Healthcare seeking behavior among subjects with irritable bowel syndrome

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ABSTRACT

تعد سلوكيات مرضى القولون العصبي في طلب الرعاية الصحية متعددة ومتفاوتة ومختلف عليها أحياناً وربما غير متطابقة. تهدف هذه المراجعة إلى استعراض العوامل المؤثرة على هذه السلوكيات ومدى تأثيرها و تداخلها. يهدف هذا المقال إلى مراجعة العوامل المصاحبة مع طلب الرعاية الصحية. من خلال مراجعات مختارة من الأدب تم البحث عن المقالات باستخدام مصطلحات البحث التالية: مرض القولون العصبي، وطلب الرعاية، والعلاج التقليدي والغير تقليدي، وعوامل اجتماعية، واختلاف الجنس. كما سوف نناقش العوامل المختلفة المصاحبة لطلب الرعاية الصحية.

The behaviors exhibited by individuals who seek healthcare for irritable bowel syndrome (IBS) are numerous, varied, and sometimes controversial, and/or inconsistent. This study aims to review the factors associated with these healthcare seeking behaviors. Through a selective review of the literature, articles were identified by using the following search terms: IBS, healthcare seeking, conventional and non-conventional treatment, cultural factors, and gender differences. The roles of different factors associated with healthcare seeking are discussed.

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Irritable bowel syndrome (IBS) is the most common functional bowel disorder, characterized by abdominal pain, and changes in stool consistency and/or stool frequency.[1] There are discrepancies in the prevalence rate and healthcare seeking behavior of IBS patients around the world.[2] A significant part of the international variation may arise from locale-specific differences in healthcare utilization,[2] diagnostic practices,[2] sampling techniques, differences in healthcare systems,[3] and the definition of healthcare seeking. Current evidence supports a biopsychosocial pathophysiological model of IBS in which biological and psychosocial determinants interact in the clinical expression of disease and illness.[4-6] Psychosocial factors have an impact on symptoms presentation, experience, and interpretation. They can also modify illness behavior and influence treatment and clinical outcomes.[7] Healthcare use is a costly outcome of IBS[8] in terms of inappropriate medical investigation,[9] unnecessary surgery (particularly hysterectomy and cholecystectomy),[10] medication usage,[9] and repeated consultation with healthcare professionals.[11] On average, healthcare costs for IBS patients are 50% higher than those for patients of similar age and gender who do not have IBS.[12] Although IBS causes considerable morbidity and impairment of quality of life, not all IBS patients seek medical care. Previous studies show that individuals with IBS seek medical care for the treatment of their abdominal symptoms at highly variable rates, ranging from 5%[2] to 84%.[13] Multiple factors of interest are associated with the healthcare seeking behavior of IBS patients. This manuscript highlights these factors through a selective review of literature pertaining to this topic from 1980-2011. Selection is based mainly on relevance and year of publication. Using the following search terms we identified approximately 200 articles: IBS, healthcare seeking, conventional and non-conventional treatment, cultural factors, and gender differences. Emphasis was placed on controlled trials and review articles.

Symptoms factor. The importance of IBS symptom severity as a determinant for seeking healthcare has

been recognized in many population-based studies.[3,11,14] Among IBS symptoms, abdominal pain is most consistently associated with consultation behavior, along with symptom duration, specifically, duration and/or severity of abdominal pain.[3,15-18] Furthermore, Koloski et al[3] reviewed the literature and found that the type of care received by IBS patients was predicted by their pain reports, with tertiary care patients reporting more pain. Irritable bowel syndrome is a chronic, non-organic syndrome, primarily involving altered perception, and processing of pain.[19-21] These altered pain mechanisms may lead to the heightened perception of physical discomfort related to the gut function,[22] which in turn can lead to increased health-related behaviors (namely, seeking medical advice or taking sick leave).[23] A vicious cycle that is focused on illness-related stimuli and reactions may thus be incurred by increased symptom perception, focus on illness-related stimuli, and illness behavior.[23] Symptoms other than abdominal pain have been reported, but these symptoms are not as significant as abdominal pain in predicting the healthcare seeking behavior of IBS subjects.

