Review Article

Impact of Multidisciplinary Teams on Quality of Life in Gastrointestinal Cancer Patient Care: A Comprehensive Review

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Abstract: Multidisciplinary teams (MDTs) have shown great importance in help to diagnose the patient in a timely manner, patient tailored treatment plan, better symptom management, greater recovery and a better palliative care. MDTs are currently being extensively researched for integration into the management of GI cancers. GI cancers represent a multifaceted disease with a high morbidity and mortality rate. These cancers typically present at later stages of disease making them exceedingly challenging to treat and as a result significantly impacting patient's QOL. The purpose of this review is to describe the MDT's role in making management recommendations for GI cancers and to outline their impact on patients' QOL in detail. The review discusses the different types of GI cancers, the accurate diagnosis, as well as management of GI cancers with the role of collaborative teams in developing the most effective treatment plan for these patients.

MDT is a useful tool in GI cancers that facilitates the provision of an appropriate diagnosis and help make suitable management recommendations based on a team approach in this sub-specialty and is anticipated to address the growing global cancer burden. Future research should focus on factors vital to establishing a team approach in GI oncology and identify the barriers to formation of a sustainable MDT ecosystem.

Keywords: Narrative review, Multidisciplinary teams, GI cancers, Patient care, Quality of life.

INTRODUCTION

GI cancers significantly contribute to the global health burden, and the rise in diagnosed cases has raised questions regarding the gaps in preventing and managing these cancers. GI cancers are one of the leading causes of cancer-related mortalities in the world, making up nearly 35% of them. Approximately 5 million new cases were reported in 2020 [1]. Research predicts that in the next 20 years, the number of new cases and mortality from GI cancers will go up by 58% and 73%, respectively [2]. Pakistan is no exception in dealing with the increasing number of reported GI cancer cases day by day. GI cancers account for about 13% of all the cases of cancer in Pakistan, with approximately 35,000 new cases reported annually [3]. With the country carrying an immense burden of hepatitis B and C cases, co-infection with GI cancer has contributed to an increased number of mortalities [4]. Annually, there are 15,000 GI cancer related deaths in Pakistan. These statistics are quite concerning and require the world and Pakistan to act swiftly and propose strategies for improved cancer management.

The purpose of this review is to emphasize and investigate how the engagement of MDTs has improved the management and QoL of GI cancer patients. MDTs can improve patient care, oncological outcomes, treatment recommendations, managing side effects, and enhance psychological wellbeing of GI cancer patients, thus helping the caregiver provide a more holistic care of GI cancer patients [5].

These cancers have multiple risk factors that include age, genetics, chronic alcohol consumption, smoking, and a high-fat diet [6]. Advanced age is a significant risk factor, with most cases being diagnosed in patients over 50 years [7]. APC gene mutations for colorectal and BRCA2 mutations for pancreatic cancer predispose individuals to develop these cancers [8]. In addition, most GI cancers have a risk determined by geographic locations and socioeconomic status. Gastric cancers are common in East Asia with higher incidences associated with diet and increased *H. pylori* infections and colorectal cancer is common in the Western world [9]. These factors exemplify the complicated pathophysiology of GI cancers and thus warrants a customized approach to management of different populations.

QUALITY OF LIFE IN GI CANCER CARE

A definition of health related quality of life (HR-QoL) is a multidimensional assessment of how treatment and disease affect patients' well-being and functional outcomes in life [10], which

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is measured with validated instruments, core cancer QoL questionnaire C30 (QLQ C30) developed with EORTC in conjunction with site specific tools [11]. As with other cancer types, some cancers have additional modules available with a pattern specific for symptoms relevant to their type, like for stomach cancers EORTC QLQ-STO22 [12]. These toolkits are constantly being converted into multiple native languages for the QoL assessment with the values as applicable to the vast social and economical values of the population. In a meta-analysis of 30 RCTs on the use of EORTC measure to quantify patients' QoL who had survived due to different types of cancers, some QoL factors like appetite, pain threshold, and physical functioning were found to affect cancer patients overall survival. Acquisition of the additional 6% increase of the accuracy of survival outcome assessment was also realized when factoring age and clinical disease stage, as QoL assessments provide additional information as to how patients are responding to treatment [13].

