysiol* 2004, 115:2530–2541, doi: 10.1016/j.clinph.2004.05.025
53. Yang C, Guo Z, Peng H, Xing G, Chen H, McClure MA et al. Repetitive transcranial magnetic stimulation therapy for motor recovery in Parkinson's disease: A Meta-analysis. *Brain Behav* 2018, 8:e01132, doi: 10.1002/brb3.1132
54. Misra UK, Kalita J, Bhoi SK. High frequency repetitive transcranial magnetic stimulation (rTMS) is effective in migraine prophylaxis: an open labeled study. *Neurol Res* 2012, 34:547–551, doi: 10.1179/1743132812Y.0000000045
55. Barker AT, Shields K. Transcranial Magnetic Stimulation: Basic Principles and Clinical Applications in Migraine. *Headache* 2017, 57:517–524, doi: 10.1111/head.13002
56. Fisicaro F, Lanza G, Grasso AA, Pennisi G, Bella R, Paulus W et al. Repetitive transcranial magnetic stimulation in stroke rehabilitation: review of the current evidence and pitfalls. *Ther Adv Neurol Disord* 2019, 12:1756286419878317, doi: 10.1177/1756286419878317
57. Ren CL, Zhang GF, Xia N, Jin CH, Zhang XH, Hao JF et al. Effect of Low-Frequency rTMS on Aphasia in Stroke Patients: A Meta-Analysis of Randomized Controlled Trials. *PLoS One* 2014, 9:e102557, doi: 10.1371/journal.pone.0102557
58. O'Reardon JP, Solvason HB, Janicak PG, Sampson S, Isenberg KE, Nahas Z et al. Efficacy and safety of transcranial magnetic stimulation in the acute treatment of major depression: a multisite randomized controlled trial. *Biol Psychiatry* 2007, 62:1208–1216, doi:10.1016/j.biopsych. 2007.01.018
59. US Food and Drug Administration. *De Novo classification request for cerena transcranial magnetic stimulator (TMS) device* (Cited 5 March 2013). Available from https://www.accessdata.fda.gov/cdrh_docs/reviews/K130556.pdf
60. US Food and Drug Administration. *FDA permits marketing of transcranial magnetic stimulation for treatment of obsessive compulsive disorder* (Cited 14 August 2018). Available from https://www.fda.gov/news-events/press-announcements/fda-permits-marketing-transcranial-magnetic-stimulation-treatment-obsessive-compulsive-disorder
61. National Institute for Health and Care Excellence (NICE). *Transcranial magnetic stimulation for treating and preventing migraine* (Cited 23 January 2014) Available from https://www.nice.org.uk/guidance/ipg477
62. National Institute for Health and Care Excellence (NICE). *Repetitive transcranial magnetic stimulation for Depression* (Cited 16 December 2015). Available from https://www.nice.org.uk/guidance/ipg542
63. Sanna A, Follesa P, Puligheddu M, Cannas A, Serra M, Pisu MG et al. Cerebellar continuous theta burst stimulation reduces levodopa-induced dyskinesias and decreases serum BDNF levels. *Neurosci Lett* 2020, 716:134653, doi: 10.1016/j.neulet.2019.134653
64. Bradnam LV, McDonnell MN, Ridding MC. Cerebellar Intermittent Theta-Burst Stimulation and Motor Control Training in Individuals with Cervical Dystonia. *Brain Sci* 2016, 6:56, doi:10.3390/brainsci6040056
65. Duprat R, Desmyter S, Rudi de R, van Heeringen K, Van den Abbeele D, Tandt H et al. Accelerated intermittent theta burst stimulation treatment in medication-resistant major depression: A fast road to remission? *J Affect Disord* 2016, 200:6–14, doi: 10.1016/j.jad.2016.04.015
66. Chauhan P, Garg S, Tikka SK, Khattri S. Efficacy of Intensive Cerebellar Intermittent Theta Burst Stimulation (iCiTBS) in Treatment-Resistant Schizophrenia: a Randomized Placebo-Controlled Study. *Cerebellum* 2020, 22:1–8, doi:10.1007/s12311-020-01193-9
67. Blumberger DM, Vila-Rodriguez F, Thorpe KE, Feffer K, Noda Y, Giacobbe P et al. Effectiveness of theta burst versus high-frequency repetitive transcranial magnetic stimulation in patients with depression (THREE-D): a randomised non-inferiority trial. *Lancet* 2018, 391:1683–1692, doi: 10.1016/S0140-6736(18)30295-2
68. Fox MD, Halko MA, Eldaief MC, Pascual-Leone A. Measuring and manipulating brain connectivity with resting state functional connectivity magnetic resonance imaging (fcMRI) and transcranial magnetic stimulation (TMS). *Neuroimage* 2012, 62:2232–2243, doi: 10.1016/j.neuroimage.2012.03.035
69. Remanan R, Panchal J, Lange D. Role of Neuronavigation for Training and Improvement of Accuracy During Transcranial Magnetic Stimulation. *Neurology* 2016, 86(16 Supplement)
70. Ruohonen J, Karhu J. Navigated transcranial magnetic stimulation. *Neurophysiol Clin* 2010, 40:7–17, doi: 10.1016/j.neucli.2010.01.006

