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**Quality of decision aids developed for women at average risk of breast cancer eligible for mammographic screening: systematic review and assessment according to the International Patient Decision Aid Standards instrument.**

**--- Decision aids for mammographic screening ---**

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SH and CR were responsible for conducting the systematic review, including the interpretation of the results and the drafting of the full report of the systematic review. MJ, AV, MT, FL conducted the search and data extraction. EF contributed to the data analysis and helped to draft the manuscript. All authors read and approved the final manuscript prior submission.

*Precis for use in the table of content:*

A classification of the quality demonstrated large variations between the 23 decision aids identified for women who are at average risk of breast cancer and eligible for mammographic screening. Our review provide a focus on the 3 decision aids with the highest overall score.

*Keywords:*

Breast cancer; mammography; cancer screening; decision aid; informed decision making; shared decision making

## **ABSTRACT**

**Background.** Mammographic screening contributes to a reduction in specific mortality, but it has disadvantages. Decision aids are tools designed to support people's decisions. Because they influence patient choice, their quality is crucial. The purpose of our study was to conduct a systematic review of decision aids developed for women who are at average risk of breast cancer and eligible for mammographic screening and to assess their quality.

**method.** This systematic review was conducted on articles published between January 1st, 1997 and August 1st, 2019 in PubMed, Embase, Cochrane and PsycInfo. The studies were reviewed independently by two reviewers. Any type of study containing a decision aid for women at average risk of breast cancer and eligible for mammographic screening was included. Two double-blind reviewers assessed the quality of the selected decision aids using the International Patient Decision Aid Standards instrument version 3 (IPDASi).

**Results.** 23 decision aids were extracted. A classification of the decision aid quality using the IPDASi v3 demonstrated large variations between the decision aids (mean score = 132.6/188, SD=23.8, range: 85-172). Three decision aids had high overall scores. The 3 dimensions that were best rated were Disclosure (6.8/8), focusing on transparency; Information (26.1/32), focusing on the provision of sufficient details; and Probabilities (25/32), focusing on the presentation of probabilities. The 3 dimensions with the lowest score were Decision support technology evaluation (4.3/8), focusing on the effectiveness of the decision aid; Development (12.6/24), evaluating the development process; and Plain language (1.9/4), assessing the appropriateness for patients with low literacy.

**Conclusions:** This review identified 3 high-quality decision aids for breast cancer screening.

*Total number of each:*

1) text pages (including title page(s), abstract, main text, references, and figure legends) : 22

2) table : 1

3) figure : 1

4) and supporting files for publication : 1 appendix (2 pages), 1 table (9 pages)

## ***Introduction***

Breast cancer is the leading cause of women's mortality worldwide (1). Screening programs based on mammography lead to a 15-20% reduction in specific mortality (2,3). However, assessing the benefits and harms of these programs requires taking into account biases and disadvantages of mammographic screening (2). The most important harms of this screening are false positives, overdiagnosis, overtreatment and radiation-induced cancer (4). The cumulative risk of false positives ranges from 3% to 63% for a woman exposed to annual rounds of mammographic screening between 50 and 70 years (5,6). In this context, clinicians may feel uncomfortable submitting their patients to such a screening process without a shared decision-making process (7).

There is now a consensus that patients should have the opportunity to participate in decisions about their health (8,9). They should understand whether there are options and the related consequences. Patient preferences should be integrated into decision making (10). Decision aids are tools designed to support people's decisions about tests and treatments during a shared decision-making process (11). However, 1) Caverly et al. reported that a large majority of US cancer screening guidelines did not quantify benefits and harms (12), and 2) the impact on patient behavior might depend on the decision aid itself, so a major issue is the quality of the decision aid itself (13).

The aim of the following systematic review was to assess the quality of decision aids developed for women who are at average risk of breast cancer and are eligible for mammographic screening according to the International Patient Decision Aid Standards instrument v3 (IPDASi) (14).

