# Comparison of quality of systematic reviews published across major urology journals from 2016 to 2020

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## Abstract

**Background:** To compare the reporting and methodological quality of systematic reviews published in five major urological journals from 2016-2020 using Assessment of multiple systematic reviews (AMSTAR) and Preferred reporting items for systematic review and meta-analysis (PRISMA) items checklist.

**Materials and Methods:** Hand searches of all the issues of top five urology journals (British Journal of Urology International (BJUI), European Urology (EU), Urology Gold, World Journal of Urology, The journal of Urology were performed by two authors. Data was extracted from the included studies for adherence to PRISMA and AMSTAR checklist items.

**Results:** A total of 138 systematic reviews with meta-analyses published from January 2016 to August 2020 were included in this study. Mean PRISMA and AMSTAR scores were 23.9 and 7.4 respectively. BJUI (8.7) had the highest mean AMSTAR score followed by the EU (8.0). BJUI also had the highest number of high-quality reviews. Reviews with prior protocol registration had significantly higher mean PRISMA and AMSTAR scores. On multivariate logistic regression analysis, prior protocol registration and journal were identified as independent predictors of high-quality reviews. Compliance to item numbers 5 and 8 was least for PRISMA checklist, whereas for AMSTAR it was least for 5, 4 8 and 1item numbers

**Conclusions:** The quality of systematic reviews published in major five urological literature has improved significantly in the last five years. The methodological quality of reviews published in BJUI and EU were better than other journals. Prior protocol registration is associated with a significantly better quality of the study.

**Keywords:** AMSTAR, PRISMA, Systematic review, Urology, Meta-analysis.

## Introduction

The volume of medical literature is increasing at a pace never seen before. Multitudes of online journals and peer/non-peer-reviewed publications often make searching for quality publications a daunting task. Similar proliferation can also be noted in the publication of systematic reviews across the medical literature. For example, a PubMed search for the term 'systematic review' returned 43,853 results from 2010 to 2014, whereas a similar search from 2015 to 2020 returned 133,283 results. Similarly, for the terms "systematic review AND Urology" the Pubmed search returned 672 and 3273 results for the 2020-2014 and 2015-2020 time periods. With increasing quantity lies the question of quality. In the present era, where evidence-based medicine is considered standard, it is pertinent to ponder regarding the quality of evidence generated from a study. Systematic reviews of high quality randomized controlled trials (RCT) constitute level I evidence. The quality of a systematic review depends not only on the quality of the included studies but also on the methodology employed while conducting the review. To increase the standard of systematic reviews Quality Of Reporting Of Meta-analysis (QUOROM) statement was published in 1999.[1] In 2009, Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) was published as an update to QUOROM.[2] PRISMA statement constitutes of 27 items checklist and four diagrams. Along similar lines, an 11-item measurement tool called 'assessment of multiple systematic reviews' (AMSTAR) was developed to assess the methodological quality of systematic reviews in 2007.[3] Adherence to these guidelines has been recommended, to produce a high-quality systematic review. However, compliance with these recommendations is not universal. Pertinent to the urology literature, in a previous assessment of systematic reviews published from 1998 to 2013; Han et al reported mean AMSTAR scores of only 4.8, 5.4, and 4.8 for the periods of 2013-2015, 2009-2012, and 1998-2008 respectively.[4] On contrary, Xia et al in their assessment of urology literature across ten journals from 2011-2015 noted a higher mean AMSTAR score of 7.57 and a mean PRISMA score of 22.74.[5] There hasn't been any study conducted in recent times assessing the quality of systematic reviews published in urology literature for the last five years. Therefore with this study, we aimed to appraise the quality of systematic reviews and meta-analyses published across five major urology journals i.e. European Urology (EU), The Journal of Urology (JU), British Journal of Urology International (BJUI), Urology Gold (UG) and World Journal of Urology (WJUR) over the past five years based on their adherence to AMSTAR and PRISMA guidelines. This study also aims to identify predictors of high-quality reviews according to the AMSTAR scores; which are imperative in making a systematic review more compliant to these guidelines and thus of better quality.

## Materials and Methods

In this study, we included all the systematic reviews published from January 2016 to August 2020 in five major urology journals i.e. European Urology (EU), Journal of Urology (JU), British Journal of Urology International (BJUI), World Journal of Urology (WJUR), and Urology

Gold (UG). Four trained reviewers (GS, TY, PMK and MK) were involved in the literature search, study selection and data extraction. To reduce discrepancy in the interpretation of the data, a pilot assessment of 10 systematic reviews was performed by each of the authors.

