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Prevalence of Cancer-related Fatigue and Associated Factors among Cancer Patients in Ethiopia: A Systematic Review and Meta-Analysis

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Abstract

Introduction: *Cancer-related fatigue is a distressing, persistent, and subjective sense of physical, emotional, and cognitive exhaustion commonly experienced by individuals with cancer. This systematic review and meta-analysis aimed to estimate the pooled prevalence of cancer-related fatigue and identify its associated factors among cancer patients in Ethiopia.*

Methods: *A comprehensive search was conducted in PubMed, the Cochrane Library, and Google Scholar using predefined keywords related to cancer-related fatigue in Ethiopia. Eligible studies were assessed using the Joanna Briggs Institute Meta-Analysis of Statistics checklist. Data were analyzed using STATA version 17. Heterogeneity across studies was examined through Cochran's Q test and the I^2 statistic. Forest plots were used to present pooled prevalence estimates with 95% confidence intervals.*

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Results: *A total of 12,718 articles were identified, screened, and managed using EndNote X7 software. The pooled prevalence of cancer-related fatigue among Ethiopian cancer patients was 73.74% (95% CI: 71.09–76.38, I^2=76.9%, p < 0.001). Several factors showed significant associations with cancer-related fatigue, including low body mass index (BMI < 18.5) (AOR = 2.01, 95% CI: 1.48–2.73), anxiety (AOR = 3.97, 95% CI: 3.16–4.99), anemia (AOR = 3.35, 95% CI: 2.33–4.81), depression (AOR = 3.28, 95% CI: 2.33–4.61), and type of cancer (AOR= 4.96, 95% CI: 2.48–9.93).*

Conclusions: *This review demonstrates a high prevalence of cancer-related fatigue among cancer patients in Ethiopia. Low BMI, anxiety, anemia, depression, and cancer type were significant contributing factors. These findings highlight the need for integrated clinical and policy interventions that address both physical and psychological components of cancer-related fatigue.*

Keywords: Cancer, cancer-related fatigue, fatigue, Ethiopia

1. Introduction

Fatigue is one of the most prevalent symptoms experienced by cancer patients. It has been reported to occur in a majority of patients across a wide range of cancer types (Cella, Davis, Breitbart, Curt, & Coalition, 2001).

Fatigue can be classified as varying depending on the level of fatigue you have. Mild fatigue (0–3): keep doing usual activities; moderate fatigue (4–6): reduce symptoms and increase your energy levels gently. Severe fatigue (7–10) (Hofman, Ryan, Figueroa-Moseley, Jean-Pierre, & Morrow, 2007). Fatigue is the most common side effect of cancer and cancer treatment. Cancer-related fatigue is different from fatigue that people without cancer experience. Cancer-related fatigue usually lasts longer, can be intense, and may not get better with rest (Pearson, Morris, & McKinstry, 2017). Cancer-related fatigue is a personal experience of physical, emotional, and mental exhaustion associated with cancer. It is often persistent, distressing, out of proportion to recent activity, and significantly disrupts normal daily functioning (Kassa, Mengistu, Woldemariam, Assefa, & Kebede, 2020). Cancer-related fatigue is a frequent symptom that may affect individuals from the time of diagnosis, throughout treatment, and continue for months or even years into survivorship.

It can be highly distressing and significantly impair daily functioning and overall quality of life (Lenrow, 2020). Cancer-related fatigue (CRF) significantly impacts the quality of life (QOL) of both patients and their caregivers, influencing physical well-being, psychological and social functioning, as well as economic and occupational aspects (Escalante, Hesketh, & Savarese, 2013). Cancer-related fatigue can be described as a clinical syndrome marked by a pervasive sense of weakness, along with both physical and mental exhaustion (Savina & Zaydiner, 2019). Cancer-related fatigue (CRF) is frequently experienced by individuals with cancer at all stages prior to, throughout, and following treatment. It is a long-lasting feeling of fatigue that disrupts daily functioning, causes significant distress, and may necessitate regular assessment and appropriate management (Gerber, 2017). Cancer-related fatigue (CRF) is a subjective experience characterized by a painful and persistent feeling of physical, emotional, and/or cognitive fatigue related to cancer or its treatment.

Unlike normal fatigue, CRF is not proportional to recent activity and has a significant impact on daily activities. The prevalence of ESRD varies widely between studies, ranging from 25% to 100%, depending on factors such as cancer type, stage, and treatment used (Kassa et al., 2020).

Cancer-related fatigue (CRF) is a subjective, distressing, and often debilitating symptom commonly experienced by cancer patients. Although ESRD has a significant impact on quality of life, the underlying factors associated with ESRD remain poorly understood, especially in developing countries (Tian et al., 2016). Persistent fatigue is considered one of the most persistent and distressing symptoms patients experience after cancer treatment.