Effect of Treatment Modalities on QoL

Survival outcome and QoL should both be considered when treating patients with GI cancer. Although there has been some improvement in survival outcomes due to advanced treatment modalities over the last decade, the overall prognosis remains poor because QoL is highly dependent on the treatment type [14]. Self-reported QoL is an independent predictor of treatment response and survival outcome in a retrospective analysis of patients with advanced GI cancer receiving first-line chemotherapy [15]. Furthermore, another clinical trial reported a positive survival outcome, alleviation of symptoms, and overall improved performance status in patients undergoing a second-line chemotherapy regimen. Chemotherapy has been seen to improve symptoms related to GI cancers [16]. In 2018, a systemic chemotherapy regimen in a palliative setting was found to not only extend the survival but also improve the QoL, leading to the overarching goal of enhancing the patients well-being [17].

A randomized NORDIC9 study found that reducing the dose in a combination chemotherapy regimen resulted in longer progression-free survival, overall survival, and fewer toxicities when compared to full-dose chemotherapy, when compared to monotherapy in full dose, there was a trend towards improved QoL, physical functioning, and fewer episodes of symptoms [18]. These trends in treatment regimens and patient QoL should be considered while determining the appropriate treatment plan, intensity, and duration for chemotherapeutic agents during interdisciplinary approaches [19].

There is general controversy regarding the effect of early postoperative complications on patients' HR-QoL. One study has reported that early esophagectomy postoperative complications have a detrimental effect on HR-QoL. It has been discovered that intrathoracic or intra-abdominal abscess, bleeding, sepsis, pneumonia, pulmonary embolism, renal failure, respiratory failure, stroke, and myocardial infarction are independent predictors of poor HQ-QoL [20]. Nonetheless, a recently conducted cohort study discovered that there was no correlation between HR-QoL and postoperative complications following esophagectomy [21]. In order to reduce the likelihood of postoperative complications, it is necessary to choose appropriate surgical techniques during MDTs [22]. Physical symptoms like constipation, fatigue, and loss of appetite, as well as physical, social, and cognitive functioning, were found to be associated with cancer-specific survival in another study assessing the role of surgery as a curative or palliative measure in gastro-oesophageal cancer [23]. Patients are more likely to prefer treatments with fewer side effects and no hospital stay, even when such options offers no survival benefit compared to the standardized care [24].

Effect of Symptoms on QoL

The QoL of a patient receiving treatment for GI is significantly affected by symptoms such as weight loss, heartburn, dysphagia, reflux, early satiety, and dumping syndrome. Because of their shortened life expectancy, this effect is more noticeable in patients receiving palliative care for GI cancer [25].

Dumping syndrome, categorized as late and early, affects approximately 40% of GI cancer patients. Early dumping syndrome is defined by constellation of vasomotor symptoms such as fatigue, flushes, a desire to lie down after meals, perspiration, palpitations, syncope, tachycardia, hypotension, which are in addition to many GI symptoms such as nausea, diarrhea, abdominal cramps, and bloating caused by the rapid passage of food to the small intestine after gastrectomy. In contrast, late dumping syndrome is defined as hypoglycemia occurring within 1-3 hours of a meal. It often causes patients to avoid eating, thus accelerating weight loss [26].

Weight loss has the potential to impair QoL in GI cancer patients, particularly following gastrectomy. According to the results of a three-year survival study, a higher level of ghrelin—a key cause of weight loss that is released from A-like cells in the stomach fundus and stimulates the hypothalamus's appetite centre—is linked to a lower chance of surviving [27]. Moreover, impaired delivery of pancreatic enzymes as a result of anatomical changes after gastrectomy has been linked to malnutrition [28-30]. Therefore, patients should receive nutritional support from a qualified nutritionist during a multidisciplinary approach. The approach includes assessing the patient's nutritional status prior to any medical or surgical treatment; developing a comprehensive nutrition strategy before treatment begins; and, to avoid surgical complications such as infections, working on immunonutrition prior to the procedure [25, 29, 31].

