

## Original Article

# Gaslighting at Work Scale: Determination of an Optimal Cut-Off Point

**Aglaia Katsiroumpa, RN, MSc, PhD (c)**

Clinical Epidemiology Laboratory, Faculty of Nursing, National and Kapodistrian University of Athens, Athens, Greece

**Ioannis Moisoglou, PhD**

Assistant Professor, Faculty of Nursing, University of Thessaly, Larissa, Greece

**Maria Tsiachri**

Kindergarten Teacher, MEd, PhD (c), 6<sup>th</sup> Kindergarten, Lamia, Greece

**Katerina Lamprakopoulou, MSc, PhD**

Postdoctoral researcher, Embedded Systems Design & Applications Laboratory, Electrical & Computer Engineering Department, University of the Peloponnese, Patras, Greece

**Olga Galani, MSc, PhD (c)**

Clinical Epidemiology Laboratory, Faculty of Nursing, National and Kapodistrian University of Athens, Athens, Greece

**Anastasia Tsakalaki**

Faculty of Primary Education, National and Kapodistrian University of Athens, Athens, Greece

**Petros Galanis, PhD**

Associate Professor, Clinical Epidemiology Laboratory, Faculty of Nursing, National and Kapodistrian University of Athens, Athens, Greece

**Correspondence:** Petros Galanis, Associate Professor, Clinical Epidemiology Laboratory, Faculty of Nursing, National and Kapodistrian University of Athens, 123 Papadiamantopoulou street, GR-11527, Athens, Greece, e-mail: pegalan@nurs.uoa.gr <https://orcid.org/0000-0002-1308-5782>

## Abstract

**Background:** The Gaslighting at Work Scale (GWS) is a newly developed instrument that measures levels of workplace gaslighting among employees. **Aim:** To identify an optimal cut-off point for the GWS in a sample of workers in Greece.

**Methods:** We collected our data during December 2024. We employed the Receiver Operating Characteristic (ROC) analysis to define an optimal cut-off point for the GWS. We used the Patient Health Questionnaire-4 (PHQ-4) and the Quiet Quitting Scale (QQS) as external criterions for the ROC analysis.

**Results:** We found that the best cut-off point for the GWS was 2.1 using the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS as external criterions. Therefore, all external criterions suggested the same cut-off point (2.1) for the GWS. Youden's index for the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS was 0.42, 0.35, and 0.35, respectively. The AUC for the PHQ-4 (anxiety

scale), the PHQ-4 (depression scale), and the QQS was 0.78, 0.73, and 0.65, respectively. Sensitivity for the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS was 0.85, 0.81, and 0.81, respectively. Specificity for the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS was 0.57, 0.55, and 0.55, respectively.

**Conclusion:** The best cut-off point for the GWS was 2.1. Workers with mean GWS score  $\geq 2.1$  are suffered high levels of workplace gaslighting.

**Keywords:** Gaslighting at Work Scale; Receiver Operating Characteristic analysis; cut-off point; Quiet Quitting Scale

## Introduction

Gaslighting, a form of psychological manipulation, involves subjecting someone to abuse that leads them to doubt their own perceptions or abilities (Gass & Nichols, 1988). This continuous tactic is designed to sow seeds of self-doubt in the victim's mind (Fielding-Singh & Dmowska, 2022). Recently, there has been a notable resurgence of interest in gaslighting, resulting in a deeper understanding of its impact in various social contexts (Alvesson & Einola, 2022; Christensen & Evans-Murray, 2021; Dickson et al., 2023; Graves & Spencer, 2022; Sweet, 2019). The growing public awareness of gaslighting is highlighted by the “Merriam-Webster Dictionary” naming it the Word of the Year for 2022 (Merriam-Webster Dictionary., 2025).

In the workplace, gaslighting has become a prevalent issue, complicating the already intricate dynamics of professional environments. This manipulative tactic, often used by those in leadership roles, involves undermining subordinates' perceptions and realities through belittlement, instilling negative emotions such as fear and self-doubt (Sweet, 2019). Supervisors who engage in

gaslighting use their authority to employ psychological strategies that make others question their own judgment, memories, and mental stability. In professional settings, gaslighting frequently targets subordinates' skills and expertise. Supervisors may consistently undermine their subordinates' abilities, knowledge, and decision-making skills, gradually eroding their self-confidence and assurance. This behavior can create a negative work environment where subordinates constantly feel inadequate and uncertain about their abilities (Christensen & Evans-Murray, 2021; Clark, 2024; Katsiroumpa, Moisoglou, Konstantakopoulou, Gallos, et al., 2025; Moisoglou et al., 2025; Sweet, 2019).