Cancer-related fatigue (CRF) is characterized by a distressing and persistent subjective feeling of physical, emotional, and cognitive fatigue or exhaustion related to cancer or its treatment. Unlike normal fatigue, CRF is not proportional to recent activity and does not completely resolve with rest, often impairing patients' daily function and quality of life (Berger et al., 2010). Cancer-related fatigue (CRF) is a subjective feeling of tiredness or exhaustion associated with cancer or cancer treatment, encompassing physical, emotional, and/or cognitive aspects (Shin et al., 2024). Cancer-related fatigue (CRF) is a distressing, persistent, and subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion that is related to cancer or its treatment. It is disproportionate to recent activity and significantly interferes with usual functioning(Karthikeyan, Jumnani, Prabhu, Manoor, & Supe, 2012).

2. Materials and Methods

2.1 Development of the review method

The methodology of this systematic review was developed based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA 2020) Statement guidelines (Page et al., 2021), and the items in the PRISMA checklist were addressed (**S1 file**). The four phases that were drawn from the PRISMA flow chart were documented in the results to show the study selection process from initially identified records to finally included studies. The protocol for this systematic review and meta-analysis was registered in the International Prospective Register of Systematic Reviews (PROSPERO) and obtained the registration number: CRD420251020204.

2.2 Publication Search Strategy

The literature search was carried out independently by the primary authors (AMZ, WCT, and YAF). A comprehensive search strategy was carried out to identify studies on cancer-related fatigue among cancer patients in Ethiopia, utilizing various databases, including PubMed, Scopus, Web of Science, and African Journals Online (AJOL). Additionally, we used Google

Scholar as a search engine to find scholarly content, rather than as an independent database. The search, conducted between March 20, 2025, and April 15, 2025, specifically targeted studies that reported on the prevalence and associated factors of cancer-related fatigue in Ethiopia. The search utilized a combination of free-text keywords and Medical Subject Headings (MeSH), incorporating terms such as (cancer OR neoplasm OR malignant OR tumor OR tumour'' AND "cancer-related fatigue" OR "cancer related fatigue" OR "cancer fatigue" OR fatigue OR asthenia OR "cancer-associated fatigue" AND (prevalence OR proportion OR epidemiology OR magnitude OR frequency OR occurrence) AND "associated factor" OR "risk factor" OR determinant OR predictor OR correlation OR "related factor" OR "contributing factor") AND (Ethiopia OR Ethiopian).For the Cochrane Database, the search was adapted to maximize comprehensiveness.

Additionally, the reference lists of relevant studies were systematically reviewed to identify further pertinent articles, focusing on citations related to cancer-related fatigue among cancer patients in Ethiopia. Duplicate records from each database were exported to EndNote X7 citation manager and removed. Any disagreements were resolved through discussion and consensus or, if needed, by involving all investigators. After removing duplicates, titles and abstracts of the remaining records were screened. Reference lists of retrieved articles were also reviewed to identify additional relevant studies.

2. 3. Eligibility criteria

Inclusion criteria: This systematic review and meta-analysis included published studies conducted in Ethiopia that met the following inclusion criteria: Study design: Cross-sectional; Language: Only studies reported in English; Study participants: Studies involving all cancer-related fatigue; Publication year: Articles published up to 2025 were considered for inclusion in this study.

The exclusion criteria: (1**)** books, case reports, conference abstracts, review articles of any kind, or letters; (2) duplicate publications or data; and (3) studies lacking full text, specific data, or only presenting statistical summaries.

Article selection and data extraction

Article selection

To eliminate duplicate studies, the retrieved articles were imported into the reference management software EndNote version 7. Subsequently, the authors (AMZ and YAF) assessed

the titles of the remaining articles, excluding those that did not meet the eligibility criteria. Articles meeting the inclusion criteria were utilized as data sources for analysis. The authors (JAB and AMZ) extracted data from the included studies using Microsoft Excel and a standard data extraction template. The extracted data encompassed various study characteristics, such as the corresponding author's name, publication year, study setting or region, study design, sample size, participants or response rate, sampling technique, prevalence of cancer-related fatigue, and associated factors. The data extracted by two authors (JAB and WCT) were cross-checked for consistency.

2. 4. Data extraction

After carefully screening the titles, abstracts, and full texts of the selected studies, data were extracted using a standardized form adapted from the Joanna Briggs Institute (JBI) guidelines. Two reviewers (JAB and WCT) carried out this process independently, thoroughly assessing each eligible study. Any disagreements or uncertainties were resolved through discussion until consensus was reached. Key details, including the first author's name, study location, setting, publication year, design, participant characteristics, sample size, and response rate, were systematically documented. In addition, information on risk factors and the prevalence of cancer-related fatigue, along with the corresponding 95% confidence intervals, was compiled to provide a comprehensive summary of the evidence among cancer patients in Ethiopia.