Health-related quality of life. There is a strong evidence from previous studies that individuals with IBS have an impaired health-related quality of life (HRQOL) compared with unaffected individuals.[24,25] Studies have shown that patients with IBS are more likely to have a reduced quality of life that is manifested by a negative effect on sleep,[26] employment,[27] sexual functioning,[28] leisure, travel, and diet.[29,30] Greater interference of gastrointestinal (GI) symptoms with work and other activities,[3] as well as reduced IBS-specific quality of life,[31,32] have previously been identified as predictors of increased healthcare seeking and healthcare use among IBS subjects relative to healthy subjects. Interestingly, a study by Hahn et al [33] showed no relationship between patient-perceived severity of IBS and GI symptoms.However, the same study revealed that perceived IBS severity was clearly associated with quality of life. Patients who rated themselves as a very severely afflicted reported the lowest scores and had the poorest overall health indicators for all quality of life dimensions measured. Hahn et al[33] proposed that perceived IBS severity is defined by the limitations that the disease imposes, instead of by the actual symptoms. The limitations imposed by IBS are correlated with the patient's perception of his or her illness and the manner in which the patient conceptualizes the symptoms. This proposal leaves one with the impression that the effect of IBS on quality of life is unique and complex resulting from the ambiguous characteristics of the disorder, including its psychosomatic nature, and the patient's subjective GI symptoms. It is thus, entirely conceivable that the complex and psychosomatic nature of IBS can influence the healthcare seeking behavior of IBS patients.

Psychological comorbidity. It is widely recognized that IBS patients have a high prevalence of psychopathology, affecting 40-60% of afflicted individuals. This psychopathology displays itself as anxiety, depression, panic disorder, post-traumatic stress, and somatization disorder.[4] Numerous investigators have found that psychiatric symptoms are predictors of healthcare seeking in IBS patients.[15,34-40] However, other studies have found no association between psychological comorbidity and healthcare seeking behavior in these individuals.[3,17,41] These conflicting results make it difficult to draw a conclusion about this matter and raise a valid query on the role of methodological factors in the suppositions. For example, many studies suggesting a relationship between psychiatric comorbidity and healthcare seeking targeted out-patients and volunteers,[34-37,42] while studies failing to confirm this relationship were population-based.[11,16,43] Another relevant issue is the reliability of the psychiatric assessment tools that were used in the various studies. It is worth noting that the relationship between psychological comorbidity and IBS must be viewed in a broad context that is not confined to healthcare seeking behavior per se. Generally, depression and anxiety are known to be associated with higher healthcare costs in the population at large, despite the coexistence of IBS.[44,45] In IBS patients, however, psychopathological features generally influence symptom perception, healthcare seeking behavior, and quality of life.[3,4,40] Furthermore, psychological disturbances in IBS patients appear to be bone fide predictors of poor health outcomes of more days spent in bed, more frequent healthcare visits and surgeries, greater pain scores and psychological distress, and impaired daily function.[39,40] Given these findings, we can conclude that psychological comorbidity has a significant effect on healthcare seeking behavior in IBS patients, either directly or indirectly via multiple effects on different aspects of the disorder.

Gender differences. Numerous studies show a significant female predominance in hospital series of IBS patients in Western countries, but this was not the case in community series.[14,46] This finding has been attributed at least in part to gender differences in healthcare utilization, because women with IBS are more likely to seek healthcare for their symptoms compared with men.[2,40] Some authors have suggested that GI symptoms are augmented in female patients with IBS, which might be related to the effects of ovarian hormones on visceral hypersensitivity.[47] However, this

view is probably not sufficient to explain the possible gender differences between women and men.

In contrast, the predominance of female IBS patients in hospital series is sometimes nonexistent in developing countries.[48,49] For instance, male IBS patients are the majority in India and Sri Lanka, which suggest that differences in the healthcare seeking behavior of men versus women instead of disease prevalence are responsible for gender variations in these countries.[39,50] However, other investigations have found no influence of gender on healthcare seeking behavior in patients with IBS, regardless of the country.[17,41] Because the results regarding gender are neither consistent nor universal, a solid conclusion cannot be drawn on gender effect on healthcare seeking behavior. Moreover, this issue may be the subject to the influence of additional factors, such as sociocultural background.