In the workplace, gaslighting can manifest through relentless criticism and intentional dismissal of subordinates' experiences and emotions. Subordinates may find their concerns and frustrations minimized or ignored, causing them to doubt their own feelings and perceptions. This invalidation can lead to feelings of isolation and powerlessness, as subordinates struggle to find support or empathy within their work environment (Jones, 2023).

Recently, a newly developed instrument aim to evaluate levels of workplace gaslighting among employees. In particular, the Gaslighting at Work Scale (Katsiroumpa, Moisoglou, Konstantakopoulou, Tsiachri, et al., 2025) is developed to measure levels of workplace gaslighting in workers. In this context, our aim was to identify an optimal cut-off point for the GWS in a sample of workers in Greece.

## **Methods**

### **Study design**

Study population included 580 workers in Greece. Our study was conducted in December 2024. We employed a convenience sample of workers in Greece. Our participants have been working in public and private sector for at least three years.

We used the Gaslighting at Work Scale (GWS) (Katsiroumpa, Moisoglou, Konstantakopoulou, Tsiachri, et al., 2025) to measure levels of workplace gaslighting among our workers. The GWS includes 11 items such as “In the last six months, your supervisor denies saying things that you remember him/her saying” and “In the last six months, your supervisor accuses you of lying when you disagree with him/her”. Answers are on a five-point Likert scale: never (1), rarely (2), sometimes (3), very often (4), always (5). Adding up the responses to the 11 items and dividing by 11 gives the total score on the scale. Total score ranges from 1 to 5. Higher scores indicate higher levels of gaslighting at work.

We used the Patient Health Questionnaire-4 (PHQ-4) (Kroenke et al., 2009) to measure levels of anxiety and depression. The PHQ-4 includes four items, while two items refer to anxiety and the other two items refer to depression. Score on anxiety and depression

scales range from 0 to 6. Score  $\geq 3$  in each scale suggests anxiety and depression. In our study, Cronbach’s alpha for the anxiety and the depression scales was 0.801 and 0.827, respectively. We used the valid Greek version of the PHQ-4 (Karekla et al., 2012).

We used the Quiet Quitting Scale (QQS) (Galanis et al., 2023; Galanis, Katsiroumpa, Vraka, Konstantakopoulou, et al., 2024) to measure levels of quiet quitting in our workers. The QQS includes nine items, and answers are on five-point Likert scale: strongly disagree (1), disagree (2), neither disagree nor agree (3), agree (4), strongly agree (5). Score ranges from 1 to 5 after calculating the mean score of all answers. Higher scores indicate higher levels of quiet quitting. Workers with score on the QQS  $\geq 2.06$  are considered as quiet quitters. In our study, Cronbach’s alpha for the QQS was 0.857. We used the valid Greek version of the QQS (Galanis, Katsiroumpa, Vraka, Siskou, et al., 2024).

### **Ethical considerations**

We applied the guidelines of the Declaration of Helsinki to perform this study (World Medical Association, 2013). Additionally, the study protocol was approved by the Ethics Committee of Faculty of Nursing, National and Kapodistrian University of Athens (approval number; 15, December 9, 2024).

### **Statistical analysis**

We employed the Receiver Operating Characteristic analysis to identify an optimal cut-off point for the GWS by using the Patient Health Questionnaire-4 (PHQ-4) and the Quiet Quitting Scale (QQS) as external criterions. We used the suggested cut-off points from the literature to develop dichotomous variables for the PHQ-4 and the QQS. The optimal cut-off point for the anxiety scale is  $\geq 3$ , and for the depression is

$\geq 3$ . Also, the optimal cut-off point for the QQS is  $\geq 2.06$ . We calculated sensitivity, specificity, and the Youden index. These measures take values from 0 to 1 with higher values indicating better diagnostic value of the BSMAS. The Youden index defines an optimal cut-off point and is calculated as (Sensitivity + Specificity) – 1. Additionally, we calculated the area under the curve (AUC), 95% confidence interval (CI), and p-value. Values for the AUC between 0.5 and 0.7 indicate low accuracy, values between 0.71 and 0.9 indicate moderate accuracy, and values greater than 0.9 indicate high accuracy (Akobeng, 2007; Fischer et al., 2003; Fluss et al., 2005). After defining the best cut-off point for the GWS, workers with a score above this value are considered to suffer high levels of workplace gaslighting. P-values less than 0.05 were considered as statistically significant. We used the IBM SPSS 28.0 (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp) for the analysis.

