



## Review Article

# Fatigue in Irritable Bowel Syndrome: A Systematic Review and Meta-analysis of Pooled Frequency and Severity of Fatigue



Claire Jungyoun Han, MSN, RN, <sup>1,\*</sup> Gee Su Yang, MSN, RN <sup>2</sup>

<sup>1</sup> Biobehavioral Nursing and Health Systems, School of Nursing, University of Washington, Seattle, USA

<sup>2</sup> Department of Pain and Symptom Translational Science, School of Nursing, University of Maryland, College Park, USA

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## SUMMARY

**Purpose:** Fatigue is the third most common “extraintestinal” complaint of patients with irritable bowel syndrome (IBS), but it is still poorly understood. This study aimed to review characteristics of IBS-associated fatigue and to examine pooled frequency, severity of fatigue, and correlations of related factors with fatigue in IBS via meta-analyses.

**Methods:** Publications were searched in eight databases from 1995 to 2014. Random effects meta-analyses were applied with standard error, weighted effect size, and correlation-based measure of effect size.

**Results:** Twenty-four studies were included in systematic review. Seventeen studies were used for meta-analyses (2 studies were excluded in the frequency of fatigue analysis due to data unavailability). Using “tiredness” to define fatigue, and Fatigue Impact Scale to assess fatigue were the most frequently used across the studies. Gastrointestinal symptoms, psychological distress, and health-related quality of life were the most common correlates with fatigue. The pooled frequency of fatigue was 54.2% [95% confidence interval (38.5, 69.4)]. Metaregression on the frequency of fatigue showed positive and significant relations with tertiary care settings, female sex, and younger age. There was a negatively moderate relationship between the severity of fatigue and health-related quality of life score (correlation-based measure of effect size:  $-0.378$ ).

**Conclusions:** Fatigue is prevalent among patients with IBS and commonly co-occurs with other symptoms. This is the first study to fully examine fatigue in IBS, which shed light on the comprehensive management of fatigue in this patient group. Future research is warranted to further explore fatigue-related factors and underlying mechanisms of fatigue in IBS.

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## Introduction

Irritable bowel syndrome (IBS) is the most common functional gastrointestinal (GI) disorder diagnosed by Rome III criteria, which was developed to classify IBS based on clinical symptoms [1]. The worldwide prevalence of IBS in adults is between 9.0% and 23.5% [2]. It affects about 22 million people in the United States, representing 14.0% of the U.S. population [3] and 2.9%–15.6% in Asian countries [4]. Low-grade mucosal inflammation, microbiome, and visceral hypersensitivity are commonly accepted mechanisms that alter gut function and generate symptoms of IBS [5,6]. Common GI

symptoms are changes in bowel habits (e.g., constipation-dominant, diarrhea-dominant, & mixed), abdominal pain, bloating, intestinal gas, distension, flatulence, incomplete evacuation, and urgency [1]. Non-GI symptoms, such as depression, anxiety and fatigue, can co-occur with GI symptoms in IBS [7,8].

Symptoms of IBS could result in significant direct costs (e.g., physician visits, diagnostic tests, and prescription, or over-the-counter medication) and indirect costs [e.g., work absenteeism, diminished health-related quality of life (HRQOL)] to patients and health care industries. The biggest causes of health care costs of patients with IBS are non-GI symptoms (e.g., fatigue, depression, anxiety) [9].

Among non-GI symptoms of IBS, Lackner and Gudleski [8] reported that 60.0% of patients with IBS ( $N = 176$ ) experienced fatigue independent of other symptoms in IBS. In addition, fatigue ranks as the third most common [8] somatic complaint after abdominal pain and frequent bowel movements in patients with IBS. Fatigue in IBS

\* Correspondence to: Claire Jungyoun Han, MSN, RN, Biobehavioral Nursing and Health Systems, School of Nursing, University of Washington, 5015, 19th Avenue NE, 98105, Seattle, Washington, USA.

E-mail address: [jyh0908@uw.edu](mailto:jyh0908@uw.edu)

was described with a wide range of definitions, such as tiredness, extreme weariness, and a state of exhaustion [8,10]. Fatigue is likely to interfere with work productivity, HRQOL, cost effectiveness, and daily activity in this patient group [11]. Qualitative research has shown that patients with IBS experience fatigue as multidimensional, persistent symptoms with far-reaching consequences, and report low HRQOL [10].

It is challenging to provide effective fatigue management for patients with IBS because there is a lack of research and information about fatigue compared to other IBS symptoms, such as abdominal pain, diarrhea, constipation, and psychological distress [8]. The characteristics of fatigue (i.e., prevalence, severity, related factors) and overall health care burden of fatigue in IBS are unknown [8]. In addition, definition and assessment of fatigue used in IBS studies are not consistent. The underlying mechanisms remain unclear, although one study demonstrated that low-grade inflammation is related to fatigue in IBS [12].

