

# Knowledge and Attitudes of Nursing Students Regarding Postoperative Pain Management: A Cross-Sectional Study

## Abstract

**Background:** Nurses play a critical role in pain assessment and management; therefore, it is essential that nursing students possess adequate knowledge and appropriate attitudes toward this aspect of care. Previous research has consistently shown that nursing students have deficiencies in both knowledge and attitudes related to the effective management of postoperative pain.

**Aim:** This descriptive, cross-sectional study aimed to evaluate nursing students' knowledge and attitudes regarding pain management.

**Methods:** The study sample consisted of 306 second-, third-, and fourth-year nursing students who were 18 years of age or older, enrolled in a nursing faculty, and consented to participate. Data were collected between May 30, 2022 and June 3, 2022 using a Student Information Form and the Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP), administered through structured face-to-face interviews. Data analysis included descriptive statistics, independent samples t-tests, and analysis of variance (ANOVA).

**Results:** Of the participants, 69.9% were female and 97.7% were single. The mean NKASRP score was  $15.98 \pm 3.32$ , with a correct response rate of 38%, indicating a poor level of knowledge and attitudes. Notably, 92.2% of students correctly answered the question, "Who best expresses the severity of the patient's pain?", and 90.5% correctly identified that "After the recommended initial doses of opioid analgesics, additional doses should be adjusted according to the patient's individual response." A statistically significant difference was found in NKASRP scores based on whether students had received education on pain management ( $p < 0.05$ ).

**Conclusion:** The findings indicate that nursing students have insufficient knowledge regarding pain management. It is recommended that pharmacology and pain management content in nursing curricula be reviewed and strengthened to address these deficiencies.

**Keywords:** Attitude, nursing, pain management, postoperative pain, students

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*This study is a master's thesis research. Thesis title: Evaluation of the Knowledge and Attitudes of a Nursing School Students on Pain Management in the Postoperative Period [2023]. Demiroğlu Bilim University Health Sciences Institute. (Advisor: Asist. Prof. Dr. Gamze Oğuz).*

**Cite this article as:** Yümnü H, Oğuz Erdem G. Knowledge and Attitudes of Nursing Students Regarding Postoperative Pain Management: A Cross-Sectional Study. J Educ Res Nurs. 2026;23(2):128-133.

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Received: October 11, 2024

Accepted: April 24, 2026

Publication Date: June 01, 2026



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## Introduction

Pain is a complex sensation that can impair an individual's quality of life, limit daily activities, and, in some cases, threaten life itself.<sup>1</sup> The International Association for the Study of Pain (IASP) defined pain in 1979 as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." This definition, proposed by the Subcommittee on Taxonomy, was later adopted by the IASP Council.<sup>2</sup> Inadequate management of a patient's pain perception can negatively affect the individual physically, spiritually, and socially,<sup>3</sup> thereby diminishing overall quality of life.<sup>4</sup> Effective pain management is therefore a fundamental component of patient care, as untreated pain has significant adverse consequences.<sup>5</sup> Each year, millions of individuals worldwide undergo surgical procedures and experience pain during the postoperative period.<sup>6</sup> Postoperative pain is one of the most significant concerns for surgical patients.<sup>7</sup> It begins with the surgical procedure, and nurses play a vital role in decision-making regarding pain management during patients' clinical follow-up.<sup>5</sup> Nurses should deliver effective pain management to prevent unnecessary suffering during the postoperative period and to minimize potential complications. Pain management should focus on achieving optimal patient comfort through individualized care, including both pharmacological and non-pharmacological interventions.<sup>8</sup>

The knowledge, attitudes, and practices of nurses directly influence patients' ability to achieve adequate pain control.<sup>3</sup> Nursing students, as future healthcare professionals, must also be prepared to take an active role in pain management.<sup>9</sup> It is well established that healthcare professionals' knowledge, particularly that of nurses, is critical for accurate pain assessment and effective pain management. Consequently, undergraduate nursing education must be grounded in strong theoretical and clinical foundations to enhance students' competencies in this area. By the time they graduate, nursing students are expected to possess comprehensive knowledge of pain and its management.<sup>10</sup> A systematic review examining nursing students' knowledge and attitudes toward pain management over the past two decades reported insufficient levels of knowledge among students. This deficiency has been attributed to limitations in undergraduate curricula, particularly in translating theoretical knowledge into clinical practice.<sup>2,11-14</sup> In light of these concerns, this study aims to evaluate nursing students' knowledge and attitudes regarding postoperative pain and its management. Such evaluation represents an important initial step in developing educational strategies and interventions to improve nursing curricula and enhance the quality of patient care. This study is expected to contribute to the evaluation and improvement of students' competencies in pain management, thereby supporting better clinical outcomes.

