

Evaluation of the capacity to recognize the facial expression of emotions in psychiatry residents throughout three years of training

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Original article

SUMMARY

Facial emotion recognition in mental health professionals may be influenced by their psychological state of mind and attachment experiences. The purpose of this study was to examine the association between current psychological symptoms and attachment styles, and the ability of psychiatry residents to correctly identify the facial expressions of emotions throughout their three-year period of psychiatry training. Sixteen psychiatry residents were recruited in a highly specialized mental health center. In order to evaluate the subjects' psychiatric symptoms, the Checklist (SCL-90) and Attachment Styles Questionnaire (ASQ). Likewise, were used to examine the ability to recognize facial expressions of emotion, we chose the Picture of Facial Affect (POFA). During the psychiatric residency, the severity of psychiatric symptoms was minimal in all participants. Fear was the least-well recognized emotion, both initially and in the third year of residency, while neutral emotion was recognized best at both times. Significant changes in time were observed in the recognition of sadness and disgust. No significant associations were found between attachment styles and the changes in time observed in depressive and anxiety symptoms in psychiatry residents.

Key words: Emotion, nonverbal behavior, psychiatry training, human ethology.

RESUMEN

El reconocimiento facial de las emociones en profesionales de la salud mental puede estar influenciado por el estado psicológico y las experiencias de apego. El objetivo del presente estudio fue examinar la asociación de los síntomas psicológicos y los estilos de apego en relación con la capacidad de residentes de psiquiatría para identificar correctamente la expresión facial de las emociones a lo largo de tres de los cuatro años de su formación como psiquiatras.

La muestra estuvo compuesta por 16 residentes de psiquiatría de un centro especializado en salud mental. Con el objeto de evaluar los síntomas psiquiátricos, se aplicaron el instrumento conocido como SCL-90 y el cuestionario de estilos de apego ASQ. Para el reconocimiento de las emociones, se aplicó el instrumento conocido como POFA (Picture of Facial Affect). Durante la residencia en psiquiatría, la gravedad de los síntomas psiquiátricos se mantuvo en un mínimo en todos los participantes. El miedo fue la emoción menos reconocida al inicio y durante el tercer año de residencia, mientras que la expresión neutra fue la mejor reconocida en ambos momentos. Se observaron cambios significativos a lo largo del tiempo en el reconocimiento de la tristeza y el asco. No se encontraron asociaciones significativas entre el tiempo y los síntomas de ansiedad y depresión y los estilos de apego.

Palabras clave: Emoción, conducta no verbal, formación en psiquiatría, etología humana.

INTRODUCTION

Facial expression of emotions reveals complex mental states that have physiological correlates and signal internal states to others, such as distress, which are crucial for social interaction.¹ Conversely, inaccurate interpretation or failure to correctly decipher emotional information, as revealed in facial expressions, may be a cause of interpersonal and social conflict.² From an

evolutionary perspective, the non-verbal communication of negative internal states may be associated with a broader range of emotional expressions (such as fear, anger, and disgust) and more complex emotions such as jealousy, envy, or gloating.

Consistent with primate research, humans with higher levels of social anxiety tend to misinterpret social cues, suggesting that the subjective evaluation of another person's emotional state is influenced by one's own state of mind³

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and insecure attachment styles (anxious and avoidant).⁴ In fact, in clinical populations, such as in borderline personality disorder, there is evidence for a misinterpretation of neutral facial expressions as depicting negative emotions.⁵

In recent years, facial emotion recognition has become a research subject and clinical interest in psychiatry, particularly for the study of psychotic and affective disorders. Nevertheless, accurate recognition and interpretation of emotional signals is one of the main skills that mental health professionals require to perform their everyday activities during patient care and treatment. Research using ethological methodology has shown that the correct identification of patients' facial expression of emotions and other non-verbal signals is essential, since non-verbal behavior is much less under conscious control than verbal and therefore yields important information about a patient's "actual emotional state, including motivation ambivalence in suicidal patients".⁶⁻¹⁰