Ανασκόπηση

# Επαναλαμβανόμενη διακρανιακή μαγνητική διέγερση: Μια καινοτόμος ιατρική θεραπεία

Γεώργιος Μικελλίδης,[1] Παναγιώτα Μιχαήλ,[2] Μαριάννα Ταντελέ[3]

[1]*Σχολή Ψυχολογίας και Νευροεπιστήμης, Πανεπιστήμιο Maastricht, Ολλανδία*

[2]*Cyprus rTMS Centre, Λάρνακα, Κύπρος*

[3]*Ιατρική Σχολή, Πανεπιστήμιο Λευκωσίας, Λευκωσία, Κύπρος*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 6 Αυγούστου 2020/Αναθεωρήθηκε 7 Οκτωβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 26 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Η επαναλαμβανόμενη διακρανιακή μαγνητική διέγερση είναι μια καινοτόμος, μη επεμβατική και καλά ανεκτή μέθοδος, η οποία μπορεί να χρησιμοποιηθεί ως επιλογή θεραπείας σε μια πληθώρα νευροψυχιατρικών διαταραχών. Ένας μεγάλος αριθμός μελετών, για περισσότερο από 30 χρόνια, έχει αποδείξει ότι είναι ένα ισχυρό εργαλείο στη νευροεπιστήμη τόσο για διαγνωστικούς όσο και για θεραπευτικούς σκοπούς. Η επαναλαμβανόμενη διακρανιακή διέγερση βασίζεται στο φαινόμενο της ηλεκτρομαγνητικής αμοιβαίας επαγωγής, το οποίο διατυπώθηκε για πρώτη φορά από τον Michael Faraday το 1831. Αργότερα το 1985, ο Anthony Barker και οι συνεργάτες του δημιούργησαν την πρώτη σύγχρονη συσκευή διακρανιακής μαγνητικής διέγερσης. Η επαναλαμβανόμενη διακρανιακή μαγνητική διέγερση χρησιμοποιεί σύντομους ηλεκτομαγνητικούς παλμούς, οι οποίοι παράγονται από ένα μονωμένο πηνίο το οποίο είναι τοποθετημένο πάνω στο τριχωτό της κεφαλής. Αυτή η τεχνική έχει την ικανότητα να μεταβάλλει τη δραστηριότητα στον φλοιό του εγκεφάλου. Καθημερινή επαναλαμβανόμενη διακρανιακή μαγνητική διέγερση για αρκετές εβδομάδες έχει φανεί ότι είναι αποτελεσματική στη μείωση των συμπτωμάτων μιας σωρείας νευροψυχιατρικών διαταραχών. Επιπρόσθετα, μελέτες έχουν δείξει ότι ο ραχιαίος πλάγιος προμετωπιαίος φλοιός διαδραματίζει καίριο ρόλο στη βελτίωση της νοητικής απόδοσης, και ως αποτέλεσμα, είναι μια περιοχή-στόχος η οποία χρησιμοποιείται πολύ συχνά για τη θεραπεία αρκετών νευροψυχιατρικών διαταραχών, όπως είναι η κατάθλιψη. Το 2008 ήταν μια σημαντική χρονιά για την ιστορία της διακρανιακής μαγνητικής διέγερσης, αφού ο Οργανισμός Τροφίμων και Φαρμάκων (Food and Drug Administration; FDA) ενέκρινε για πρώτη φορά μια συσκευή θεραπείας διακρανιακής μαγνητικής διέγερσης για την κλινική θεραπεία της κατάθλιψης. Αυτή η έγκριση καθώς και η σύσταση από το Εθνικό Ινστιτούτο για την Αριστεία της Υγείας και της Φροντίδας (National Institute for Health and Care Excellence, NICE) για την κατάθλιψη το 2015 οδήγησαν στην καθιέρωση της επαναλαμβανόμενης διακρανιακής μαγνητικής διέγερσης ως θεραπεία πρώτης γραμμής για ασθενείς που απέτυχαν σε τουλάχιστον μία αντικαταθλιπτική φαρμακευτική αγωγή στο παρελθόν. Ακολούθησαν εγκρίσεις από το FDA για την ημικρανία και την ιδεοψυχαναγκαστική διαταραχή. Αυτή η μελέτη σκοπεύει να ενισχύσει περαιτέρω κάποιες από τις κλινικές χρησιμότητες της επαναλαμβανόμενης διακρανιακής μαγνητικής διέγερσης.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Επαναλαμβανόμενη διακρανιακή μαγνητική διέγερση, νευροψυχιατρική, καταθλιπτικές διαταραχές, νοητική νευροεπιστήμη, διέγερση εγκεφάλου.