**Table 1.** Sociodemographic characteristics of nursing students (n=306)

Characteristics	n	%
Age (mean±SD: 22.30±2.15)		
≤22 years	184	60.1
>22 years	122	39.9
Gender		
Female	214	69.9
Male	92	30.1
Year of study		
Second year	99	32.4
Third year	108	35.3
Fourth year	99	32.3
Type of high school graduated		
Health vocational high school	79	25.8
General high school	28	9.2
Anatolian/Science high school	164	53.6
Other*	35	11.4
Academic achievement		
Poor	14	4.6
Moderate	122	39.9
Good	150	49.0
Very good	20	6.5
Previous bachelor's or associate degree		
No	233	76.1
Yes	73	23.9
Marital status		
Married	7	2.3
Single	299	97.7
Employment status		
Not employed	213	69.6
Employed	93	30.4
Current work unit		
Surgery	16	17.2
Intensive care	16	17.2
Operating room	10	10.8
Other**	51	54.8
Presence of health problems		
No	286	93.5
Yes	20	6.5

\*: Other: Anatolian Imam Hatip High School, Vocational and Technical Anatolian High School.

\*\* : Other: Service units. SD: Standard deviation.

## Research Questions

1. What is the level of nursing students' knowledge regarding postoperative pain?
2. What are nursing students' attitudes toward postoperative pain?
3. Which factors influence nursing students' knowledge and attitudes regarding postoperative pain?

## Materials and Methods

### Study Design

This study employed a descriptive, cross-sectional design.

### Study Population

The study population consisted of 353 nursing students enrolled in the nursing faculty of a foundation university in Istanbul, Türkiye, during the spring semester of the

**Table 2.** Learning and knowledge levels regarding pain among nursing students (n=306)

Characteristic	n	%
Training related to pain		
No	24	7.8
Yes	282	92.2
Follow-up of pain-related literature		
No	285	93.1
Yes	21	6.9
Self-reported knowledge of pain		
No knowledge	4	1.3
Insufficient	24	7.8
Moderate	256	83.7
Advanced	22	7.2

2021–2022 academic year. Despite the absence of a dedicated course on pain in the nursing curriculum, several courses include relevant content. Specifically, four hours are allocated to “Pain and Nursing Care” in the Internal Medicine Nursing course, two hours to “Postoperative Pain and Management” in the Surgical Nursing course, two hours to “Pain Assessment” in the Health Assessment course, and two hours to “Pain and Symptom Management” in the elective Palliative Care course offered to third-year students. Although a two-hour pain management component was introduced into the Fundamentals of Nursing course during the spring semester of the first year, first-year students were excluded from the study because they had not yet received in-depth instruction on pain and were not involved in clinical practice. Data were collected between May 30, 2022 and June 3, 2022, during the final examination week, when all students were present on campus, to maximize participation. The study population consisted of 353 students enrolled in the second, third, and fourth years. The sample included 306 students aged 18 years or older who were present during the study period, voluntarily consented to participate, and completed the questionnaire in full. Twenty students submitted incomplete questionnaires, and 15 declined to participate. The final sample represented 86.7% of the total population, indicating a high participation rate.

### Data Collection Tools

Data were collected using the Student Information Form and the Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP).

### Student Information Form

The Student Information Form was developed by the researcher based on the literature.<sup>3,5,9,10,16</sup> It consisted of 20 items covering demographic and related characteristics, including age, gender, marital status, year of study, type of previously completed school, employment status (unit and duration), medication use, health status, personal pain experience, pain coping methods, and level of knowledge about pain.