In regard to patients, facial emotion recognition in mental health professionals may be influenced by their psychological state of mind and attachment experiences. A pioneering study by Csukly et al. (2008) applied a Virtual Human Interface to examine the ability of psychology and medicine students to correctly recognize facial the expression of emotions. Respondents' subjective well-being was examined using the Symptom Checklist (SCL-90). This research group found that students with higher scores on the SCL-90 had greater difficulty in recognizing anger and neutral facial expressions. However, the study did not report whether or not early attachment experiences had an influence on the students' ability to read facial emotions.¹¹

Previous research has demonstrated that the recognition of the facial expression of emotions at the beginning of an interaction facilitates the establishment of adequate verbal communication.¹² Conversely, poor communication can deteriorate relationships over time,¹³ something which can be particularly detrimental to the patient-therapist relationship, since interaction and the establishment of intersubjectivity are two of the main tools in psychiatric treatment. In light of the importance of non-verbal communication for social interaction, we expected mental health professionals—including those in training—to have an ability to recognize emotional facial expressions, which would be influenced nevertheless by current psychological symptoms and variation in attachment style. The attachment behavioral system is an innate psychobiological system that drives human beings to seek proximity to significant others at times of need or distress.

In a previous study of our group, we found that psychiatric residents were fairly good at identifying the basic facial emotions. Nonetheless, certain minor symptoms of anxiety and hostility were related to better recognition of fear, while obsessive-compulsive traits were linked to the recognition of disgust. With respect to attachment styles, we observed that happiness recognition was positively related

to an attachment-style based on confidence, while the recognition of sadness and surprise correlated negatively with an attachment style based on considering relationships as being of secondary importance.¹⁴ Although this was one of the first studies examining the relation between facial emotion recognition and psychological symptoms and attachment styles, its main limitation was its cross-sectional design, as it is important to observe the development of emotion recognition abilities throughout medical training in psychiatry.

Therefore, the present study aimed to examine the association of current psychological symptoms and attachment styles with their ability to correctly identify facial expressions of emotions in psychiatry residents throughout their three-year training in psychiatry. Specifically, we hypothesized that facial emotion recognition in psychiatry residents will exhibit changes in time and that these changes will relate to attachment styles and psychological symptoms.

METHODS

Participants

Psychiatry residents were recruited in a highly specialized mental health center dedicated to research, resource training, and both short- and long-term treatment of psychiatric patients, including supportive psychotherapy, pharmacological prescription, and rehabilitation as required. Written informed consent was obtained from all residents after they received a comprehensive explanation of the nature of the study. They were included in a three-year follow-up study during their residency. During the first year of psychiatry residency (R1), residents are mainly concerned with the inpatient service of the psychiatric facility, while in the second (R2), their activities are mainly focused in the outpatient service. In turn, during the third year (R3), they work in special care units of the psychiatric facility. The fourth year of residency was not included in the present study, because all residents did a compulsory rotation to other institutions outside psychiatry.

Psychological tests

In order to evaluate subjects' psychological symptoms, a validated Spanish version¹⁵ of the Symptom Checklist (SCL-90)¹⁶ was administered to all subjects. This instrument consists of 90 items which evaluate nine dimensions (somatization, obsessions and compulsions, interpersonal sensitivity, depression, hostility, phobic anxiety, paranoid ideation and psychoticism), and a global index of severity. To assess the attachment styles, the Attachment Styles Questionnaire (ASQ)¹⁷ was given to the residents. The ASQ is a 40-item questionnaire with an alpha coefficients ranging from 0.76 to 0.84 in five scales (confidence, discomfort with closeness,

relationships as secondary, need for approval, preoccupation). A validated version in Spanish was used.¹⁸ To examine the ability to recognize facial expressions of emotion we chose the Pictures of Facial Affect (POFA),¹⁹ which consists of 110 black and white photographs depicting six basic emotions (happiness, fear, anger, sadness, surprise, disgust) and a neutral expression.

All instruments were given to residents at the beginning of their psychiatry residency (R1), in the second (R2) and third year (R3) of training.

