

(Table 1) contd....

S.No.	Study	Type of Study	Location	Sample	Condition	Diagnosis	Evaluation Tools	Main Results
39	Burlacu A <i>et al.</i> , 2019 [45]	Systematic Review	America, Europe, Philippines, Thailand, Malaysia, Taiwan	K=50 N= 9265	Dialysis patients vs. use of R/S assessment in dialysis patients	-Hemodialysis and peritoneal dialysis	-WHOQOL-brief -WHOQOL-SRPB -HRQoL-Ferrans and Powers QLI Dialysis Version-III - KDQOL-SF -WHOQOL -SF-36 -SWLS -EQ-5D-3L	In this review, nineteen studies (comprising 9 RCTs and 10 single-arm studies) explored the impact of exercise on enhancing Quality of Life (QOL) among individuals with advanced cancer. Among these studies, 10 (52.6%) reported an improvement in QOL, while 9 (47.4%) found no significant change; notably, the positive studies had larger participant numbers. Additionally, this review underscores the strong correlation between religiosity and enhanced QOL. Plausible explanations for this notable finding include reduced symptoms of depression, a decreased risk of suicide, positive associations with hope and spirituality, and potential links to improved mental health.
40	Lu F <i>et al.</i> , 2019 [40]	Meta-analysis and Systematic Review	USA India Mexico Canada	K=6 N=437(60 for the study that reported QoL data)	Patients with cancer (control group not specified)	-Pancreatic cancer -Abdominal cancer -Abdominal pain -Celiac plexus neurolysis	N/A	Only one study provided Quality of Life (QoL) data, revealing no significant difference between the two investigated groups at 3 months.

The potential risk of bias was assessed with the AMSTAR scale [3, 4]. For this study, the articles were evaluated according to the following rule: any “yes” was scored 1; instances of “no” or “cannot say” were scored 0. The articles that received a global score of 1 to 6, 7 to 9

and 10 to 11 were evaluated, respectively, as “Unacceptable,” “Acceptable,” and “High Quality” articles. Articles that received a score of 0 were rated as “Rejected” and consequently excluded from the search, just like articles that scored 1 to 6 (Unacceptable) (Table 2).

Table 2. Quality evaluation of the studies. The evaluation was done according to the assessment of multiple systematic reviews (AMSTAR) scale.

S.NO	Study	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	1.11	2.1
1	1.Salakari MR <i>et al.</i> , 2015 [5]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	+
2	2.Kavalieratos <i>et al.</i> , 2016 [28]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
3	3.McCaffrey N <i>et al.</i> , 2016 [6]	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Cs	No	Yes	+
4	4. Lau CH <i>et al.</i> , 2016 [29]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
5	5. Maharaj S <i>et al.</i> , 2016 [7]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Cs	No	+
6	6. Health Quality Ontario. 2016 [8]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	+
7	7. Hayley Barnes <i>et al.</i> , 2016 [9]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	Yes	++
8	8. Waldemar Siemens <i>et al.</i> , 2016 [10]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Cs	Yes	++
9	9. Kun Hyung Kim <i>et al.</i> , 2016 [11]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
10	10. Guerrero-Torrelles M <i>et al.</i> , 2017 [30]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	+
11	11. Gaertner J <i>et al.</i> , 2017 [31]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
12	12. Mochamat <i>et al.</i> , 2017 [12]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	No	Yes	++
13	13. Schuurhuizen CSEW <i>et al.</i> , 2017 [13]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	No	Yes	+

(Table 2) contd....

S.NO	Study	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	1.11	2.1
14	14. Diop MS et al., 2017 [32]	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	+
15	15. Wang CW et al., 2017 [33]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
16	16. Vincent T Janmaat et al., 2017 [14]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	Yes	++
17	17. Kassianos AP et al., 2017 [34]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
18	18. Latorraca COC et al., 2017 [25]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	No	Yes	+
19	19. Dittus KL et al., 2017 [16]	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	+
20	20. Grossman CH et al., 2018 [17]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	No	Yes	+
21	21. Van Roij J et al., 2018 [18]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	No	No	+
22	22. Schüchen RH et al., 2018 [35]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
23	23. Rosian K et al., 2018 [19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	++
24	24. Claassen YH et al., 2018 [20]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	++
25	25. Omar Abdel-Rahman et al., 2018 [21]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	Yes	++
26	26. Fulton JJ et al., 2018 [43]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	++
27	27. Sowerbutts AM et al., 2018 [22]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
28	28. Gao Y et al., 2019 [36]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
29	29. Fulton JJ et al., 2019 [37]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
30	30. Cui X et al., 2019 [38]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
31	31. Friedel M et al., 2019 [23]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Cs	Yes	+
32	32. Ibeneme SC et al., 2019 [39]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
33	33. Chumnan Kietpeerakool et al., 2019 [25]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	Yes	++
34	34. Carolina OC Latorraca et al., 2019 [15]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Cs	Yes	++
35	35. Evan T. Hall et al., 2019 [26]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	+
36	36. Zhou K et al., 2019 [42]	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Cs	Yes	+
37	37. Tobberup R et al., 2019 [27]	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Cs	Cs	Yes	+
38	38. Warth M et al., 2019 [41]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	++
39	39. Burlacu A et al., 2019 [45]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	++
40	40. Lu F et al., 2019 [40]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cs	Yes	++

Note: 1.1: The study addresses a clearly defined research question.