### Nurses' Knowledge and Attitudes Survey Regarding Pain

The Nurses' Knowledge and Attitudes Survey Regarding Pain is a 39-item instrument developed by Ferrell, McGuire, and Donovan in 1993 to assess nurses' knowledge and attitudes regarding pain and its management. The Turkish validity and reliability study was conducted by Yıldırım et al.<sup>15</sup>, with a reported Cronbach's  $\alpha$  of 0.74. The instrument includes 22 true/false items and 13 multiple-choice questions, as well as two case scenarios requiring participants to assess patients. The correct response rate was calculated by dividing the number of correct answers by the total number of items. Each correct response was assigned 1 point, while incorrect or unanswered items received 0 points. The total score ranges from 0 to 39.<sup>15</sup> When expressed as percentages, scores are categorized as poor (<50%), moderate (50–75%), or good (>75%). In the present study, the Cronbach's  $\alpha$  coefficient was 0.54.

### Data Collection

Data were collected through structured, face-to-face interviews conducted in classroom settings by trained research assistants. Participation was voluntary, and written informed consent was obtained from all participants prior to data collection. The average time required to complete the questionnaire was 15 minutes.

**Table 3.** Comparison of Nurses' Knowledge and Attitudes Survey Regarding Pain scores according to students' sociodemographic characteristics (n=306)

Characteristic		Mean	SD	Min-Max	Test value	p
NKASRP	39-item scale	15.98	3.32	7-34		
Age	≤22 years	16.02	3.24		0.246**	0.806
	>22 years	15.93	3.45			
Gender	Female	16.40	3.27		3.383**	0.001°
	Male	15.02	3.24			
Marital status	Married	15.86	2.21		0.120**	0.919
	Single	15.99	3.33			
Year of study	Second year	15.60	3.39		2.353***	0.072
	Third year	15.65	3.01			
	Fourth year	16.74	3.54			
Type of high school graduated	Health vocational high school	15.96	3.21		0.150***	0.930
	General high school	15.68	2.87			
	Anatolian/Science high school	16.08	3.50			
	Other	15.83	3.12			
Academic achievement	Poor	15.64	3.91		0.544***	0.652
	Moderate	15.72	3.08			
	Good	16.19	3.52			
	Very good	16.25	2.75			
Previous bachelor's or associate degree	No	15.94	3.45		-0.371**	0.711
	Yes	16.11	2.86			
Employment status	Not employed	16.00	3.51		0.096**	0.923
	Employed	15.96	2.82			
Work unit	Surgery	16.75	2.72		2.539***	0.062
	Intensive care	17.37	2.55			
	Operating room	15.70	2.79			
	Other	15.36	2.83			
Health problems	No	15.90	3.30		-1.772**	0.077
	Yes	17.25	3.35			
Pain-related education	No	13.83	3.60		-3.364**	0.001°
	Yes	16.17	3.23			
Follow-up of pain-related literature	No	16.00	3.34		0.385**	0.700
	Yes	15.71	2.97			
Self-reported knowledge of pain	No knowledge	14.75	1.50		0.724***	0.538
	Insufficient	16.12	4.54			
	Moderate	16.06	3.26			
	Advanced	15.14	2.62			

°: p<0.05, \*\*: Independent samples t-test, \*\*\*: One-way analysis of variance. Min-Max: Minimum-Maximum, SD: Standard deviation, NKASRP: Nurses' Knowledge and Attitudes Survey Regarding Pain.

### Ethical Considerations

Ethical approval was obtained from Demiroğlu Science University Clinical Research Ethics Committee (Approval Number: 44140529/17680, Date: 24.05.2022). Additional written permission was obtained from the Directorate of the School of Nursing where the study was conducted. The study was carried out in accordance with the principles of the Declaration of Helsinki. Prior to data collection, participants were informed about the study and provided written informed consent. Permission to use the Nurses' Knowledge and Attitudes Survey Regarding Pain was obtained from the first author, who conducted the Turkish validity and reliability study of the scale.

### Statistical Analysis

Data were analyzed using the SPSS Statistics software (Statistical Package for the Social Sciences), version 25.0 (IBM, Armonk, NY, USA). Descriptive statistics, including

frequency, percentage, mean, and standard deviation, were used to summarize the data. For comparisons between two independent groups with normally distributed data, an independent samples t-test was applied. For comparisons among more than two groups, one-way analysis of variance was used. Statistical significance was set at p<0.05.