The effect of culture. Sociocultural factors must be considered in regard to IBS, not only in terms of healthcare seeking behavior, but for almost all pertinent aspects of the disorder. For example, results from prevalence studies may be biased by the use of translated questionnaires, given that the description of IBS symptoms may have different meanings in different cultures and languages.[50,51] Moreover, earlier studies suggested that the effect of IBS on HRQOL varies in different cultural settings.[32,52] It has been found that IBS has a significant effect on quality of life in both of United Kingdom (UK) and the United States (US). But, the effect appeared to be greater in the UK than in the US.[32] Furthermore, individuals may interpret their health events that is partly dependent on their social and cultural backgrounds.[53] Based on several lines of evidence, Gwee et al[54] concluded that the perception of IBS symptoms by patients in Asia might be different from the perception of symptoms by patients in the West, and that sociocultural factors may therefore be more important determinants of healthcare seeking behavior than psychological factors. Generally, up to approximately 50% of individuals suffering from IBS will seek healthcare for their GI symptoms, according to the estimates in Western[55] and Asian populations.[56] Consultation rates were reported to be as high as 84% in Singapore, 57% in Hong Kong, and 55% in Taipei. These rates were generally higher than those reported in many Western countries.[13,14,57-60] Observation of different Asian countries reveals a trend for higher consultation rates in more affluent city-states. The highest rate of medical consultation for IBS was recorded in Singapore (84%), followed by Japan (59%), Hong Kong (57%), and Taipei (55%).[13,57-59] However, more modest consultation rates were reported in Malaysia (43%), Pakistan (39%), Bangladesh (35%), and India (34%) (**Table 1**).[50,61-63] In India, IBS consultation rates were associated with higher socioeconomic class.[50,61] Generally, healthcare-related behavior and beliefs, the socioeconomic environment, and religious proclivities[52] are all cultural factors of interest in regard to IBS. These factors play an important role in the patient's overall perception of his or her IBS symptoms and hence, healthcare seeking.

Illness behavior and patient beliefs. Illness behavior describes the various aspects of how patients perceive, react, and cope with their symptoms. The term "illness behavior" was originally introduced by Mechanic.[64] Illness behavior includes features such as healthcare seeking, requests for investigations, partaking in conventional or non-conventional treatment, taking sick leave, avoidance of physical activity, and expression of symptoms. These features are subject to multiple cultural, psychosocial, economic, demographic, and geographic factors that influence the reaction of an individual to illness. An individual who holds the belief that he or she is vulnerable to illness and disease and who then experiences IBS symptoms may regard the symptoms as confirmation of this vulnerability; thereby, reinforcing the negative illness belief.[65] A perception of vulnerability to illness may also increase treatment seeking behavior and fears of serious disease, reducing an individual's expectations for his or her own recovery.[65] Pilowsky[66,67] introduced the term "abnormal illness behavior" to summarize the behavioral aspects that might contribute to the maintenance of the disorder.

Interestingly, illness behavior shows only moderate association with illness severity. This implies that subjects with the same illness can exhibit very different illness behaviors, highlighting the fact that intra-individual and social factors play a major part in illness behavior.[68] Thus, a patient's attitude to his or her symptoms will determine what type of illness behavior he or she will adopt. However, it is possible that the illness attitudes of individuals with IBS actually develop as a response to the experience of living with the disorder and the (potentially frustrating) process of seeking medical treatment.[69] It must be noted that some IBS patients do not seek medical help for their disorder. Kolosky et al[3] found that the main self-reported reasons for non-consultation for IBS-related GI symptoms were that the subjects believed they could treat their GI issues themselves by taking over-the-counter medications or by altering their diet. Furthermore, these subjects were already knew the cause of their symptoms (diet, stress, viral infection, and so forth) and that consultation would be of little help.

Table 1 - Rates of medical consultation for irritable bowel syndrome (IBS) in some Asian countries.

Country	Reference	Percentage
Singapore	57	84
Japan	13	59
Hong Kong	59	57
Taipei	58	55
Malaysia	62	43
Pakistan	61	39
Bangladesh	63	35
India	50	34

On the other hand, excessive health anxiety represents one of the most prevalent maladaptive illness behaviors exhibited by IBS patients who are high healthcare seekers and users.[69,70] In this regard, studies have found that healthcare seeking among IBS subjects was associated with disproportionate concern on the medical meaning of IBS symptoms.[17,18,71] Many IBS patients express concerns or fears on their disease and believe that their symptoms represent a dangerous or life threatening condition, such as cancer. Such patients pay selective attention to abdominal sensations and may feel as if physicians do not answer their questions or provide appropriate support.[17,29] Indeed, fear of cancer is a major factor in predicting whether a person with IBS decides to consult a healthcare provider on his or her symptoms.[18] This fear is of great importance in terms of clinical implications for the healthcare of IBS patients. Thus, the ambiguity of IBS, the generally limited response to treatment, and the great impact on HRQOL necessitate that the patient's fears and concerns be thoroughly addressed.