2. 5. Risk of bias (quality) assessment

The quality of the included studies was evaluated using the Joanna Briggs Institute (JBI) version 2020 critical appraisal checklist for analytical cross-sectional studies, which consists of nine items (Jun et al., 2021). This tool assesses (1) whether the sampling frame was appropriate for the target population, (2) Appropriate participant sampling, (3) adequacy of the sample size, (4) clarity in describing the study participants and setting, (5) whether the data analysis adequately addressed the identified sample, (6) validity of the methods used to identify the condition, (7) consistency and reliability of condition measurement across all participants(8) appropriateness of the statistical analysis, and (9) adequacy of the response rate. Each item was scored as 1 ("yes") if reported appropriately and 0 ("no" or "not reported"), giving a possible total score between 0 and 9. Based on these totals, study quality was categorized as low (0–4), moderate (5–7), or high (8–9).

2.6. Statistical Analysis

After data extraction, the information was entered into Stata version 17 (StataCorp LLC, Texas, USA) for statistical analysis. Heterogeneity across the included studies was examined using Cochran's Q chi-square test with a significance threshold of $p < 0.05$, along with the inverse variance statistic (I^2). The I^2 values were interpreted as follows: 0–40% indicating low heterogeneity, 40–60% moderate, 60–90% substantial, and 90–100% very high heterogeneity (Poorolajal & Noornejad, 2021).The DerSimonian and Laird (D+L) random-effects model was applied to generate pooled estimates, as considerable heterogeneity was observed among the included studies (Jackson, Bowden, & Baker, 2010). To further explore and manage this heterogeneity, subgroup analyses and sensitivity analyses were performed. Potential publication bias was evaluated using Egger's and Begg's regression tests, complemented by visual inspection of the funnel plot.

Operational definition: cancer-related fatigue and measurement

Operational definition: Cancer-related fatigue was defined as a persistent feeling of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer. CRF was considered present according to the validated measurement instrument and cutoff point reported in each included study, such as the Fatigue Severity Scale (FSS), Brief Fatigue Inventory (BFI), EORTC QLQ-C30 fatigue subscale, or FACIT-Fatigue Scale(Mendoza et al., 1999).

3. Results

3.1 Study Selection

Our comprehensive search retrieved 12,718 records from seven databases: Google Scholar (3,600), PubMed (2,437), Cochrane Library (5), ScienceDirect (5,226), African Journals Online (730), CINAHL (690), and MEDLINE (30). After importing all records into EndNote, 11,617 duplicates were removed. Of the remaining studies, 11,561 were excluded based on title screening due to title differences. The abstracts of 56 studies were then reviewed against the eligibility criteria, and 6 articles ultimately fulfilled the inclusion criteria and were incorporated into the review. A detailed outline of the screening steps and reasons for exclusion is presented in the review (Figure 1).