### Results

Analysis of age distribution showed that 60.1% (n=184) of the students were 22 years of age or younger, while 39.9% (n=122) were older than 22 years. Of the participants, 69.9% (n=214) were female and 97.7% (n=299) were single. The sociodemographic characteristics of the participants are presented in Table 1. Regarding educational exposure, 92.2% (n=282) of the students reported having received education or coursework related to pain. However, 93.1% (n=285) indicated that they did not follow any publications related to pain. In terms of self-reported knowledge, 83.7% (n=256) of the students reported having a moderate level of knowledge about pain (Table 2).

**Table 4.** Percentage distribution of correct responses to the Nurses' Knowledge and Attitudes Survey Regarding Pain items (n=306)

Item no.	Item (Correct answer)	Correct responses	
		N	%
<b>Items with &lt;50% correct responses (poor)</b>			
34	Percentage of patients who over-report pain [0]	0	0.0
35	Likelihood of opioid addiction when treating pain [<1-5%]	12	3.9
37	Appropriate action for inadequate pain relief [administer morphine 3 mg IV]	14	4.6
7	Effectiveness of non-drug interventions for severe pain	22	7.2
38	Appropriate action for inadequate pain relief [administer morphine 3 mg IV]	22	7.2
23	Recommended route of administration for prolonged cancer pain [oral]	23	7.5
28	Risk of respiratory depression with increasing opioid doses [<1%]	31	10.1
13	Patients with a history of substance abuse should not be given opioids for pain due to addiction risk	40	13.1
1	Reliance on vital signs to assess severe pain	52	17.0
22	Heat and cold should only be applied to the painful area	68	22.2
21	Use of placebo [sterile water] to assess pain validity	69	22.5
2	Because of underdeveloped neurological systems, children under two years of age have decreased pain sensitivity and limited memory of painful experiences	80	26.1
25	Drug of choice for moderate-to-severe cancer pain [morphine]	92	30.1
11	Duration of action of meperidine [Demerol] IM [4-5 hours]	100	32.7
26	IV morphine dose equivalent to oral morphine	101	33.0
20	Patients should be advised to use non-pharmacological techniques alone	112	36.6
16	Encouraging patients to tolerate pain before seeking relief	116	37.9
12	Research shows that promethazine [Phenergan] is a reliable potentiator of opioid analgesics	118	38.6
10	The World Health Organization (WHO) pain ladder recommends using a single analgesic rather than combining drug classes	123	40.2
17	For children under 11 years, nurses should rely on parents' assessment of pain intensity	124	40.5
3	If a patient can be distracted from their pain, this usually indicates that they do NOT have high pain intensity	127	41.5
39	Postoperative pain assessment [pain score of 8]	133	43.5
15	Elderly patients cannot tolerate opioids for pain relief	145	47.4
23	The recommended route of administration for opioid analgesics in patients with sudden-onset, severe pain is [intravenous]	146	47.7
<b>Items with 50-74% correct responses</b>			
6	Aspirin and other nonsteroidal anti-inflammatory drugs are NOT effective analgesics for bone pain caused by metastases	157	51.3
33	Which of the following best describes the appropriate approach to cultural considerations in caring for patients in pain?	173	56.5
9	Aspirin 650 mg PO is approximately equal in analgesic effect to meperidine [Demerol] 50 mg PO	176	57.5
30	Reason for requesting increased pain medication [the patient is experiencing increased pain]	179	58.5
4	Patients may sleep despite severe pain	183	59.8
8	Respiratory depression rarely occurs in patients receiving opioids over an extended period	193	63.1
5	Comparable stimuli produce the same intensity of pain in different individuals	200	65.4
30	Which of the following drugs are useful for the treatment of cancer pain?	201	65.7
36	A 25-year-old patient, Andrew, following abdominal surgery, reports a pain level of 8/10 despite normal vital signs and social interaction	201	65.7
14	Beyond a certain dose, increasing morphine does not improve pain relief	203	66.3
27	Analgesics for postoperative pain should initially be administered [around the clock on a fixed schedule]	212	69.3
29	Analgesia for chronic cancer pain should be administered [around the clock on a fixed schedule]	226	73.9
<b>Items with ≥75% correct responses</b>			
16	Based on religious beliefs, a patient may perceive pain and suffering as necessary	254	83.0
17	After the initial recommended dose of an opioid analgesic, subsequent doses should be adjusted according to the patient's individual response	277	90.5
31	The most accurate judge of the intensity of the patient's pain is [the patient]	282	92.2