1.2: At least two people should select studies and extract data.

1.3: A comprehensive literature search is carried out.

1.4: The authors clearly state if or how they limited their review by publication type.

1.5: The included and excluded studies are listed.

1.6: The characteristics of the included studies are provided.

1.7: The scientific quality of the included studies is assessed and documented.

1.8: The scientific quality of the included studies is assessed appropriately.

1.9: Appropriate methods are used to combine the individual study findings.

1.10: The likelihood of publication bias is assessed.

1.11: Conflicts of interest are declared.

2.1: What is your overall assessment of the methodological quality of this review? -High quality (++) -Acceptable (+) -Unacceptable - reject 0

3. RESULTS

The included 40 articles were: 23 systematic reviews [5-27], 15 systematic reviews completed with a meta-analysis [28-41], and 2 meta-analyses [42, 43].

3.1. Sample Size and Characteristics of the Included Studies

The results obtained relating to QoL were often extrapolated from the selected articles since not all

research had QoL as the main topic. For this reason, we carefully analyzed each search to minimize the possibility of entering incorrect data in the results. The largest sample size was found in a study by Diop *et al.* [32], with 24,403 participants, while the smaller one was found in a study by Abdel-Rahman *et al.* [21]. It should be noted that a few articles reported no sample size information or data (Table 1).

Regarding geolocation, the articles included results from different countries; most studies were conducted in

North America, Europe, and China and less frequently in Central and South America, Australia, South Africa, Israel, Japan, and the former Soviet Union.

3.2. Evaluation Tools for the Assessment of the QoL

Most articles reported the evaluation tools that were used to assess QoL (Table 3).

Table 3. Tools that are most often used to evaluate the QoL in the reviewed studies.

Acronym	Complete Name	Description	Reference
EORTC QLQ (1-40 items)	European Organization for Research and Treatment of Cancer Quality of Life questionnaire	This is a 40-item questionnaire designed to evaluate the quality of life among cancer patients. It was translated into over 100 languages and is widely used.	<ul style="list-style-type: none"> • Van Roij J <i>et al.</i>, 2018 [18] • Claassen YH <i>et al.</i>, 2018 [20] • Abdel-Rahman <i>et al.</i>, 2018 [21] • Chumnan Kietpeerakool <i>et al.</i>, 2019 [25] • Evan T. Hall <i>et al.</i>, 2019 [26]
ESAS	Edmonton Symptom Assessment Scale	The ESAS targets nine prevalent symptoms in cancer patients, including fatigue, pain, nausea, depression, and anxiety. Symptom severity is graded from 0 to 10, with 10 indicating the utmost severity. The ESAS offers a framework for comprehending the onset and progression of symptoms.	<ul style="list-style-type: none"> • Van Roij J <i>et al.</i>, 2018 [18]
EORTC QLQ-LC13	European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Lung Cancer Module (EORTC QLQ-LC13)	This 13-item tool is intended specifically for lung cancer, to be used alongside the QLQ-C30 (see the EORTC QLQ-C30).	<ul style="list-style-type: none"> • Abdel-Rahman <i>et al.</i>, 2018 [21] • Evan T. Hall <i>et al.</i>, 2019 [26]
EUROQOL EQ-5D	EuroQol Five-Dimensions Questionnaire	The EQ-5D encompasses five dimensions, each explored with a single question: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. It is a generic quality-of-life assessment tool developed in Europe but extensively applied worldwide.	<ul style="list-style-type: none"> • Ibeneme SC <i>et al.</i>, 2019 [39] • Evan T. Hall <i>et al.</i>, 2019 [26] • Fulton JJ <i>et al.</i>, 2018 [43] • Burlacu A <i>et al.</i>, 2019 [45]
FACT-BP	Functional Assessment of Cancer Therapy - Bone Pain	The FACT-BP is a 16-item questionnaire that includes a broader core module, FACT-General (FACT-G), and explores three key areas of quality of life in patients with bone metastases: general functioning, physical well-being, and bone pain.	<ul style="list-style-type: none"> • Rosian K <i>et al.</i>, 2018 [19] • Evan T. Hall <i>et al.</i>, 2019 [26]
FACT - G	Functional Assessment of Cancer Therapy - General	The FACT-G gauges the effects of cancer treatment across four domains: physical, social/family, emotional, and functional. There are supplementary questions to capture cancer-specific factors potentially influencing quality of life.	<ul style="list-style-type: none"> • Gaertner J <i>et al.</i>, 2017 [31]
FACT-G7	Functional Assessment of Cancer Therapy - General (7-item version)	A short version of the FACT-G features three items from the physical well-being subscale (fatigue, pain, and nausea), one item from the emotional well-being subscale (concern about condition deterioration), and three items from the functional well-being subscale (life enjoyment, satisfaction with quality of life, and sleep).	<ul style="list-style-type: none"> • Rosian K <i>et al.</i>, 2018 [19] • Kassianos AP <i>et al.</i>, 2017 [34] • Fulton JJ <i>et al.</i>, 2018 [43]
HADS	Hospital anxiety and depression	The HADS is a widely used 14-item tool to assess levels of anxiety and depression in patients. Seven items are on anxiety, and seven on depression.	<ul style="list-style-type: none"> • Friedel M <i>et al.</i>, 2019 [23]
IDS-SR30	Self-rated Inventory of Depressive Symptomatology	The IDS-SR30, widely used in large-scale studies and clinical trials, assesses depression severity over seven days. Its clinician-rated (IDS-C) and self-report (IDS-SR) versions are easy to use and sensitive to treatment effects, making them valuable for research and clinical use.	<ul style="list-style-type: none"> • Waldemar Siemens <i>et al.</i>, 2016 [10]
KDQOL KDQOL SF	Kidney Disease Quality of Life Instrument	The KDQOL survey expands the MOS SF-36 by focusing on kidney disease patients' HRQOL, incorporating specific items like symptoms, burden of illness, social interaction, staff support, and patient satisfaction.	<ul style="list-style-type: none"> • Kun Hyung Kim <i>et al.</i>, 2016 [11] • Burlacu A <i>et al.</i>, 2019 [45]
MQOL	The McGill Quality of Life Questionnaire	The tool is crafted to measure key areas of quality of life (physical, psychological, social, and occasionally existential/spiritual) pertinent to individuals facing life-threatening illnesses.	<ul style="list-style-type: none"> • Van Roij J <i>et al.</i>, 2018 [18] • Kassianos AP <i>et al.</i>, 2017 [34] • Fulton JJ <i>et al.</i>, 2018 [43] • Warth M <i>et al.</i>, 2019 [41]
MOS-HIV survey CD4 Count	HIV Medical Outcomes Survey	The HIV Medical Outcomes Survey assesses HRQOL among those with HIV. Its 35 items cover ten health dimensions and typically require about five minutes to complete.	<ul style="list-style-type: none"> • Ibeneme SC <i>et al.</i>, 2019 [39]