Non-systematic manual search of all the issues for the stipulated period of the above-mentioned journals was performed by the two reviewers (GS and MK). Initial title and abstract screening were performed and studies including the term "systematic review" in the title and containing an explicit statement in the methodology section of the abstract that review was performed in lines of PRISMA guidelines were selected for full-text review. For inclusion in the study, a review should have applied systematic methods for literature search, selection and analysis. Narrative reviews and reviews not adhering to PRISMA guidelines such as those adhering to other guidelines were excluded from this study. Meta-analysis performed without systematic search, network meta-analysis, systematic reviews without meta-analysis or reviews of diagnostic performance studies were also excluded from this study.

Each study was evaluated for the 27 items mentioned in the PRISMA checklist. A final score was calculated on the basis of total number of checklist items satisfied by the review. Similarly, a total score was calculated on the basis of number of criteria's satisfied from the AMSTAR instrument. Further rating of each review was done according to the AMSTAR score as low-quality (0-3), moderate-quality (4-7) and high-quality (8-11). Further details of how PRISMA and AMSTAR scores were calculated have been provided in the supplementary file.

Data extraction was performed independently by two reviewers for each journal (TY and MKG). Data was then matched for discrepancy and any incongruity in the data was resolved after arbitration among the study authors (GS, SS and PMK). From each article data was extracted for first author, country, journal, year, topic of study, adherence to PRISMA and AMSTAR guidelines, PRISMA flow-chart provided or not, number of authors, application of Grading of Recommendations Assessment, Development and Evaluation (GRADE) recommendations. No priori sample size calculation was performed for this study.

**Statistical analysis**

The primary outcome for this study was the difference in mean PRISMA and AMSTAR scores according to the various journals. Secondary outcomes included difference in quality of reviews with or without a priori protocol and identifying predictors of high quality reviews. Categorical data was presented as proportions or percentages and continuous data as mean with standard deviation (SD) or median and range wherever applicable. Normality of data was checked using Kolmogorov-Smirnov and Shapiro's test. For both the variables i.e. AMSTAR and PRISMA scores data was not normally distributed. Krusal-Wallis test was used to compare mean AMSTAR and PRISMA scores for various journals. Dunn-Bonferroni approach was used for post-hoc analysis for pair-wise comparisons. Qualitative or categorical variables were described as frequencies and proportions. Categorical data was compared using the $\chi 2$ test or Fisher exact test, whichever was applicable. Inter-observer agreement was tested using Kappa statistics for each AMSTAR and PRISMA check-list items. Minimum kappa value was 0.66 and none of the kappa value was less than 0.50 for any of the variables included in the AMSTAR and PRISMA check-list items. All statistical tests were 2-sided and performed at a significance level of $P < 0.05$. Univariate and multivariate logistic regression analysis was used to identify predictors of high AMSTAR scores. The statistical analysis was done using the Statistical Product and Service Solutions (SPSS Inc., Chicago, IL, version 23.0 for Windows).

## Results

A total of 282 systematic reviews published in the five major urological journals were obtained following initial hand searches of the various journals. After applying study inclusion and exclusion criteria, a total of 138 reviews were included in this study (see supplementary file for complete list). Reasons for exclusion include; systematic reviews without meta-analysis (114), meta-analysis of diagnostic accuracy (19) and network meta-analysis (10). Of these 138 reviews, 55 (39.9%) were multinational, 22 (16%) were from Europe and 14 (12.3%) were from North America. Year-wise distribution of the included reviews is provided in the Table 1. World Journal of Urology (39) had the highest number of reviews published during the above-mentioned period followed by EU (29), JU (26), BJUI (25) and UG (19). Topic wise distribution revealed oncology (49.2%) was the most common subcategory followed by benign prostatic hyperplasia (BPH) (21.2%). Mean number of authors in the included studies were 7.8 with a median of 8 and range of 1 to 18. Overall median AMSTAR and PRISMA scores were 7 and 24 respectively. Thirty two reviews were completely compliant to 27 items of PRISMA check-list. According to AMSTAR score, 2 (1.4%), 71 (51.4%) and 65 (47.1%) reviews were of low, moderate and high quality respectively. Prior protocol registration was done in 74 (53.6%) and GRADE recommendations were followed in 24.6% of the reviews (Table 1). Overall compliance to PRISMA and AMSTAR checklist items was 67.3% and 88.5% respectively.