The results of the NKASRP indicate that students' knowledge and attitudes regarding pain management are insufficient. The mean correct response rate for the overall scale was 38%, ranging from 20.51% to 82.05%. According to the evaluation criteria, 93.13% (284) of the students were classified as having poor knowledge, 6.9% (21) as moderate, and 0.03% (1) as good. The analysis showed that students performed at a poor level (<50%) on 24 items of the NKASRP, at a moderate level (50–75%) on 12 items, and at a good level (>75%) on three items.

Out of the 39 items assessing knowledge of pain, the mean number of correct responses was  $15.98 \pm 3.32$ , with scores ranging from 7 to 34. Analysis of sociodemographic variables revealed that female students had higher NKASRP scores than male students (Table 3).

Students who had received education on pain-related topics during their studies demonstrated higher NKASRP scores compared to those who had not. However, no statistically significant difference was found between students' year of study and their NKASRP scores (Table 3).

Table 4 presents the percentage of correct responses for each item. The highest correct response rates were observed for the statements "The most accurate judge of the intensity of the patient's pain is (the patient)" (92.2%) and "After the initial recommended dose of opioid analgesics, subsequent doses should be adjusted according to the patient's individual response" (90.5%). The lowest correct response rate was observed for the question "What percentage of patients do you think over-report their pain?" (0%).

## Discussion

Untreated pain is a global health problem that leads to preventable complications and increased healthcare costs. The knowledge, behaviors, and attitudes of healthcare professionals, particularly nurses, are critical in effective pain management. The foundational knowledge, skills, and attitudes that nursing students acquire during their education directly influence their future clinical practice. Therefore, it is essential that nursing students receive adequate education on pain management before entering professional practice.<sup>16</sup> The aim of this study was to evaluate nursing students' knowledge and attitudes regarding postoperative pain management to contribute to improving the quality of nursing education as a first step toward developing educational and strategic initiatives for optimal pain control.

The findings indicate that students' knowledge and attitudes toward pain management are inadequate. These results are consistent with previous studies.<sup>10,17–19</sup> However, studies reporting higher rates of correct responses among students have also been documented.<sup>20,21</sup> This variation may be attributed to differences in sample characteristics and curricular structures. Additionally, the continuation of education through distance learning during the coronavirus disease 2019 (COVID-19) pandemic may have contributed to the low levels of knowledge and attitudes observed, suggesting that remote education may negatively affect students' academic performance. Furthermore, insufficient emphasis on pain management in the curriculum, the absence of a dedicated course, and the limited integration of this topic within core courses, such as internal medicine nursing, surgical nursing, women's health nursing, health assessment, and palliative care, may also explain these deficiencies. Reorganizing the curriculum and incorporating diverse educational strategies could help improve students' knowledge and attitudes toward pain management. Supporting this, Evan and Mixon (2015) reported that students who received simulation-based training achieved higher NKASRP scores.<sup>21</sup>

The NKASRP items with the highest correct response rates indicate that most students identified the patient as "the most accurate judge of the intensity of pain." A large majority also correctly recognized that "after the initial recommended dose of an opioid analgesic, subsequent doses should be adjusted according to the patient's individual response." Additionally, most students acknowledged that "based on religious beliefs, a patient may perceive pain and suffering as necessary" and that "analgesia for chronic cancer pain should be administered." Similar findings have been reported in previous studies.<sup>10,16,22</sup> Given that pain is a subjective experience, patients' self-reports should be considered the most reliable indicator. Factors such as past experiences, age, and cultural and familial and cultural influences shape patients' perceptions of pain and their responses to pain management. Cultural background, in particular, may affect how patients express pain and their tolerance levels.<sup>23</sup> These findings suggest that students have a sound understanding of fundamental principles of pain assessment and management, consistent with the literature.