Alternative healthcare use. Complementary and Alternative Medicine (CAM) is defined by the National Center for Complementary and Alternative Medicine (NCCAM) as a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine.[72] Based on low levels of satisfaction with conventional treatment[73-75] and their overall medical care,[76,77] in addition to the fact that no single available treatment is reliably effective for IBS,[78] it is not surprising that up to 50% of IBS patients turn to CAM therapies.[74,79] Ample evidence suggests that out-patients with IBS experience symptoms that are more severe than those of patients in primary care. As a result, IBS out-patients may consider alternative healthcare remedies more frequently than patients in primary care.[80] In out-patient studies, rates of CAM use for IBS ranged from 16-50%.[80-83] By contrast, a population-based study showed that 21% of IBS patients sought care from an alternative healthcare provider.[3] Complementary and Alternative Medicine users tend to be younger,[80,84] more frequently female,[3,80,84] and more highly educated than non-CAM users.[84] Moreover, CAM users report an enhanced level of IBS symptom severity,[84] as well as less satisfactory relief of bowel symptoms following treatment for their condition.[3,84] They also demonstrate a greater degree of bowel distention, a higher rate of depression and anxiety, higher somatization scores and expenditures on non-prescription drugs, and a lower quality of life.[84] In a randomized, double-blinded, placebo-controlled trial, Chinese herbal formulations were shown to be effective for the management of IBS.[85] However, there is considerable variation in alternative healthcare use in terms of its availability, efficacy, level of organization, and acceptance by patients, not to mention differences in the cultural and religious backgrounds of the patients themselves and the attitudes toward CAM that these backgrounds afford. Another relevant issue relating to IBS management is self-medication, which is a common practice worldwide in both developed and developing countries.[86,87] Self-medication may be even more common than the use of prescribed medication,[88] with prevalence rates ranging from 13-92%.[89] Furthermore, a population-based case control study showed that the use of over-the-counter (OTC) drugs is common among IBS patients.[90]

Healthcare systems. Irritable bowel syndrome is common worldwide, and major variances in healthcare systems around the globe are likely to influence the means by which individuals seek medical care. Healthcare system variables include the distribution of services and their organization, accessibility, and integration; patient satisfaction with the quality of their healthcare and the physician-patient relationship; availability and efficiency of a primary care system; the referral system for medical care; the availability of gastroenterology services, and so on. Interestingly, a population-based study published in 2003 revealed that only satisfaction with the physician-patient relationship discriminated between IBS subjects who sought continued consultation with a physician versus those who did not. This relationship provided an independent prediction of healthcare seeking behavior.[3]

Regarding the patient-physician relationship and as noted above, the majority of IBS patients report that they are insufficiently informed on their condition and that physicians do not provide an adequate explanation for their symptoms.[76] Irritable bowel syndrome patients often ask for explanations and educate them about their

disease, rather than for medication to cure or alleviate their symptoms.[29] Outside of the patient-physician relationship, Koloski et al[3] found that factors related to the healthcare system in and of itself did not appear to be important in explaining the healthcare seeking behavior and healthcare use of IBS patients. However, research in this area is scarce, and further investigation is required to more conclusively elucidate the impact of healthcare system factors on healthcare seeking for the treatment of IBS.

In conclusion, the heterogeneous clinical presentation of IBS and the magnitude of the inter-individual variability in symptom perception can result in highly erratic manifestations of this disorder. At the same time, healthcare seeking behavior is multidimensional and involves many intersecting factors. The end result of these complex interactions might drive an IBS patient to seek healthcare, or not. The lack of effective treatment options makes IBS a frustrating condition. Education represents a cornerstone in the overall care for IBS patients. It is mandatory for patients to understand the nature of IBS, how to react to it, what they should expect from IBS and IBS treatment, and how to live with it. Thus, an increase in patient education in regard to the illness and a better strategy to address patient concerns on symptoms are anticipated to improve the overall well-being of IBS sufferers, while concomitantly decreasing their healthcare seeking behaviors and healthcare costs.

