anales de psicología / annals of psychology
2025, vol. 41, nº 3 (october), 303-311
https://doi.org/10.6018/analesps.665671

Published by Editum, Servicio de Publicaciones, Universidad de Murcia (Spain), in https://revistas.um.es/analesps
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Malingering of disabling mental illness to obtain a temporary work disability benefit: detection and morphology

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Título: Simulación de enfermedad mental incapacitante para obtener una incapacidad laboral temporal: detección y morfología.

Resumen: *Antecedentes/Objetivo:* En las evaluaciones psicológicas cuyos resultados pueden conllevar la obtención de algún beneficio o ganancia debe sospecharse la posibilidad de simulación. Este es el caso de la incapacidad laboral temporal por causas psicológicas, casuística para la que se han estimado altas prevalencias de simulación. Por ello, se diseñó un estudio con el objetivo de examinar la utilidad del *Symptom Checklist-90-Revised* (SCL-90-R) en la detección de psicopatología simulada, motivada por el incentivo externo de obtener una incapacidad laboral temporal. *Método*: Un total de 182 participantes completaron el SCL-90-R en un diseño de simulación, bajo dos condiciones diferentes: una respuesta siguiendo instrucciones estándar y, otra, instrucciones de simulación de síntomas psicológicos con el fin de obtener una incapacidad laboral temporal. *Resultados*: Los resultados revelaron que la población trabajadora es, en su mayoría, capaz de simular tanto síntomas clínicos como trastornos mentales con una intensidad suficiente para justificar una incapacidad laboral temporal (ganancia secundaria). Para ello, emplearon dos estrategias principales: la agrupación indiscriminada de síntomas (simulación de deterioro en todas las dimensiones clínicas, incluso superior al observado en la población psiquiátrica) y la severidad de síntomas (simulación de una intensidad extrema de los síntomas, también superior a la de la población psiquiátrica). Finalmente, se observó que el género no desempeña un papel significativo en la simulación. *Conclusiones*: Se discuten las implicaciones de estos hallazgos para la evaluación forense.

Palabras clave: Incapacidad laboral temporal. Psicopatología. Simulación. SCL-90-R. Agrupación indiscriminada de síntomas. Severidad de síntomas.

Abstract: *Background/Objective:* In psychological assessments where the results may lead to obtaining some benefit or gain, malingering should be suspected. This is the case for temporary work disability due to psychological causes, for which high prevalence of malingering have been estimated. Therefore, a study was designed to examine the utility of the SCL-90-R in detecting malingered psychopathology motivated by the external incentive of obtaining a temporary work disability. *Method*: A total of 182 participants completed the SCL-90-R in a simulation design, under two conditions: responding under standard instructions and under instructions for malingering of psychological cause to obtain a temporary work disability. *Results*: The results revealed that the working population is almost entirely capable of malingering both clinical symptoms and mental disorders with sufficient severity to obtain a temporary work disability (secondary gain). They employed two strategies: indiscriminant symptom endorsement (malingering impairment across all clinical dimensions, even greater than the psychiatric population) and symptom severity (malinger an extreme intensity, even greater than the psychiatric population). Finally, it was found that the gender factor does not play a significant role in malingering. *Conclusions*: The implications of the results for forensic assessments are discussed.

Keywords: Temporary work disability. Psychopathology. Malingering. SCL-90-R. Indiscriminant symptom endorsement. Symptom severity.

Introduction

The necessity to suspect malingering in clinical assessments with forensic implications, where the results may influence the acquisition of benefits or gains, is a recurring warning in the scientific literature (Catwright & Donkin, 2020; Rogers, 2018a), as well as in clinical guidelines (American Psychiatric Association [APA], 2013). Ignoring this prescription implies, in criminal trials, that the assessment of psychological injury may not be sufficient to undermine the principle of the presumption of innocence (no innocent person should be convicted; as malinger may be diagnosed as patients); while in civil trials, it may lead to the loss of the claim, as the reality (discarding any probability of malingering) of the injury or clinical sequela cannot be demonstrated. Estimating the prevalence of malingering is a controversial topic, due to there is no valid (ground truth) and shared classification criterion for the measure (e.g., clinical impressions, forensic impressions, performance validity test, Social Security Administration disability examinations), as well as high variability depending on the assessment context (e.g., clinical, forensic, post-traumatic stress disorder, traumatic brain injury, chronic pain). In any case, the figures are very high and far from the unacceptable error in the forensic field (in the forensic assessment of disabilities, Type II error, false negatives, must be 0; Arce, 2017). Thus, Larrabee (2003) estimated the prevalence of malingering in the context of neuropsychological assessment at 40±10%, and Young (2015) estimated a general prevalence of 15±15%, with a higher prevalence in the forensic context. One of the assessment settings where a high prevalence of malingering is suspected is in work disability, both temporary and permanent (Collado et al., 2014; Domínguez et al., 2017; Yoxall et al., 2018), being of special relevance work disability due to psychological causes, as the nature of the illnesses that could substantiate it, unlike most physical pathologies, lacks easily demonstrable organicity that facilitates its objectification (Goldwaser & Goldwaser, 2018). In fact, the pathologies with the highest prevalence of malingering in the field of disabilities are mood disorders and chronic pain (Pina et al., 2022).