A statistically significant difference was found between gender and NKASRP scores, with female students scoring higher than male students. This finding is consistent with studies by Topal Hançer and Yılmaz<sup>22</sup> and Shdaifat et al.<sup>24</sup> and may be explained by higher levels of empathy among female students<sup>25</sup> and greater receptivity to pain management information. However, studies by Karaman et al.,<sup>10</sup> Al Khalailah,<sup>26</sup> and Gadallah et al.<sup>27</sup> have reported that gender does not significantly influence nursing students' knowledge of pain management.

A statistically significant difference was found between students who had received education on pain-related topics and those who had not, with higher NKASRP scores among the former group. A similar relationship was reported by Al Khawaldeh et al.<sup>18</sup> This finding is expected and highlights the importance of incorporating pain management education into the nursing curriculum.

Although most students reported a moderate level of pain knowledge, no statistically significant relationship was found between self-reported knowledge and actual NKASRP scores. Karaman et al.<sup>10</sup> similarly reported inadequate knowledge and attitudes among nursing students. This discrepancy between perceived and actual knowledge has also been highlighted by Dalkılıç.<sup>28</sup>

The analysis showed that knowledge and attitude scores were not significantly associated with variables such as age, marital status, year of study, type of high school graduated, academic achievement, enrollment in a bachelor's or associate degree program, presence of a health condition, or following publications related to pain.

The overall low level of knowledge among nursing students about pain may be attributed to variations in curriculum content and teaching methods. Insufficient emphasis on pain assessment and management may result in inadequate patient care and continued suffering. Limited curriculum time devoted to pain management may also contribute to these deficiencies. Studies using the NKASRP have shown that students' knowledge does not significantly improve throughout their education, with topics such as addiction often remaining insufficiently addressed.<sup>21</sup>

The majority of surgical patients experience acute postoperative pain; however, evidence suggests that fewer than 50% achieve adequate pain relief. It is therefore essential that nurses possess comprehensive knowledge of postoperative pain assessment and effective management strategies.<sup>29</sup> Nursing education programs should prioritize this area, including robust pharmacology instruction, as the present study identified deficiencies in students' pharmacological knowledge. It is recommended that curricula be revised to include dedicated content on the pathophysiology, assessment, and management of pain, incorporating both pharmacological and non-pharmacological approaches. To enhance students' competencies, course content should be comprehensive and regularly updated.

## Study Limitations

The descriptive cross-sectional study was conducted at a single center to examine factors associated with nursing students' inadequate knowledge, attitudes, and practices in postoperative pain management. The relatively low Cronbach's alpha coefficient and overall scores may be related to the timing of data collection, which occurred during the post-pandemic transition period, when students had just resumed in-person education after an extended period of distance learning. Additionally, limited exposure to structured pain management education may have contributed to the inadequate knowledge and attitudes observed among students.

## Conclusion

Postoperative pain is an inevitable consequence of surgical procedures. Effective pain management is essential for promoting recovery and improving patient well-being, making it a fundamental responsibility of healthcare professionals. The findings of this study reveal significant deficiencies in nursing students' knowledge and attitudes regarding pain management in Türkiye, particularly in pharmacological aspects. These results highlight the need to revise undergraduate nursing curricula to include comprehensive pain management education. Nursing programs should strengthen both theoretical instruction and clinical training in this area. Addressing the identified gaps requires a holistic, evidence-based educational approach that also considers barriers to effective pain management. Further research is needed to identify these barriers among nurses in Türkiye and to evaluate the effectiveness of current pain management practices.

**Ethics Committee Approval:** The study was approved by the Demiroğlu Science University Clinical Research Ethics Committee (Approval Number: 44140529/17680, Date: 24.05.2022).

**Informed Consent:** Students who agreed to participate provided verbal consent and signed a written consent form.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

**Funding:** The authors declared that this study received no financial support.

**Author Contributions:** Concept – G.O.E.; Design – H.Y.; Supervision – G.O.E.; Resource – G.O.E.; Materials – H.Y.; Data Collection and/or Processing – H.Y.; Analysis and/or Interpretation – H.Y., G.O.E.; Literature Review – H.Y., G.O.E.; Writing – H.Y.; Critical Review – G.O.E.

**Peer-review:** Externally peer-reviewed.

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