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Exploring the impact of uro-oncology multidisciplinary team meetings on patient.

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Title: Exploring the impact of uro-oncology multidisciplinary team meetings on patient outcomes: A systematic review

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Abstract

Purpose: Multidisciplinary team (MDT) meetings are mainstay clinical management globally. Clinical guidelines state that patients should be considered for MDT review, but evidence has identified that within the specialty of uro-oncology not all patients are reviewed by an MDT. This systematic review aimed to understand the impact of uro-oncology MDT meetings on patient outcomes, to explore how patient engagement is incorporated in the process, and to identify the barriers and facilitators within an MDT.

Methods: A systematic review was reported according to PRISMA guidelines. Electronic databases (MEDLINE, CINAHL and PsychINFO) were searched in EBSCOhost from January 2010 to March 2021, using a range of key search words. Studies were assessed for inclusion according to a pre-defined eligibility criteria. Data extraction and quality assessment was undertaken. The findings were tabulated, and a narrative synthesis undertaken.

Results: 373 articles were screened, and seven studies were included. The studies were conducted in a range of international countries which provided an overview of uro-oncology MDTs in different healthcare contexts. The following themes were identified: 1) MDT and clinical outcomes, 2) structure and format, 3) patient engagement in the process, and 4) barriers and facilitators.

Conclusion: Cancer care is constantly being challenged due to complex newer therapies, including multimodality treatments, and newer emergent broader considerations such as, oncogeriatrics, genetic counselling, and survivorship issues which should have a central place for consideration in the MDT.

Key words: multidisciplinary teams, cancer, genitourinary, review, systematic, patient outcomes, decision-making, cancer care

Introduction

Multidisciplinary teams (MDTs) are implemented internationally in cancer care with the aim to improve treatment through discussions held by healthcare professionals from a range of disciplines (Rao et al., 2014; Rosell et al., 2018). The purpose of a cancer MDT is to facilitate discussions between clinical experts to consider all clinical options and to develop personalised care that incorporates each patients' preferences and needs when considering the best possible clinical recommendations (Cancer Australia, n.d.; Heidenreich, 2019). Cancer MDT discussions will often incorporate perspectives on individual patients from surgeons, radiation oncologists, medical oncologists, pathologists, radiologists, and nurses (Rao et al., 2014). These discussions are typically held weekly to share clinical information and the expert opinion from each of the health disciplines involved in the care of people affected by cancer (El Saghir et al., 2014; Rao et al., 2014; Rosell et al., 2018). The premise of the MDT discussion is to increase the likelihood that patients receive care which is evidence-based and in keeping with clinical guidelines (American Urological Association, 2021; European Association of Urology, 2021). MDT discussions should incorporate each patient's perspectives, strive to shorten the time frame between diagnosis and treatment, and improve information sharing, communication, and overall cancer survival (Cancer Australia, n.d.). MDT informed care can also benefit healthcare professionals by improving care coordination and patient outcomes, streamlining treatment, as well as, providing educational opportunities for the professionals involved in the discussions (Cancer Australia, n.d.; Rosell et al., 2018).

Over the last 30 years MDTs have expanded to provide tumor streams for all common cancers (Walpole et al., 2019). Given the specialties of cancer MDTs (Lamb et al., 2011b; Pillay et al., 2016; Prades et al., 2015) evidence has underscored that each tumor specific MDT has their own unique challenges and impact on patient outcomes. Specifically, the uro-oncology MDT aims to optimize the quality of clinical decisions for people affected by penile, bladder, prostate, testicular and kidney cancer (Chennupati et al., 2015). The uro-oncology MDT provides each patient with a review of their history, examination of clinical findings, biopsy results and investigations (Holmes et al., 2021). However, research has identified that uro-oncology MDTs may only discuss up to two thirds of all patients newly diagnosed with GU cancers in Australia (Kinnear et al., 2017; Rao et al., 2014). This practice is in contrast with international guidelines, where all patients who have clinical complexity are recommended to be referred for an MDT for review (NHS England, 2020). Most international guidelines state that all patients should be considered for multidisciplinary review, however very recently the United Kingdom (UK) NICE guidelines recommends that only patients with 'clinical complexity or psycho-social issues' are required to be review and discussed (Cancer Australia n.d.; NHS England 2020). Furthermore, some uro-oncology MDTs have transitioned to virtual platforms in the face of the COVID-19 pandemic (Ambrosini et al., 2020) and consequently, the impact of such differences in uro-oncology MDTs on patient outcomes are currently unknown. Additionally, little is known about how patient's needs, and psycho-social perspectives are embedded in the MDT meeting discussions to ensure that the patient's views and concerns are considered as active partners in their own care (Australian Commission on Safety and Quality in Health Care, 2017).

With the increasing numbers of people affected by cancer, MDTs utilize considerable financial resources, time and effort from a clinical and administrative perspectives and therefore, gaining insight into uro-oncology MDTs is timely (Gil et al., 2021; Ke et al., 2013). This systematic review aims to understand the impact of uro-oncology MDT discussions on patient outcomes, identify existing factors which influence patient engagement in the MDT process, and the barriers and facilitators within the MDT.