QoL in Lower-Middle-Income Countries

According to one study, the lower-middle-income country's patients with colorectal cancer had an overall mean QoL score of 69.08. This was higher than the global QoL score of 65.48 measured in all GI cancers at the same center. It was seen that patients with upper GI cancers are typically diagnosed in late stages, which resulting in less curative treatment approaches than those used for colorectal cancers [32, 33]. Racial, ethnical, and

socioeconomic disparity, along with limited access to healthcare, were significant social determinants of poor HR-QoL. Absence of physical activity has been noted to be the most significant behavioral factor associated with poor HR-QoL, followed by heavy alcohol consumption and continued smoking [34].

Psychosocial Parameters and QoL

It was discovered that low levels of physical functioning, role functioning, social functioning, and global QoL score were linked to reduced survival rates of roughly 45%, 42%, 67%, and 81%, respectively. It was also noted that a 10-point increase in physical functioning reduced the risk of death in patients with upper GI cancer. Furthermore, a 10-point increase in social functioning was seen to significantly predict lower GI cancer survival outcome, while a 10-point increase in global QoL and physical functioning was found to reduce the risk of death by 13%. All of these effects were more pronounced in upper GI cancer patients [35]. Early and late individual patient data metaanalysis revealed that GI symptoms had a negative impact on HR-QoL. Patients' survival can be predicted based on baseline QoL parameters such as pain, dyspnoea, loss of appetite, and physical function [36].

It has also been noted that patients receiving surgery for GI cancers scored lower on the prevalence of anxiety (20%) and depression (12%), respectively, than patients receiving no treatment, or (29%) and (20%), respectively. This may be due to improved functionality during treatment and the support of family and friends. Regular communication with medical professionals may also improve the patients' social wellbeing [37].

MDT APPROACH IN IMPROVING QOL AND SURVIVAL

GI MDTs have been specifically designed to improve diagnostic accuracy, rectify misdiagnosis, improve preoperative staging and postoperative mortality, and ultimately help improve overall survival (OS) and QoL of patients [38, 39]. In addition, preventing psycho-social burden by improving patient's QoL is of utmost importance in the treatment of gastric cancer patients [40]. While most studies prove MDT groups to display positive clinical outcomes, their role in improving the QoL still remains to be seen. A recent Pakistani study reported global QoL to be negatively impacted by ongoing treatment and positively associated with a history of surgery [32]. Estimation of these scores paves the way for improved QoL and enhanced treatment plans, leading to better patient outcomes. A standardized approach for discussion of cases from diagnosis, investigations, and treatment plans to QoL, prognosis, and overall survival is therefore becoming increasingly important [38]. Regardless of the format, MDTs are focused on addressing the numerous challenges that may arise due to tumor resectability, metastasis to other organs and therapeutic and surgical complications across different patient demographics. MDT approach influences endoscopic, pathological and radiological assessments. This leads to a more accurate cancer staging and coordinated treatment planning that considers the patient's QoL. Some studies have even demonstrated that MDT-based interventions not only maintained but improved the QoL of patients with advanced cancer [41].

GI cancer registries, which compare pre-MDT and post-MDT cohorts, illustrate how changes in diagnosis after MDT involvement are not uncommon. MDT plays a crucial role in guiding the accurate diagnosis and informing treatment recommendations in GI cancer. Ye *et al.* demonstrated that patients managed through MDTs had a lower incidence of liver metastasis. [42]. Lowes *et al.* expressed their concern regarding the overall low utilisation of GI MDTs despite their proven effectiveness [39]. In addition to their role in pre-treatment decisions, a subset of patients with metastatic or unresectable disease also benefit from MDTs, as they facilitate clinical trial eligibility and offer patients and providers access to resources for symptom palliation, including radiation therapy and stent or feeding tube placement. This is especially important, as many patients enter the clinic, unfortunately, with advanced disease, and preserving the remaining QoL is their only option [43].