When considering the economic and health costs associated with malingering (Pascual & Salces, 2018), the need to

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(Article received: 04-06-2025; revised: 11-06-2025; accepted: 01-07-2025)

control for malingering becomes immense, if not imperative, especially if fraud may be underlying part of these costs (Chafetz & Underhill, 2013). Various techniques have been developed in psychology for the detection of deception, some focusing on the analysis of the credibility of the statement (Cabezas-García et al., 2022; Leal et al., 2023; Montes et al., 2024; Sanmarco et al., 2023; Selaya et al., 2024) and others on the validity of the reported symptoms (Gonzalez et al., 2022; Puente-López et al., 2024; Puente-López et al., 2023).

Professionals tasked with conducting these assessments identify malingering as a common phenomenon, while also acknowledging the lack of standardized procedures and criteria for its detection (Domínguez et al., 2017). Nevertheless, there are psychological assessment tools for clinical symptoms that could be utilized in this context. The MMPI-2 and its reformulated version, the MMPI-2-RF, the PAI, and the SCL-90-R, among others, have a substantial body of scientific evidence supporting their clinical and forensic use (Graham, 2011; Greene, 2011; Hawes & Boccaccini, 2009; Redondo et al., 2019; Rogers et al., 2003; Sharf et al., 2017; Vilariño et al., 2018; Wolf & Miller, 2014; Yoxall et al., 2018), as they fulfil the dual psychological-forensic purpose: the assessment of injury and the differential diagnosis of malingering.

Among the aforementioned instruments, the SCL-90-R stands out for its optimal response to this demand. Through 90 items, a diagnostic impression of the evaluated individual can be obtained quickly and easily, and based on its three global indices (GSI, PSDI, and PST), the suspicion of malingering can be investigated. In fact, its utility for the study of malingering has been evidenced in various types of cases. In this regard, findings reveal its capacity to discriminate between malingers and genuine patients suffering from clinical conditions characterized by pain (McGuire & Shores, 2001; Torres et al., 2010; Wallis & Bogduk, 1996), as well as between real and malingered psychopathology in simulation designs (Sullivan & King, 2010) and, specifically, in cases of gender-based violence and bullying (Arce et al., 2013; Vilariño et al., 2009). Furthermore, Martínez et al. (2011) found that the SCL-90-R was useful for detecting malingered psychopathology in ILP assessments when used in conjunction with other measures.

For the detection of malingering, one can refer to the analysis of specific response styles (Rogers, 2018b). In this regard, two major categories have been established: one focused on unlikely symptom patterns due to their atypical or unusual nature, which are rarely detected in genuine patients (e.g., rare symptoms, improbable symptoms, symptom combinations), and the other related to amplified symptom presentations in which the frequency and intensity of suffering exceed that of real patients. Within this second category, which is highly common among malingers (van Impelen et al., 2014), two malingering strategies are manifested: the indiscriminant symptom endorsement, characterized by reporting a high number of symptoms that very rarely occur in genuine patients, and the symptom severity, which involves assigning such severity (extreme severity) to the reported symptoms that genuine patients rarely present (Fariña et al., 2014; Vilariño et al., 2020; Vilariño et al., 2013). Both types of patterns are evaluated using the global indices (i.e., GSI, PST, PSDI) of the SCL-90-R, which have been shown to be highly effective in the accurate classification of malingered responses, as well as in the discrimination between honest and malingered responses (Arce et al., 2013; Lees-Haley, 1989; Vilariño et al., 2009; Wallis & Bogduk, 1996).

Over the past few decades, the importance of adopting a gender perspective in science has been emphasized, particularly when the subject of study involves people. However, it is common to encounter some confusion in research regarding the concepts of gender and sex, in the sense that many studies tend to focus on differences between sexes, while gender is a construct that transcends such distinctions. Aware of this controversy, and without intending to delve deeper into it, this work will equate both variables, referring to them as gender, to determine whether there are differences between men and women in malingering. In this regard, the literature provides abundant evidence of differences across various dimensions of psychological functioning (Ching et al., 2014; Novo et al., 2015; Riecher-Rössler, 2017; Strömwall et al., 2014; Vinagre-González et al., 2023).

Based on the preceding review, a malingering study was designed with the general objective of examining the utility of the SCL-90-R in detecting malingered psychological symptoms motivated by the external incentive of obtaining a temporary work disability. Additionally, four specific objectives were intended to be achieved. First, to determine whether the general population is capable of malingering psychological symptoms that warrant temporary work disability on the SCL-90-R. Second, to estimate and quantify the effectiveness of the global indicators of the SCL-90-R (GSI, PSDI, and PST) in detecting malingering. Third, to examine the characteristics of malingered response patterns in relation to the presence of malingering strategies and the typology of malingered symptoms. Fourth, to study the effect of the gender factor on the malingering of disabling symptoms for work practice.