Understanding the phenomenon of fatigue in IBS via systematic review and meta-analyses can guide health care providers toward having insight and knowledge for the consistent symptom

diagnosis and fatigue-specific management. Therefore, the aims of this study are (a) to explore characteristics of fatigue in IBS via a systematic review, and (b) to examine pooled frequency and severity of fatigue as well as pooled correlations between related factors and fatigue in IBS via meta-analyses.

## Methods

### Search strategies

A systematic literature search was conducted in Medline, Web of Science, Scopus, EMBASE, PubMed, CINAHL, Cochrane Library, and PsychINFO. Key words were “symptoms”, “fatigue”, “prevalence”, and “frequency”, in combination with “irritable bowel syndrome” and “correlates”, “etiology” and “pathophysiology”. The lists of studies were published from January 1995 to July 2014. Other eligible studies were also identified by searching the cited references from obtained published studies. The screening procedure was based on the Preferred Reporting Items for Systematic Reviews and Meta Analyses flow diagram [13] (Figure 1).

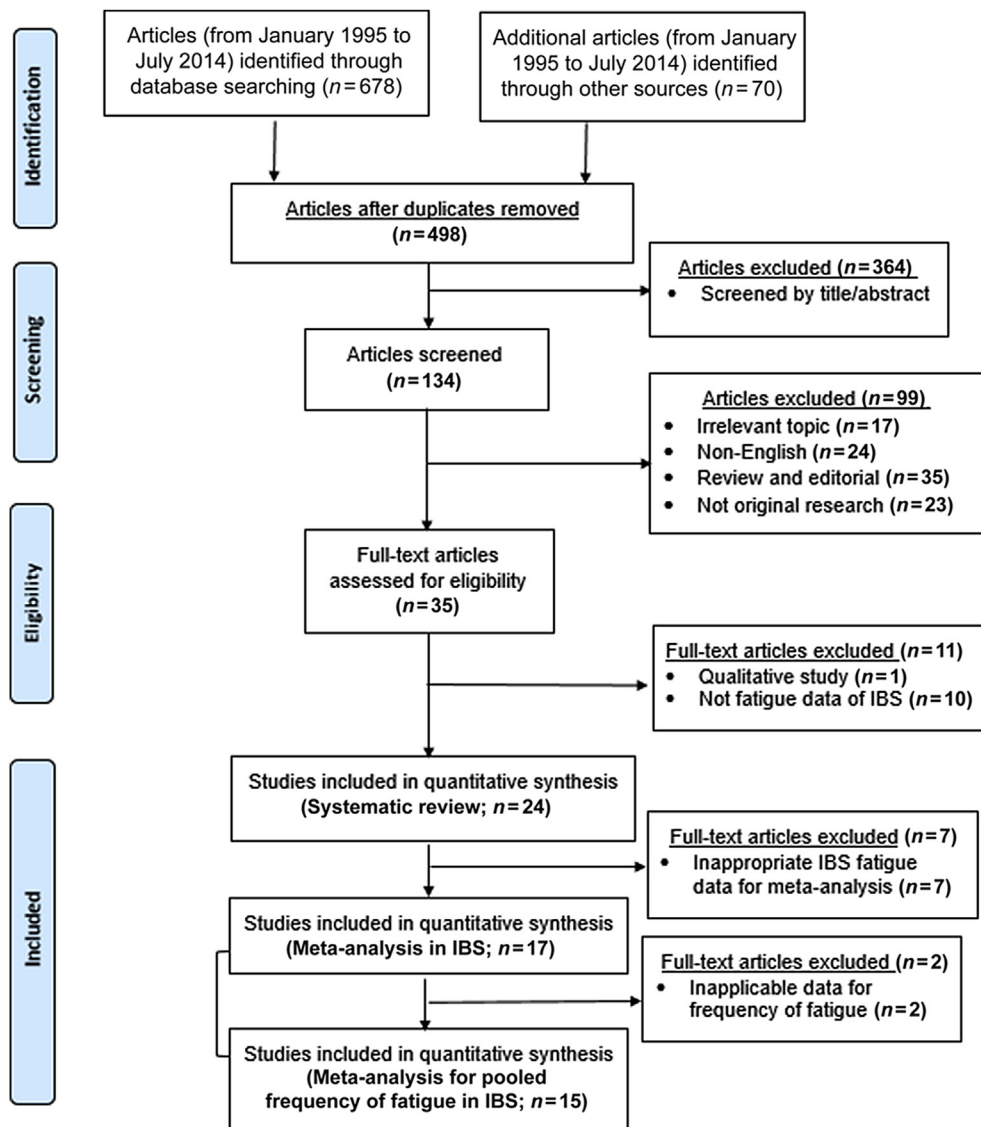


Figure 1. Flow diagram preferred reporting items for systematic reviews and meta-analyses. Note. IBS = irritable bowel syndrome.

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