**Table 1:** Characteristics of the reviews included in this study.

| **Variable** | **Value (n=138)** |
|---|---|
| Continent wise distribution | |
| North America | 17 (12.3%) |
| South America | 4 (2.9%) |
| Asia | 34 (24.6%) |
| Europe | 22 (16%) |
| Multinational | 55 (39.9%) |
| Australia | 6 (4.3%) |
| Year wise distribution | |
| 2016 | 22 (15.9%) |
| 2017 | 28 (20.3%) |
| 2018 | 31 (22.5%) |
| 2019 | 33 (23.9%) |
| 2020 | 24 (17.4%) |
| Journal wise distribution | |
| BJUI | 25(18.1%) |
| EU | 29 (21%) |
| JU | 26 (18.8%) |
| WJUR | 39 (28.3%) |
| UG | 19 (13.8%) |
| Topic wise distribution | |
| Oncology | 68 (49.2%) |
| Non-oncological | 70 (50.7%) |
| Robotic | 9 (12.8%) |
| Laparoscopic | 2 (2.8%) |
| Urethral stricture | 4 (5.7%) |
| Andrology | 10 (14.2%) |
| BPH | 15(21.4%) |
| Urogyanecology | 3 (4.2%) |
| Neurourology | 7 (10%) |
| Endourology | 10(14.2%) |
| Infections | 8 (11.4%) |
| Pediatrics | 4 (5.7%) |
| Number of authors | |
| Mean ±SD | 7.83 ±3.5 |
| Median (Range) | 8(1-18) |
| PRISMA score | |
| Mean ±SD | 23.9±2.7 |
| Median (Range) | 24(13-27) |
| Completely PRISMA Compliant | 32(23.2%) |
| AMSTAR score | |
| Mean ±SD | 7.4±1.5 |
| Median (Range) | 7 (3-10) |
| AMSTAR quality of review | |
| Low | 2 (1.4%) |
| Moderate | 71 (51.4%) |
| High | 65 (47.1%) |
| Others | |
| GRADE recommendations | 34 (24.6%) |
| Priori Protocol registration | 74 (53.6%) |

**Table 2:** Comparison of characteristics and quality of included systematic reviews across various journals.

| Variable | BJUI (25) | EU (29) | JU (26) | WJUR (39) | UG (19) | p-value |
|---|---|---|---|---|---|---|
| **Continent wise** | | | | | | |
| **North America** | 0 | 3 (10.3%) | 8 (30.7%) | 1 2.5%) | 5 (26.3%) | |
| **Europe** | 5 (20%) | 3 (10.3%) | 7 (27%) | 3 (7.7%) | 4 (21%) | **0.000*** |
| **Multinational** | 15 (60%) | 22 (75.8%) | 7 (27%) | 10 (25.6%) | 1 (5.2%) | |
| **Asia** | 4 (16%) | 0 | 4 (15.3%) | 21 (53.8%) | 5 (26.3%) | |
| **South America** | 1 (4%) | 0 | 0 | 2 (5.1%) | 1 (5.2%) | |
| **Australia** | 0 | 1 (3.4%) | 0 | 2 (5.1%) | 3 (15.7%) | |
| **Topic Oncology** | 14(56%) | 12 (41.3%) | 20(77%) | 16 (41%) | 6 (31.5%) | **0.017*** |
| **Number of authors** | | | | | | |
| **Mean ±SD** | 8.2±2.8 | 9.3±5.2 | 8.8±3.7 | 7.2±2.5 | 5.4±2.0 | **0.003**$^{\$}$ |
| **PRISMA score Mean ±SD** | 22.6±2.6 | 24.3±2.1 | 23.3±3.8 | 24.9±1.5 | 23.5±3.1 | **0.013**$^{\$}$ |
| **Completely PRISMA Compliant** | 2 (8%) | 7(24.1%) | 9 (34.6%) | 10 (25.6%) | 4 (21%) | 0.224* |
| **AMSTAR score** | | | | | | |
| **Mean ±SD** | 8.7±1.1 | 8.0±1.2 | 6.5±1.3 | 7.1±1.2 | 6.3±1.3 | **0.000**$^{\$}$ |
| **AMSTAR quality of review** | | | | | | |
| **Low** | 0 | 0 | 1 (3.8%) | 0 | 1(5.2%) | |
| **Moderate** | 3 (12%) | 8 (27.5%) | 20(77%) | 24 (61.5%) | 16(84.2%) | **0.000*** |
| **High** | 22 (88%) | 21 (72.4%) | 5 (19.2%) | 15 (38.4%) | 2 (10.4%) | |
| **Priori Protocol** | 13 (52%) | 15(51.8%) | 16 (61.5%) | 1 (41%) | 14 (73.6%) | 0.179* |
| **GRADE recommendations** | 11(44%) | 4 (13.8%) | 8 (30.7%) | 7 (18%) | 4 (21%) | 0.075* |