Method

Participants

A total of 182 individuals participated in the study, with ages ranging from 20 to 65 years (M = 41.87, SEM = 1.04). The sample was balanced in terms of gender, $\chi^2(1) = 3.16$, *ns*, and age, $t(180) = 0.60$, $p = .550$. Of the participants, 103 (56.6%) were women aged between 20 and 65 years (M = 42.53, SEM = 1.33), and 79 were men aged between 20 and 65 years (M = 41.15, SEM = 1.67).

Design and Procedure

A within-subjects simulation design was adopted (Rogers, 2018a) in which participants responded to the SCL-90-R under standard response instructions and under instructions for malingering response. In the first condition, participants responded to the SCL-90-R following the manual instructions (honest response). In the second condition, participants were instructed to malinger a temporary work disability, not a permanent disability, motivated by reasons they deemed appropriate, such as obtaining compensation, taking a work break, work demands, negative work environment, etc. They were given one week to prepare for the evaluation and were not provided with any instructions on how to simulate. They were asked to respond quickly (first impulse) and without the ability to go back. The response time ranged from 12 to 15 minutes. Finally, a debriefing was conducted to verify the participants' recall, engagement, and understanding of the task. Furthermore, clinical significance change has computed for each participant i.e., $CS = (X_{hr} - X_{mr})/S_{Diff} > 1.96$, where X_{hr} is the honest response score, X_{mr} is the malingering response score, and S_{Diff}, is the standard error of difference between the two scores. A significant clinical change was observed in all participants. On the other hand, a between-subject design was implemented to compare scores between male and female participants. The aim was to analyze the effect of gender. Participation was voluntary and subject to informed consent. Data were processed and stored in line with the requirements of the Spanish data protection law (Ley Orgánica 3/2018, de 5 de diciembre, de Protección de Datos Personales y Garantía de los Derechos Digitales, 2018).

The following inclusion and exclusion criteria were applied: being or having been in a condition of employed by others; to be of working age and not retired; absence of physical illness or mental disorder that incapacitates them from working; having malingered the experience of at least 5 additional symptoms (significant malingering) beyond those reported under honest response instructions; and none of the global indices indicating suspicion of symptom denial or severity.

Measurement Instrument

Psychological adjustment was measured using the Spanish adaptation of the Symptom Check List 90-R (SCL-90-R; Derogatis, 1994, 2002). The SCL-90-R consists of 90 items (psychological, psychiatric, and somatic symptoms) to which participants respond on a five-point response scale that rates the intensity of suffering: *none at all* (0), *a little bit* (1), *moderately* (2), *quite a bit* (3) and *very severe* (4). The measure is structured around 9 symptom dimensions [somatization (SOM), obsessive-compulsive (O-C), interpersonal sensitivity (INT), depression (DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid ideation (PAR) y psychoticism (PSY)], 7 additional items, and 3 global indexes of distress [Global Severity Index (GSI), Positive Symptom Total (PST) and Positive Symptom Distress Index (PSDI)].

The global indices have different utilities in the clinical realm (intensity measurement; Derogatis, 1994, 2002) and in the forensic setting (assessment of response distortion: malingering and defensiveness; Arce, Fariña, & Vilariño, 2015; McGuire & Shores, 2001; Vilariño et al., 2009). In this work, the measures in these indices were interpreted in terms of intensity (clinical assessment) to estimate the ability for malingering and the suspicion of malingering (forensic assessment), using a cutoff point for suspicion of malingering and significant clinical intensity of *T* scores ≥ 66.45 (95th percentile; statistical, clinical, and forensic significance).

Data analysis

The paired-sample t-test for related samples was conducted to compare the means of self-reports of psychological symptoms obtained under standard instructions (honest response) and under malingering instructions (malingered response). The effect size was obtained using Cohen's *d* for repeated measures [$d_{rm} = (M_1 - M_2/SD_{Diff}$], qualitatively interpreted as small ($d = 0.20$), moderate ($d = 0.50$), large ($d = 0.80$), and more than large ($d > 1.20$; Arce, Fariña, Seijo et al., 2015). The error of the empirical model was estimated with the Probability of an Inferiority Score (PIS; Arias et al., 2020), being trivial if PIS < .05 or the 95% interval has .05; between trivial and common if .05 < PIS < .50; common if PIS = .50 (the CI has .50); between common and normal if .50 < PIS < .95; and normal if the lower limit of PIS > .95 or the 95% CI has .95.

Similarly, in order to compare the mean responses under malingering instructions with the psychiatric population, a one-sample t-test was applied (test value: mean of the psychiatric population in the spanish standardization of the SCL-90-R), calculating the effect size using Cohen's *d* and quantifying the model error with PIS. Additionally, to compare means between men and women in the measure of psychopathological symptoms, as well as in the measures of malingering suspicion, *two-sample t-tests* were conducted, with effect size calculated using *d* and model error assessed with PIS. The observed prevalence of caseness in symptom dimensions ($T \geq 66.45$ i.e., percentile ≥ 95 clinical, statistical, and forensic significance in symptom dimensions and global indices) was contrasted with a constant (.05, .50, and .95, trivial, common, and normal prevalence, respectively), estimating the Zeta value for the difference in proportions. The magnitude of the effect was measured in Cohen's *h* interpreting the magnitude of the effect size as small, moderate, larger and more than large when $h = 0.20$, $h = 0.50$, $h = 0.80$ and $h > 1.20$, respectively (Arce, Fariña, Seijo et al., 2015; Cohen, 1988).