CHALLENGES AND FUTURE DIRECTIONS IN MDT

Despite being the standard for cancer care, MDT establishments face numerous obstacles, including monetary, physical, and social constraints. These barriers appear magnified for patients residing in Lower-Middle-Income-Countries (LMICs) like Pakistan, where, in addition to financial constraints, the role of MTBs is impeded by lack of awareness, poor governance and low acceptability [44, 45]. These set-backs can be attributed to cultural norms like single-physician-management, hierarchical medical decision making and limited professional availability for timely collaboration [46]. The vast number of cases in comparison to limited physician availability demands a streamlined system with defined interventions and protocols so that more complex cases are targeted and selected for multidisciplinary review, by implementing simple and available tools like MeDiC (Measure of case-Discussion Complexity) [47, 48].

CONCLUSION

The nature of MDT demands dynamic changes with the times to improve convenience, accessibility and accuracy. Artificial intelligence subfields such as deep learning and machine learning have transformed medical research, diagnosis, and treatment. The integration of artificial intelligence and radiomics in oncology provides another avenue for enhancing the decision-making process of MTBs, which can further the improvement of our patients' QoL. Most current research on QoL in GI cancer patients' care focuses on short- or intermediate-term results, and studies examining long-term outcomes are necessary, particularly following complex treatment modalities. With an increasing number of cancer survivors, particularly those with colorectal cancers, there is a need to provide additional support to patients suffering from the effects of ongoing treatments, such as sexual dysfunction, permanent stoma, bowel and urinary problems, as well as other psychosocial issues [49]. Further, to overcome the

physical barriers to holding meetings, Virtual Multidisciplinary Tumor Boards (VMTBs) offer an alternative platform for multidisciplinary consensus [45]. This model could be beneficial in obtaining more specialized professionals on board, particularly in an LMIC. It is becoming increasingly necessary to explore the impact of MDT decisions on the QoL of cancer patients and to also consider the improvement of patients' lives alongside survival outcomes during these interdisciplinary collaborations. However, there is a paucity of research on patient-centered outcomes from VMBTs, such as psychosocial or QoL elements. With a patient-centered approach in mind, additional research should be conducted on the contributions of auxiliary professionals, such as dietitians, palliative care managers, and mental health specialists, whose close link to improving patient-centered outcomes paves the way for better, more comprehensive cancer care.

ABBREVIATIONS

GI Cancer: Gastrointestinal Cancer.

HR-QoL: Health Related Quality of Life.

LMIC: Low and Middle Income Countries.

MTB: Multidisciplinary Tumor Board.

OS: Overall Survival.

QoL: Quality of Life.

VMTBs: Virtual Multidisciplinary Tumor Boards.

AUTHORS' CONTRIBUTION

Arisha Issa, Alisha Ahmed and **Maryam Mohsin**: Conceptualization, Study design, Methodology, Data analysis and interpretation, Writing draft, Critical review and revision of the manuscript.

Urooba Jawwad: Writing draft, Critical review and revision of the manuscript, and Final approval, final proof to be published.

Fatima Shaukat and **Tayyab Siddiqui**: Final approval, final proof to be published.

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REFERENCES

[1] Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, *et al.* Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2024; 74(3): 229-63.

[2] Kayali S, Marabotto E, Giannini E. Gastrointestinal tract cancers, an increasing burden of the modern era: Epidemiology and prevention. Cancers 2023; 15(18): 4634.

[3] Bhurgri Y, Bhurgri A, Hassan SH, Zaidi SH, Rahim A, Sankaranarayanan R, *et al.* Cancer incidence in Karachi, Pakistan: First results from Karachi Cancer Registry. Int J Cancer 2000; 85(3): 325-9.