*Συγγραφέας επικοινωνίας:* Γεώργιος Μικελλίδης , Faculty of Psychology and Neuroscience, Maastricht University, Oxfordlaan 55, 6229 EV Maastricht, Netherlands, Διεύθυνση e-mail: george.mikellides@gmail.com

https://doi.org/10.22365/jpsych.2021.007 / Psychiatriki 2021, 32:75–78

Brief communication

# Artists and psychoactive substances use

Efthymia Patsika, Minerva-Melpomeni Malliori

*MSc Treatment of Addictions, Medical School, National and Kapodistrian University of Athens, Athens, Greece*

**ARTICLE HISTORY:** Received 30 May 2020/Revised 14 September 2020/Published Online 17 March 2021

**ABSTRACT**

It is a well-established common notion that artists appear to use and abuse psychoactive substances more frequently and heavily than non-artists. The purpose of this study was to investigate if this holds true. The sample consisted of 118 participants, both artists and non-artists. They were asked to complete the ASSIST questionnaire, developed by the World Health Organization, that includes closed questions on substance use along with an additional questionnaire on demographic characteristics. The questionnaires were posted online in a digital platform. The artists scored significantly higher on substance use than the other professionals. Women reported less psychoactive substance use compared to men. The results confirmed the study hypothesis, in line with previous research findings. The number of similar studies in the international literature is limited. Our results are particularly useful but due to significant limitations of this study further investigation is suggested, as well as further examination of the causes of the phenomenon.

**KEYWORDS:** Artists, psychoactive substances, alcohol, substance use, art.

## Introduction

The mistaken social perception that alcohol and substance use stimulates artistic creation has prevailed for thousands of years.[1] At the same time, the Media propagate that art professionals tend to use or abuse psychoactive substances.[2] Recognizing a privileged relationship between artists and substance use, the artists' need for expression, creation and imagination is determined. Secondarily, the social attribution of symbolic meanings in substance use by artists is also highlighted.[3]

The present cross-sectional study investigates the rates of psychoactive substance use among artists and non-artists.

## Material and Method

The avalanche approach was used as a sampling method. The sample consisted of a group of artists, who were professionally engaged in at least one of the nine fine arts, and a group of professionals from other disciplines. The participants were 118, with an average age of 30.7 years (SD=6.9 years), 57 of whom were artists. More specifically, 11.9% of artists were professionally engaged in theater, 11% were architects, 11% were musicians, 7.6% were working in the field of visual arts, 4.2% were cinematographers, 0.8% engaged in poetry, 0.8 %in photography and 0.8% in comics (table 1).

Assessments were conducted with the ASSIST questionnaire, which provides information on lifelong substance use, use in the last three months, problems with use, dependence, injectable use and risk of harm.[4] The questionnaire was distributed and completed on an online platform.

Pearson's chi-squared test or Fisher's exact test were used to compare ratios, where necessary. The Student's t-test or the Mann-Whitney U non-parametric test were used to compare quantitative variables between the two groups. Linear regression analysis with stepwise integration/subtraction was used to identify independent variables related to the use scores for various substances. The linear regression analysis was performed using

*Corresponding author:* Efthymia Patsika, MSc Treatment of Addictions, Medical School, National and Kapodistrian University of Athens, 25 Alexandroupoleos street, GR-115 27 Athens, Greece • e-mail: efthimiapatsika@gmail.com

**Table 1.** Demographic characteristics in total sample and comparisons between artists and non-artists.

| | | Total Sample (N=118) | | Are you an artist? | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | No (N=61, 51.7%) | | Yes (N=57, 48.3%) | | |
| | | N | (%) | N | (%) | N | (%) | p |
| Sex | Men | 50 | 42.4 | 24 | 39.3 | 26 | 45.6 | 0.491* |
| | Women | 68 | 57.6 | 37 | 60.7 | 31 | 54.4 | |
| Age, mean value (SD) | | 30.7 (6.9) | | 32.5 (8.0) | | 28.8 (4.8) | | 0.004‡ |
| Educational level | Secondary | 7 | 5.9 | 4 | 6.6 | 3 | 5.3 | 0.099** |
| | Vocational institute | 2 | 1.7 | 1 | 1.6 | 1 | 1.8 | |
| | Higher education institutes/ Technology higher institutions | 58 | 49.2 | 23 | 37.7 | 35 | 61.4 | |
| | Master's degree | 43 | 36.4 | 28 | 45.9 | 15 | 26.3 | |
| | Doctorate | 8 | 6.8 | 5 | 8.2 | 3 | 5.3 | |

*Pearson's chi-square test; **Fisher's exact test; ‡Student's t-test

logarithmic transformations. Significance level was set at 0.05. The SPSS 22.0 was used for the analysis.

## Results

Almost all participants (98.3%) were found to consume alcohol, while the rate for tobacco use was also high (83.1%). The median number of substances used amounted to three, i.e., 50% of the sample had used up to three substances (int. Range: w2-5). Use of cannabis, cocaine, amphetamine-type stimulants and hallucinogens was significantly higher in artists than in non-artists (table 2). Moreover, the number of substances used by artists cumulatively was significantly higher than that used by non-artists. Risk levels relating to psychoactive substances dependence (low, moderate, high) were similar for artists and non-artists.