(Table 3) contd....

Acronym	Complete Name	Description	Reference
NEST	Needs at the End of Life Screening Tool	The NEST includes 13 questions and screens for palliative care needs across four domains: social, existential, symptoms (physical and psychological), and therapeutic. An advantage of the NEST is that it has been validated in palliative care.	• Friedel M <i>et al.</i> , 2019 [23]
PedsQL 4.0	Pediatric Quality of Life Inventory Version 4.0	This is a 23-item tool assessing HRQOL in children and adolescents, whether healthy or affected by acute and chronic health conditions. It has some generic core scales, investigating physical, emotional, social, and school functioning alongside disease-specific modules that are unified into a meaningful measurement system.	• Friedel M <i>et al.</i> , 2019 [23]
QOLLI-F	Quality of Life in Life-Threatening Illness - Family Caregiver Questionnaire	The QOLLI-F is a 17-item multidimensional tool tailored to assess various aspects of family caregivers' experiences, including their state, distress related to the patient's condition, environment, outlook, financial concerns, relationships, quality of care, and overall quality of life. It has been developed from a qualitative study involving palliative care caregivers.	• Friedel M <i>et al.</i> , 2019 [23]
SWB	Subjective wellbeing (SWB) measurement	The SWB is a self-reported 24-item measure of well-being. Its questions encompass emotional reactions, including infrequent negative affect, cognitive judgments, and life satisfaction.	• Ibeneme SC <i>et al.</i> , 2019 [39]
SCID	Structured Clinical Interview for DSM Disorders	It is a 119-item semi-structured interview guide used to diagnose mental disorders based on criteria outlined in the American Psychiatric Association's Diagnostic and Statistical Manual for Mental Disorders (DSM).	• Waldemar Siemens <i>et al.</i> , 2016 [10]
SEIQOL-DW	Schedule for the Evaluation of Individual Quality of Life-Direct Weighting	It is an abridged version of the schedule for evaluation of individual quality of life (SEIQoL). People rate the most significant areas of their lives, assessing satisfaction and the relative importance of these areas to overall quality of life.	• Carolina OC Latorraca <i>et al.</i> , 2019 [15] • Kassianos AP <i>et al.</i> , 2017 [34]
SF-36	36-Item Short Form Survey	It is one of the most widely used and easily administered quality-of-life assessments. It includes 36 items, and it is in use in medicare for routine monitoring and evaluation of care outcomes in adult patients.	• Ibeneme SC <i>et al.</i> , 2019 [39] • Health Quality Ontario. 2016 [8] • Waldemar Siemens <i>et al.</i> , 2016 [10] • Latorraca COC <i>et al.</i> , 2017 [25] • Burlacu A <i>et al.</i> , 2019 [45]
VAS	Visual Analogue Scale	A VAS uses a single-item measurement to assess characteristics or attitudes across a continuum of values. Usually, a VAS gauges the intensity or frequency of diverse symptoms, <i>e.g.</i> , the extent of pain experienced by patients, from none to severe.	• Waldemar Siemens <i>et al.</i> , 2016 [10]
WHOQOL-BREF WHOQOL-SRPB	The World Health Organization (WHO) Quality of Life - BREF	The WHOQOL-BREF is a 26-item abridged version of the parent interview assessing four main domains: physical health, psychological health, social relationships, and environment.	• Ibeneme SC <i>et al.</i> , 2019 [39] • Kun Hyung Kim <i>et al.</i> , 2016 [11] • Burlacu A <i>et al.</i> , 2019 [45]
CSS	Client Satisfaction Survey	The CSS is a 10-item tool designed to evaluate satisfaction with the service and the dignity of the treatment.	• Evan T. Hall <i>et al.</i> , 2019 [26]
EORTC QLQ-C30	European Organization for Research and Treatment of Cancer Quality of Life questionnaire	It is a 9 multi-item self-administered scale that measures functioning across five subscales (physical, role, cognitive, emotional, and social functioning), the impact of symptoms through three subscales (fatigue, pain, and nausea or vomiting), and, finally, the global quality of life. It is often supplemented with other diagnosis-specific questionnaires.	• Evan T. Hall <i>et al.</i> , 2019 [26] • Kassianos AP <i>et al.</i> , 2017 [34] • Tobberup R <i>et al.</i> , 2019 [27] • Sowerbutts AM <i>et al.</i> , 2018 [22]
FACIT-SP	Functional Assessment of Chronic Illness Therapy-Spiritual	The FACIT-SP presents the patients with a semi-structured interview to assess the presence of thoughts related to death (rated as absent, sub-threshold, or present) from the point of view of spirituality.	• Kassianos AP <i>et al.</i> , 2017 [34]
Fact-L	Functional Assessment of Cancer Therapy Lung	It is a lung cancer-tailored version of the Functional Assessment of Cancer Therapy - General (FACT-G). Across 36 items, the FACT-L explores five distinct areas (physical, social, family, emotional, and functional well-being).	• Kassianos AP <i>et al.</i> , 2017 [34]
QUAL-E	Quality of life and quality of care at the end of life	The QUAL-E is a 25-item instrument rating the quality and effectiveness of interventions aimed at enhancing end-of-life care. It encompasses four domains: life completion, symptoms impact, relationship with healthcare providers, and preparation for the end of life.	• Kassianos AP <i>et al.</i> , 2017 [34] • Fulton JJ <i>et al.</i> , 2018 [43]
SWLS	Satisfaction With Life Scale	It is a 5-item abridged version of an initial 48-item version, after extensive factorial analysis and retention of only the cognitive component of well-being. It is used to assess life satisfaction in end-stage chronic conditions.	• Burlacu A <i>et al.</i> , 2019 [45]