References

1. Drossman DA, Corazziari E, Delvaux M, Spiller RC, Talley NJ, Grant Thompson W & Whitehead WE. Rome III: The Functional Gastrointestinal Disorders. 3rd ed. McLean (VA): Degnon Associates, Inc: 2006.
2. Kang JY. Systematic review: the influence of geography and ethnicity in irritable bowel syndrome. ***Aliment Pharmacol Ther*** 2005; 21: 663-676.
3. Koloski NA, Talley NJ, Huskic SS, Boyce PM. Predictors of conventional and alternative healthcare seeking for irritable bowel syndrome and functional dyspepsia. ***Aliment Pharmacol Ther*** 2003; 17: 841-851.
4. Levy RL, Olden KW, Naliboff BD, Bradley LA, Francisconi C, Drossman DA, et al. Psychosocial aspects of the functional gastrointestinal disorders. ***Gastroenterology*** 2006; 130: 1447-1458.
5. Halpert A, Drossman D. Biopsychosocial issues in irritable bowel syndrome. ***J Clin Gastroenterol*** 2005; 39: 665-669.
6. Sykes MA, Blanchard EB, Lackner J, Keefer L, Krasner S. Psychopathology in irritable bowel syndrome: support for a psychophysiological model. ***J Behav Med*** 2003; 26: 361-372.
7. Drossman DA, Camilleri M, Mayer EA, Whitehead WE. AGA technical review on irritable bowel syndrome. ***Gastroenterology*** 2002; 123: 2108-2131.
8. Gralnek IM. Healthcare utilization and economic issues in irritable bowel syndrome. ***Eur J Surg Suppl*** 1998; 583: 73-76.
9. Longstreth GF, Wilson A, Knight K, Wong J, Chiou CF, Barghout V, et al. Irritable bowel syndrome, healthcare use, and costs: a U.S. managed care perspective. ***Am J Gastroenterol*** 2003; 98: 600-607.
10. Kennedy TM, Jones RH. The epidemiology of hysterectomy and irritable bowel syndrome in a UK population. ***Int J Clin Pract*** 2000; 54: 647-650.
11. Koloski NA, Talley NJ, Boyce PM. Epidemiology and healthcare seeking in the functional GI disorders: a population-based study. ***Am J Gastroenterol*** 2002; 97: 2290-2299.
12. Levy RL, Von KM, Whitehead WE, Stang P, Saunders K, Jhingran P, et al. Costs of care for irritable bowel syndrome patients in a health maintenance organization. ***Am J Gastroenterol*** 2001; 96: 3122-3129.
13. Gwee KA, Lu CL, Ghoshal UC. Epidemiology of irritable bowel syndrome in Asia: something old, something new, something borrowed. ***J Gastroenterol Hepatol*** 2009; 24: 1601-1607.
14. Talley NJ, Zinsmeister AR, Van DC, Melton LJ, III. Epidemiology of colonic symptoms and the irritable bowel syndrome. ***Gastroenterology*** 1991; 101: 927-934.
15. Heaton KW, O'Donnell LJ, Braddon FE, Mountford RA, Hughes AO, Cripps PJ. Symptoms of irritable bowel syndrome in a British urban community: consulters and nonconsulters. ***Gastroenterology*** 1992; 102: 1962-1927.
16. Talley NJ, Boyce PM, Jones M. Predictors of healthcare seeking for irritable bowel syndrome: a population based study. ***Gut*** 1997; 41: 394-398.
17. Williams RE, Black CL, Kim HY, Andrews EB, Mangel AW, Buda JJ, et al. Determinants of healthcare-seeking behaviour among subjects with irritable bowel syndrome. ***Aliment Pharmacol Ther*** 2006; 23: 1667-1675.
18. Kettell J, Jones R, Lydeard S. Reasons for consultation in irritable bowel syndrome: symptoms and patient characteristics. ***Br J Gen Pract*** 1992; 42: 459-461.
19. Katiraei P, Bultron G. Need for a comprehensive medical approach to the neuro-immuno-gastroenterology of irritable bowel syndrome. ***World J Gastroenterol*** 2011; 17: 2791-2800.
20. Verne GN, Himes NC, Robinson ME, Gopinath KS, Briggs RW, Crosson B, et al. Central representation of visceral and cutaneous hypersensitivity in the irritable bowel syndrome. ***Pain*** 2003; 103: 99-110.
21. Price DD, Zhou Q, Moshiree B, Robinson ME, Verne GN. Peripheral and central contributions to hyperalgesia in irritable bowel syndrome. ***J Pain*** 2006; 7: 529-535.
22. Ringel Y, Sperber AD, Drossman DA. Irritable bowel syndrome. ***Annu Rev Med*** 2001;52:319-38.
23. Chapman S, Martin M. Attention to pain words in irritable bowel syndrome: increased orienting and speeded engagement. ***Br J Health Psychol*** 2011; 16 (Pt 1): 47-60.
24. El-Serag HB. Impact of irritable bowel syndrome: prevalence and effect on health-related quality of life. ***Rev Gastroenterol Disord*** 2003; 3 Suppl 2: S3-S11.
25. Dean BB, Aguilar D, Barghout V, Kahler KH, Frech F, Groves D, et al. Impairment in work productivity and health-related quality of life in patients with IBS. ***Am J Manag Care*** 2005; 11 (1 Suppl): S17-S26.
26. Sjodin I, Svedlund J. Psychological aspects of non-ulcer dyspepsia: a psychosomatic view focusing on a comparison between the irritable bowel syndrome and peptic ulcer disease. ***Scand J Gastroenterol Suppl*** 1985; 109: 51-58.