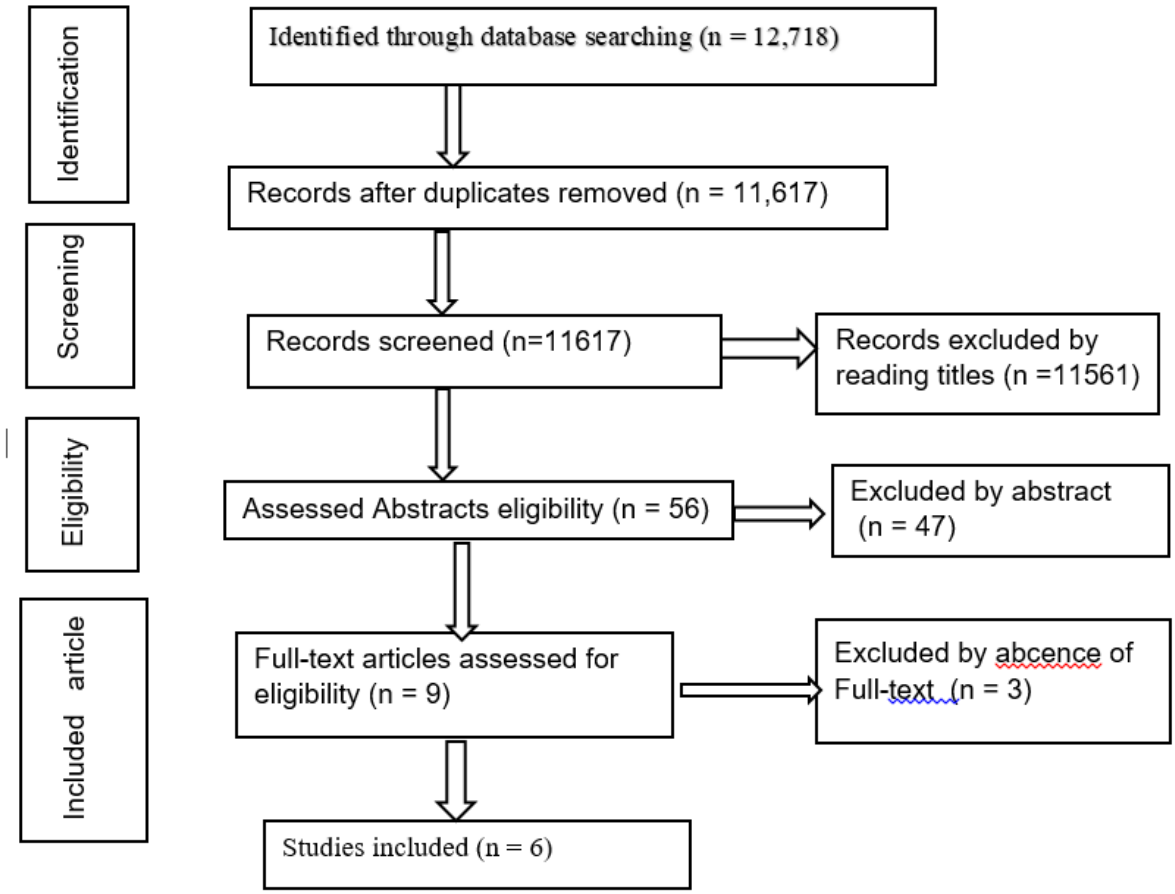


Figure 1.PRISMA flow diagram for a systematic review and meta-analysis prevalence of cancer related fatigue and associated factors among Cancer Patients in Ethiopia (n=6).

This systematic review and meta-analysis incorporated six public studies with a combined total of 1,972 participants. All of the included studies employed an institution-based cross-sectional design. Regarding the geographical settings of the included studies, one study was conducted in the South region (Asefa, Bitew, Tezera, & Tesfaye, 2024), three studies were conducted in the Amhara region(Animaw, Woldegiorgis Abate, Endeshaw, & Tsegaye, 2023; Zeleke, Worku, & Ayele, 2024), and two studies were conducted in Addis Ababa (Kassa et al., 2020; Nugusse, Lemlem, Deressa, & Kisa, 2021) (Table 1).

Table 1. Overview of the included articles

Author	Pub Year	Region	Study Design	Study Population	Sample size	Study participants	JPI quality score
Belaynew et al	2021	Amhara	Cross sectional study	Cancer patients	800	260	High
Lingerew et al.	2023	Amhara	Cross-sectional study	Cancer patients	458	449	High
Gebreeyesus et al	2022	Amhara	Cross-sectional study	Cancer patients	326	305	High
Teka et al	2021	Addis Ababa	Cross-sectional study	Cancer patients	384	278	High
Sholaye et al	2020	Addis Ababa	Cross sectional study	Cancer patients	406	383	Medium
Tseganesh et al.	2024	South region	Cross-sectional study	Cancer patients	297	297	High

3.2 . Meta-analysis

The meta-analysis estimated the pooled prevalence of cancer-related fatigue among cancer patients in Ethiopia at 73.74% (95% CI: 71.09–76.38; I^2 = 76.9%, $p < 0.001$). Moderate heterogeneity was observed among the studies; therefore, the DerSimonian and Laird (D+L) random-effects model was applied to estimate the pooled prevalence of cancer-related fatigue and its associated factors among cancer patients in Ethiopia (Figure 2).