Methods

A systematic review (Dobbins, 2017; Harker and Kleijnen, 2012) was conducted using a priori protocol and has been reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA guidelines) (Page et al., 2021), see **Supplementary Table 1** for completed checklist.

Pre-screening eligibility criteria

Types of studies

Inclusion:

- All qualitative, quantitative, or mixed research methods irrespective of study design.
- Studies published in the English language.

Exclusion:

- Any reviews, commentaries, editorials, conference abstracts, and any paper written in a language other than English.

Types of outcomes

Inclusion:

- Studies were deemed eligible if they depict patient management of the clinical and process outcomes, as well, as patient engagement within the uro-oncology MDT discussion.

- Studies which provided data on the members, roles, responsibilities, format of MDTs, and identified any facilitators and barriers of the MDT.

Exclusion:

- Any original studies which did not focus on the uro-oncology MDT decision-making process, clinical outcomes, or patient engagement.
- Any study in which the MDT did not include the medical specialties necessary for planning treatment.

Types of participants

Inclusion:

- All members of the uro-oncology MDT irrespective of healthcare discipline.
- All patients >18 years of age irrespective of GU cancer, stage, or treatment modality.

Exclusion:

- Any participants from other cancer specific MDTs.

Delineation: This review defined the MDT using the consensus of, “MDTs are an alliance of all medical and health care professionals related to a specific tumor disease whose approach to cancer care is guided by their willingness to agree on evidence-based clinical decisions and to coordinate the delivery of care at all stages of the process, encouraging patients in turn to take an active role in their care” (Borras et al., 2014, p.3).

Literature search

A review was carried out adhering to the guidelines as described in Dobbins (2017). The MEDLINE, CINAHL and PsychINFO databases were searched in EBSCOhost (data from January 2010 – March 2021 in the English language only). The search contained boolean operators and used examples such as (see **Supplementary Table 2** for PICO framework): uro-oncology AND multidisciplinary team OR multidisciplinary team meeting OR multidisciplinary conference OR multidisciplinary discussion OR multidisciplinary care forum OR multidisciplinary clinic (see **Table 1** for exemplary database search). Google scholar was also used to search for grey literature and reference lists of all included full-text articles were checked to increase the inclusiveness of the search process. Endnote reference software was used to manage the literature search results and the selection process of articles was managed using Covidence systematic review software.

Selection of studies

Following de-duplication of the articles in Covidence, two authors (BA, CP) screened the titles and abstracts according to the pre-determined eligibility criteria to determine topic relevance to the research aim. The full-text articles were then screened in full by one author (BA) and quality checked by two reviewers (CP, AH). Conflicting views and opinions on individual full-text articles were resolved by face-to-face discussions until consensus was reached.

Data extraction

Data extraction was performed by one author (BA) independently and quality-checked by two additional reviewers (CP, AH). The data extraction included a ‘characteristics of the included studies’ which included: author and year, country, aim, participants, methods, study design, data collection, structure and format of MDTs, patient engagement, MDT process, clinical outcomes, and the barriers and facilitators of MDTs.

Assessment of risk of bias in included studies

In parallel with the data extraction process an assessment of risk of bias within the individual included studies was performed using the Mixed Methods Assessment Tool (MMAT) (Hong et al., 2018). The MMAT enabled a plethora of research designs to be assessed to check their methodological quality. The studies were assessed with three levels of quality assessment namely: ‘yes’, ‘no’, or ‘unclear’, and each study design had questions relevant to a particular research methodology (Hong et al., 2018).

Data Analysis

A narrative synthesis approach was used to summarize the evidence. This process involved the tabulation of primary research studies, identifying similarities and differences within and between studies, and seeking explanations for these differences. Specifically, this involved the following steps: data reduction and sub-group classification based on levels of evidence and the review question, narrative data comparison (iterative process of making comparisons and identifying relationships) and finally, drawing conclusions (Whittemore and Knafl, 2005).

Findings

Of the 390 articles retrieved, 14 articles were reviewed in full text and of which seven were excluded with reasons, see **Figure 1**. There were a range of study designs which included cross-sectional survey studies (n=2), prospective case series studies (n=3), prospective longitudinal survey study (n=1) and a retrospective case series (n=1). The studies were representative of a range of countries which included Australia (n=2), England (n=2), Italy (n=1), Lebanon (n=1) and a joint study of comparison between (n=1) Australia and England which provides an overview of uro-oncology MDTs in a range of international contexts, see **Table 2** for the characteristics of the included studies. The methodological quality assessment results across the included studies are reported in **Table 3**.

There were several themes which emerged in relation to the relationship of uro-oncology MDT meetings with clinical outcomes, which included the structure and format of MDTs, patient engagement in the process and the barriers and facilitators of MDT meetings. See **Figure 2** for an overview of the study findings which will be discussed in greater detail in the following section.