Acronym	Complete Name	Description	Reference
EORTC QLQ-C15 PAL	European Organisation for Research and Treatment of Cancer Quality of Life Core 15 palliative questionnaire	It is a 15-item questionnaire specifically designed for patients in palliative care, typically utilized alongside modules or scales targeting specific disease-related topics.	• Tobberup R <i>et al.</i> , 2019 [27]
HQLI-R	Hospice Quality of Life Index	It is a concise and straightforward 5-item scale designed for the assessment of treatment outcomes in cancer patients. Its derived indexes assess three areas: psychophysiological, functional, and social/spiritual well-being.	• Warth M <i>et al.</i> , 2019 [41]

The most frequently assessed dimensions were the mental, physical, and functional health status, while the measurement tools only aimed at the assessment of the physical health status were rarely used, and many studies did not report QoL results about this dimension. Several tools were also found for measuring QoL in patients with specific pathologies, tools for measuring QoL in pediatric patients, and tools for measuring QoL of families or staff caring for the patient in palliative care or in the hospital.

The most commonly administered questionnaires were the EORTC-QLQ (various versions), SF-36, MQOL, and EUROQOL EQ-5D. Several studies did not directly report the measurement tools used but only the data.

3.3. Quality of the Assessment Tools and Risk of Bias

It was found that there were problems in the reliability of the results due to the high mortality of patients, often due to pathology or other complications, and therefore, in many studies, there was a lack of follow-up. This problem, leading to the loss of critical information, was found in most articles dealing with terminal illnesses, and many of these studies reported the data as “statistically significant but not clinically relevant” due to the risk of bias.

3.4. Disorders and Pathologies

In the included articles, we found various pathologies and carefully selected those that exclusively concerned the possibility of receiving treatments that include palliative care. Of these, we distinguished 2 categories, terminal pathologies and permanently disabling pathologies (both respect the standards of the study of QoL in palliative care). The first group included tumors, cardiac arrest, HIV / AIDS, and a combination of them (multiple tumors, cardiac arrest associated with tumors, *etc.*). The chronic diseases included multiple sclerosis, chronic obstructive pulmonary disease, Parkinson's disease, chronic pruritus, hemodialysis, dyspnea, and chronic kidney disease.

3.5. Treatments

Many treatments have been proposed in the studies, all related to palliative care.

Of these, 5 used a placebo in the control group [9, 10, 12, 14, 33], 4 had a control group without palliative care [6, 8, 17, 32], and the remaining ones had specific therapies versus the lack of them in the control.

Among the prescribed therapies, there were:

3.5.1. Protocols Based on the Administration of Drugs or Integrators

- Administration of vitamins,

- Administration of minerals,
- Administration of proteins,
- Administration of morphine or other opioids,
- Checkpoint inhibitor therapy.

3.5.2. Protocols Based on Psychosocial Interventions

- Psychotherapy,
- Music therapy,
- Acupuncture,
- Mindfulness,
- Exercise.

3.5.3. Protocols Focused on the Oncological Treatment of the Patient

- Radiofrequency ablation (RFA/Rhizotomy),
- Delayed chemotherapy,
- Surgery combined with chemo and radiotherapy.