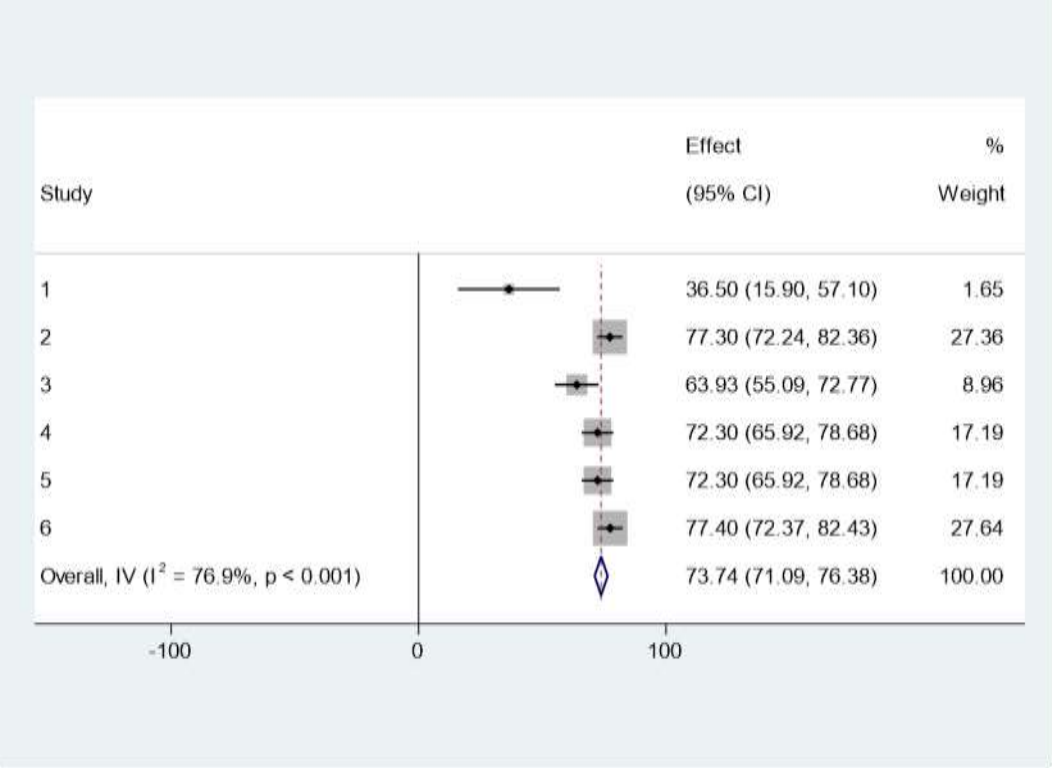


Figure 2. Pooled prevalence of cancer-related fatigue and associated factors among Among Cancer Patients in Ethiopia

3.3 Quality assessment

Quality assessment using the JBI critical appraisal checklist showed that all included studies were of medium (6-7) to high quality, with scores ranging from 8 to 9. A detailed summary of the quality appraisal is provided in the supplementary file.

3.3 Publication bias

As shown in Figure 3, visual inspection of the funnel plot indicated some degree of asymmetry among the included studies. This finding was supported by Egger's regression test ($P < 0.001$), suggesting small-study effects and possible publication bias (Figure 3).