Statistical analyses

Demographic and clinical characteristics were described using frequencies and percentages for categorical variables, as well as means and standard deviations (S.D.) for continuous variables. Non-parametric tests were used to determine differences over time. Friedman tests were used for the comparison during the three-year residency and, where appropriate, Wilcoxon rank-sum tests were conducted. In addition, in those variables where differences were detected, the mean score variation between periods was obtained. These mean values were used to measure linear association among them and with the scores of the ASQ through the Spearman correlation coefficient. The significance level for tests was established at $p \leq 0.05$ (2-tailed).

RESULTS

Participants

A total of 21 psychiatry residents were included in the study. Eleven were women and the remaining 10 (47.6%), men with a mean age of 25.7 (S.D.=1.1). Five residents refused to continue the study after the initial assessment during their first year of residency. The data of the remaining 16 residents is reported.

Psychiatric symptomatology

During the three-year psychiatric residency, psychiatric symptom severity was minimal (<3 points in each SCL-90 subscale) in all participants.

Over time, a significant change in depressive and anxiety symptoms, as well as the general severity index (GSI), was observed. For depressive symptoms, changes in severity were observed between the first and the second year of residency ($Z=-2.2$, $p=0.02$), where symptom severity increased, and a decrease was observed between the second and the third year ($Z=-2.6$, $p=0.008$). A significant decrease in the severity of the anxiety symptoms was observed between the second and the third years ($Z=-2.1$, $p=0.03$), and for the GSI, an increase was observed from the first to the second years of residency ($Z=-2.0$, $p=0.04$). The mean change observed in time for depression was 0.28 (S.D.=0.48), for anxiety -0.13 (S.D.=0.23), and for the GSI 0.16 (S.D.=0.29). No differences in time were observed in the remaining subscales (table 1).

Facial emotion recognition

The mean percentages of correct emotion recognition are shown in figure 1. Fear was the least-well recognized emotion both initially and in the third year of residency, while the neutral emotion was best recognized at both times.

Significant changes in time were observed in the recognition of sadness and disgust. There was a progressive increase in the recognition of sadness, whereby a statistically significant difference emerged when the percentage of sadness recognition in the first year of residency was compared to the sadness recognition in the third year of training ($Z=-2.4$, $p=0.01$). The mean difference in percentage recognition of sadness was 7.3% (S.D.=10.6).

Similar results were observed for disgust, where its recognition increased progressively and significantly according to the year of residency (from 1st to 2nd years, $Z=-2.1$,

Table 1. SCL-90 subscales scores of psychiatry residents in time

	Year of residency						Friedman's
	1st		2nd		3rd		
SCL90 subscales	Mean	S.D.	Mean	S.D.	Mean	S.D.	Chi-Square Test
Somatization	0.30	0.22	0.50	0.29	0.56	0.91	$\chi^2=4.2$, p=0.12
Obsessions/compulsions	0.63	0.47	0.95	0.51	0.81	0.51	$\chi^2=5.4$, p=0.07
Interpersonal sensitivity	0.40	0.40	0.69	0.48	0.41	0.34	$\chi^2=5.1$, p=0.08
Depression	0.39	0.35	0.68	0.44	0.50	0.49	$\chi^2=6.6$, p=0.03
Anxiety	0.43	0.28	0.53	0.25	0.39	0.19	$\chi^2=6.4$, p=0.03
Hostility	0.22	0.22	0.29	0.19	0.19	0.12	$\chi^2=2.0$, p=0.35
Phobic anxiety	0.11	0.21	0.07	0.17	0.21	0.77	$\chi^2=3.3$, p=0.19
Paranoid ideation	0.15	0.23	0.28	0.30	0.09	0.12	$\chi^2=3.5$, p=0.16
Psychoticism	0.05	0.10	0.05	0.08	0.02	0.05	$\chi^2=1.4$, p=0.48
Global severity index	0.32	0.26	0.49	0.20	0.39	0.27	$\chi^2=7.5$, p=0.02

$p=0.03$; from 2nd to 3rd year, $Z=-2.0$, $p=0.03$). The mean increase in disgust recognition in time was 1.4% (S.D.=10.6).