The association between gender and the incidence of psychopathological symptoms ($T \geq 66.45$) and the suspected malingering ($T \geq 66.45$) in the global indices, was estimated using Pearson's chi-squared test (none contingency was ob-

served of expected frequency cells < 5). The effect size was computed with prevalence ratio, interpreting the magnitude as small (PR = 1.44), moderate (PR = 2.47), large (PR = 4.25) and more than large (PR > 8.82; Arce, Fariña, Seijo et al., 2015), and quantified the effect with the Effect Incremental Index (EII) i.e., the increment (or decrement in negatives) in the observed probability in a category over other category (Vilariño et al., 2022).

Results

Evaluation of the ability to malinger clinical symptoms and disorders for a temporary work disability

The results (see Table 1) showed that participants have a significant ability to malinger mental illness across all 9 symptom dimensions. This malingering ability has a large effect size (d > 1.20), with the statistical model error being trivial (PIS ≤ .05) except for the obsessive-compulsive dimension, which is significant but very close to trivial (lower limit of the PIS 95% CI was .069). In summary, the ability of the working population to malinger clinical symptoms to motivate temporary work disability is practically total.

Table 1
Mean comparison of the honest and malingering responses. Paired t-test

Variable	t	M_{mr}	M_{hr}	d[95% CI]	PIS[95% CI]
SOM	20.20***	2.33	0.83	1.50[1.54, 1.46]	.067[.041, .093]
O-C	17.31***	2.33	1.01	1.28[1.24, 1.32]	.100[.069, .131]
INT	21.00***	2.49	0.86	1.55[1.51, 1.59]	.061[.036, .086]
DEP	24.94***	2.69	0.84	1.85[1.81, 1.89]	.032[.014, .051]
ANX	26.03***	2.56	0.65	1.93[1.89, 1.97]	.027[.010, .044]
HOS	20.59***	2.46	0.74	1.35[1.31, 1.39]	.089[.060, .118]
PHOB	23.01***	2.36	0.38	1.69[1.65, 1.73]	.046[.024, .068]
PAR	23.35***	2.68	0.85	1.74[1.70, 1.78]	.041[.021, .061]
PSY	26.10***	2.38	0.32	1.93[1.89, 1.97]	.027[.010, .044]

Note. df(182); M_{mr}: Mean of the responses under malingering instructions (malingering responses); M_{hr}: Mean of the responses under standard instructions (honest responses); d[95% CI]: Cohen´s d[95% Confidence Interval]; PIS[95% CI]: Probability of an Inferiority Score[95% Confidence Interval]; ***p < .001.

Likewise, the results (see Table 2) also show that participants have the ability to malinger clinical intensity, i.e., global severity, total positive symptoms, and positive symptom distress. The magnitude of the effect is also more than large, and the statistical model error is trivial (PIS ≤ .05).

Table 2
Mean comparison of the effects of the response factor (malingering vs. honest) on the reported global distress. Paired t-test

Index	t	M_{mr}	M_{hr}	d[95% CI]	PIS[95% CI]
GSI	26.34***	2.50	0.75	1.94[1.90, 1.98]	.026[.009, .042]
PST	20.56***	80.01	45.05	1.74[1.70, 1,78]	.041[.020, .061]
PSDI	26.80***	2.75	1.41	2.00[1.96, 2.04]	.023[.008, .038]

Note. df(182). M_{mr}: Mean of the responses under malingering instructions (malingering responses); M_{hr}: Mean of the responses under standard instructions (honest responses); d[95% CI]: Cohen´s d[95% Confidence Interval]; PIS[95% CI]: Probability of an Inferiority Score; [95% Confidence Interval]; ***p < .001.

The results of the contrast of the observed probability of caseness (T ≥ 66.45) with a trivial prevalence (constant: .05) exhibited a significant ability to malinger in all nine symptom dimensions (see $Z_{.05}$ in Table 3) with a more than large magnitude effect size ($h_{.05}$ > 1.20). Thus, the ability to malinger psychopathology is highly significant. Moreover, this ability is significantly (see $Z_{.50}$ in Table 3) more than common (> .50) with a magnitude of the effect large (h > .80) in somatization, obsessive-compulsive, depression, anxiety, hostility and phobic anxiety, and more than large (h > 1.20) in interpersonal sensitivity, paranoid ideation and psychoticism. In any case, the ability to malinger significant clinical distress is not normal (i.e., may not be extended to all the population) in any of the dimensions.