In the multiple linear regression models, use scores for each substance and the overall score were the dependent variables, and age, sex, educational level and the distinction between artists and non-artists were the independent variables. According to these models, age was the only variable significantly related to alcohol and cannabis use scores. More specifically, the older the participants the less they used alcohol and cannabis.

Also, sex and the distinction between artists and non-artists were found to be related independently to the overall substance use score. Women scored significantly lower, i.e., they used less psychoactive substances compared to men. Finally, artists overall reported significantly higher scores compared to non-artists.

## Discussion

Artists in our sample used cannabis, cocaine, amphetamine-type stimulants and hallucinogens at significantly higher rates compared to non-artists. Furthermore, the number of psychoactive substances used by artists cumulatively was significantly higher than the corresponding number for non-artists. The above findings are consistent with the results of a previous study that examined the use of psychotropic substances and psychopathology in art students and students of other disciplines and found that fine arts students try more types of psychoactive substances and use more cannabis and alcohol, compared to students of other disciplines.[2] Our findings are also consistent with a previous study that focused on the potential correlation between creativity and psychopathology in a sample of 80 artists and 80 non-artists and found that higher use of psychoactive substances in artists. Furthermore, artists used illicit psychotropic substances in significantly higher levels than non-artists.[5] In another study professional artists also showed higher rates of alcohol and drug abuse compared to other professionals.[6]

Multiple regression analysis revealed some interesting findings. More specifically, age was found to be significantly associated with alcohol use. The older the participants were the less alcohol they used. Age was also significantly associated with cannabis use. Overall, the use of all reported substances was lower in women than men. Artists used more substances and more types of substances compared to other individuals in the sample.

Our study has significant limitations. Selecting artists in nine fine arts and excluding artists of the applied arts may be obsolete today, as it involves a narrow perception of the artist's identity and their means of expression. Furthermore, it is suggested that an official society or association should recruit the artists to be involved in future studies, as our sample was limited to individuals who identified themselves as artists, following, of course, certain criteria that were set. Furthermore, the

**Table 2.** Use scores for each substance and the total score in the sample total and comparisons between artists and non-artists.

| Use rate | Total Sample (N=118) | Are you an artist? | | | | p Mann-Whitney test |
|---|---|---|---|---|---|---|
| | | No (N=61, 51.7%) | | Yes (N=57, 48.3%) | | |
| | Mean value (SD) | Median (Int. Width) | Mean value (SD) | Median (Int. Width) | Mean value (SD) | Median (Int. Width) | |
| Tobacco products | 13.83 (8.05) | 15 (7–20) | 13.73 (8.06) | 15 (9–20) | 13.92 (8.12) | 15 (7–18) | 0.909 |
| Alcohol | 10.91 (7.69) | 9 (5.5–14.5) | 9.81 (7.31) | 7 (4–14) | 12.04 (7.98) | 9 (7–15) | 0.057 |
| Cannabis | 7.24 (7.55) | 6 (2–11) | 5.38 (5.95) | 3 (0–8) | 8.68 (8.37) | 7 (2.5–12.5) | 0.071 |
| Cocaine | 3.55 (4.53) | 2 (0–6) | 2.64 (2.76) | 2 (0–5) | 4.04 (5.23) | 2 (0–8) | 0.847 |
| Amphetamine-type stimulants | 2.76 (4.06) | 2 (0–3) | 1.73 (1.95) | 2 (0–3) | 3.19 (4.65) | 2 (0–5) | 0.699 |
| Inhaled substances | 1 (1.63) | 0 (0–2) | 1.25 (2.12) | 0 (0–2) | 0.75 (1.04) | 0 (0–2) | 0.854 |
| Sedative or sleeping pills | 5.6 (8.41) | 3 (0–6) | 3.63 (4.21) | 2.5 (0–6) | 7.86 (11.54) | 3 (0–22) | 0.857 |
| Hallucinogens | 1.32 (1.74) | 0 (0–3) | 1.38 (2.2) | 0 (0–2.5) | 1.3 (1.59) | 0 (0–3) | 0.842 |
| Opioids | 1.75 (2.14) | 1 (0–3) | 2.2 (2.49) | 2 (0–3) | 1.43 (1.99) | 0 (0–3) | 0.542 |
| Other | 5.5 (7.78) | 5.5 (0–11) | – | – | 5.5 (7.78) | 5.5 (0–11) | – |
| Overall use rate | 41.74 (27) | 37 (19–59) | 35.1 (22.72) | 32 (17–52) | 48.84 (29.5) | 42 (29–73) | 0.011 |

sample size of the present study is relatively small for generalization of our findings to the population under consideration. The choice of a purely quantitative method also poses some limitations. A more detailed investigation would be useful, including, for example, possible causes of the phenomenon, the combination of the quantitative and the qualitative method, comparisons with rates reported by official Greek institutions, and associations with other demographic characteristics.