Structure and format of MDTs

Six studies reported information relating to the structure and format of MDTs. The frequency of MDT discussions was identified as being conducted weekly, noteworthy with several discussions also occurring at private hospitals (Ambrosini et al., 2020; El khoury et al., 2016; Kinnear et al., 2017). Across the studies most of the MDT meetings included representation from urologists, oncologists, radiation oncologists, pathologists, radiologists, and nurses who were often identified to be the core members of the MDT participation. However, noteworthy in one study it was only a research nurse involved (Rao et al., 2014) and while provided nursing representation, it was a different role from that of a cancer specialist nurse. A cancer specialist nurse often takes the lead in the care co-ordination of patients affected by cancer. Other studies included other healthcare professionals such as, general practitioners, scientists (Lamb et al., 2014), and trainees from various disciplines (El khoury et al., 2016; Kinnear et al., 2017; Rao et al., 2014). Three studies (Ambrosini et al., 2020; De Ieso et al., 2013; Lamb et al., 2014) did not identify trainees, ward nurses, or other junior healthcare professionals as a core member of the MDT which is an important consideration because MDT discussions provide a valuable learning opportunity to understand cancer care, clinical management and clinical decision-making. One study did not report on the format of the MDT (Lamb et al., 2011a).

MDT roles and responsibilities, data-management, and support

Only three studies reported information related to the roles and responsibilities of MDT members and data-management. Lamb et al. (2011a) found that leadership of MDTs commonly rested with the MDT chair and the vast majority (76.5%) of the MDT meetings were chaired by a surgeon. Respondents surveyed in the study agreed that clinical oncologists (96%) and medical oncologists (93%) were capable of chairing the uro-oncology MDT (Lamb et al., 2011a) but they were rarely given the opportunity. Furthermore, 88% of clinicians reported that they attend one or more MDT discussion per week (Lamb et al., 2011a).   Furthermore, 81% of clinicians had protected time to attend MDT discussions with consensus (92%) that clinicians perceived that the environment used for the MDT discussions fit for purpose (Lamb et al., 2011a). In a separate study, Lamb et al. (2014) reported the average time spent per week at the MDT discussion ranged from two to six hours across oncologists, urologists, and nurses. The time commitments from the other healthcare professional disciplines were not detailed in this study. Two studies (Kinnear et al., 2017; Rao et al., 2014) both utilized prospectively managed MDT databases. The consensus plans developed for each patient at the MDT meeting was derived from a database prospectively managed (Kinnear et al., 2017).

Information on patient engagement in the MDT process.

Rao et al. (2014) reported that only 34% of all GU cancer patients newly diagnosed were discussed at an MDT meeting and that significant clinical changes were made to 26.7% of cases who were discussed in the uro-oncology MDT. Similarly, a retrospective case review performed by Kinnear et al. (2017) found that of 240 patients eligible for MDT discussions, only 66.7% patients were discussed. A single study (Ambrosini et al., 2020) reported information relating to uro-oncology MDT discussions and the use of virtual platforms. Ambrosini et al. (2020) reported that 56/60 (93.3%) patients were successfully managed by virtual MDT discussions which included pathologists, radiotherapists, urologists, medical oncologists, and clinical nurse specialists.

None of the studies detailed how patients are engaged in the MDT discussion process to address their individual needs and preferences for care and treatment, including preferences to participate in clinical trials. It was identified that the MDT discussion requires considerable time and resources, and with high volumes of patients (such as uro-oncology) MDTs are often fast paced to cover a large number of cases due to an inadequate amount time for in-depth quality discussions (Lamb et al., 2014). For example, important quality of life considerations such as, symptoms related to urinary, bowel, sexual function, social situation, family history, level of physical function for activities of daily living, and the psycho-social impact of cancer, and individual family circumstances were not acknowledged in any of the included studies. Importantly, one study emphasized the need for greater patient engagement in the MDT process which was currently absent and insufficient (Kinnear et al., 2017)

MDT relationship with clinical outcomes

Several of the studies reported information that related to the MDT and with clinical outcomes. De Ieso et al. (2013) reported that 97.3% of patients started treatment after MDT meetings with a median time frame of 16 days from discussion to treatment. De Ieso et al. (2013) also found that 12.7% of patients had a delay to their decision-making due to a lack of radiology (48.4%) and pathology (41.9%) availability in the MDT, with small number of the delayed cases (9.7%) being directly impacted by both a lack of radiology and pathology. Elsewhere it was observed that there were 48 instances where the treatment deviated from the agreed upon treatment plan discussed in the MDT meeting (De Ieso et al., 2013). The reasons for these deviations included: consultant decision 11 (22.9%), patient deterioration or comorbidities 16 (33.3%), patient preference 15 (31.2%), delays with pathology or radiology 3 (6.3%), and new information 3 (6.3%) (De Ieso et al., 2013). It was also observed that patients in clinical trials are subject to more MDT re-discussions

Rao et al. (2014) found that changes to the clinical management of patients with metastasis were twice as likely to occur and that MDT discussions made significant changes to the original clinical plan in 26.7% of cases. Furthermore, it was also found that MDT discussions increased cross-referrals to other disciplines in a third (33.3%) of cases and increased the likelihood of patients participating in clinical trials (Rao et al., 2014). Similarly, El khoury et al. (2016) reported that MDT meetings changed management decisions in almost half of the case studies. Specifically, MDT decision outcomes were change from the original consultant plan in 57.1% of testicular cancers, 42.7% of prostate cancers, 38.2% of bladder cancers and 33.3% of renal cancers. Whereas Kinnear et al. (2017) found that consensus plans were implemented in 91.1% patients with an average of 1.5 recommendations being made per patient, and 72.7% of cases were directed towards further MDT specialist consultation.