## ***Methodology***

This systematic review was conducted according to the PRISMA guidelines. We searched studies published between January 1<sup>st</sup>, 1997 and August 1<sup>st</sup>, 2019. The following databases were searched: PubMed, Embase, Cochrane and PsycInfo. Additional articles that were found via hand searching the references were also reviewed. The following research algorithm was used in PubMed: (decision support techniques OR decision making OR decision aid OR decision tool OR computer assisted decision making OR risk assessment OR health communication OR patient participation OR decisions trees OR health knowledge, attitudes, practice OR choice behavior) AND (breast neoplasm OR breast cancer) AND (mass screening OR cancer early detection OR cancer screening). The same algorithm was used with few variations in the other databases. First titles, then abstracts and then full texts were reviewed independently by two reviewers with the Abstrackr tool (15). Any disagreements were resolved by consensus; CR and SH resolved any remaining disagreements. Any type of study that contained a decision aid for women who are at average risk of breast cancer and eligible for mammographic screening were included. The exclusion criteria were the following: a focus on women at high risk of breast cancer, no available informational material, promotion of screening (without any information about the harms), information for health professionals, and a focus only on women's willingness regarding a shared decision-making process. A few other exclusion criteria are reported in Appendix 1. The decision aids were extracted when reading the full articles. If the decision aid was not provided in the article, the manuscript authors were contacted by e-mail.

The decision aids underwent double-blind evaluation by three pairs of two reviewers with the IPDASi (14). The IPDASi contains 47 items that assess 10 dimensions (the maximum score for each dimension is provided in parentheses): *Information* (32), *Probabilities* (32), *Values* (16), *Decision guidance* (8), *Development* (24), *Evidence* (20), *Disclosure* (8), *Plain language* (4), *Decision support technology (DST) evaluation* (8), and *Test* (36). Each item was scored on a 4-point rating scale, leading to an overall possible score of 188.

## ***Results***

### **Decision aids selection**

In total, 5979 titles, 1243 abstracts and 304 full-text papers were screened for eligibility using the inclusion and exclusion criteria (figure 1). Twenty-two papers were included in the review, leading to the identification of 23 decision aids.

### **Decision aid characteristics**

Twenty decision aids were in English, 3 of which were also available in another language: one in Chinese (16), one in Spanish (17) and one in French (18). Three decision aids were not available in English: one was in Spanish (19), one was in German (20), and one was in French (21). Fifteen decision aids were on paper (as a booklet, invitation letter, poster, text or diagram) (6,17–19,21–31), 7 were online (16,20,32–36) and 1 was an audio dialogue (presented with a written version in the published manuscript) (37). Concerning the target population of these decision aids, 10 were developed for women in their forties (6,16,22,25,32–37), 17 were for women over 50 years (6,16–26,28–30,32,35), and 3 were developed for women aged 70 years or older to help them decide whether to continue screening (22,27,31).

### **Assessment of decision aid quality**

- **Overall assessment (IPDAS score out of 188) (table 1)**

The overall mean score was 132.6/188 (standard deviation (SD)=23.8, range: 85-172), with large variations among the decision aids. The decision aids with the highest overall scores were those of Hersch (24) (172/188), Schonberg (31) (168/188) and Elkin (33) (166/188). The decision aids with the



lowest overall scores were those of Marshall (25) (95/188), Marshall (26) (94/188) and Fuller (23) (85/188).

The 3 dimensions that were best rated were *Disclosure* (6.8/8, SD=1.0, range: 4-8), *Information* (26.1/32, SD=4.1, range: 17-32) and *Probabilities* (25/32, SD=6.0, range: 8-32). The 3 dimensions that were worst rated were *DST evaluation* (4.3/8, SD=2.3, range: 2-8), *Development* (12.6/24, SD=5.3, range 6-24) and *Plain language* (1.9/4, SD=1.2, range: 1-4).