* p-value according to Chi-square test

$^{\$}$P-value according to the Krusal-Wallis test

BJUI: British Journal of Urology International; JU: Journal of Urology; EU: European Urology; WJUR; World Journal of Urology; UG: Urology Gold; SD: Standard Deviation; PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analyses; AMSTAR: assessment of multiple systematic reviews; GRADE: Grading of Recommendations Assessment, Development and Evaluation.

**Table 3:** Comparison of reviews with and without priori protocol registration.

| Variable | Prior protocol registered (n=74) | Prior protocol not registered (n=64) | p-value |
|---|---|---|---|
| **Year** | | | |
| **2016** | 7(9.4%) | 15 (23.4%) | |
| **2017** | 10 (13.5%) | 18 (28%) | |
| **2018** | 22 (29.7%) | 9 (14%) | **0.011** |
| **2019** | 20 (27%) | 13 (20.3%) | |
| **2020** | 15 (20.2%) | 9 (14%) | |
| **Number of authors Mean ±SD** | 8.4±3.8 | 7.3±3.3 | 0.060 |
| **PRISMA score Mean ±SD** | 24.9±2.6 | 22.8±2.4 | **0.000** |
| **AMSTAR score Mean ±SD** | 7.9± 1.2 | 6.8±1.5 | **0.000** |
| **AMSTAR quality of review** | | | |
| **Low** | 0 | 2 (3.1%) | **0.010** |
| **Moderate** | 31 (41.8%) | 40 (62.5%) | |
| **High** | 43 (58.7%) | 22 (34.3%) | |
| **GRADE recommendations** | 24 (32.4%) | 10 (15.6%) | **0.022** |

PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analyses; AMSTAR: assessment of multiple systematic reviews; GRADE: Grading of Recommendations Assessment, Development and Evaluation.

**Table 4:** Logistic regression analysis to identify predictors of high quality review according to AMSTAR score

| Variable | Univariate OR (95% CI) | p-value | Multivariate OR (95% CI) | p-value |
|---|---|---|---|---|
| **Multinational** | | 0.000 | | |
| **No** | Reference | | Reference | |
| **Yes** | 4.0(1.9, 8.3) | | 1.2(0.4, 3.1) | 0.828 |
| **Journal** | | | | |
| **BJUI** | 62.3(9.3, 415) | 0.000 | 172(19.5, 1519) | **0.000** |
| **EU** | 22.3(4.1, 119.2) | 0.000 | 52.5(6.9, 400) | **0.000** |
| **JU** | 2.02(0.34, 11.7) | 0.432 | 2.4(0.39, 15.0) | 0.390 |
| **WJUR** | 5.3(1.0, 26.3) | 0.041 | 11.7(2.04, 67) | **0.006** |
| **UG** | Reference | | | |
| **Oncology** | 1.4(0.7, 2.7) | 0.311 | | |
| **Non-oncology** | Reference | | | |
| **Number of authors (continuous)** | 1.08(0.98,1.19) | 0.083 | | |
| **Prior protocol registered** | | | | |
| **No** | Reference | | Reference | |
| **Yes** | 2.6(1.3, 5.2) | **0.006** | 7.6(2.6, 22) | **0.000** |
| **GRADE recommendations** | | | | |
| **No** | Reference | 0.051 | | |
| **Yes** | 2.2(0.9, 4.8) | | | |

BJUI: British Journal of Urology International; JU: Journal of Urology; EU: European Urology; WJUR; World Journal of Urology; UG: Urology Gold; SD: Standard Deviation; GRADE: Grading of Recommendations Assessment, Development and Evaluation.