Attachment styles

Psychiatry residents reported similar scores in the attachment styles assessed by the ASQ in the first and the third years of their residency. These were as follows: avoidant style (1st, 40.4, S.D.=7.8; 3rd, 41.4, S.D.=9.2), anxious style (1st, 37.4, S.D.=7.0; 3rd, 37.1, S.D.=8.2), confidence style (1st, 27.0, S.D.=2.8; 3rd, 28.1, S.D.=3.0), uncomfortable with proximity (1st, 29.0, S.D.=5.8; 3rd, 28.3, S.D.=6.5), relationships as being secondary (1st, 14.4, S.D.=4.1; 3rd, 14.1, S.D.=3.8), need of recognition (1st, 19.3, S.D.=4.9; 3rd, 20.0, S.D.=5.3), and preoccupation (1st, 23.0, S.D.=5.5; 3rd, 22.5, S.D.=5.1).

Association between facial emotion recognition, psychiatric symptoms and attachment styles

No significant associations were found between attachment styles and the changes in time observed in depressive and anxiety symptoms in psychiatry residents ($p>0.05$).

Nonetheless, the percentage of change observed in the recognition of sadness exhibited significant inverse correlations with the anxious attachment style and preoccupation

(figures 2A and 2B, respectively). Residents with higher scores in these attachment styles had a poorer recognition of sadness. In line with these results, residents with less depressive symptom severity showed better recognition of sadness (figure 3).

DISCUSSION AND CONCLUSIONS

The main objective of the present study was to examine the association of current psychological symptoms and attachment styles with the ability of psychiatry residents to correctly identify facial expressions of emotions throughout their three-year of psychiatry training.

We found that facial emotion recognition is already well developed in psychiatry residents from the first year of residency onwards, as almost all emotions were appropriately recognized by over 80% of participants. Furthermore, psychiatry residents improved their performance during their residency for the recognition of sadness and disgust. This improvement may be related to the theoretical training they receive during their academic formation. However, it is more likely that this may be associated with their daily clinical contact with psychiatric patients, who during clinical consultation may continuously exhibit these emotions as a verbal and/or non-verbal expression of their psychiatric condition. In a previous study by Minardi (2013),²⁰ it was