Table 3
Malingering ability: Caseness in symptom dimensions

Variable	$f(p)$	Z.05	h.05[95% CI]	Z.50	h.5[IC 95%]	Z.95	h.95[95% CI]
SOM	145(.797)	46.24***	2.48[2.42, 2.54]	8.01***	0.90[0.83, 0.97]	-9.47***	-0.69[-0.74, -0.64]
O-C	154(.846)	49.27***	2.66[2.60, 2.72]	9.34***	1.08[1.01, 1.15	-6.44***	-0.51[-0.55, -0.47]
INT	159(.874)	51.00***	2.77[2.71, 2.83]	10.09***	1.20[1.30, 1.27]	-4.70***	-0.39[-0.43, -0.35]
DEP	150(.824)	47.91***	2.58[2.52, 2.64]	8.74***	1.00[0,93, 1.07]	-7.79***	-0.59[-0.64, -0.54]
ANX	155(.852)	49.64***	3.28[3.22, 3.34]	9.50***	1.11[1.04, 1.18]	-6.07***	-0.48[-0.52, -0.44]
HOS	144(.791)	45.87***	2.46[2.40, 2.52]	7.85***	0.88[0.81, 0.95]	-9.84***	-0.71[-0.76, -0.66]
PHOB	157(.863)	50.32***	3.32[3.26, 3.38]	9.79***	1.15[1.08, 1.22]	-5.39***	-0.44[-0.48, -0.40]
PAR	167(.918)	53.73***	2.68[2.63, 2.73]	11.28***	1.40[1.33, 1.47]	-1.98*	-0.19[-0.22, -0.16]
PSY	162(.890)	52.00***	2.85[2.80, 2.90]	10.52***	1.27[1.20, 1.34]	-3.71***	-0.32[-0.35, -0.29]

Note. $f(p)$: observed frequency (observed probability); $Z_{.05}$: Zeta score for the difference between the observed probability and a constant, a trivial effect (.05); $h_{.05}$: Cohen's h for $Z_{.05}$; $Z_{.50}$: Zeta score for the difference between the observed probability and a constant, a common effect (.50); $h_{.50}$: Cohen's h for $Z_{.50}$; Zeta score for the difference between the observed probability and a constant, a normal effect (.95); $h_{.05}$: Cohen's h for $Z_{.95}$; *p < .05; ***p < .001.

What's more, malingering responses revealed a significant more severity in all 9 symptom dimensions than psychiatric population (see Table 4). Additionally, the magnitude of the effect was more than large (d > 1.20), meanwhile the error of the resulting statistical model was trivial (PIS ≤ .05). This finding reveals the use of the indiscriminant symptom endorsement malingering strategy, without being able to discern between psychopathology that has implications for temporary disability (e.g., depression) and another that is potentially permanent (e.g., psychoticism).

Table 4
Comparison of the mean of malingering responses with psychiatric population responses mean (test value) in symptom dimensions. One-sample t-test

Variable	t	M_{mr}	M_{Psych}	d[95% CI]	PIS[95% CI]
SOM	9.32***	2.33	1.67	2.45[2.41, 2.49]	.001[-.002, .004]
O-C	17.43***	2.52	1.42	2.96[2.92, 3.00]	.001[-.002, .004]
INT	8.78***	2.49	1.89	2.68[2.64, 2.72]	.004[-.002, .010]
DEP	16.14***	2.69	1.61	2.99[2.95, 3.03]	.001[-.002, .004]
ANX	13.13***	2.56	1.64	2.72[2.68, 2.76]	.003[-.003, .009]
HOS	15.45***	2.46	1.18	2.20[2.16,2.24]	.014[.002, .026]
PHOB	16.15***	2.36	1.04	2.13[2.09, 2.17]	.017[.004, .030]
PAR	19.90***	2.68	1.33	2.91[2.87, 2.95]	.001[-.002, .004]
PSY	17.68***	2.38	1.03	2.31[2.72, 2.35]	.010[-.000, .020]

Note. df(181). M_{mr}: Mean of the responses under malingering instructions (malingering responses); $M_{Psych:}$ mean of the psychiatric population responses; Cohen´s d[95% Confidence Interval]; PIS[95% CI]: Probability of an Inferiority Score[95% Confidence Interval]; ***p < .001.

Similarly, the comparison of malingering responses with the psychiatric population in the global indices of distress (see Table 5) also revealed that, under malingering conditions, participants reported a significantly greater severity in the global indices than the psychiatric population. Furthermore, the effect size was more than large in the PST and GSI (the 95% CI has 1.20) and moderate in the PSDI (d = 0.50). The error of the statistical model (the probability of malingers reporting a severity in the indices lower than the mean of the psychiatric population) was trivial (PIS ≤ .05) in the GSI and PST (that is, malingers typically report, ≥ 95%, greater global severity and more positive symptoms than the psychiatric population) and between trivial and common (.05 < PIS < .50) in the PSDI (approximately 1/3 of malingers report less severity in positive symptoms than the mean of the psychiatric population, while about 2/3 report more severity). Consequently, these results support that, in addition to the indiscriminant symptom endorsement, the malingering follows the strategy of 'symptom severity' to the extent that they report greater severity in all three measures than the psychiatric population.