Barriers and facilitators of MDTs

Several studies reported information relating to the barriers and facilitators of uro-oncology MDTs. The presence of all members in MDT discussions are one of the most important facilitators to optimize clinical decision-making (De Ieso et al., 2013). Lamb et al. (2011a) and De Ieso et al. (2013) both identified effective leadership as another important facilitator of MDTs. The competence of MDT leadership was key to achieving consensus in challenging and complex cases. Accurate documentation was also important in capturing management recommendations which were to be communicated clearly to the patient (De Ieso et al., 2013). Effective communication between non-judgmental healthcare professional groups is also critical in streamlining the care process and reducing wait times to clinical intervention (De Ieso et al., 2013).

Kinnear et al. (2017) found clinicians may be a barrier of patient engagement in MDTs. Clinicians were reluctant to modify their language to engage patients in MDT discussions due to time constraints, implications for the overall MDT dynamic, and provoke patient anxiety (Kinnear et al., 2017). The clinicians reported that they did not perceive involving patients would have any benefits with the MDT (Kinnear et al., 2017). Furthermore, Lamb et al. (2014) found that cases discussed in the earlier stages of MDT discussions were associated with improved presentation of information, improved teamwork, and a higher chance of reaching a treatment or management decision. This is in contrast to patients discussed towards the end of MDT who were more likely to have suboptimal quality discussions, reduced clinician focus and concentration. Likewise, healthcare professionals participating in MDT discussions being held in unsuitable venues were more likely to report in accurate or incomplete clinical history and detailed information about the patient's co-morbidities (Lamb et al., 2011a). Uro-oncology MDT discussions are also challenged by administrative factors such as a lack of timely transfers of patient records and materials from referring hospitals (De Ieso et al., 2013). Additionally, delays to pathology and radiology results which caused case re-discussions (De Ieso et al., 2013).

Discussion

This review set out to understand the impact of uro-oncology MDT meetings on patient outcomes, explore how patient engagement is facilitated, and what are the barries and facilitators within the MDT process. Importantly, this review has identified that a significant number of patients diagnosed with GU cancers are not being reviewed within an MDT. Importantly, this review identified that MDT discussions increased the likelihood of patients participating in clinical trials and patients experienced changes to management plans from those initially advised to them from their individual treating clinician (De Ieso et al., 2013; El khoury et al., 2016; Rao et al., 2014). While none of the studies in this review provided any data on the impact of MDT meeting reviews on mortality outcomes in patients diagnosed with GU cancers, evidence elsewhere has underscored that MDTs have had a significant improvement in cancer mortality (Kesson et al., 2012). Therefore, it is likely that a significant number of patients affected by GU cancers may receive suboptimal clinical management due to not having access to a timely MDT clinical review. This is a very important area which requires further research to understand the complexities (such as public and private hospital settings) and the decision-making process of clinicians who do not refer their patients for an MDT meeting discussion, and importantly, why other patients are referred.

More recently statements have been released from the UK which states that only patients with 'clinical complexity' should be referred for an MDT review and discussion (NHS England, 2020). However, what is lacking is a robust definition and an understanding of what constitutes clinical complexities among people affected by cancer, because arguably all 'individuals' have their own unique and complex needs (AIHW, 2020; NHS England, 2020; Rankin et al., 2018). Further is needed to address this issue. Future insights are clinically important because cancer care and treatments are constantly being challenged due to complex newer therapies, including multimodality treatments, and newer emergent broader considerations such as, oncogeriatrics, genetic counselling, and survivorship issues which (Paterson et al., 2020; Paterson et al., 2018; Paterson et al., 2017; Paterson et al., 2021; Paterson et al., 2020; Paterson et al., 2020;

Paterson et al., 2020; Paterson et al., 2015) which are currently not being addressed within existing GU cancer services.

This review has identified new potential insights which may further expose patients to range of issues and gaps in care co-ordination. Consequently, given that not all patients affected by a GU cancer will be reviewed in an MDT, cancer specialist nurses might not be aware of all newly diagnosed cancer patients in their service to deliver timely support and care (Paterson and Nabi, 2017). The presence of all members in the MDT discussions was regarded as one of the most important facilitators which optimized decision-making in the care process (De Ieso et al., 2013) and this has been acknowledged in other MDT studies (Lamprell et al., 2019; Soukup et al., 2018; Wallace et al., 2019).

As MDT formats varied across the studies the impact of each MDT on patient outcomes may also vary across the patient population. The reviewed studies have provided valuable insights but there are further questions which should be addressed. Firstly, future research may seek to further understand the structure and format of uro-oncology MDTs as well as the roles and responsibilities of each member, and how these impact on patient outcomes. Secondly, there are few studies that reported on MDT data-management and support, and further research is needed to identify any support systems that are in place for MDTs and to identify the differences in data-management and how patient information is accessed. Thirdly, clinicians were averse to patient engagement in the MDT discussions and requires careful exploration to gain a deeper understanding of the clinician perspectives and attitudes towards patient engagement. Finally, future research is needed to understand from the patients' perspective their potential preferences of engagement in the MDT discussions, and if patient participation reduces plan deviations (Kinnear et al., 2017) or is associated with improved clinical outcomes.