[4] Umar M, Bushra H tul, Ahmad M, Data A, Ahmad M, Khurram M, *et al.* Hepatitis C in Pakistan: A review of available data. Hepat Mon 2010; 10(3): 205-14.

[5] MacDermid E, Hooton G, MacDonald M, McKay G, Grose D, Mohammed N, *et al.* Improving patient survival with the colorectal cancer multi-disciplinary team. Colorectal Dis 2009; 11(3): 291-5.

[6] World Cancer Research Fund International. Summary of strong evidence on diet, nutrition, physical activity and the prevention of cancer. Continuous Update Project 2018; Available at: https://www.wcrf.org/wp-content/uploads/2024/10/CUP-Strong-Evidence-Matrix.pdf

[7] American Cancer Society. Stomach (Gastric) Cancer Key Statistics. 2024; Available from: https://www.cancer.org/cancer/types/stomach-cancer/about/key-statistics.html#:~:text=Stomach%20cancer%20mostly%20affects%20older,(about%201%20in%20155). [cited 2024 Sep 30].

[8] National Cancer Institute. BRCA Gene Changes: Cancer Risk and Genetic Testing Fact Sheet – NCI. 2024; Available at: https://www.cancer.gov/about-cancer/causes-prevention/genetics/brca-fact-sheet. [cited 2024 Sep 30].

[9] Correa P, Piazuelo MB. Helicobacter pylori infection and gastric adenocarcinoma. US Gastroenterol Hepatol Rev 2011; 7(1): 59-64.

[10] Sitlinger A, Zafar SY. Health-Related Quality of Life: The impact on morbidity and mortality. Surg Oncol Clin N Am 2018; 27(4): 675-84.

[11] Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, *et al.* The European organization for research and treatment of cancer QLQ-C30: A quality-of-life instrument for use in international clinical trials in oncology. J Natl Cancer Inst 1993; 85(5): 365-76.

[12] Schwarz R, Hinz A. Reference data for the quality of life questionnaire EORTC QLQ-C30 in the general German population. Eur J Cancer 2001; 37(11): 1345-51.

[13] Zang Y, Qiu Y, Sun Y, Fan Y. Baseline functioning scales of EORTC QLQ-C30 predict overall survival in patients with gastrointestinal cancer: A meta-analysis. Qual Life Res 2024; 33(6): 1455-68.

[14] Numico G, Longo V, Courthod G, Silvestris N. Cancer survivorship: Long-term side-effects of anticancer treatments of gastrointestinal cancer. Curr Opin Oncol 2015; 27(4): 351-7.

[15] Fournier E, Jooste V, Woronoff AS, Quipourt V, Bouvier AM, Mercier M. Health-related quality of life is a prognostic factor for survival in older patients after colorectal cancer diagnosis: A population-based study. Digest Liver Dis 2016; 48(1): 87-93.

[16] van Amelsfoort RM, Walraven I, Kieffer J, Jansen EP, Cats A, van Grieken NC, *et al.* Quality of life is associated with survival in patients with gastric cancer: Results from the randomized CRITICS trial. J Natl Compr CancNetw 2022; 20(3): 261-7.

[17] Tantoy IY, Cooper BA, Dhruva A, Cataldo J, Paul SM, Conley YP, *et al.* Quality of life of patients with gastrointestinal cancers undergoing chemotherapy. Qual Life Res 2018; 27: 1865-76.

[18] Liposits G. Quality of life, prognostic and predictive factors in vulnerable older patients with metastatic colorectal cancer receiving palliative chemotherapy: The randomized NORDIC9-study. Cancers (Basel) 2021; 13(11): 2604.

[19] van Seventer EE, Fish MG, Fosbenner K, Kanter K, Mojtahed A, Allen JN, *et al.* Associations of baseline patient-reported outcomes with treatment outcomes in advanced gastrointestinal cancer. Cancer 2021; 127(4): 619-27.