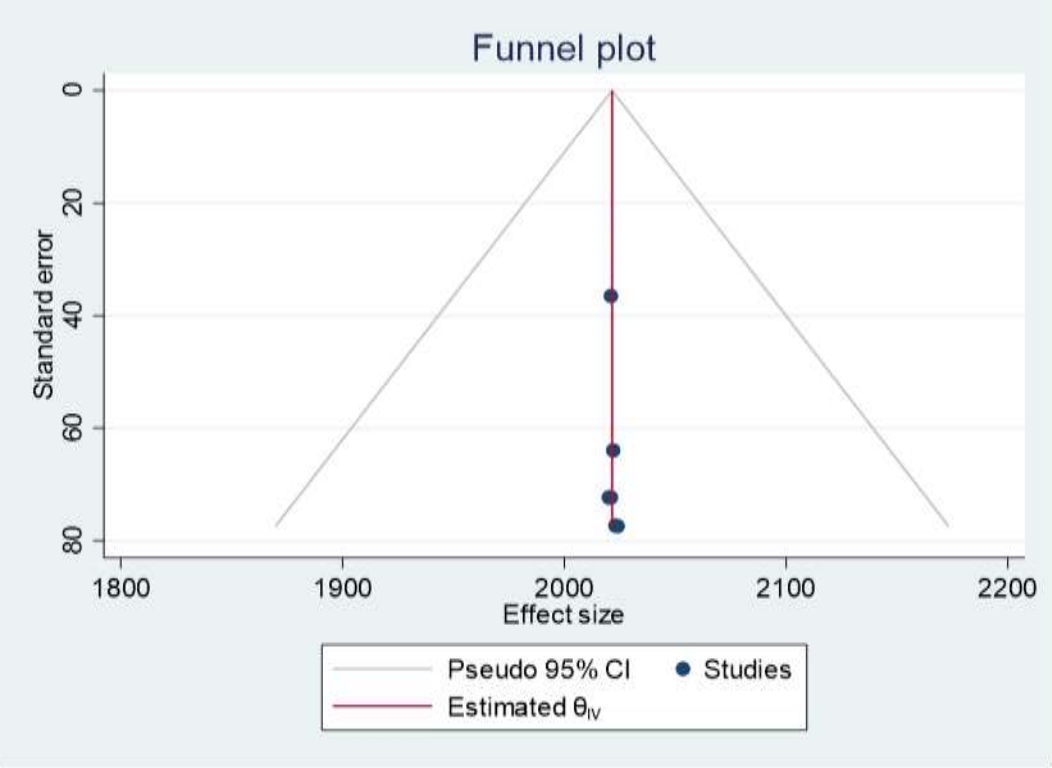


Figure 3. Funnel plot assessing publication bias

3.4 Assess the source of heterogeneity

In a meta-analysis, the pooled prevalence of cancer-related fatigue among cancer patients in Ethiopia was 73.74% (95% CI: 71.09–76.38). Considerable heterogeneity was observed among the included studies, as indicated by an I^2 statistic of 76.9% ($p < 0.001$). This suggests that a substantial proportion of the variability in the observed prevalence estimates was attributable to differences between studies rather than sampling error. Therefore, subgroup analyses were conducted to explore potential sources of heterogeneity, including study region and other study-level characteristics.

3.5 Subgroup analysis

Subgroup analysis by study region was performed to explore potential sources of variability among the included studies. The pooled prevalence of cancer-related fatigue varied across study regions, ranging from 72.37% (95% CI: 66.07–76.67, $I^2 = 89.4\%$, $p < 0.001$) in studies conducted in the Amhara region to 77.40% (95% CI: 72.37–82.47, $I^2 = 0\%$, $p < 0.001$) in Hawassa (**Figure 4**). Substantial heterogeneity was observed among studies from the Amhara region, whereas no between-study heterogeneity was observed in the Hawassa subgroup. These

findings suggest that geographical study setting may contribute to variability in the reported prevalence; however, the high residual heterogeneity within the Amhara subgroup indicates that other study-level factors may also explain the observed variability.

3.6 Sensitivity analysis

Sensitivity analysis using a random-effects model was conducted to assess the influence of individual studies on the overall meta-analysis. The results indicated that no single study had a significant impact on the pooled estimate, as each study's effect size was close to the overall combined estimate, suggesting the robustness of the findings (Table 2).

Table 2 shows the Sensitivity analysis.

Study omitted	Estimate	[95% Conf.	Interval]
Belaynew et al. (2021)	2.1562469	1.5000001	3.0996006
Lingerew et al . (2023)	1.6960765	1.1355664	2.5332515
Gebreeyesus et al. (2022)	2.0075088	1.4763379	2.729789
Teka et al. (2021)	2.1184773	1.3650744	3.2876937
Sholaye et al. (2020)	2.0075088	1.4763379	2.729789
Tseganesh et al. (2024)	2.0075088	1.4763379	2.729789
Combined	2.0075086	1.4763379	2.729789

3.7 Associated Factors

The study examined several factors associated with cancer-related fatigue among cancer patients; however, some variables were excluded due to inconsistencies in categorization across studies. Three studies reported a significant association between low body mass index (BMI < 18.5) and cancer-related fatigue, with underweight patients being twice as likely to experience fatigue compared to those with BMI ≥ 18.5 (AOR = 2.01, 95% CI: 1.48–2.73; I^2 = 0.0%, p = 0.431). Pooled results from four studies indicated that patients with anxiety were nearly four times more likely to experience cancer-related fatigue than those without anxiety (AOR = 3.97, 95% CI: 3.16–4.99; I^2 = 0.0%, p = 0.571). A random-effects meta-analysis of two studies also demonstrated a significant association between anemia and fatigue, with anemic patients being 3.35 times more likely to report fatigue compared to non-anemic patients (AOR = 3.35, 95% CI: 2.33–4.81; I^2 = 0.0%, p = 0.669). Similarly, depression was associated with cancer-related

fatigue in two studies, with depressed patients being 3.28 times more likely to experience fatigue than those without depression (AOR = 3.28, 95% CI: 2.33–4.61; I^2 = 0.0%, p = 0.855). Finally, two studies reported that specific cancer types were associated with higher fatigue, with affected patients being 4.96 times more likely to experience fatigue compared to patients without these cancer types (AOR = 4.96, 95% CI: 2.48–9.93; I^2 = 0.0%, p = 0.448). Due to substantial heterogeneity across the studies (I^2 = 76.9%, p < 0.001), a random-effects model was applied for all analyses.