Table 5
Comparison of the mean of malingering responses with psychiatric population responses mean (test value) in the global indices of distress. One-sample t-test

Index	t	M_{mr}	M_{Psych}	d[95% CI]	PIS[95% CI]
GSI	15.79***	2.49	1.49	1.17[1.11, 1.23]	.121[-087, .155]
PST	24.60***	79.58	52.73	1.82[1.76, 1.88]	.034[.015, .053]
PSDI	7.20***	2.74	2.39	0.52[0.58, 0.46]	.302[.255, .349]

Note. df (181). M_{mr}: Mean of the responses under malingering instructions (malingering responses); $M_{Psych:}$ mean of the psychiatric population responses; Cohen´s d[95% Confidence Interval]; PIS[95% CI]: Probability of an Inferiority Score[95% Confidence Interval]; ***p < .001.

Evaluation of the sensitivity to suspect malingering of the global severity distress indices

The results of the sensitivity study regarding the malingering of the global indices of distress revealed (see Table 6) that the positive total index (PST) classifies normally. (Ability to Suspect Correctly Malingering [ASCM] = .95) malingering responses; the global severity index (GSI) between common and normal (.50 < ASCM < .95) and the positive symptom distress index (PSDI), commonly (ASCM = .50). Additionally, 18 protocols (10.1%) were classified as suspected malingering for 1 index, 54(30.2%) for two indices, and 97 (54.2%) for 3 indices. Applied the gold standard for the forensic suspect of malingering (the classification of two indices as suspected of malingering; Vilariño et al., 2009), the efficacy of the malingering measures is significant, $\chi^2(1)$ = 117.12, p < .001, h = 3.54. Thus, the probability of error in the correct classification of malingering responses (false negatives) with this gold standard is practically null (PIS < .001).

Table 6
Classification of suspected malingering in the global indices

Index	$f(p)$	Z.05	h.05[IC 95%]	Z.50	h.5[IC 95%]	Z.95	h.95[IC 95%]
GSI	154(.846)	49.27***	2.66[2.60, 2.72]	9.34***	1.08[1.01, 1.15	-6.44***	-0.51[-0.55, -0.47]
PST	163(.948)	55.59***	3.15[3.11, 3.19]	12.09***	1.57[1.50, 1.64]	-0.12	-0.02[-0.04, 0.00]
PSDI	97(.533)	29.90***	1.67[1.60, 1.74]	0.89	0.09[0.06, 0.12]	-25.81***	-1.50[-1.57, -1,43]

Note. $f(p)$: observed frequency (observed probability); $Z_{.05}$: Zeta score for the difference between the observed probability and a constant, a trivial effect (.05); $h_{.05}$: Cohen's h for $Z_{.05}$; $Z_{.50}$: Zeta score for the difference between the observed probability and a constant, a common effect (.50); $h_{.50}$: Cohen's h for $Z_{.50}$; Zeta score for the difference between the observed probability and a constant, a normal effect (.95); $h_{.95}$: Cohen's h for $Z_{.95}$; ***p < .001.

Study of the effects of gender in the ability of malingering

The results of the comparison of means in the symptom dimensions (see Table 7) for the gender factor exhibited that males and females reported similar symptoms in the somatization, interpersonal sensitivity, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. As for the obsessive-compulsive and the depression dimensions, females informed of significantly more distress being small the effect size and the probability of error of the statistical model. Additionally, no differences were found in the global indices of distress (see Table 8).

Table 7
Mean comparison in the symptom dimensions for the gender factor. Two-sample t-test

Variable	*t*	*p*	$M_{females}$	M_{males}	*d* [95% CI]	PIS[95% CI]
SOM	1.71	.089	2.43	2.19	0.25[0.19, 0.31]	.401[.351, .451]
O-C	2.25	.026	2.64	2.36	0.33[0.27, 0.39]	.371[.321, .421]
INT	1.32	.187	2.57	2.39	0.19[0.13, 0.25]	.525[.474, .576]
DEP	2.64	.009	2.84	2.49	0.39[0.33, 0.45]	.348[.299, .397]
ANX	1.88	.061	2.67	2.41	0.28[0.22, 0.34]	.390[.340, .440]
HOS	0.35	.726	2.49	2.43	0.05[-0.01, 0.11]	.480[.429, .531]
PHOB	0.74	.458	2.42	2.29	0.12[0.06, 0.18]	.452[.4001, .503]
PAR	0.70	.487	2.72	2.63	0.10[0.04, 0.16]	.460[.409, .511]
PSY	-0.45	.655	2.35	2.42	-0.07[-0.13, -0.01]	.528[.477, .579]

Note. df(181). $M_{females}$: mean of the females group; M_{males} = Mean of the males group; Cohen´s *d*[95% Confidence Interval]; PIS[95% CI]: Probability of an Inferiority Score[95% Confidence Interval]; ***$p < .001$.

Table 8
Mean comparison in the global indices of distress for the gender factor. Two-sample t-test

Index	*t*	*p*	$M_{females}$	M_{males}	*d*[95% CI]	PIS
GSI	1.57	.118	2.59	2.39	0.24[0.18, 0.30]	.405
PST	1.72	.087	81.52	78.04	0.25[0.19, 0.31]	.401
PSDI	1.20	.233	2.81	2.69	0.17[0.11, 0.23]	.433

Note. df(181). $M_{females}$: mean of the females group; M_{males} = Mean of the males group; Cohen´s *d*[95% Confidence Interval]; PIS[95% CI]: Probability of an Inferiority Score[95% Confidence Interval]; ***$p < .001$.