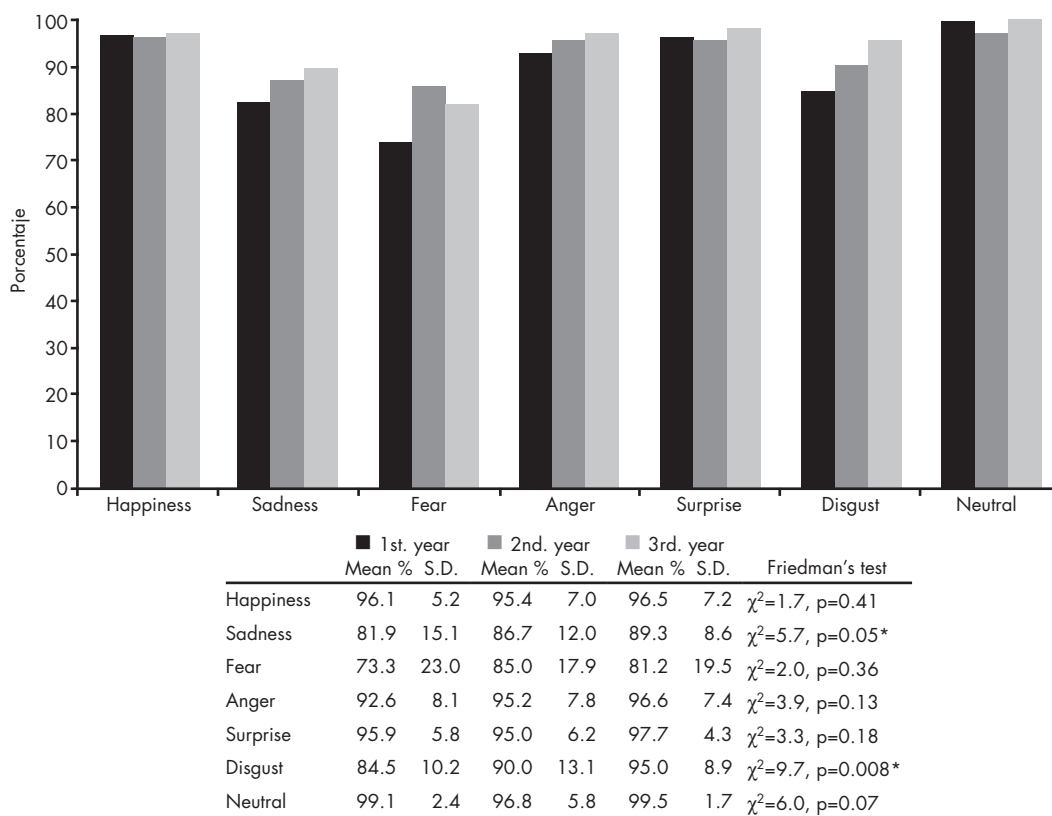


Figure 1. Facial emotion recognition during psychiatric residency.

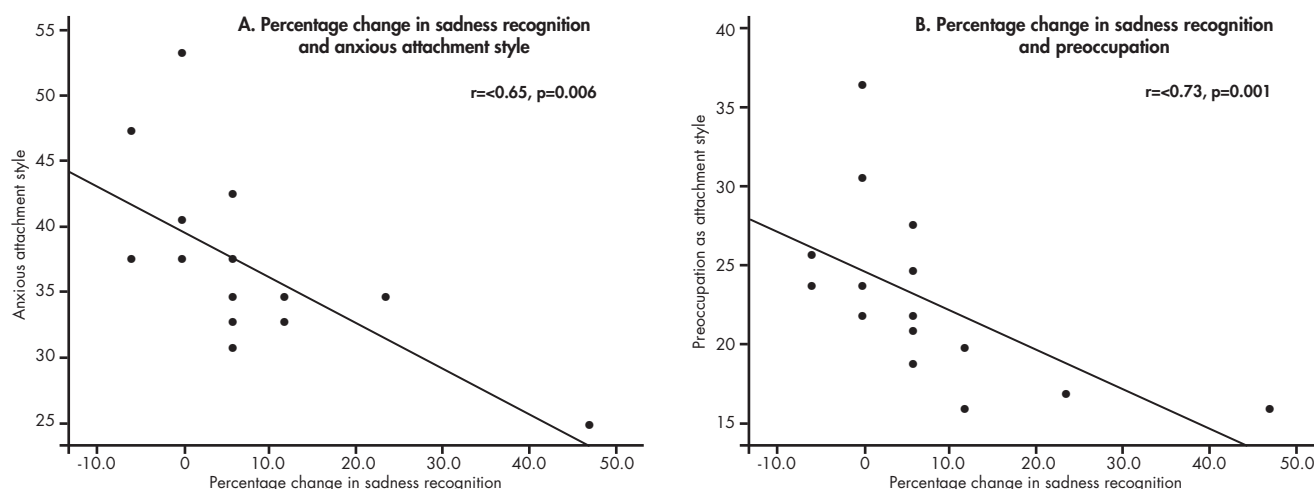


Figure 2. Association between changes in facial emotion recognition and attachment styles.

observed that training improved the ability of nursing institute students to identify emotions, and this may be also the case for psychiatry residents, where theoretical and practical training can improve their ability to identify emotions from non-verbal communication with patients.

It is considered that some of the desired abilities of medical students are related to their capacity to establish clinical distance, control, and even suppression of emotions.²¹ Nevertheless, these are not entirely desirable for psychiatry residents as they need to read and reflect back these emotions to succeed in their clinical activities during and after their training. Psychiatrists differ from physicians in general in that they must make explicit their own processes through training to understand and use their emotions to develop an empathic instrument.²²

Although a progressive increase in the recognition of sadness was observed, it is important to note that psychia-

try residents that reported higher scores in the attachment styles, based on anxiety and preoccupation, recognized sadness to a lesser extent. In a study performed in undergraduate students, anxious or avoidant individuals were less likely to perceive positive emotion (e.g., happiness) from facial expressions.²³ Attachment styles based on anxiety and preoccupation are mainly based on cognitive disconnection and self-insufficiency strategies as distancing mechanisms from negative emotions such as sadness. Thus, we suppose that these residents may be distracting attention from the recognition of this emotion in others as it may trigger the awareness of their own emotionality (sadness), which they may be striving to avoid.