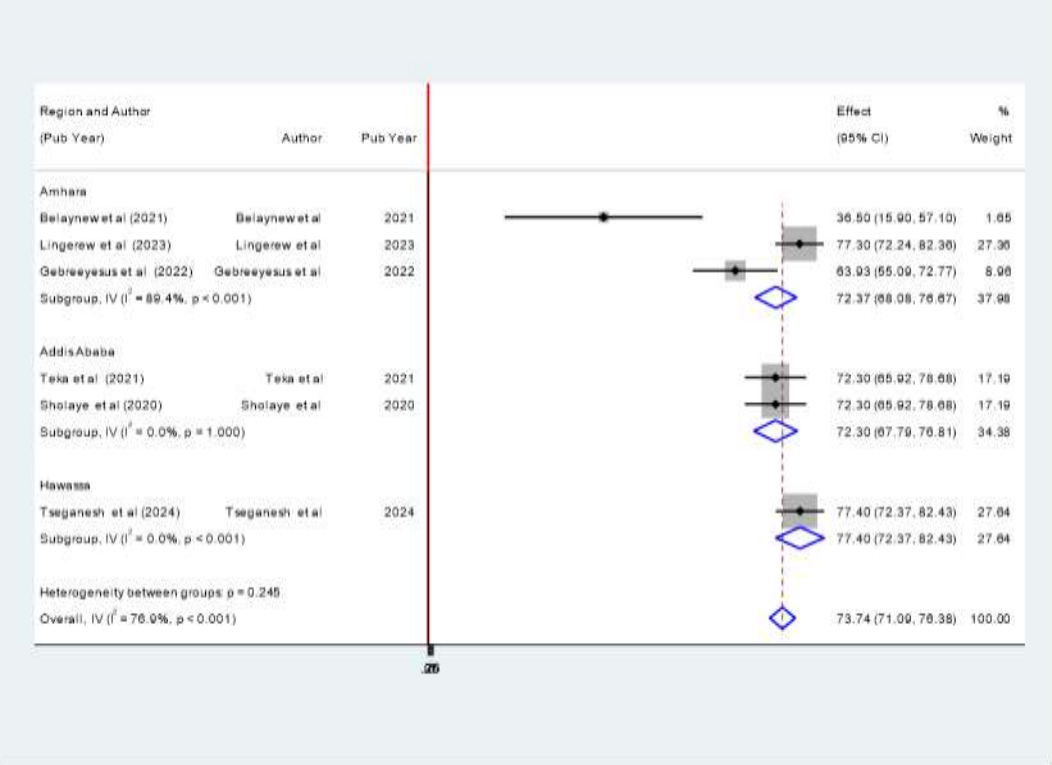


Figure 4. Subgroup analysis based on region

4. Discussion

The findings of this study indicate that the pooled prevalence of cancer-related fatigue and associated factors among cancer patients in Ethiopia was 73.74% (95% CI: 71.09–76.38, I^2=76.9%, p < 0.001). The current findings are in line with those of studies performed in Canada (73%)(Oberoi et al., 2024) and Ireland (75%) (O'Regan et al., 2019).

However, the result is higher than those reported for the Netherlands (26.1%), China (52%) (Ma et al., 2020),Jordan (26.2%) (Al Maqbali, Al Sinani, Al Naamani, Al Badi, & Tanash, 2021),Yemen (49%) (Muthanna et al., 2023), China (20%) (Wei & Li, 2018), and

Lebanon (46.3%)(Hajj et al., 2022). The possible explanation for the observed variations might be due to differences in methodology and sample size used to assess the prevalence of cancer-related fatigue among cancer patients by individual studies conducted in each country. Moreover, the difference could be due to differences in geographical area, quality of medical service, and socio-economic status, which may have a limited effect on assessing the prevalence of cancer-related fatigue.

In the current systematic review and meta-analysis, several factors were associated with cancer-related fatigue among cancer patients. Regarding depression, it was significantly associated with cancer-related fatigue. This review is supported by studies conducted in the USA (Wang et al., 2014),China (Park et al., 2024), and South Florida (Andrykowski, Schmidt, Salsman, Beacham, & Jacobsen, 2005). Depression in cancer patients may arise from multiple factors, including neurological responses to the cancer diagnosis, prolonged treatment duration, adverse effects of therapy, repeated hospitalizations, disruptions in daily life, and reduced quality of life. Identifying depression in these patients is crucial, as it can negatively affect survival and may serve as a predictor of early mortality.Multiple studies have consistently demonstrated a significant link between depression and cancer-related fatigue in patients (Blesch et al., 1991; Bower et al., 2000; Funk, 1989; Jacobsen, Donovan, & Weitzner, 2003). Fatigue can be understood in two ways: within psychiatric diagnostics, it is considered a core symptom of depressive disorders, while it is also classified as one of the somatic manifestations of depression (Jacobsen et al., 2003; Paiva et al., 2015; Reuter & Härter, 2004).In addition, cancer patients with anxiety were at a higher risk of developing cancer-related fatigue compared to those without anxiety. This finding is consistent with studies conducted in Canada (Yasin & Al-Hamad, 2015) and Indiana (Brown & Kroenke, 2009), which demonstrated a significant association between anxiety and fatigue in cancer patients. Fatigue experienced by these patients was often related to anxiety, highlighting its role as one of the most common and debilitating symptoms in cancer (Tel, Tel, & Doğan, 2011). Anxiety has been significantly associated with cancer-related fatigue (Saligan & Kim, 2012). Similarly, patients with anemia were more likely to develop cancer-related fatigue than those without anemia, a pattern supported by studies from Italy (Stone & Minton, 2008; Wang & Woodruff, 2015). Cancer-related fatigue (CRF) is generally considered to have a multifactorial origin, encompassing physical factors (e.g., anemia, cachexia), psychological factors (e.g., depression, anxiety), and situational influences (Saligan & Kim,