## Results

Study population included 580 employees from the public and private sector. Among them, 82.8% (n=480) were females and 17.2% (n=100) were males. Mean age of our sample was 39.2 years, while standard deviation was 10.6.

We employed ROC analysis to define an optimal cut-off point for the Gaslighting at

Work Scale. We found that the best cut-off point for the GWS was 2.1 using the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS as external criteria (Figure 1). Therefore, all external criteria suggested the same cut-off point (2.1) for the GWS. Youden's index for the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS was 0.42, 0.35, and 0.35, respectively. The AUC for the PHQ-4 (anxiety scale) (Figure 1), the PHQ-4 (depression scale) (Figure 2), and the QQS (Figure 3) was 0.78, 0.73, and 0.65, respectively. Sensitivity for the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS was 0.85, 0.81, and 0.81, respectively. Specificity for the PHQ-4 (anxiety scale), the PHQ-4 (depression scale), and the QQS was 0.57, 0.55, and 0.55, respectively.

Therefore, we considered that an optimal cut-off point for the GWS was 2.1. Workers with mean GWS score  $\geq 2.1$  are suffered high levels of workplace gaslighting.

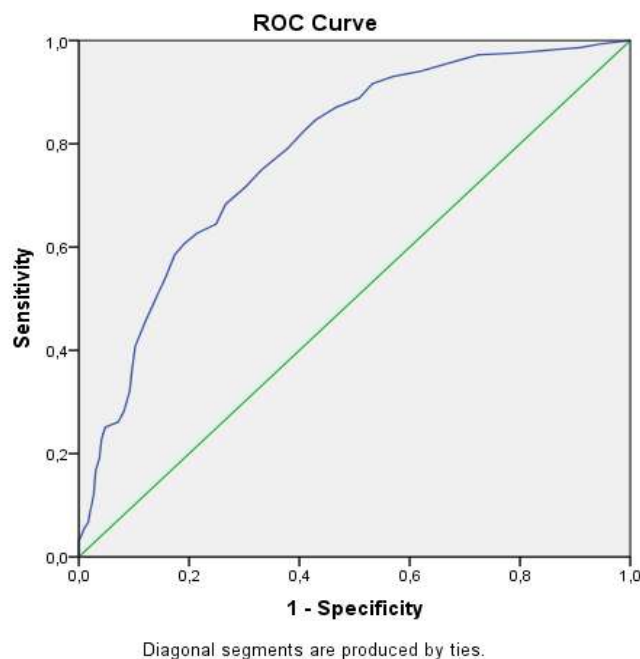
## Discussion

As there is currently no established optimal cut-off point for the Gaslighting at Work Scale (GWS), we conducted a cross-sectional study to determine one. We utilized the Patient Health Questionnaire-4 (PHQ-4) and the Quiet Quitting Scale (QQS) as external benchmarks.

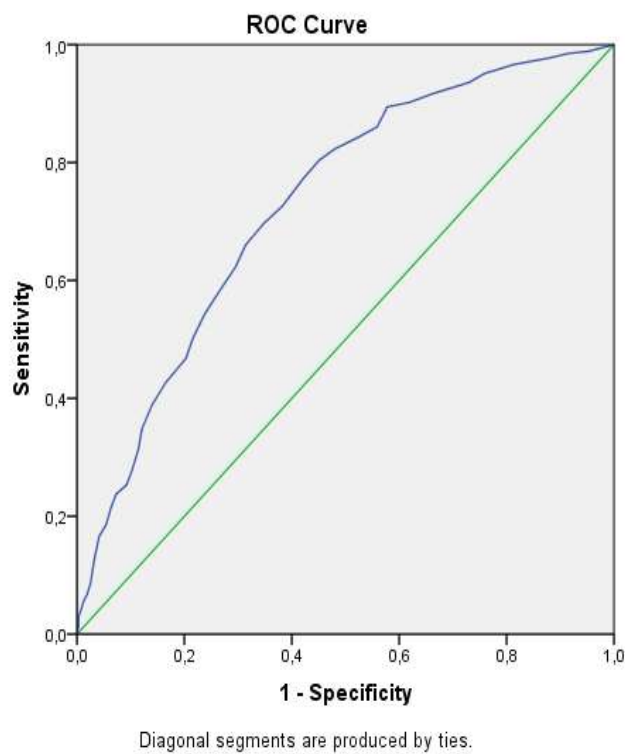
**Table 1.** Predictive validity of the Gaslighting at Work Scale (GWS).