In line with the previous statement, we observed changes in time in the severity of depressive and anxious features. Psychiatry resident impairment was recently identified as an emerging field of study for psychiatrists in academic settings.²⁴ In a study conducted in Mexico, it was found that a significant proportion of the psychiatry residents reported psychological symptoms of minor severity,²⁵ which are very similar to the scores observed in our sample. During the second year of training, residents exhibited more pronounced psychopathological features compared to their first year of residency. These changes may be directly related to the activities of the second year of residency, which involves a greater number of consultations with greater autonomy to establish psychiatric diagnoses and provide treatment, and therefore, a greater responsibility as physicians. In addition, higher number of consultations exposes residents to continuous deep, painful, and stressful emotions that each patient expresses differently and may lead to emotional burn-out and exacerbation of depressive and anxious features.²⁶ Therefore, a minor recognition of sadness in others may be related to depressive symptoms in psychiatry residents as an avoidant strategy of protection of their own feelings. While the increasing recognition of sadness remained until

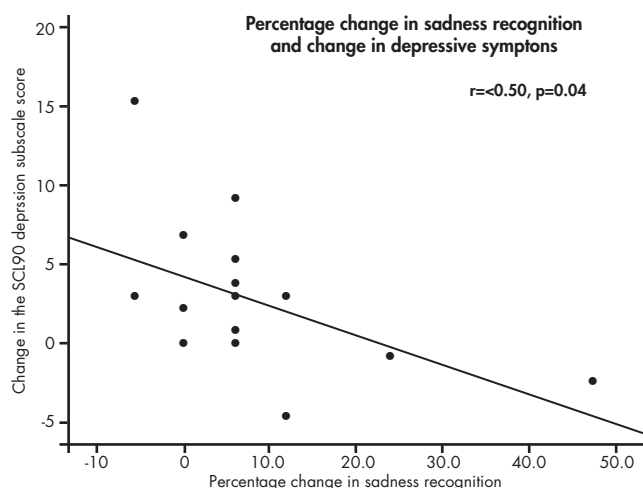


Figure 3. Association between changes in facial emotion recognition and psychiatric symptoms.

the third year of residency, depressive and anxiety features returned almost to a baseline level in the third year. This may be a reflection of how residents learn to recognize facial emotions in others, while managing their own emotions when facing psychiatric patients. Investigating emotions and body-language in a dynamically sensitive interview will get to the patients' concerns much faster than an overly directive checklist approach²² and so a more humane and sensitive perspective should be reached.

The present study has several shortcomings. First, the sample size is fairly small, especially in light of the unexpected drop-outs. So, a confirmatory study of a larger sample is warranted. Second, we were unable to include a control group of residents in other medical disciplines and non-medical students, and thus the specificity of the findings for residents in psychiatry remains elusive. Furthermore, future studies may also want to examine emotion recognition abilities in consultants in psychiatry who have several years of experience.

Emotions and behavior are the daily work tools in psychiatry. Thus, training in facial emotion recognition in psychiatry residents should be encouraged as no academic setting can afford to ignore its importance during psychiatry residency.

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Authors' contribution; Authors participated in all procedures of the present study and read and approved the final version of the manuscript.