Finally, the research did not deal with the essence of the specific artistic practices at this stage; it is worth noting, however, that practices may differ according to the category of artistic expression. Instead, we focused on approaching the demographics of the artists. This question could be part of future research. We should investigate the differences between art types as well as the degree substance use is involved in specific practices followed by individual artistic expressions.

## References


1. Holm-Hadula RM, Bertolino A. Creativity, alcohol and drug abuse: The pop icon Jim Morrison. *Psychopathology* 2014, 47:167–173, doi: 10.1159/000354617
2. Iszáj F, Kapitány-Fövény M, Farkas J, Kökönyei G, Urbán G, Griffiths MD et al. Substance use and psychological disorders among art and non-art university students: An empirical self-report survey. *Int J Ment Health Addict* 2017, 16:125–135, doi: 10.1007/s11469-017-9812-5
3. Poulopoulos Ch. Art, Drugs and Rehabilitation. *Addictions* 2013, 21:11–16 (In Greek)
4. Henry-Edwards S, Humeniuk R, Ali R, Poznyak V, Monteiro M. *The alcohol, smoking and substance involvement screening test (ASSIST): Guidelines for use in primary care* (Draft version 1.1 for field testing). World Health Organization, Geneva, 2003
5. Preti A, Vellante M. Creativity and psychopathology. Higher rates of psychosis proneness and non-right handedness among creative artists compared to same age and gender peers. *J Nerv Ment Dis* 2007, 195:837–845, doi: 10.1097/NMD.0b013e3181568180
6. Ludwig AM. Creative achievement and psychopathology: comparison among professions. *Am J Psychother* 1992, 46:330–356, doi: 10.1176/appi.psychotherapy.1992.46.3.330

Σύντομο άρθρο

# Καλλιτέχνες και χρήση ψυχοδραστικών ουσιών

Ευθυμία Πατσίκα, Μινέρβα-Μελπομένη Μαλλιώρη

*ΠΜΣ Αντιμετώπιση Εξαρτήσεων-Εξαρτησιολογία, Ιατρική Σχολή, ΕΚΠΑ*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 30 Μαΐου 2020/Αναθεωρήθηκε 14 Σεπτεμβρίου 2020/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Αποτελεί παγιωμένη αντίληψη στη συλλογική συνείδηση ότι οι καλλιτέχνες τείνουν να κάνουν συχνότερη χρήση ψυχοτρόπων ουσιών και χρήση περισσότερων ψυχοτρόπων ουσιών, σε σύγκριση με μη καλλιτέχνες. Στόχος της παρούσας μελέτης αποτελεί το αν πράγματι γίνεται περισσότερη χρήση ψυχοτρόπων από καλλιτέχνες σε σύγκριση με άλλους επαγγελματίες. Στην έρευνα συμμετείχαν 118 καλλιτέχνες και επαγγελματίες άλλων ειδικοτήτων οι οποίοι συμπλήρωσαν μέσω ειδικής διαδικτυακής πλατφόρμας το ερωτηματολόγιο ASSIST, το οποίο αφορά στην ανίχνευση χρήσης ψυχοδραστικών ουσιών, έχει αναπτυχθεί από τον Παγκόσμιο Οργανισμό Υγείας και περιέχει ερωτήσεις κλειστού τύπου. Προστέθηκαν επιπλέον κάποιες ερωτήσεις δημογραφικού χαρακτήρα. Από την ανάλυση των δεδομένων προέκυψε ότι οι καλλιτέχνες είχαν σημαντικά υψηλότερη βαθμολογία στη χρήση ουσιών σε σύγκριση με τους επαγγελματίες άλλων κλάδων. Οι γυναίκες χρησιμοποιούσαν λιγότερο τις ψυχοτρόπες ουσίες, σε σύγκριση με τους άνδρες. Τα αποτελέσματα επιβεβαίωσαν την υπόθεση της μελέτης και βρίσκονται στην ίδια κατεύθυνση με αποτελέσματα άλλων αντίστοιχων ερευνών, αν και ο αριθμός τους στη διεθνή βιβλιογραφία είναι πολύ περιορισμένος. Τα αρχικά αυτά ευρήματα είναι χρήσιμα, λόγω όμως σημαντικών περιορισμών, προτείνεται η περαιτέρω διερεύνηση του θέματος, αλλά και επιπρόσθετη αιτιολογική εξέταση του φαινομένου.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Καλλιτέχνες, ψυχοτρόπες ουσίες, αλκοόλ, χρήση ουσιών, τέχνη.