**Journal-wise comparison**

On comparison of various journals, majority of reviews published in EU (75.8%) and BJUI (60%) were multinational. Mean number of study authors was highest in EU (9.3) followed by JU (8.8). Mean PRISMA score was highest for WJUR (24.9) followed by EU (24.3), BJUI (22.6), JU (23.3) and UG (23.5). The difference between mean PRISMA scores was statistically significant using Krusal-Wallis test (p=0.013). Pair-wise comparisons using Dunn-Bonferroni approach revealed that the mean PRISMA scores were statistically different only for BJUI-WJUR (supplementary file figure 1). PRISMA check list items number 5 i.e. protocol and registration (53.6%) and item number 8 i.e. search were the least satisfied (48.6%).

Mean AMSTAR score was highest for BJUI (8.7) followed by EU (8), WJUR (7.1), UG (6.3) and JU (6.5). BJUI had the highest number of high quality and lowest number of low quality reviews according to AMSTAR score. Pair-wise comparison using Dunn-Bonferroni approach showed that mean AMSTAR score was statistically higher for BJUI compared to WJUR, JU and UG but not EU. EU had significantly higher mean AMSTAR score compared to UG and JU but not WJUR and BJUI. Mean AMSTAR score was not statistically different between JU and UG (supplementary file Fig. 2). BJUI also had the highest number of reviews that followed GRADE recommendations (44%). Urology gold (73.6%) had the highest number of reviews with a priori registered protocol followed by JU (61.5%) (Table 2). AMSTAR item numbers 5 (“Was a list of studies (included and excluded) provided?”), 4 (“Was the status of publication (i.e. grey literature) used as an inclusion criterion?”), 8 (‘Was the scientific quality of the included studies used appropriately in formulating conclusions’) and 1 (‘Was an 'a priori' design provided?’) were satisfied only in 3.6%, 34.8%, 58.7% and 53.6% of the studies respectively.

**Comparison of studies with and without protocol registration**

Studies with prior registered protocol had significantly higher mean PRISMA and AMSTAR score. The two groups were also significantly different in terms of quality of review according to AMSTAR score. Studies with prior protocol had highest number of high quality review and lowest number of low quality reviews (Table 3). GRADE recommendations were followed in significantly higher number of reviews with prior published protocol.

**Predictors of high quality reviews**

Univariate logistic regression analysis to identify predictors of high quality of reviews according to AMSTAR score (AMSTAR score 8 or more) was initially performed and the variables that were found to be statistically significant were entered into multivariate analysis. Univariate analysis revealed that journal, multinational reviews, reviews with priori protocol registration and reviews following GRADE

recommendations were predictors of high quality review. On multivariate analysis, only journal and reviews with priori protocol registration [odds ratio (OR) 7.6(2.6, 22)] were independent predictors of high AMSTAR rating. (Table 4)

## Discussion

Conducting a systematic review entails pursuing a step-wise approach; formulating a clinical question, writing and registration of study protocol, literature search, screening of the studies, and extraction of data, study quality or risk of bias assessment, analysis and interpretation of results. PRISMA checklist including 27 items was introduced to serve as a guide through different phases of the review and aimed to improve the reporting and critical appraisal of the systematic reviews. However, the instrument was not intended to assess the methodological quality of the systematic reviews. For assessment of the methodological quality of systematic reviews, AMSTAR tool is the most widely used tool.[3] AMSTAR score was not originally intended to provide an overall score or quality ratings[3]; however its use for the same has become popular after its validation studies.[6,7] Recently, an updated AMSTAR-2 has been introduced that contains 16 items checklist including 10 items of the original instrument. Due to the novelty of this instrument, its use is not that extensive compared to the original AMSTAR score; hence we used the original AMSTAR score to assess the methodological quality of systematic reviews for this study.