Likewise, the observed probability of caseness in symptom dimensions is the same for males and females (see Table 9). In fact, the incremental effect due to gender categories is trivial (see IEE).

Table 9
Association between gender and caseness in symptom dimensions

Variable	$f(p)_{males}$	$f(p)_{females}$	χ^2	*p*	PR[95% CI]	IEE[95% CI]
SOM	81(.786)	64(.811)	0.16	.715	0.97[0.83, 1.12]	-.031[-.056, -.001]
O-C	88(.854)	66(.835)	0.12	.836	1.02[0.90, 1.16]	.022[.001, .043]
INT	89(.864)	70(.886)	0.20	.822	0.98[0.87, 1.09]	.025[.002, .048]
DEP	83(.806)	67(.848)	0.55	.557	0.95[0.83, 1.09]	.050[.018, .081]
ANX	87(.845)	68(.861)	0.09	.835	0.98[0.87, 1.11]	.019[-.001, .039]
HOS	77(.748)	67(.848)	2.74	.140	0.88[0.76, 1.02]	.118[.071, .165]
PHOB	88(.854)	69(.873)	0.14	.829	0.98[0.87, 1.10]	.022[.001, .043]
PAR	93(.903)	74(.937)	0.68	.588	0.96[0.89, 1.05]	.036[.008, .063]
PSY	91(.883)	71(.899)	0.11	.814	0.98[0.89, 1.09]	.018[-.001, .037]

Note. df(1). $f(p)_{females}$: frequency of suspected malingering in females (observed proportion); $f(p)_{males}$: frequency of suspected malingering in males (observed proportion); PR[95% CI]: Prevalence Ratio[95% Confidence Interval]: IEE[95% CI]: Incremental Effect Index[95% Confidence Interval].

In relation to the suspected malingering measures (see Table 10), the results displayed no differences in the suspicion of malingering between males and females. Overall, these findings reveal that the gender factor does not have a significant effect either on the malingering or on its detection.

Table 10
Association between gender and suspected malingering in the global indices of distress

Index	$f(p)_{females}$	$f(p)_{males}$	χ^2	*p*	PR[95% CI]	IEE[95% CI]
GSI	85(.825)	69(.873)	0.80	.413	0.94[0.84, 1.07]	-.055[-.775, .033]
PST	93(.903)	70(.886)	0.14	.808	1.02[0.92, 1.13]	.019[-.001, .039]
PSDI	56(.544)	41(.519)	0.12	.766	1.05[0.79, 1.38]	.046[.016, .076]

Note. df(1). $f(p)_{females}$: frequency of suspected malingering in females (observed proportion); $f(p)_{males}$: frequency of suspected malingering in males (observed proportion); PR[95% CI]: Prevalence Ratio[95% Confidence Interval]: IEE[95% CI]: Incremental Effect Index[95% Confidence Interval].

Discussion

This study presents limitations that must be considered in the generalization of the results. Thus, the sample was selected through non-probabilistic sampling, which, combined with its size, requires caution when generalizing the results. It is possible that the characteristics of the participants do not fully reflect those of the working population, which could have effects on the quantitative results, but not on the qualitative ones (acceptance or refutation of hypotheses). Additionally, although a high-fidelity simulation design was applied, the quantitative results differ from those obtained in field studies, but not qualitatively (Amado et al., 2016; De Marchi & Balboni, 2018). Another limitation lies in the lack of a sample of true cases of temporary work disability that would allow for establishing the specificity of the global indices of the SCL-90-R in detecting malingering, as well as contrasting the measures of the symptom dimensions between both types of samples.

With these limitations in mind, the results obtained demonstrate that the worker population is capable of malingering psychopathology with the potential to motivate a temporary work disability, while also giving it clinical intensity. Thus, the contrast between the conditions of reality and malingering revealed significantly higher scores, with a very large effect size, in the malingering across all symptom dimensions and global indices. Therefore, the sample was able to fake symptoms that they did not actually suffer from. This conclusion is supported by the results from the case study, which showed a highly significant ability to malinger being a caseness in all symptom dimensions of the SCL-90-R, with effect sizes ranging from large to very large. This evidence is consistent with previous research that warned about the facilitation that symptom recognition tasks exert on malingering (Arce et al., 2013; Arce, Fariña, and Vilariño, 2015; Fariña et al., 2014). In this sense, recognition tasks like the SCL-90-R incorporate among their items the symptoms that could justify a temporary work disability, such that the evaluated person is exclusively tasked with selecting those that are necessary to achieve a successful malingering and, when requested, to rate the intensity of their suffering in their response (Vilariño et al., 2020).