Currently, it is not possible to infer a direct causal relationship between the MDT context and patient clinical outcomes, because of the small sample sizes, the short-time frame of the included studies, and many studies had a single-institution focus with a high chance of selection bias. All the studies included in this review used observational data and many being retrospective, thus some caution is needed in the interpretation of the findings. While this review identified that MDTs resulted in changes to clinical management of patients, both clinicians and scientists are required to conduct high quality, adequately powered, multi-centred prospective studies to clearly understand this causal relationship between uro-oncology MDT board meetings and clinical outcomes.

Despite these issues, it is paramount that healthcare organisations ensure a holistic and patient-centred approach to care cancer in the MDT context. This is particularly important because of fundamental aspects that should be taken into consideration such as, quality of life, patient rights and empowerment, psychosocial aspects, multiple complex comorbidities, and survivorship (Cancer Australia, n.d.; Morement et al., 2017; Paterson & Nabi, 2017; Lamprell et al., 2019). The current format of MDTs are biomedical and do not consider the holistic needs of people affected by cancer. Further research is needed to understand how MDTs can embed these considerations to ensure optimal care co-ordination and communication to deliver a holistic model of care to meet the individual needs of each person diagnosed with cancer.

Limitations

The main limitations of this review were the number of databases searched, which may not have provided a fully comprehensive search. However, the review team used strategies to increase the inclusiveness of the search by searching grey literature and backward chain-linking of the included studies. This review included studies which were published in the English language only, and as such publications in other languages might have omitted.

Conclusion

Clinicians are resistant to patient engagement in the MDT because of concerns for the patient, implications for time constraints, issues of poor leadership, inadequate collection of patient information, and diagnostic delays. Little is known about the clinical decision-making process of what constitutes of a 'complex patient justifying an MDT review' and why clinicians refer or do not refer patients affected by GU cancers to an MDT discussion.

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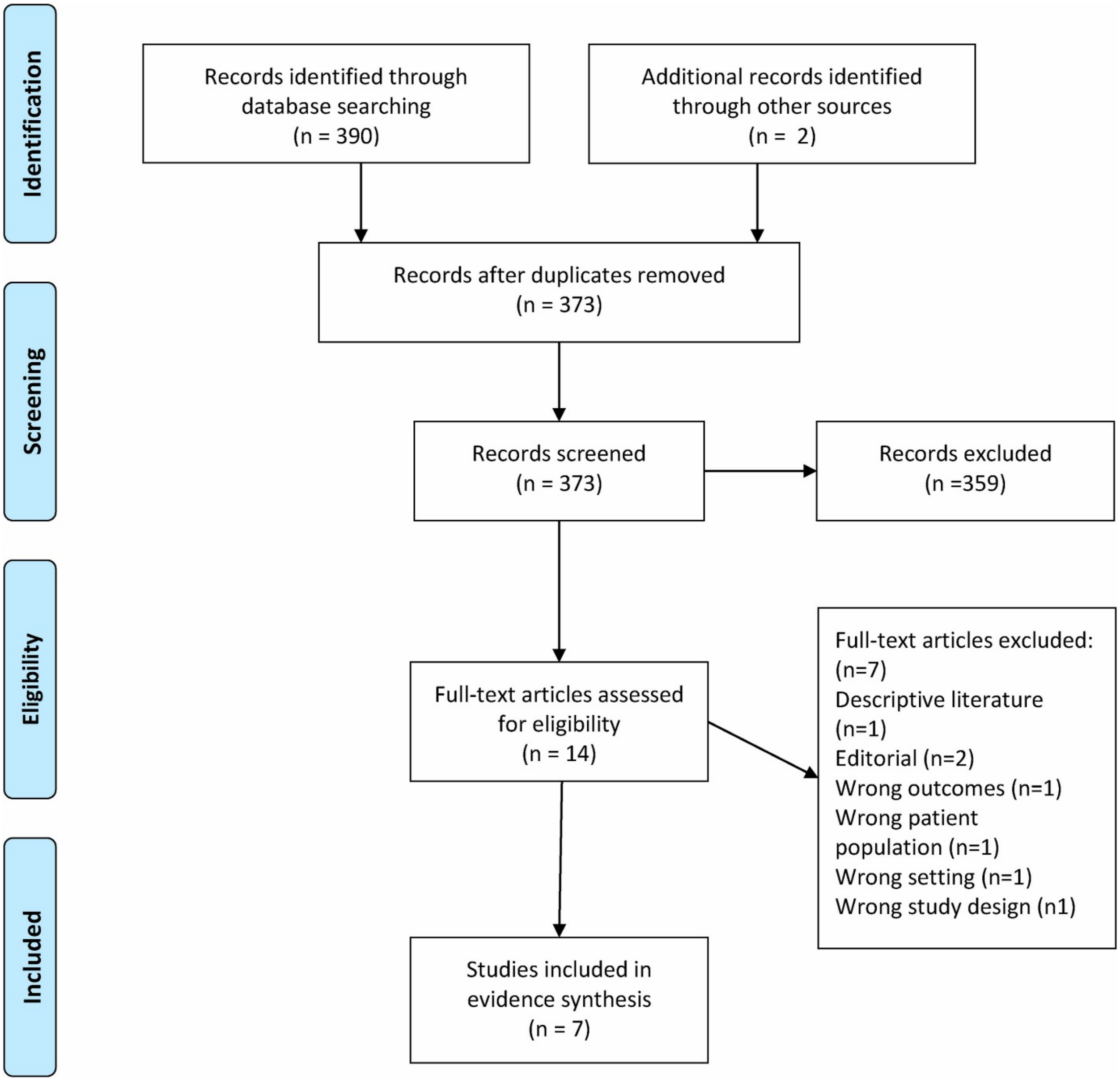


Fig. 1. PRIMSA results.