3.5.4. Special Treatment Protocols

- Parenteral nutrition,
- Paracentesis.

3.5.5. More Advanced Protocols of Care

- Advanced care plans (multiple or combined palliative care protocols),
- Hospitalization or home hospitalization,
- Multidisciplinary palliative care.

Only a minority of these protocols were tested for effectiveness, either *via* comparisons between patients with and without palliative care or measuring differences between treatments administered independently or with the support of medical staff. Indeed, only 5 out of 40 articles reported no information on the control group [7, 30, 13, 38, 40], and only the last two studies reported numerical data concerning QoL.

These treatments produced improvements that vary between zero, minimal and discrete in several sub-categories that were cited in the results of the articles reviewed. Only 27 of the 40 articles reported numerical data regarding the results of the studies that were carried out; the remaining 13 studies reported a description of the results but no numerical data, and of these, only 4 reported the impossibility of arriving at a valid result due to “high attrition rate in the measurement of quality of life due to patient death” [22], “lack of focus and content analysis” [18], or because “the heterogeneity of QoL assessments makes direct comparisons difficult” [16].

When some improvement was reported, it concerned various dimensions of HR-QoL, in particular, physical, emotional, cognitive, mental, spiritual, social, vitality, general health, self-efficacy and optimism, personal autonomy, concerns about the quality of life, purpose in life, health care, and pain reduction (Table 1).

4. DISCUSSION

The investigation of QoL is essential to understand the aspects (physical, mental, or functional) that are most affected in patients accessing palliative care and to better understand how to deal with them. This area of investigation is understudied despite being a relevant topic in evaluating the usefulness of palliative care in terminal patients. In many studies, the investigation of QoL represents a secondary or even marginal outcome. In most studies, the most relevant improvements concern the mental or functional aspects and, to a lesser extent, the physical ones.

The most noticeable improvements in HRQoL were especially in the studies comparing palliative care *versus* control groups without palliative care, with common medical treatments or without any treatment, supporting the theory on the efficacy of palliative care in relation to the conditions of terminal patients or patients with permanent disability [5, 6, 8, 11, 32, 33, 14, 34, 17, 42].

Some specific treatment was found to improve QoL in special groups of patients. For example, Rosian *et al.* reported in their study a noticeable improvement in bone pain in patients with metastatic cancer undergoing rhizotomy. An improvement in general QoL was reported by Burlacu *et al.* [44] in dying patients experiencing some sort of religious beliefs. They found fewer symptoms of depression and a lower risk of suicide in relation to a positive correlation with hope and spirituality, thus linking religiosity with a possible association with better mental health [44]. According to this study, there could be a strong correlation between religiosity and QoL improvement. Overall, improvement in QoL was more likely for medical or psychosocial protocols applied to patients with cancer, while other terminal conditions accessing palliative care were less likely to benefit from the administered protocols of care. This is an area in need of better trials, especially trials that test the proposed treatment against adequate control groups. There is a shortage of RCTs as far as QoL in palliative care is concerned.

It should be noted that the quality of the studies had a strong influence on the chance that some improvement in QoL was found in relation to palliative care. Based on the quality assessment and the results reported by the studies that received an excellent rating (25 studies with ++ scoring), there was a significant improvement in 20% of the reviewed studies, a non-significant improvement in 60%, and no improvement in 20%. Of the studies that received a positive but not excellent evaluation (25 studies), 40% of the studies reported a significant improvement, 33.3% reported a non-significant improvement, and 33.3% stated no improvement.

CONCLUSION

Overall, the investigation of QoL in palliative care remains understudied. In many studies, QoL is a secondary outcome, and there is some tendency to use a disparate range of tools to measure it, whose reliability and validity should still be established in some groups of patients. There is some evidence that patients undergoing palliative care may benefit from it as far as QoL is concerned, especially in mental and functional areas.

LIST OF ABBREVIATIONS

QoL	= Quality of Life
AMSTAR	= A Measurement Tool to Assess Systematic Reviews
WHOQOL	= World Health Organization Quality of Life
WHO	= World Health Organization
HRQoL	= Health-Related Quality of Life
PRISMA	= Preferred Reporting Items for Systematic Reviews and Meta-Analyses
WHOQOL	= World Health Organization Quality of Life
N/A	= Not available
Cs	= Cannot say
EORTC QLQ	= European Organization for Research and Treatment of Cancer Quality of Life questionnaire
EORTC QLQ-C30	= European Organization for Research and Treatment of Cancer Quality of Life questionnaire version C - 30 items
ESAS	= Edmonton Symptom Assessment Scale
EORTC QLQ-LC13	= European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Lung Cancer Module - 13 items
EUROQOL EQ-5D	= European Quality of Life Five-Dimensions Questionnaire
FACT-BP	= Functional Assessment of Cancer Therapy - Bone Pain
FACT - G	= Functional Assessment of Cancer Therapy - General
FACT-G7	= Functional Assessment of Cancer Therapy - General - 7 items
HADS	= Hospital anxiety and depression scale