*Συγγραφέας επικοινωνίας:* Ευθυμία Πατσίκα, ΠΜΣ Αντιμετώπιση Εξαρτήσεων-Εξαρτησιολογία, Ιατρική Σχολή, ΕΚΠΑ, Αλεξανδρουπόλεως 25, 115 27 Αθήνα, Διεύθυνση e-mail: efthimiapatsika@gmail.com

https://doi.org/10.22365/jpsych.2021.004 / Psychiatriki 2021, 32:79–82

Case report

# Brief psychotic disorder with delusion content related to the COVID-19 outbreak

Kyriaki Marouda, Leonidas Mantonakis, Konstantinos Kollias

*First Department of Psychiatry, Eginition Hospital, National & Kapodistrian University of Athens, Athens, Greece*

**ARTICLE HISTORY:** Received 15 October 2020/Revised 23 January 2021/Published Online 17 March 2021

**ABSTRACT**

The COVID-19 outbreak has affected millions of people globally and it also has a huge psychological impact. The objective of this case report is to outline the possible effect of the COVID-19 pandemic to the content of delusions in patients with psychosis. A 34-year-old male with no history of mental disorder, involuntarily hospitalized due to agitation and aggression towards others, experienced grandiose delusions, referential delusions and delusions of passivity. The content of all his delusions was related to the COVID-19 pandemic. His symptoms were not proven to be caused by any physical condition or substance use disorder. He was prescribed olanzapine 10 mg and lorazepam 2,5 mg daily and demonstrated significant improvement with a complete subsidence of his symptoms within a week. He was discharged after a total of 13 days with an ICD-10 diagnosis of brief psychotic disorder. At his 6 months follow-up, he reported no psychiatric symptoms. Existing literature indicates a strong relationship between life experiences and the content of delusions. This case report highlights how the stressful life event of the COVID-19 outbreak affected the content of our patient's delusions.

**KEYWORDS:** COVID-19, delusions, delusional content, stressful life events, brief psychotic disorder.

## Introduction

Since late December 2019, humanity is facing an unprecedented situation due to the latest outbreak of COVID-19, which the World Health Organization declared a public health emergency of international concern on 31th of January 2020. At the time of writing, it has affected more than 36 million people all over the world and the death toll rises currently to 1.092.000. Countries around the world had to implement measures to control the spread of the coronavirus, from school closures to national quarantines. In Greece, social-distancing measures have been applied and multi-day lockdowns have been enforced causing huge psychological distress on citizens.[1]

Thus, the actual threat to public health, the constant media preoccupation with the pandemic and social distancing have turned the last few months into a very stressful life experience. In the literature, the causal relationship between previous or current stressful life experiences and the manifestation of a psychotic episode is well established. The impact of prior stressful life events in the enrichment of the delusional theme in patients with psychosis is also outlined.[2–5]

The following case report is about a man in his thirties with no prior history of psychosis or any other mental disorder who expressed acute delusions with content related to coronavirus.

## Case report

In May 2020, a 34-year-old male was involuntarily admitted for hospitalization, following a court order, due to delusions, disorganized behavior and agitation. He was unmarried, a graduate of higher education, living with his parents and sister. He was neither a smoker nor an alcohol user, but he used cannabis occasionally (last

*Corresponding author:* Kyriaki Marouda, First Department of Psychiatry, Eginition Hospital, 74 Vasilissis Sofias Ave., GR-115 28 Athens, Greece • e-mail: kelly_marouda@hotmail.com

use 10 days prior to admission). Neither he nor his family had a remarkable history of mental disorder.

Two days prior to admission, he started feeling agitated and expressed grandiose delusions related to the recent coronavirus outbreak. He believed coronavirus constituted an organized threat, which he should help eliminate. He also mentioned that we were all somehow divided into groups based on our mask colors and he was very aggressive towards "members of superior groups". He constantly asked his family if "they support the good ones or the bad ones" and if "they want to be slaves or free people". He also expressed referential delusions, having the perception that specific books (for example N. Kazantzakis books) contained coded information foreseeing the coronavirus outbreak and its impact.

The next day, he developed disorganized behavior, walking around the house with his underwear (something he did not use to do). He also expressed fears for his girlfriend's safety whom, according to him, somebody had abducted and hugged his sister constantly to check if she had wings. In the meantime, he was yelling "we will crush coronavirus". Furthermore, he expressed delusions of passivity mentioning that an evil force, like a cockroach, was implanted in his forehead and controlled him. Throughout these events, he was referred to be much stressed, irritable and, at times, emotional.

His family worried that his behavior was due to a neurological condition and for that reason, by his arrival to the emergency department, a neurological evaluation preceded. Laboratory tests (complete blood count, basic metabolic panel, lipid panel, thyroid panel, nutrient tests) and brain CT scan did not reveal any abnormalities. A psychiatric evaluation was then requested but he became very aggressive and physically assaulted the psychiatrist. He thought that he was not a real doctor, since he did not wear a medical gown. He was evaluated as a danger to others; thus, he was involuntary admitted to a psychiatric ward.