Although the ability to malinger disabling psychopathology in the SCL-90-R has been verified, it leaves its mark on the response pattern found in the study. Specifically, the use of two malingering strategies was evidenced: indiscriminant symptom endorsement and symptom severity. Regarding the first, the contrast of the scores obtained in the malingering condition with the values of the psychiatric population revealed a significantly greater symptomatic suffering and an effect size that was more than large for the malingering sample across all symptom dimensions of the SCL-90-R. In this sense, participants did not discern between psychopathology with implications for temporary and permanent disability. This limitation in achieving a malingering with specificity was reinforced in the case study. The effect sizes associated

with the ability to malinger being a caseness were more than large in symptom dimensions with potential for permanent disability (e.g., paranoid ideation and psychoticism) compared to large effect sizes in symptom dimensions associated with temporary disability (e.g., depression, anxiety, somatization…). However, actual prevalence data reveal that anxiety and depressive disorders underlie most sick leave due to psychological causes (Pina et al., 2022). Thus, it is possible that the drive to achieve successful malingerings is behind the emphasis on reporting the suffering of psychopathology recognized for its profound severity. For its part, the symptom severity was evidenced in the significantly higher scores, with effect sizes ranging from moderate to more than large, that the malingering sample obtained in contrast with the psychiatric population. In summary, to malinger, participants indicated a high number of symptoms as present, which were assigned extreme severity. This finding is consistent with previous research that detected the use of such strategies (Arce et al., 2013; Rogers, 2018b; Rogers et al., 2003; Vilariño et al., 2009; Vilariño et al., 2013; Vilariño et al., 2020).

The analysis of the global indices of the SCL-90-R showed different detection capacities. The PST index was highly effective and classified malingering cases as "normally". The GSI performed slightly less well, classifying them between "common and normally". In contrast, the PSDI showed only "commonly" classification capacity. On the other hand, their combined use through the application of the gold standard for forensic suspicion of malingering (suspicion of malingering by two or more indices) showed significant effectiveness in detecting malingering. In this regard, 84.4% of the participants were classified as suspicious of malingering according to this standard. Additionally, it was verified that the probability of error of the gold standard in the correct classification of malingering responses was practically null, meaning that practically no malinger would be identified as a genuine patient (false negative). These findings reveal, in line with previous research (Arce et al., 2013; Sullivan & King, 2010; Torres et al., 2010; Vilariño et al., 2009; Wallis & Bogduk, 1996), that the SCL-90-R is a useful tool for detecting malingering. However, in this assessment context, it is not enough to apply the gold standard to conclude regarding the suspicion of malingering; a differential diagnosis of severe injury must also be made (Arce, 2017); as classifying a real patient as a malingerer is unacceptable in this context (punishable forensic error) as it denies the disability to a genuine patient. Additionally, research should be conducted with individuals with temporary work disability to see how the SCL-90-R behaves in these populations and to determine the specificity of the global indices of the instrument with the cutoff points used here. In any case, to achieve the highest possible effectiveness in correct classification, especially in the differential diagnosis of severe injury, it is essential to resort to a multimethod and multi-measure assessment (Greene, 2011; Vilariño et al., 2013).

Globally, the study of the gender factor revealed a non-significant role in malingering and its detection. The dominant trend was the absence of differences between men and women (i.e., symptomatic dimensions, frequency of clinical cases, detection of malingering in global indices). Only in the dimensions of obsession-compulsion and depression did women score significantly higher in the malingering condition, although with a small effect size. According to the literature, the prevalence of psychopathology is higher in women (Rieches-Rössler, 2017), as well as in the specific case of depressive and obsessive-compulsive symptomatology in adulthood (APA, 2013; Girgus & Yang, 2015). It is possible that this contingency contributed to the differences found, as familiarity with higher baseline psychopathological levels may have led to greater malingering of this symptomatology.

In summary and as a conclusion, it could be stated, first, that the sample was able to malinger psychopathological symptomatology on the SCL-90-R with potential to substantiate a temporary work disability. Second, to carry out this malingering, they resorted to indiscriminant symptom endorsement and symptom severity strategies. Third, the global indices of the SCL-90-R could be useful for controlling malingering, although it would be necessary to know their specificity through studies with actual patients. In any case, their isolated use would not be sufficient for full detection of malingering, and a differential diagnosis of severe damage would also need to be conducted in cases under suspicion of malingering. Fourth, the gender factor does not seem to play a significant role in malingering. Finally, considering professional practice, the SCL-90-R could be useful for it. In addition to its easy applicability and short duration, it provides information useful for clinical diagnosis and suspicion of malingering. However, it should be used in combination with other techniques in multimethod and multi-measure protocols.

Finally, with future research in mind, it would be of interest to conduct new studies that combine the use of the SCL-90-R with other assessment techniques involving a symptom knowledge task to understand the effectiveness of their combined use, such as forensic-clinical interview (Vilariño et al., 2013). Additionally, future studies could require malingering tasks specifying concrete types of disorders or psychopathological symptoms (e.g., depression, somatization, anxiety…), instead of allowing the participant freedom in the malingering. It would also be desirable to have samples of trained participants to understand the effect of training on the characteristics of the malingering and the sensitivity of the global indices. Finally, as previously mentioned, to understand the specificity of the global indices in detecting malingering, research should be developed that incorporates clinical samples with diverse pathologies.

Complementary information

Conflict of interest.- The authors declare no conflict of interest.
Financial support.- No funding

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