[20] Derogar M, Orsini N, Sadr-Azodi O, Lagergren P. Influence of major postoperative complications on health-related quality of life among long-term survivors of esophageal cancer surgery. J Clin Oncol 2012; 30(14): 1615-9.

[21] Jezerskyte E, van Berge Henegouwen MI, van Laarhoven HW, van Kleef JJ, Eshuis WJ, Heisterkamp J, *et al.* Postoperative complications and long-term quality of life after multimodality treatment for esophageal cancer: An analysis of the prospective observational cohort study of esophageal-gastric cancer patients (POCOP). Ann Surg Oncol 2021; 28(12): 7259-76.

[22] Toh Y, Morita M, Yamamoto M, Nakashima Y, Sugiyama M, Uehara H, *et al.* Health-related quality of life after esophagectomy in patients with esophageal cancer. Esophagus 2022; 19(1): 47-56.

[23] Tae CH, Shim KN, Kim BW, Kim JH, Hong SJ, Baik GH, *et al.* Comparison of subjective quality of life after endoscopic submucosal resection or surgery for early gastric cancer. Sci Rep 2020; 10(1): 6680.

[24] Hofheinz R, Clouth J, Borchardt-Wagner J, Wagner U, Weidling E, Jen MH, *et al.* Patient preferences for palliative treatment of locally advanced or metastatic gastric cancer and adenocarcinoma of the gastroesophageal junction: A choice-based conjoint analysis study from Germany. BMC Cancer 2016; 16(1): 937.

[25] Misawa K, Fujiwara M, Ando M, Ito S, Mochizuki Y, Ito Y, *et al.* Long-term quality of life after laparoscopic distal gastrectomy for early gastric cancer: Results of a prospective multi-institutional-comparative trial. Gastric Cancer 2015; 18(2): 417-25.

[26] Scarpellini E, Arts J, Karamanolis G, Laurenius A, Siquini W, Suzuki H, *et al.* International consensus on the diagnosis and management of dumping syndrome. Nat Rev Endocrinol 2020; 16(8): 448-66.

[27] Soleyman-Jahi S, Abdirad A, Fallah AA, Ghasemi S, Sadeghi F, Heidari R, *et al.* Prognostic significance of preoperative and postoperative plasma levels of ghrelin in gastric cancer: 3-year survival study. Cl Transl Gastroenterol 2017; 8(1): e209.

[28] Takachi K, Doki Y, Ishikawa O, Miyashiro I, Sasaki Y, Ohigashi H, *et al.* Postoperative ghrelin levels and delayed recovery from body weight loss after distal or total gastrectomy. J Surg Res 2006; 130(1): 1-7.

[29] Takiguchi S, Takata A, Murakami K, Miyazaki Y, Yanagimoto Y, Kurokawa Y, *et al.* Clinical application of ghrelin administration for gastric cancer patients undergoing gastrectomy. Gastric Cancer 2014; 17(2): 200-5.

[30] Koizumi M, Hosoya Y, Dezaki K, Yada T, Hosoda H, Kangawa K, *et al.* Serum ghrelin levels partially recover with the recovery of appetite and food intake after total gastrectomy. Surg Today 2014; 44(11): 2131-7.

[31] Turpin A, Jésus P. Nutritional care in gastrointestinal oncology. Guidelines synthesis. Hépato-Gastro Oncol Dig 2024; 31(S3): 15-21.

[32] Siddiqui MTH, Khan MR, Jawaid A, Shaukat F, Zahid N. Evaluation of quality of life of gastrointestinal cancer patients presenting to a tertiary care hospital in Pakistan. Ecancermedicalscience 2023; 17: 1527.

[33] Siddiqui MT, Shaukat F, Khan MR, Zahid N, Arbani S. Quality of life of colorectal cancer patients and its association with anxiety

and depression: Cross-sectional study at a tertiary care hospital in low middle income country. J Surg Res 2024; 301: 336-44.