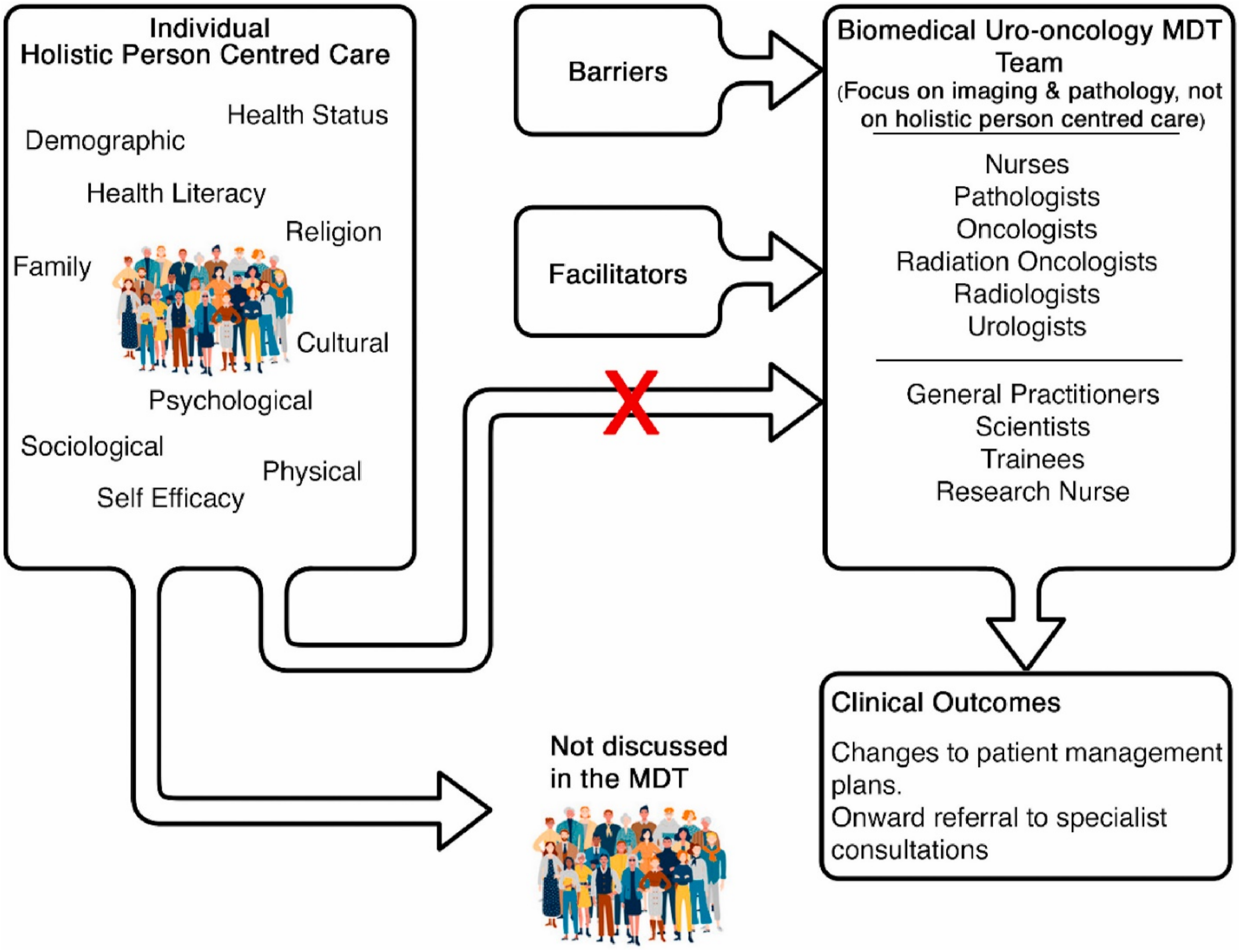


Fig. 2. Overview of study findings.

Table 1. Exemplar of database search. Search date – January 2010 to March 2021, no limiters.

Search #	Concept	Search Terms
#1	Uro-oncology Multidisciplinary teams	Uro-oncology AND Multidisciplinary team OR Multidisciplinary team meeting OR Multidisciplinary conference OR Multidisciplinary discussion OR Multidisciplinary care forum OR Multidisciplinary clinic

Table 2. Overview of included studies.