27. Whitehead WE, Winget C, Fedoravicius AS, Wooley S, Blackwell B. Learned illness behavior in patients with irritable bowel syndrome and peptic ulcer. ***Dig Dis Sci*** 1982; 27: 202-208.
28. Guthrie E, Creed FH, Whorwell PJ. Severe sexual dysfunction in women with the irritable bowel syndrome: comparison with inflammatory bowel disease and duodenal ulceration. ***Br Med J (Clin Res Ed)*** 1987; 295: 577-578.
29. Dancey CP, Backhouse S. Towards a better understanding of patients with irritable bowel syndrome. ***J Adv Nurs*** 1993; 18: 1443-1450.
30. Corney RH, Stanton R. Physical symptom severity, psychological and social dysfunction in a series of outpatients with irritable bowel syndrome. ***J Psychosom Res*** 1990; 34: 483-491.
31. Wilson S, Roberts L, Roalfe A, Bridge P, Singh S. Prevalence of irritable bowel syndrome: a community survey. ***Br J Gen Pract*** 2004; 54: 495-502.
32. Hahn BA, Yan S, Strassels S. Impact of irritable bowel syndrome on quality of life and resource use in the United States and United Kingdom. ***Digestion*** 1999; 60: 77-81.
33. Hahn BA, Kirchdoerfer LJ, Fullerton S, Mayer E. Patient-perceived severity of irritable bowel syndrome in relation to symptoms, health resource utilization and quality of life. ***Aliment Pharmacol Ther*** 1997; 11: 553-559.
34. Whitehead WE, Bosmajian L, Zonderman AB, Costa PT, Jr., Schuster MM. Symptoms of psychologic distress associated with irritable bowel syndrome. Comparison of community and medical clinic samples. ***Gastroenterology*** 1988; 95: 709-714.
35. Smith RC, Greenbaum DS, Vancouver JB, Henry RC, Reinhart MA, Greenbaum RB, et al. Psychosocial factors are associated with healthcare seeking rather than diagnosis in irritable bowel syndrome. ***Gastroenterology*** 1990; 98: 293-301.
36. Walker EA, Roy-Byrne PP, Katon WJ. Irritable bowel syndrome and psychiatric illness. ***Am J Psychiatry*** 1990; 147: 565-572.
37. Toner BB, Garfinkel PE, Jeejeebhoy KN. Psychological factors in irritable bowel syndrome. ***Can J Psychiatry*** 1990; 35: 158-161.
38. Drossman DA, Li Z, Andruzzi E, Temple RD, Talley NJ, Thompson WG, et al. U.S. householder survey of functional gastrointestinal disorders. Prevalence, sociodemography, and health impact. ***Dig Dis Sci*** 1993; 38: 1569-1580.
39. Birrer RB. Irritable bowel syndrome. ***Dis Mon*** 2002; 48: 105-143.
40. Jones R, Latinovic R, Charlton J, Gulliford M. Physical and psychological co-morbidity in irritable bowel syndrome: a matched cohort study using the General Practice Research Database. ***Aliment Pharmacol Ther*** 2006; 24: 879-886.
41. Hauser W, Musial F, Caspary WF, Stein J, Stallmach A. Predictors of irritable bowel-type symptoms and healthcare-seeking behavior among adults with celiac disease. ***Psychosom Med*** 2007; 69: 370-376.
42. Welch GW, Hillman LC, Pomare EW. Psychoneurotic symptomatology in the irritable bowel syndrome: a study of reporters and non-reporters. ***Br Med J (Clin Res Ed)*** 1985; 291: 1382-1384.
43. Talley NJ, Boyce P, Jones M. Dyspepsia and healthcare seeking in a community: How important are psychological factors? ***Dig Dis Sci*** 1998; 43: 1016-1022.
44. Cheng C. Seeking medical consultation: perceptual and behavioral characteristics distinguishing consulters and nonconsulters with functional dyspepsia. ***Psychosom Med*** 2000; 62: 844-852.