Criterion	Cut-off point for criterion	Cut-off point for the GWS	Sensitivity	Specificity	AUC	95% CI	Significance	Youden's index
Anxiety (PHQ-4)	High level of anxiety (total score $\geq 3$ )	2.1	0.85	0.57	0.78	0.75-0.82	<0.001	0.42
Depression (PHQ-4)	High level of anxiety (total score $\geq 3$ )	2.1	0.81	0.55	0.73	0.69-0.77	<0.001	0.35
QQS	High level of quiet quitting (total score $\geq 2.06$ )	2.1	0.81	0.55	0.65	0.60-0.70	<0.001	0.35

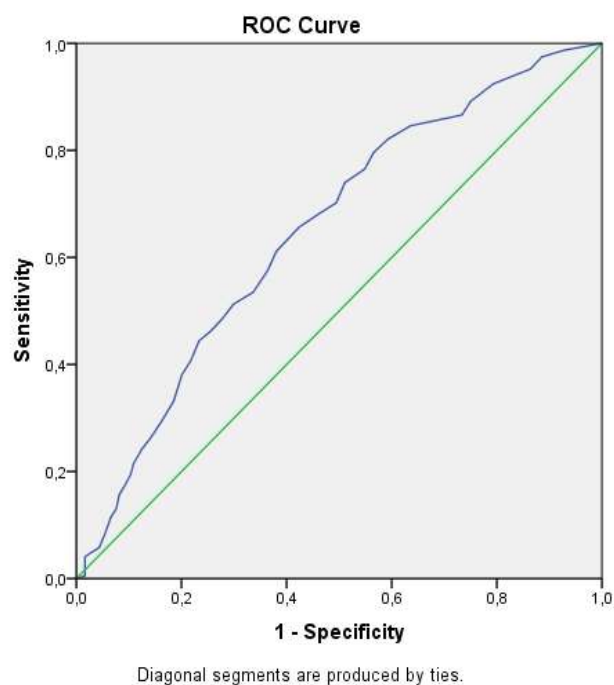
AUC: area under the curve; CI: confidence interval; PHQ-4: Patient Health Questionnaire-4; QQS: Quiet Quitting Scale



**Figure 1.** ROC curve of the Gaslighting at Work Scale by using the PHQ-4 (anxiety scale) as the gold standard.



**Figure 2.** ROC curve of the Gaslighting at Work Scale by using the PHQ-4 (depression scale) as the gold standard.



**Figure 3.** ROC curve of the Gaslighting at Work Scale by using the Quiet Quitting Scale as the gold standard.

Specifically, we applied Receiver Operating Characteristic (ROC) analysis to pinpoint an ideal cut-off for the GWS. In this context, we calculated the Youden index, as its peak value indicates the optimal cut-off. We also determined the area under the curve (AUC), identifying the optimal cut-off as the point where the AUC reaches its maximum. Our analysis involved three separate evaluations using the PHQ-4 (anxiety scale), PHQ-4 (depression scale), and QQS to ascertain the most effective cut-off for the GWS.

Ultimately, we identified 2.1 as the best cut-off point for the GWS, which aligned with the highest sensitivity and specificity values across the three external criteria. Consequently, employees with a mean GWS score of 2.1 or higher are likely experiencing significant workplace gaslighting.

Our study, however, had several limitations. Although we employed valid tools as external criteria to determine an optimal cut-off for the GWS, these tools may not be the ideal gold standard for assessing workplace gaslighting. Additionally, while we used two valid tools as external criteria, other tools could have been considered. Furthermore, our analysis focused on evaluating the validity and predictive capability of the GWS rather than for diagnostic purposes. Moreover, since we conducted a cross-sectional study with a convenience sample, our findings may not be applicable to other populations and contexts.

In conclusion, we identified an optimal cut-off for the GWS with notable predictive power for anxiety, depression, and quiet quitting. This cut-off could serve as a quick, reliable, and valid preliminary screening tool to detect workers at high risk of experiencing workplace gaslighting. Researchers should extend our study to diverse populations and settings to further validate our findings.

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