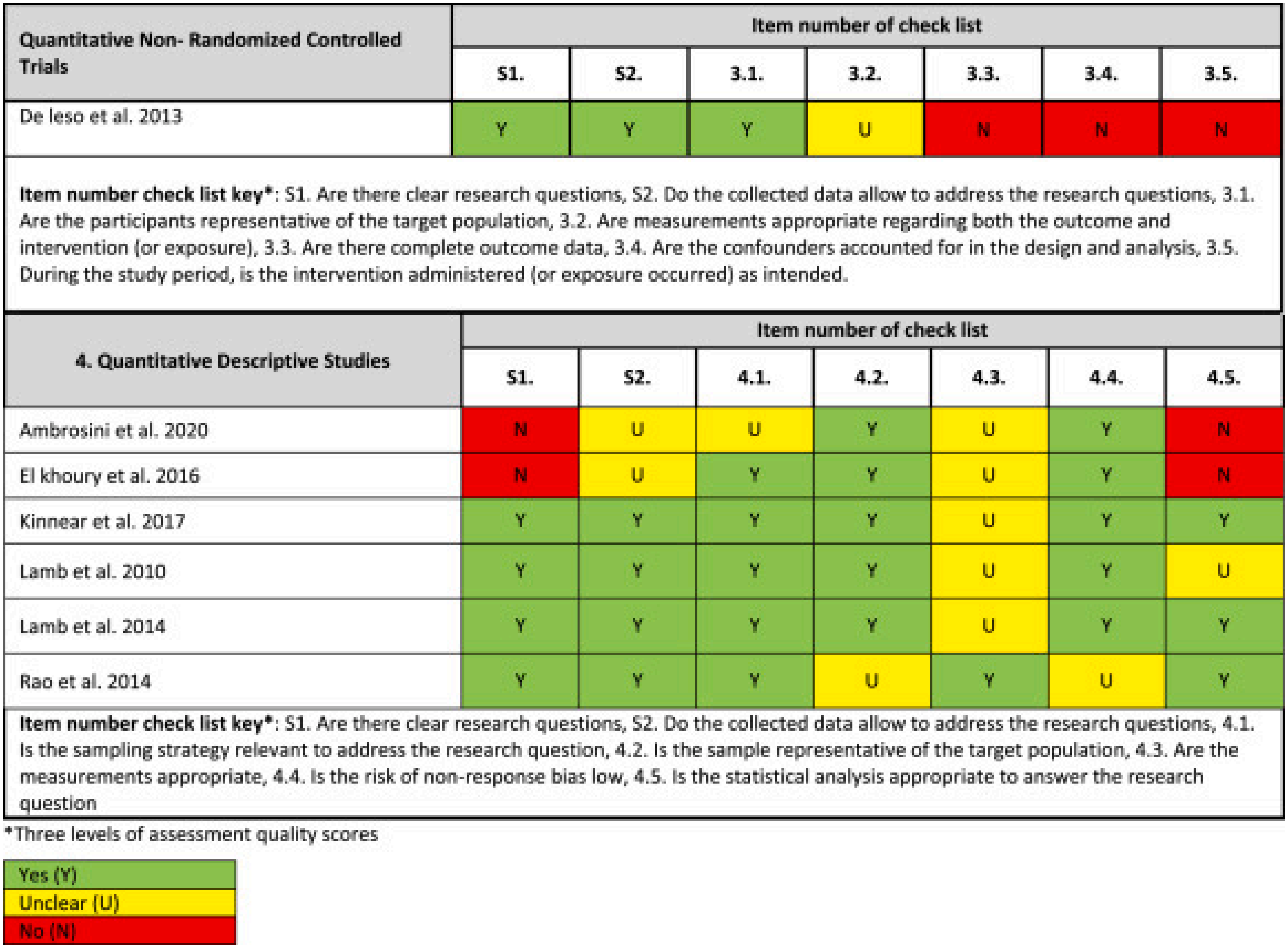
Author and year, Country	Aim	Participants	Methods	Study design	Data collection	Limitations
Ambrosini et al. (2020) Italy.	To present preliminary findings of using video communications to carry out discussions in uro-oncology multidisciplinary care during the COVID-19 pandemic.	60 patient participants.	41/60 patients (68.3% response rate) participated in an online survey to report their satisfaction regarding the virtual MDT meeting experience.	Prospective study.	At the end of virtual meetings, patients were asked to complete an anonymous online survey through google forums.	Small sample size. Survey details not reported.
De Ieso et al. (2013) England and Australia.	To analyse the financial costs and decision outcomes of multidisciplinary teams in various oncology settings.	52 MDT meetings. 551 patient records. Mean age of patients discussed 62.	551 patient records were discussed and reviewed by 52 MDTs at the Royal Marsden NHS foundation.	Prospective case note review.	MDT case note reviews. Over 1 month, 551 patient records were assessed.	Limited time frame of data collection (only 1 month). Small sample size regarding uro-oncology MDTs.
Lamb et al. (2011) England.	To examine the perspectives and contributions of oncologists in multidisciplinary teams	61 participants (response rate 79%). 7 medical oncologists, 52 clinical oncologists	Data collected through a survey issued at the British Uro-oncology Group	Prospective cross-sectional study.	A 29-question multiple choice survey that was developed over three iterative phases that sought to demonstrate content	Small sample size. Represents a large sample within a small select population.