Upon admission, he was oriented to time, place and person and maintained eye contact. He was, however, very agitated, non-cooperative, with increased psychomotor activity. He was anxious, irritable and hostile and his affect was of normal range and intensity. No thought disorder or speech disturbance was detected. He expressed well-formed referential delusions, grandiose delusions and delusions of passivity, all concerning coronavirus. No hallucinations were detected and he had partial insight of his condition. His Positive and Negative Symptoms Scale (PANSS) score was 67 (Positive: 25, Negative:8, General Psychopathology: 34) and his Hamilton Rating Scale for Depression (HRSD) score was 25.

He was prescribed olanzapine 20 mg and lorazepam 7.5 mg daily. One day after his admission, he developed a fever, (37.9 °C) with elevated CRP: 11.3 mg/L but no other remarkable change in his laboratory tests. He developed no other symptoms; nevertheless, he was tested for COVID-19 and proved negative. During the next days, his temperature was within normal range.

A brain MRI scan revealed white matter lesions, mainly periventricularly corresponding to the posterior part of the body and the trigones of the lateral ventricles. Neurologists requested also an EEG, antibodies tests, lumbar puncture and a second brain and cervical MRI scan with contrast, from which no specific neurological disorder was identified and a one-year follow-up was recommended.

He had a rapid response to treatment and his psychotic symptoms significantly improved in the first couple of days and completely subsided within a week. He was discharged after 13 days of inpatient treatment with an ICD-10 diagnosis of brief psychotic disorder.[6] Upon discharge, his total PANSS score was then 36 (Positive:7, Negative: 7, General Psychopathology: 22) and his HRSD score was 11. At his 6 months follow-up, he reported no psychiatric symptoms.

Due to the short duration of the psychotic episode (about 10 days) the ICD-10 diagnosis of acute schizophrenia-like psychotic disorder and schizophrenia were rejected. The ICD-10 diagnosis of psychotic disorder due to use of cannabinoids and unspecified organic or symptomatic mental disorder were also rejected as the psychotic symptoms were not deemed to be related to cannabis use (intoxication or withdrawal) and were not proven to be caused by any physical condition. In addition, there were no indications of major mood episodes (depressive or manic), so the criteria of the ICD-10 diagnosis of schizoaffective disorder and bipolar affective disorder were not met.[6]

## Discussion

There has been an extensive discussion in the literature on the mental health consequences of the COVID-19 pandemic among the general population and an increased incidence of common mental disorders such as depression, anxiety and posttraumatic stress disorder (PTSD) is expected.[7] However, limited attention is paid to a number of vulnerable people who might develop psychosis under the psychosocial stress related to the COVID-19 pandemic.[8] Our patient, who had no remarkable personal or family psychiatric history, exhibited grandiose, referential and passivity delusions with content related to coronavirus after the stressful experience of the lockdown. There is limited evidence suggesting that stress related to the COVID-19 pandemic

can cause or precipitate the manifestation of a psychotic episode in apparently unaffected by the virus healthy individuals, with just one case report of a man of similar age in Malaysia.[9]

DSM-V in its definition of the term delusion, includes the following: "Delusions are deemed bizarre if they are clearly implausible and not understandable to some culture peers and do not derive from ordinary life experience" .[10] This statement seems to explicitly accept the link between non-bizarre delusion content and previous experiences or emotional conditions, thereby expanding the possibilities of understanding a patient's psychotic symptoms.[11] A relationship has been demonstrated between intrusive events and persecutory delusions or danger events and depressive delusions.[12] It is generally considered that psychotic symptoms have specific meaning for each patient and that they may facilitate a "making of sense" of complex feelings related to stressful experiences. Empirical studies have also shown that certain life events may specifically influence the delusional theme.[13]

Thus, as the link between delusion content and stressful life events is well established, a modification to their theme due to COVID-19 pandemic and its impact is now expected. One such indication is our case report. Since evidence upon this matter are limited so far, further research in this field is required.