IDS-SR30	= Inventory of Depressive Symptomatology - Self-rated version - 30 items
IDS-C	= Inventory of Depressive Symptomatology - Clinician-rated version
KDQOL	= Kidney Disease Quality of Life Instrument
KDQOL SF	= Kidney Disease Quality of Life Instrument - Self-rated version
MOS SF-36	= Medical Outcomes Study short-form - 36 items
MQOL	= McGill Quality of Life Questionnaire
MOS-HIV survey	= Medical Outcomes Survey - Human Immunodeficiency Virus survey
NEST	= Needs at the End of Life Screening Tool
PedsQL 4.0	= Pediatric Quality of Life Inventory - Version 4.0
QOLLI-F	= Quality of Life in Life-Threatening Illness - Family Caregiver Questionnaire
SWB	= Subjective well-being measurement
SCID	= Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders
SEiQOL-DW	= Schedule for the Evaluation of Individual Quality of Life-Direct Weighting
SF-36	= 36-Item Short Form Survey
VAS	= Visual Analogue Scale
WHOQOL-BREF	= The World Health Organization (WHO) Quality of Life - Brief Version
WHOQOL-SRPB	= WHOQOL spirituality, religiousness, and personal beliefs (SRPB) field-test instrument
CSS	= Client Satisfaction Survey
FACIT-SP	= Functional Assessment of Chronic Illness Therapy—Spiritual well-being scale
FACT-L	= Functional Assessment of Cancer Therapy - Lung
QUAL-E	= Quality of Life and Quality of Care at the end of Life
SWLS	= Satisfaction With Life Scale

EORTC QLQ-C15 PAL	= European Organization for Research and Treatment of Cancer Quality of Life Core 15 items palliative questionnaire
HQLI-R	= Hospice Quality of Life Index - Revised
AIDS	= Acquired Immune Deficiency Syndrome
RFA	= Radiofrequency Ablation

CONSENT FOR PUBLICATION

Not applicable.

STANDARDS OF REPORTING

PRISMA guidelines and methodology were followed.

AVAILABILITY OF DATA AND MATERIALS

There was no dataset. All data were in the tables of the article.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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SUPPLEMENTARY MATERIAL

PRISMA checklist is available as supplementary material on the publisher's website along with the published article.

Supplementary material is available on the publisher's website along with the published article.

REFERENCES

- [1] National cancer control programmes : Policies and managerial guidelines, World Health Organization (2nd ed.), 2002. Available from: <https://apps.who.int/iris/handle/10665/42494>
- [2] Page MJ, McKenzie JE, Bossuyt PM, *et al*. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ* 2021; 372(71): n71. <http://dx.doi.org/10.1136/bmj.n71> PMID: 33782057
- [3] Shea BJ, Grimshaw JM, Wells GA, *et al*. Development of AMSTAR: A measurement tool to assess the methodological quality of systematic reviews. *BMC Med Res Methodol* 2007; 7(1): 10. <http://dx.doi.org/10.1186/1471-2288-7-10> PMID: 17302989
- [4] Shea BJ, Hamel C, Wells GA, *et al*. AMSTAR is a reliable and valid measurement tool to assess the methodological quality of systematic reviews. *J Clin Epidemiol* 2009; 62(10): 1013-20. <http://dx.doi.org/10.1016/j.jclinepi.2008.10.009> PMID: 19230606
- [5] Salakari MRJ, Surakka T, Nurminen R, Pylkkänen L. Effects of rehabilitation among patients with advanced cancer: A systematic review. *Acta Oncol* 2015; 54(5): 618-28. <http://dx.doi.org/10.3109/0284186X.2014.996661> PMID: 25752965
- [6] McCaffrey N, Bradley S, Ratcliffe J, Currow DC. What aspects of quality of life are important from palliative care patients' perspectives? A systematic review of qualitative research. *J Pain*