Author and year, Country	Aim	Participants	Methods	Study design	Data collection	Limitations
	and explore their potential to lead the MDT meeting.	and 2 respondents (a nurse and a surgeon) were excluded due to not being oncologists 63% of participants were male. Age range 40–49 years.	6th Annual Meeting.		validity, face validity and feasibility. Data from the survey was collected at one point in time and focused on the perspectives of oncologists.	Possible selection bias.
Lamb et al. (2014) England.	To explore members views of uro-oncology MDTs and to identify interventions to increase the efficiency of multidisciplinary team meetings.	173 MDT members (54% response rate), 77 oncologists, 54 cancer nurse specialists, 30 urologist, 3 general practitioners, 2 radiologists, 3 radiographers, 3 radiotherapists and 1 scientist.	Two surveys were conducted, the first survey included members of the British Uro-oncology group annual meeting in 2011. The second survey was issued to members of a national Royal Society of Medicine meeting.	Prospective cross-sectional study.	Members were sent an online survey that included a mix of open and closed questions. 6 questions were multiple choice, and 3 questions were free text response.	Small sample size Primarily includes oncologists, urologists and cancer nurses and is therefore not representative of all MDT members. Possible selection bias.

Author and year, Country	Aim	Participants	Methods	Study design	Data collection	Limitations
Rao et al. (2014) Australia.	To understand how MDT meetings impact patient management decisions and to develop inclusion criteria for patient engagement.	120 MDT meetings. 107 patient records. Mean age of patients discussed 63 (17–90 years). 103 (85.8%) of patients discussed were males. Disease: bladder 35, kidney 28, prostate 47, testis 12, other 2.	Prospective MDT database review held at the Austin Health uro-oncology MDT. MDT consensus plan was compared to the clinician's plan.	Prospective case note review.	MDT case notes reviews. Over 3 months, all cases at the weekly uro-oncology MDT meeting were assessed during 2012.	Limited time frame of data collection (only 3 months). Small sample size.
El khoury et al., 2016 Lebanon.	To examine the impact of uro-oncology MDT meetings regarding the treatment or management decisions for urological cancers.	189 cases presented to the MDTs between July 2012 and July 2014. 173 (91.53%) males, 16 (8.47%) (females. Median age of patients discussed 65 (23–93 years). 20 MDT meetings. Disease: penis 5, prostate 82, testis 7, kidney 19, bladder and urinary tract 76.	Prospective MDT database review held at Notre-Dame de Secours University Medical Centre.	Prospective Study.	A standard document that contained information about the patient, the history, primary diagnosis and staging, the management decision of the physician, his question to the MDT and the decision decided by the team was used to collect data (modified 3 months after implementation). No other information reported.	Prospective study design precludes hypotheses testing. Small sample size. Interpretations of the study are limited to the management decisions after the MDT meeting.

Author and year, Country	Aim	Participants	Methods	Study design	Data collection	Limitations
Kinnear et al. (2017) Australia.	To assess the implementation rates of the treatment and management decisions made by uro-oncology MDT meetings and to identify obstacles to implementation of treatment and management decisions.	202 patients. 50 (24.8%) patients had metastasis. 170 (84.2%) males, 32 (15.8%) females. Mean age of patients discussed 68 (59–74 years). Disease: prostate 86, bladder 47, kidney 46, testes 17. 6 patients had tumours of other urological organs.	Retrospective MDT data base review held at the Austin Health uro-oncology MDT.	Retrospective case note review.	Retrospective review of all patients discussed at the uro-oncology MDT between January 1, 2015 and 30.	Retrospective nature of the study. small sample size. Single-institution focus.

Table 3. Results of quality Assessment.



Quantitative Non- Randomized Controlled Trials	**Item number of check list**						
	S1.	**S2.**	**3.1.**	**3.2.**	**3.3.**	**3.4.**	**3.5.**
De leso et al. 2013	Y	Y	Y	U	N	N	N

Item number check list key*: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 3.1. Are the participants representative of the target population, 3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure), 3.3. Are there complete outcome data, 3.4. Are the confounders accounted for in the design and analysis, 3.5. During the study period, is the intervention administered (or exposure occurred) as intended.

4. Quantitative Descriptive Studies	**Item number of check list**						
	S1.	**S2.**	**4.1.**	**4.2.**	**4.3.**	**4.4.**	**4.5.**
Ambrosini et al. 2020	N	U	U	Y	U	Y	N
El khoury et al. 2016	N	U	Y	Y	U	Y	N
Kinnear et al. 2017	Y	Y	Y	Y	U	Y	Y
Lamb et al. 2010	Y	Y	Y	Y	U	Y	U
Lamb et al. 2014	Y	Y	Y	Y	U	Y	Y
Rao et al. 2014	Y	Y	Y	U	Y	U	Y

Item number check list key*: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 4.1. Is the sampling strategy relevant to address the research question, 4.2. Is the sample representative of the target population, 4.3. Are the measurements appropriate, 4.4. Is the risk of non-response bias low, 4.5. Is the statistical analysis appropriate to answer the research question

*Three levels of assessment quality scores

🟩 Yes (Y)
🟨 Unclear (U)
🟥 No (N)