Overall mean AMSTAR score (7.4) noted in the present study is higher as compared to previous assessments of the urological literature by Han et al (4.8),[4] Corbyons et al[8] (5.3) and MacDonald et al[9] (4.8). For reporting quality assessment using PRISMA score, our results are comparable to previous reviews focusing on urological[5] and non-urological literature.[10-12] Overall, the quality of reviews published across the urological literature has improved with the lowest mean AMSTAR score being 6.3 for UG, which is higher compared to the previous review of urological literature by Han et al for systematic reviews published from 2013 to 2015. Furthermore, Han et al noted 31.2% of the reviews to be of low quality and only 12.8% were of high quality. Our findings are contrary to their findings, as we noted 1.4% and 47.1% of the reviews to be of low and high quality respectively. We further explored the possible causes of this improving quality of systematic reviews in our study compared to previous similar studies in the urological literature. In the present study, " a priori" study protocol design was provided in 53.6% of the studies compared to less than 20% in the study by Han et al.[4] Prospective registration of study protocol has been previously noted to be associated with high review quality.[13,14] We also noted studies with a priori protocol to be associated with significantly higher mean PRISMA and AMSTAR scores. Secondly, certain journals such as BJUI, WJUR and EU have made the declaration of conflict of interests as a compulsory step during the submission process. A similar protocol is not routinely followed in UG and JU which remains a possible lacuna to be dealt by the journal publishers and editors. Han et al in their study noted three least commonly met AMSTAR criteria to be items number 11 ("conflict of interest statement included", 4 ("status of publication used as an inclusion criterion" and 1 ("a priori design provided"). Compliance to item number 11 and 1 has increased to greater than 50%; however, for items 5 and 4 still remain below 50 percent. Lastly, we excluded systematic reviews without meta-analysis which could be another possible explanation for improved quality of reviews compared to previous studies.[4,8,9] In a previous review of urological literature by Xia et al,[5] authors noted mean PRISMA and AMSTAR scores of 22.74 and 7.57 respectively for the reviews published across 10 urological journals. Xia et al had also followed similar methodology to ours and excluded studies without meta-analysis.[5]

Comparison of top urological journals in the present study showed that BJUI had the highest mean AMSTAR score (significantly higher than other journals except for EU). BJUI had the highest number of systematic reviews of high quality according to AMSTAR scores (88%). EU and BJUI journals have been consistently associated with the publication of high-quality systematic reviews; also noted previously in the studies by Han et al[4] and Corbyons et al.[8] High-quality reviews published with these journals could be attributed to a number of healthy editorial policies including mandatory pre-submission approval of the reviews by the editors, encouraging adherence of the systematic reviews to AMSTAR guidelines and prospective protocol registration, publication of Cochrane reviews, and mandatory inclusion of conflict of interests' statement with the submission of the manuscript.

With this study, we emphasized the priority areas for authors, journal editors and publishers to further progress upon for increasing the quality of systematic reviews in the urological literature. For PRISMA, compliance for items number 5(protocol and registration) and item number 8 (search) remains poor. For AMSTAR items 5 ("Was a list of studies (included and excluded) provided?"), 4 ("Was the status of publication (i.e. grey literature) used as an inclusion criterion?"), 8 ('was the scientific quality of the included studies used appropriately in formulating conclusions') and 1 ('Was an 'a priori' design provided?') remains an area for improvement. We also underscored the value of "priori protocol" not only being associated with high-quality reviews but also being an independent predictor for the same. Increased priori protocol registration noted in the present study could be attributed to the introduction of the International Prospective Register of systematic reviews (PROSPERO) since 2011 by the Centre of Reviews and Dissemination (CRD).

## Limitations

The present study is not without limitations. We acknowledge the fact that we did not perform a systematic literature search for this review. Furthermore, we limited the scope of the present review to top 5 urological journals only which may not be representative of the urological literature. We also recognize that the original AMSTAR tool was only intended for systematic reviews of randomized controlled

trials and was not meant for granting overall scores and grading into 'low', 'moderate' or 'high' quality reviews. As already noted previously, we used the AMSTAR score instead of its recently updated version i.e. AMSTAR-2. Lastly, the exclusion of systematic reviews without meta-analysis might have influenced the overall results as discussed previously.

## Conclusion

The quality of systematic reviews published in the top urological journals has improved in the last 5 years. Comparison of top journals showed BJUI has the highest mean AMSTAR score followed by EU. From the PRISMA checklist, items 5 and 8 are the least reported. According to the AMSTAR instrument, items number 5, 4, 8 and 1 are least satisfied. A 'priori protocol' is associated with improved quality of systematic review and is an independent predictor of high-quality review.

## List of Abbreviations

Assessment of multiple systematic reviews (AMSTAR)
Benign prostatic hyperplasia (BPH)
British Journal of Urology International (BJUI)
Centre of Reviews and Dissemination (CRD)
European Urology (EU)
Grading of Recommendations Assessment, Development and Evaluation (GRADE)
Journal of Urology (JU)
Preferred reporting items for systematic review and meta-analysis (PRISMA)
Quality Of Reporting Of Meta-analysis (QUOROM)
Randomized controlled trials (RCT)
Standard deviation (SD)
Urology Gold (UG)
World Journal of Urology (WJUR)

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## Conflict of Interest

The authors declare that there is no conflict of interests.

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