- Symptom Manage 2016; 52(2): 318-328.e5.
<http://dx.doi.org/10.1016/j.jpainsymman.2016.02.012> PMID: 27216362
- [7] Maharaj S, Harding R. The needs, models of care, interventions and outcomes of palliative care in the Caribbean: A systematic review of the evidence. *BMC Palliat Care* 2016; 15(1): 9.
<http://dx.doi.org/10.1186/s12904-016-0079-6> PMID: 26801078
- [8] Vertebral augmentation involving vertebroplasty or kyphoplasty for cancer-related vertebral compression fractures: A systematic review. *Ont Health Technol Assess Ser* 2016; 16(11): 1-202.
 PMID: 27298655
- [9] Barnes H, McDonald J, Smallwood N, Manser R. Opioids for the palliation of refractory breathlessness in adults with advanced disease and terminal illness. *Cochrane Database Syst Rev* 2016; 3(3): CD011008.
<http://dx.doi.org/10.1002/14651858.CD011008.pub2>
- [10] Siemens W, Xander C, Meerpohl JJ, *et al.* Pharmacological interventions for pruritus in adult palliative care patients. *Cochrane Libr* 2016; 2016(11): CD008320.
<http://dx.doi.org/10.1002/14651858.CD008320.pub3> PMID: 27849111
- [11] Kim KH, Lee MS, Kim TH, Kang JW, Choi TY, Lee JD. Acupuncture and related interventions for symptoms of chronic kidney disease. *Cochrane Libr* 2016; 2016(6): CD009440.
<http://dx.doi.org/10.1002/14651858.CD009440.pub2> PMID: 27349639
- [12] Mochamat CH, Cuhls H, Marinova M, *et al.* A systematic review on the role of vitamins, minerals, proteins, and other supplements for the treatment of cachexia in cancer: A european palliative care research centre cachexia project. *J Cachexia Sarcopenia Muscle* 2017; 8(1): 25-39.
<http://dx.doi.org/10.1002/jcsm.12127> PMID: 27897391
- [13] Schuurhuizen CSEW, Braamse AMJ, Konings IRHM, *et al.* Does severe toxicity affect global quality of life in patients with metastatic colorectal cancer during palliative systemic treatment? A systematic review. *Ann Oncol* 2017; 28(3): 478-86.
<http://dx.doi.org/10.1093/annonc/mdw617> PMID: 27998965
- [14] Janmaat VT, Steyerberg EW, van der Gaast A, *et al.* Palliative chemotherapy and targeted therapies for esophageal and gastroesophageal junction cancer. *Cochrane Libr* 2017; 2017(11): CD004063.
<http://dx.doi.org/10.1002/14651858.CD004063.pub4> PMID: 29182797
- [15] Latorraca COC, Martimbianco ALC, Pachito DV, *et al.* Palliative care interventions for people with multiple sclerosis. *Cochrane Libr* 2019; 2019(10): CD012936.
<http://dx.doi.org/10.1002/14651858.CD012936.pub2> PMID: 31637711
- [16] Dittus KL, Gramling RE, Ades PA. Exercise interventions for individuals with advanced cancer: A systematic review. *Prev Med* 2017; 104: 124-32.
<http://dx.doi.org/10.1016/j.ypmed.2017.07.015> PMID: 28716654
- [17] Grossman CH, Brooker J, Michael N, Kissane D. Death anxiety interventions in patients with advanced cancer: A systematic review. *Palliat Med* 2018; 32(1): 172-84.
<http://dx.doi.org/10.1177/0269216317722123> PMID: 28786328
- [18] van Roij J, Fransen H, van de Poll-Franse L, Zijlstra M, Raijmakers N. Measuring health-related quality of life in patients with advanced cancer: A systematic review of self-administered measurement instruments. *Qual Life Res* 2018; 27(8): 1937-55.
<http://dx.doi.org/10.1007/s11136-018-1809-4> PMID: 29427216
- [19] Rosian K, Hawlik K, Piso B. Efficacy assessment of radiofrequency ablation as a palliative pain treatment in patients with painful metastatic spinal lesions: A systematic review. *Pain Physician* 2018; 1(21;1): E467-47.
<http://dx.doi.org/10.36076/ppj.2018.5.E467> PMID: 30282388
- [20] Claassen YHM, van der Valk MJM, Breugom AJ, *et al.* Survival differences with immediate versus delayed chemotherapy for asymptomatic incurable metastatic colorectal cancer. *Cochrane Libr* 2018; 2018(11): CD012326.
<http://dx.doi.org/10.1002/14651858.CD012326.pub2> PMID: 30480771
- [21] Abdel-Rahman O, Elsayed Z, Mohamed H, Eltobgy M. Radical multimodality therapy for malignant pleural mesothelioma. *Cochrane Libr* 2018; 2018(1): CD012605.
<http://dx.doi.org/10.1002/14651858.CD012605.pub2> PMID: 29309720
- [22] Sowerbutts AM, Lal S, Sremanakova J, *et al.* Home parenteral nutrition for people with inoperable malignant bowel obstruction. *Cochrane Libr* 2018; 8(8): CD012812.
<http://dx.doi.org/10.1002/14651858.CD012812.pub2> PMID: 30095168
- [23] Friedel M, Aujoulat I, Dubois AC, Degryse JM. Instruments to measure outcomes in pediatric palliative care: A systematic review. *Pediatrics* 2019; 143(1): e20182379.
<http://dx.doi.org/10.1542/peds.2018-2379> PMID: 30530504
- [24] Kietpeerakool C, Rattanakanokchai S, Jampathong N, Srisomboon J, Lumbiganon P. Management of drainage for malignant ascites in gynaecological cancer. *Cochrane Libr* 2019; 12(12): CD007794.
<http://dx.doi.org/10.1002/14651858.CD007794.pub3> PMID: 31825525
- [25] Latorraca COC, Martimbianco ALC, Pachito DV, Pacheco RL, Riera R. Mindfulness for palliative care patients. Systematic review. *Int J Clin Pract* 2017; 71(12): e13034.
<http://dx.doi.org/10.1111/ijcp.13034> PMID: 29105910
- [26] Hall ET, Singhal S, Dickerson J, *et al.* Patient-reported outcomes for cancer patients receiving checkpoint inhibitors: Opportunities for palliative care—a systematic review. *J Pain Symptom Manage* 2019; 58(1): 137-156.e1.
<http://dx.doi.org/10.1016/j.jpainsymman.2019.03.015> PMID: 30905677
- [27] Tøtberup R, Thoresen L, Falkmer UG, Yilmaz MK, Solheim TS, Balstad TR. Effects of current parenteral nutrition treatment on health-related quality of life, physical function, nutritional status, survival and adverse events exclusively in patients with advanced cancer: A systematic literature review. *Crit Rev Oncol Hematol* 2019; 139: 96-107.
<http://dx.doi.org/10.1016/j.critrevonc.2019.04.014> PMID: 31150954
- [28] Kavalieratos D, Corbelli J, Zhang D, *et al.* Association between palliative care and patient and caregiver outcomes. *JAMA* 2016; 316(20): 2104-14.
<http://dx.doi.org/10.1001/jama.2016.16840> PMID: 27893131
- [29] Lau CHY, Wu X, Chung VCH, *et al.* Acupuncture and related therapies for symptom management in palliative cancer care. *Medicine* 2016; 95(9): e2901.
<http://dx.doi.org/10.1097/MD.0000000000002901> PMID: 26945382
- [30] Guerrero-Torrelles M, Monforte-Royo C, Rodríguez-Prat A, Porta-Sales J, Balaguer A. Understanding meaning in life interventions in patients with advanced disease: A systematic review and realist synthesis. *Palliat Med* 2017; 31(9): 798-813.
<http://dx.doi.org/10.1177/0269216316685235> PMID: 28498025
- [31] Gaertner J, Siemens W, Meerpohl JJ, *et al.* Effect of specialist palliative care services on quality of life in adults with advanced incurable illness in hospital, hospice, or community settings: systematic review and meta-analysis. *BMJ* 2017; 357: j2925.
<http://dx.doi.org/10.1136/bmj.j2925> PMID: 28676557
- [32] Diop MS, Rudolph JL, Zimmerman KM, Richter MA, Skarf LM. Palliative care interventions for patients with heart failure: A systematic review and meta-analysis. *J Palliat Med* 2017; 20(1): 84-92.
<http://dx.doi.org/10.1089/jpm.2016.0330> PMID: 27912043
- [33] Wang CW, Chow AYM, Chan CLW. The effects of life review interventions on spiritual well-being, psychological distress, and quality of life in patients with terminal or advanced cancer: A systematic review and meta-analysis of randomized controlled trials. *Palliat Med* 2017; 31(10): 883-94.
<http://dx.doi.org/10.1177/0269216317705101> PMID: 28488923
- [34] Kassianos AP, Ioannou M, Koutsantoni M, Charalambous H. The