2012). Anemia is a frequent condition in cancer patients and may arise from multiple mechanisms, including bone marrow infiltration, blood loss, hemolysis, organ dysfunction (renal, hepatic, or endocrine), or nutritional deficiencies (Stone & Minton, 2008; Wang & Woodruff, 2015). In many cancer patients, anemia arises from multiple factors. Contributing mechanisms include chronic bleeding, inadequate nutrition, hemolysis, decreased erythropoietin production, inflammation with elevated hepcidin levels, and the marrow-suppressive effects of chemotherapy. Determining the underlying cause of anemia is essential for guiding appropriate treatment strategies.

The review also indicated that patients with a body mass index (BMI) below 18.5 had a significantly higher risk of developing cancer-related fatigue compared to those with a BMI above 18.5, a finding consistent with studies conducted in China (Saligan & Kim, 2012).

These studies identified underweight status as a risk factor for cancer-related fatigue. While both underweight and obesity may contribute to fatigue, a BMI below 18.5 often indicates poor nutritional and functional status, which can exacerbate fatigue symptoms (Golubnitschaja et al., 2021). Additional studies have reported that cancer patients with low or decreasing BMI generally experience poorer clinical outcomes compared to those with higher or obese BMI (Strulov Shachar & Williams, 2017). Furthermore, the review indicated that cancer type influences the risk of developing CRF. Patients with certain cancer types were more likely to experience severe fatigue compared to those with less aggressive or inactive cancers. These results are consistent with studies conducted in India (Agarwal et al., 2020; Karthikeyan et al., 2012). Fatigue in cancer patients is understood as a complex, multidimensional phenomenon that impacts physical, emotional, and cognitive functioning (Abrahams, Gielissen, Verhagen, & Knoop, 2018; Schmidt, Hermann, Arndt, & Steindorf, 2020). Many patients perceive cancer-related fatigue (CRF) as distinct from ordinary tiredness. Its intensity and unfamiliarity often make it difficult for patients to describe using their past experiences or everyday language (Hodge, Itty, Cadogan, Martinez, & Pham, 2016; Nielsen, 2003; Wu & McSweeney, 2007). Therefore, comprehending CRF from the patient's perspective is crucial. A qualitative study examining patients' lived experiences highlighted the multidimensional nature of CRF. Other studies have examined the severity of fatigue and its associated factors in specific cancer types, including breast cancer (Abrahams et al., 2016; Wang & Woodruff, 2015).

Limitation

This systematic review and meta-analysis had several limitations. First, only primary studies published in English were included, which may have led to the exclusion of relevant studies published in other languages. Additionally, none of the included studies examined age categories, gender-based comparisons, or socioeconomic status among cancer patients, limiting the depth of subgroup analyses. The overall sample size was also relatively small due to the limited number of primary studies eligible for meta-analysis. Furthermore, all included studies employed a cross-sectional design, which restricts the ability to infer causality and increases the potential influence of confounding variables on the observed associations**.**

7. Conclusions

The overall assessment indicated a high pooled prevalence of cancer-related fatigue. Depression, anxiety, anemia, BMI, and other clinical and sociodemographic factors were significantly associated with cancer-related fatigu**e** among cancer patients. Based on these findings, we recommend that health initiatives and policymakers prioritize addressing the physical burden, psychological stress, and malnutrition experienced by cancer patients. Strengthening local programs targeting non-communicable diseases may also help mitigate the impact of cancer-related fatigue.

Abbreviations

CRF: Cancer–related fatigue

BMI: Body mass index

LMIC: Low- and middle-income countries

QOL: Quality of life

AOR: Adjusted Odds Ratio

Supplementary materials

SI PRISMA checklist

S2 Joanna Briggs Institute critical appraisal checklist

Author Contributions:

AMZ: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Software, Validation, Visualization, Writing – Original Draft, Writing – Review & Editing, Supervision, Project Administration, Resources, and Funding Acquisition.YAF, JAB, and WCT:

Conceptualization, Data Extraction, Analysis, Draft Writing, and Review.All authors have read and approved the final version of the manuscript for publication.

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Consent for publication

Not applicable

Competing interests:

The authors declare no competing interests

Declarations:

Ethical approval and consent to participate

Ethical approval not applicable

Data availability:

All relevant data generated and analyzed are included in this article

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