## References


1. Ploumpidis D. Living with covid-19. *Psychiatriki* 2020, 31:197–200, doi: 10.22365/jpsych.2020. 313.197
2. Hardy A, Fowler D, Freeman D, Smith B, Steel C, Evans J et al. Trauma and hallucinatory experience in psychosis. *J Nerv Ment Dis* 2005, 193:501–507, doi: 10.1097/01.nmd.0000172480.56308.21
3. Kelleher I, Keeley H, Corcoran P, Ramsay H, Wasserman C, Carli V et al. Childhood trauma and psychosis in a prospective cohort study: cause, effect, and directionality. *Am J Psychiatry* 2013, 170:734–741, doi: 10.1176/appi.ajp.2012.12091169
4. Bebbington PE, Bhugra D, Brugha T, Singleton N, Farrell M, Jenkins R et al. Psychosis, victimization and childhood disadvantage: evidence from the second British National Survey of Psychiatric Morbidity. *Br J Psychiatry* 2004, 185:220–226, doi: 10.1192/bjp.185.3.220
5. Morrison AP, Frame L, Larkin W. Relationships between trauma and psychosis: A review and integration. *Br J Clin Psychol* 2003, 42:331–353, doi: 10.1348/014466503322528892
6. World Health Organization. *The ICD-10 classification of mental and behavioural disorders. Diagnostic criteria for research*. World Health Organization, Geneva, 1993. Available from https://apps.who.int/iris/handle/10665/37108
7. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 2020, 395:14–20, doi: 10.1016/S0140-6736(20)30460-8
8. Brown E, Gray R, Monaco SL, O'Donoghue B, Nelson B, Thompson A et al. The potential impact of COVID-19 on psychosis: A rapid review of contemporary epidemic and pandemic research. *Schizophr Res* 2020, 222:79–87, doi: 10.1016/j.schres.2020.05.005
9. Zulkifli NA, Sivapatham S, Guan NC. Brief Psychotic Disorder in Relation to Coronavirus, COVID-19 Outbreaks: A Case Report. *Malaysian Journal of Psychiatry* 2020, 29:1–6
10. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. American Psychiatric Publishing, Arlington, VA, 2013, doi: 10.1176/appi.books.9780890425596
11. Catone G, Pisano S, Broome M, Lindau JF, Pascotto A, Gritti A. Continuity between stressful experiences and delusion content in adolescents with psychotic disorders–a pilot study. Scand J *Child Adolesc Psychiatr Psychol* 2016, 4:14–22, doi: 10.21307/sjcapp-2016-004
12. Raune D, Bebbington P, Dunn G, Kuipers E. Event attributes and the content of psychotic experiences in first-episode psychosis. *Psychol Med* 2006, 36:221–230, doi: 10.1017/S003329170500615X
13. Freeman D, Garety PA, Kuipers E, Fowler D, Bebbington PE. A cognitive model of persecutory delusions. *Br J Clin Psychol* 2002, 41:331–347, doi: 10.1348/014466502760387461

Ενδιαφέρουσα περίπτωση

# Βραχεία ψυχωσική διαταραχή με παραληρητικό περιεχόμενο σχετιζόμενο με την πανδημία COVID-19

Κυριακή Μαρούδα, Λεωνίδας Μαντωνάκης, Κωνσταντίνος Κόλλιας

*Α΄ Ψυχιατρική Κλινική ΕΚΠΑ, Αιγινήτειο Νοσοκομείο, Αθήνα*

**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 15 Οκτωβρίου 2020/Αναθεωρήθηκε 23 Ιανουαρίου 2021/Δημοσιεύτηκε Διαδικτυακά 17 Μαρτίου 2021

**ΠΕΡΙΛΗΨΗ**

Η πανδημία COVID-19 έχει επηρεάσει εκατομμύρια ανθρώπους ανά τον κόσμο με σημαντικό αντίκτυπο, πλην της σωματικής, και στην ψυχική υγεία. Σκοπός αυτού του άρθρου είναι να επισημάνει την επίδραση της πανδημίας στο περιεχόμενο των παραληρητικών ιδεών σε ασθενείς με ψυχωσική συνδρομή. Άνδρας, 34 ετών, με ελεύθερο ψυχιατρικό ιστορικό, ο οποίος παρουσίασε παραληρητικές ιδέες μεγαλείου, αναφοράς, επίδρασης, ψυχοκινητική διέγερση και ετεροεπιθετικότητα, νοσηλεύθηκε κατόπιν εισαγγελικής εντολής στην κλινική μας. Το περιεχόμενο των παραληρητικών ιδεών του ασθενούς αφορούσε την πανδημία COVID-19. Η συμπτωματολογία του δεν αποδόθηκε σε χρήση ουσιών ή άλλη ιατρική κατάσταση και τέθηκε η διάγνωση βραχείας ψυχωσικής διαταραχής κατά ICD-10. Χορηγήθηκε ολανζαπίνη 20 mg και λοραζεπάμη 7,5 mg ημερησίως με πλήρη ύφεση των συμπτωμάτων του και έλαβε εξιτήριο μετά από συνολικά 13 ημέρες νοσηλείας. Στο 6μηνο follow-up ο ασθενής παρέμενε ελεύθερος συμπτωμάτων. Στη βιβλιογραφία αναφέρεται ισχυρή συσχέτιση μεταξύ των γεγονότων ζωής και του περιεχομένου των παραληρητικών ιδεών. Με το εν λόγω περιστατικό επισημαίνεται η επίδραση του συγκεκριμένου γεγονότος ζωής, της πανδημίας COVID-19, στη διαμόρφωση των παραληρητικών ιδεών του ασθενούς μας.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** COVID-19, παραληρητικές ιδέες, παραληρητικό περιεχόμενο, ψυχοπιεστικά γεγονότα ζωής, βραχεία ψυχωσική διαταραχή.

*Συγγραφέας επικοινωνίας:* Κυριακή Μαρούδα, Α΄ Ψυχιατρική Κλινική ΕΚΠΑ, Αιγινήτειο Νοσοκομείο, Λεωφ. Βασιλίσσης Σοφίας, 115 28 Αθήνα, Διεύθυνση e-mail: kelly_marouda@hotmail.com