[34] Han CJ, Tounkara F, Kalady M, Noonan AM, Burse NR, Paskett ED, *et al.* Risk factors of healthrelated quality of life among gastrointestinal cancer survivors in the US: With a focus on social and behavioral determinants of health (SBDH). Int J Environ Res Public Health 2023; 20(17): 6676.

[35] Quinten C, Coens C, Mauer M, Comte S, Sprangers MA, Cleeland C, *et al.* Baseline quality of life as a prognostic indicator of survival: A meta-analysis of individual patient data from EORTC clinical trials. Lancet Oncol 2009; 10(9): 865-71.

[36] Efficace F, Collins GS, Cottone F, Giesinger JM, Sommer K, Anota A, *et al.* Patient-reported outcomes as independent prognostic factors for survival in oncology: Systematic review and meta-analysis. Value Health J Int Soc Pharmacoeconomics Outcomes Res 2021; 24(2): 250-67.

[37] Marco DJT, White VM. The impact of cancer type, treatment, and distress on health-related quality of life: Cross-sectional findings from a study of Australian cancer patients. Support Care Cancer 2019; 27(9): 3421-9.

[38] Meguid C, Ryan CE, Edil BH, Schulick RD, Gajdos C, Boniface M, *et al.* Establishing a framework for building multidisciplinary programs. J Multidiscip Healthc 2015; 8: 519-26.

[39] Lowes M, Kleiss M, Lueck R, Detken S, Koenig A, Nietert M, *et al.* The utilization of multidisciplinary tumor boards (MDT) in clinical routine: Results of a health care research study focusing on patients with metastasized colorectal cancer. Int J Colorectal Dis 2017; 32(10): 1463-9.

[40] Rupp SK, Stengel A. Influencing factors and effects of treatment on quality of life in patients with gastric cancer—a systematic review. Front Psychiatry 2021; 12: 656929.

[41] Keller DS, Berho M, Perez RO, Wexner SD, Chand M. The multidisciplinary management of rectal cancer. Nat Rev Gastroenterol Hepatol 2020; 17(7): 414-29.

[42] Ye YJ, Shen ZL, Sun XT, Wang ZF, Shen DH, Liu HJ, *et al.* Impact of multidisciplinary team working on the management of colorectal cancer. Chin Med J (Engl) 2012; 125(2): 172-7.

[43] Boniface MM, Wani SB, Schefter TE, Koo PJ, Meguid C, Leong S, *et al.* Multidisciplinary management for esophageal and gastric cancer. Cancer Manag Res 2016; 8: 39-44.

[44] Shakir M, Khowaja AH, Shariq SF, Irshad HA, Tahir I, Rae AI, *et al.* Neurosurgical care of brain tumors in low-and middle-income countries: A scoping review of the workforce challenges. World Neurosurg 2024; 189: 387-98.e3.

[45] Abdul Rehman M, Jawwad U, Tahir E, Naeem U, Qamar M, Hussain N, *et al.* Mobilizing students to effect multidisciplinary cancer care: The tumor board establishment facilitation forum. Lancet Reg Health Southeast Asia 2024; 27: 100441.

[46] Blackwood O, Deb R. Multidisciplinary team approach in breast cancer care: Benefits and challenges. Indian J Pathol Microbiol 2020; 63(Suppl 1): S105-12.

[47] Shao J, Rodrigues M, Corter AL, Baxter NN. Multidisciplinary care of breast cancer patients: A scoping review of multidisciplinary styles, processes, and outcomes. Curr Oncol 2019; 26(3): e385.

[48] Soukup T, Morbi A, Lamb BW, Gandamihardja TA, Hogben K, Noyes K, *et al.* A measure of case complexity for streamlining workflow in multidisciplinary tumor boards: Mixed methods development and early validation of the MeDiC tool. Cancer Med 2020; 9(14): 5143-54.

[49] Beets G, Sebag-Montefiore D, Andritsch E, Arnold D, Beishon M, Crul M, *et al.* ECCO essential requirements for quality cancer care: Colorectal cancer. A critical review. Crit Rev Oncol Hematol 2017; 110: 81-93.

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