- impact of specialized palliative care on cancer patients' health-related quality of life: A systematic review and meta-analysis. *Support Care Cancer* 2018; 26(1): 61-79.
<http://dx.doi.org/10.1007/s00520-017-3895-1> PMID: 28932908
- [35] Schüchen RH, Mücke M, Marinova M, *et al.* Systematic review and meta-analysis on non-opioid analgesics in palliative medicine. *J Cachexia Sarcopenia Muscle* 2018; 9(7): 1235-54.
<http://dx.doi.org/10.1002/jcsm.12352> PMID: 30375188
- [36] Gao Y, Wei Y, Yang W, *et al.* The effectiveness of music therapy for terminally ill patients: A meta-analysis and systematic review. *J Pain Symptom Manage* 2019; 57(2): 319-29.
<http://dx.doi.org/10.1016/j.jpainsymman.2018.10.504> PMID: 30389608
- [37] Fulton JJ, LeBlanc TW, Cutson TM, *et al.* Integrated outpatient palliative care for patients with advanced cancer: A systematic review and meta-analysis. *Palliat Med* 2019; 33(2): 123-34.
<http://dx.doi.org/10.1177/0269216318812633> PMID: 30488781
- [38] Cui X, Dong W, Zheng H, Li H. Collaborative care intervention for patients with chronic heart failure. *Medicine* 2019; 98(13): e14867.
<http://dx.doi.org/10.1097/MD.00000000000014867> PMID: 30921185
- [39] Ibeneme SC, Irem FO, Iloanusi NI, *et al.* Impact of physical exercises on immune function, bone mineral density, and quality of life in people living with HIV/AIDS: A systematic review with meta-analysis. *BMC Infect Dis* 2019; 19(1): 340.
<http://dx.doi.org/10.1186/s12879-019-3916-4> PMID: 31014262
- [40] Lu F, Dong J, Tang Y, *et al.* Bilateral vs. unilateral endoscopic ultrasound-guided celiac plexus neurolysis for abdominal pain management in patients with pancreatic malignancy: A systematic review and meta-analysis. *Support Care Cancer* 2018; 26(2): 353-9.
<http://dx.doi.org/10.1007/s00520-017-3888-0> PMID: 28956176
- [41] Warth M, Kessler J, Koehler F, Aguilar-Raab C, Bardenheuer HJ, Ditzen B. Brief psychosocial interventions improve quality of life of patients receiving palliative care: A systematic review and meta-analysis. *Palliat Med* 2019; 33(3): 332-45.
<http://dx.doi.org/10.1177/0269216318818011> PMID: 30648926
- [42] Zhou K, Mao Y. Palliative care in heart failure. *Herz* 2019; 44(5): 440-4.
<http://dx.doi.org/10.1007/s00059-017-4677-8> PMID: 29468259
- [43] Fulton JJ, Newins AR, Porter LS, Ramos K. Psychotherapy targeting depression and anxiety for use in palliative care: A meta-analysis. *J Palliat Med* 2018; 21(7): 1024-37.
<http://dx.doi.org/10.1089/jpm.2017.0576> PMID: 29676960
- [44] Burlacu A, Artene B, Nistor I, *et al.* Religiosity, spirituality and quality of life of dialysis patients: A systematic review. *Int Urol Nephrol* 2019; 51(5): 839-50.
<http://dx.doi.org/10.1007/s11255-019-02129-x> PMID: 30919258