REFERENCES

1. Fasel B, Luetttin J. Automatic facial expression analysis: a survey. *Pattern Recognition* 2003;36(1):259-275.
2. Leber S, Heidenreich T, Stangier U, Hofmann SG. Processing of facial affect under social threat in socially anxious adults: mood matters. *Depression Anxiety* 2009;26(2):196-206.
3. Ekman P, Oster H. Expresiones faciales de la emoción. *Annual Review Psychology* 1979;30(7):527-554.
4. Guterma O. Adult attachment style and sensitivity to non-verbal expressions of emotion: The facilitating role of attachment security. 2006.
5. Unoka Z, Fogd D, Füzy M, Csukly G. Misreading the facial signs: specific impairments and error patterns in recognition of facial emotions with negative valence in borderline personality disorder. *Psychiatry Res* 2011;189(3):419-425.
6. Grant EC. An ethological description of non-verbal behaviour during interviews. *British J Medical Psychology* 1968;41:177-183.
7. Schelde T, Hertz M. Ethology and psychotherapy. *Ethology Sociobiology* 1994;15:383-392.
8. Geerts E, Bouhuys AL, Hoofdakker RH van den. Nonverbal attunement between depressed patients and an interviewer predicts subsequent improvement. *J Affective Disorders* 1996;40:15-21.
9. Troisi A. Ethological research in clinical psychiatry: the study of non-verbal behavior during interviews. *Neuroscience Biobehavioral Reviews* 1999;23:905-913.
10. Geerts E, Brüne M. Ethological approaches to psychiatric disorders: Focus on depression and schizophrenia. *Australian New Zealand J Psychiatry* 2009;43:1007-1015.
11. Csukly G, Czobor P, Simon L, Takács B. Basic emotions and psychological distress: association between recognition of facial expressions and Symptom Checklist-90 subscales. *Comprehensive Psychiatry* 2008;49:177-183.
12. Mueser KT, Doonan R, Penn DL et al. Emotion recognition and social competence in chronic schizophrenia. *J Abnormal Psychology* 1996;105(2):271-275.
13. Poole JH, Tobias FC, Vinogradov S. The functional relevance of affect recognition errors in schizophrenia. *J International Neuropsychology Soc* 2000;6:649-658.
14. Arango de Montis I, Brüne M, Fresán A et al. Recognition of facial expression of the emotions and their relation to attachment styles and psychiatric symptoms. Preliminary study on Psychiatric Residents. *Salud Mental* 2013;36(2):95-100.
15. Cruz Fuentes C, López Bello L, Blas García C, González Macías L et al. Sobre la validez y confiabilidad de la SYMPTOM CHECK LIST 90 (SCL 90), en una muestra de sujetos mexicanos. *Salud Mental* 2005;20(1):72-81.
16. Degoratis L. SCL-90-R Symptom Checklist-90-R. 1994.
17. Feeney JA, Noller P, Hanrahan M. Assessing adult attachment. In: *Attachment in adults: Clinical and developmental perspectives*. New York: Guilford Press; 1994; pp.128-152.
18. Ahumada Castillo JP. Traducción y validación del cuestionario de estilos de apego en el adulto (Attachment Style Questionnaire). 2011.
19. Ekman P. Pictures of facial affect (POFA). 1993:1-110.
20. Minardi H. Emotion recognition by mental health professionals and students. *Nursing Standar* 2013;20(25):41-48.
21. Newton BW, Barber L, Clardy J, Cleveland E et al. Is there hardening of the heart during medical school? *Academic Medicine* 2008;83(3):244-249.
22. Forrest DV. FRONTLINE: teaching affect recognition to medical students: evaluation and reflections. *J Am Acad Psychoanal Dyn Psychiatry* 2011;39(2):229-241.
23. Kanemasa Y. Effects of beliefs and expectations about self and others on emotional recognition of facial expressions: from the perspective of adult attachment. *Shinrigaku Kenkyu* 2005;76(4):359-367.
24. Myers MF. Physician impairment: is it relevant to academic psychiatry? *Acad Psychiatry* 2008;32:39-43.
25. Mesa Ríos FJ, Muñoz Mdel C. Screening for psychopathology symptoms in Mexican psychiatry residents. *Acad Psychiatry* 2011;35(6):370-372.
26. Velásquez-Pérez L, Colin-Piana R, González-González M. Coping with medical residency: depression burnout. *Gac Med Mex* 2013;149(2):183-195.

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