45. Hansen MS, Fink P, Frydenberg M, Oxhoj ML. Use of health services, mental illness, and self-rated disability and health in medical inpatients. ***Psychosom Med*** 2002; 64: 668-675.
46. Saito YA, Locke GR, Talley NJ, Zinsmeister AR, Fett SL, Melton LJ, III. A comparison of the Rome and Manning criteria for case identification in epidemiological investigations of irritable bowel syndrome. ***Am J Gastroenterol*** 2000; 95: 2816-2824.
47. Heitkemper MM, Chang L. Do fluctuations in ovarian hormones affect gastrointestinal symptoms in women with irritable bowel syndrome? ***Gend Med*** 2009; 6 Suppl 2: 152-1567.
48. Atoba MA. Irritable bowel syndrome in Nigerians. ***Dig Dis Sci*** 1988; 33: 414-416.
49. Mendis BL, Wijesiriwardena BC, Sheriff MH, Dharmadasa K. Irritable bowel syndrome. ***Ceylon Med J*** 1982; 27: 171-181.
50. Ghoshal UC, Abraham P, Bhatt C, Choudhuri G, Bhatia SJ, Shenoy KT, et al. Epidemiological and clinical profile of irritable bowel syndrome in India: report of the Indian Society of Gastroenterology Task Force. ***Indian J Gastroenterol*** 2008; 27: 22-28.
51. Bommelaer G, Poynard T, Le PC, Gaudin AF, Maurel F, Priol G, et al. Prevalence of irritable bowel syndrome (IBS) and variability of diagnostic criteria. ***Gastroenterol Clin Biol*** 2004; 28 (6-7 Pt 1): 554-561.
52. Faresjo A, Anastasiou F, Lionis C, Johansson S, Wallander MA, Faresjo T. Health-related quality of life of irritable bowel syndrome patients in different cultural settings. ***Health Qual Life Outcomes*** 2006; 4: 21.
53. Cho HS, Park JM, Lim CH, Cho YK, Lee IS, Kim SW, et al. Anxiety, depression and quality of life in patients with irritable bowel syndrome. ***Gut Liver*** 2011; 5: 29-36.
54. Gwee KA, Bak YT, Ghoshal UC, Gonlachanvit S, Lee OY, Fock KM, et al. Asian consensus on irritable bowel syndrome. ***J Gastroenterol Hepatol*** 2010; 25: 1189-1205.
55. Locke GR, III. The epidemiology of functional gastrointestinal disorders in North America. ***Gastroenterol Clin North Am*** 1996; 25: 1-19.
56. Gwee KA, Wee S, Wong ML, Png DJ. The prevalence, symptom characteristics, and impact of irritable bowel syndrome in an asian urban community. ***Am J Gastroenterol*** 2004; 99: 924-931.
57. Ho KY, Kang JY, Seow A. Prevalence of gastrointestinal symptoms in a multiracial Asian population, with particular reference to reflux-type symptoms. ***Am J Gastroenterol*** 1998; 93: 1816-1822.
58. Lu CL, Chen CY, Lang HC, Luo JC, Wang SS, Chang FY, et al. Current patterns of irritable bowel syndrome in Taiwan: the Rome II questionnaire on a Chinese population. ***Aliment Pharmacol Ther*** 2003; 18: 1159-1169.
59. Hu WH, Wong WM, Lam CL, Lam KF, Hui WM, Lai KC, et al. Anxiety but not depression determines healthcare-seeking behaviour in Chinese patients with dyspepsia and irritable bowel syndrome: a population-based study. ***Aliment Pharmacol Ther*** 2002; 16: 2081-208.
60. Jones R, Lydeard S. Irritable bowel syndrome in the general population. ***BMJ*** 1992; 304: 87-90.
61. Husain N, Chaudhry IB, Jafri F, Niaz SK, Tomenson B, Creed F. A population-based study of irritable bowel syndrome in a non-Western population. ***Neurogastroenterol Motil*** 2008; 20: 1022-1029.
62. Rajendra S, Alahuddin S. Prevalence of irritable bowel syndrome in a multi-ethnic Asian population. ***Aliment Pharmacol Ther*** 2004; 19: 704-706.

63. Masud MA, Hasan M, Khan AK. Irritable bowel syndrome in a rural community in Bangladesh: prevalence, symptoms pattern, and healthcare seeking behavior. ***Am J Gastroenterol*** 2001; 96: 1547-1552.
64. Mechanic D. Social psychologic factors affecting the presentation of bodily complaints. ***N Engl J Med*** 1972; 286: 1132-1139.
65. Crane C, Martin M. Perceived vulnerability to illness in individuals with irritable bowel syndrome. ***J Psychosom Res*** 2002; 53: 1115-1122.
66. Pilowsky I. Abnormal illness behaviour. ***Br J Med Psychol*** 1969; 42: 347-351.
67. Pilowsky I. Aspects of abnormal illness behavior. ***Indian J Psychiatry*** 1993; 35: 145-150.
68. Rief W, Martin A, Klaiberg A, Brahler E. Specific effects of depression, panic, and somatic symptoms on illness behavior. ***Psychosom Med*** 2005; 67: 596-601.
69. Salmon P, Peters S, Stanley I. Patients' perceptions of medical explanations for somatisation disorders: qualitative analysis. ***BMJ*** 1999; 318: 372-376.
70. Budavari AI, Olden KW. Psychosocial aspects of functional gastrointestinal disorders. ***Gastroenterol Clin North Am*** 2003; 32: 477-506.
71. Koloski NA, Talley NJ, Boyce PM. Does psychological distress modulate functional gastrointestinal symptoms and healthcare seeking? A prospective, community Cohort study. ***Am J Gastroenterol*** 2003; 98: 789-797.
72. National Center for Complementary and Alternative Medicine (NCCAM). (Accessed 22 January 2013). Available from URL: http://nccam.nih.gov/
73. Hunt RH, Dhaliwal S, Tougas G, Pedro C, Labbe JF, Paul H, et al. Prevalence, impact and attitudes toward lower gastrointestinal dysmotility and sensory symptoms, and their treatment in Canada: A descriptive study. ***Can J Gastroenterol*** 2007; 21: 31-37.
74. Hussain Z, Quigley EM. Systematic review: Complementary and alternative medicine in the irritable bowel syndrome. ***Aliment Pharmacol Ther*** 2006; 23: 465-471.
75. Whitehead WE, Levy RL, Von KM, Feld AD, Palsson OS, Turner M, et al. The usual medical care for irritable bowel syndrome. ***Aliment Pharmacol Ther*** 2004; 20: 1305-1315.
76. Dhaliwal SK, Hunt RH. Doctor-patient interaction for irritable bowel syndrome in primary care: a systematic perspective. ***Eur J Gastroenterol Hepatol*** 2004; 16: 1161-1166.
77. Harris LR, Roberts L. Treatments for irritable bowel syndrome: patients' attitudes and acceptability. ***BMC Complement Altern Med*** 2008; 8: 65.
78. Shen YH, Nahas R. Complementary and alternative medicine for treatment of irritable bowel syndrome. ***Can Fam Physician*** 2009; 55: 143-148.
79. Carmona-Sanchez R, Tostado-Fernandez FA. [Prevalence of use of alternative and complementary medicine in patients with irritable bowel syndrome, functional dyspepsia and gastroesophageal reflux disease]. ***Rev Gastroenterol Mex*** 2005; 70: 393-398.
80. Smart HL, Mayberry JF, Atkinson M. Alternative medicine consultations and remedies in patients with the irritable bowel syndrome. ***Gut*** 1986; 27: 826-828.
81. Donker GA, Foets M, Spreeuwenberg P. Patients with irritable bowel syndrome: health status and use of healthcare services. ***Br J Gen Pract*** 1999; 49: 787-792.
82. Verhoef MJ, Sutherland LR, Brkich L. Use of alternative medicine by patients attending a gastroenterology clinic. ***CMAJ*** 1990; 142: 121-125.
83. Kong SC, Hurlstone DP, Pocock CY, Walkington LA, Farquharson NR, Bramble MG, et al. The Incidence of self-prescribed oral complementary and alternative medicine use by patients with gastrointestinal diseases. ***J Clin Gastroenterol*** 2005; 39: 138-141.
84. van Tilburg MA, Palsson OS, Levy RL, Feld AD, Turner MJ, Drossman DA, et al. Complementary and alternative medicine use and cost in functional bowel disorders: a six month prospective study in a large HMO. ***BMC Complement Altern Med*** 2008; 8: 46.
85. Bensoussan A, Talley NJ, Hing M, Menzies R, Guo A, Ngu M. Treatment of irritable bowel syndrome with Chinese herbal medicine: a randomized controlled trial. ***JAMA*** 1998; 280: 1585-1589.
86. Figueiras A, Caamano F, Gestal-Otero JJ. Sociodemographic factors related to self-medication in Spain. ***Eur J Epidemiol*** 2000; 16: 19-26.
87. Fuentes AK, Villa ZL. Analysis and quantification of self-medication patterns of customers in community pharmacies in southern Chile. ***Pharm World Sci*** 2008; 30: 863-868.
88. Lam CL, Catarivas MG, Munro C, Lauder IJ. Self medication among Hong Kong Chinese. ***Soc Sci Med*** 1994; 39: 1641-1647.
89. Alghanim SA. Self-medication practice among patients in a public healthcare system. ***East Mediterr Health J*** 2011; 17: 409-416.
90. Faresjo A, Grodzinsky E, Johansson S, Wallander MA, Faresjo T, Timpka T. Self-reported use of pharmaceuticals among patients with irritable bowel syndrome in primary care. ***J Manag Care Pharm*** 2008; 14: 870-877.