- **Score for each dimension (table 2)**

1. Information dimension assessment (IPDAS score out of 32)

This dimension assesses whether the provided information about the option includes sufficient detail for the patient to make a specific decision. The mean score was 26.1/32 (SD= 4.1, range: 17-32). The two items with the highest scores were “*Description of the health condition or problem for which the index decision is required*” (3.9/4) and “*Description of the decision that needs to be considered*” (3.8/4). The two items with the lowest scores were “*Description of the natural course of the health condition or problem if no action is taken*” (2.7/4) and “*Description of the positive features (benefits or advantages) of each option*” (2.9/4).

The decision aids with the highest scores for the *Information* dimension were those of Keevil (35) (32/32), Reder (20) (32/32), Hersch (24) (31/32), Schonberg (31) (31/32), Elkin (33) (29/32), Mathieu (36) (29/32) and Mathieu (27) (29/32). None of the decision aids were scored below 16/32 points for this dimension.

2. Probabilities dimension assessment (IPDAS score out of 32)

This dimension focuses on the presentation of outcome probabilities. The mean score was 25/32 (SD= 6.0, range: 8-32). The three items with the highest scores were “*Information about the outcome probabilities associated with the options*” (3.5/4), “*Specification of the defined group of patients to which the outcome probabilities apply*” (3.3/4) and “*Specification of the event rates for the outcome*” (3.3/4).

*probabilities*” (3.3/4). The item with the lowest score was “*Information about the level of uncertainty around the event or outcome probabilities*” (2.4/4).

The decision aids with the highest scores for the *Probabilities* dimension were those of Hersch (24) (32/32), Keevil (35) (32/32), Reder (20) (32/32), Healthwise (34) (31/32), Mathieu (27) (31/32) and Schonberg (31) (31/32). Two decision aids were scored below 16/32 points for this dimension (23,28).

### 3. Values dimension assessment (IPDAS score out of 16)

This dimension focuses on clarifying and expressing values. The mean score was 9.4/16 (SD= 3.1, range: 4-14). The items with the two highest scores were “*Description of the features of the options to help patients imagine what it is like to experience the psychological effects*” (2.8/4) and “*Asking patients to think about which positive and negative features of the options matter most to them*” (2.5/4). The item with the lowest score was “*Description of [...] social effects*” of each option (1.7/4). The decision aids with the highest scores for the *Values* dimension were those of Reder (20) (14/16), Elkin (33) (13/16), Mathieu (27) (13/16), Nekhluydov (37) (13/16), Keevil (35) (12/32) and Wong (16) (12/16). Six decision aids were scored below 8/16 points for this dimension (6,19,22,25,26,29).

### 4. Decision guidance dimension assessment (IPDAS score out of 8)

This dimension assesses the structured guidance provided for deliberation and communication with a practitioner.

The mean score was 5/8 (SD= 2.4, range: 2-8). There were two items in this dimension. The item with the highest score was “*Provision of a step-by-step way to make a decision*” (2.7/4). The item with the lowest score was “*Inclusion of tools like worksheets or lists of questions to use when discussing options with a practitioner*” (2.2/4).

The decision aids with the highest scores for the *Decision guidance* dimension were those of Elkin (33) (8/8), Healthwise (34) (8/8), Keevil (35) (8/8), Mathieu (27) (8/8), Mathieu (36) (8/8), Reder (20) (8/8), and Schonberg (31) (8/8). Eight decision aids were scored below 4/8 points for this dimension (6,17,22,23,25,26,28,29).

5. Development dimension assessment (IPDAS score out of 24)

This dimension evaluates the authors' use of systematic development processes. The mean score was 12.6/24 (SD= 5.3, range: 6-24). The two items with the highest scores were "*Field testing [the decision aids] with patients who were facing the decision*" (2.7/4) and "*Review by patients not involved in producing the decision aid*" (2.3/4). The item with the lowest score was "*Field testing with practitioners who counsel patients who face the decision*" (1.4/4).

The decision aids with the highest scores for the *Development* dimension were those of Hersch (24) (24/24), Schonberg (31) (23/24), Elkin (33) (21/24), Webster (18) (19/24) and Eden (32) (17/24). Ten decision aids scored below 12/24 points for this dimension (6,22,23,25,26,29,30,34–36).

6. Evidence dimension assessment (IPDAS score out of 20)

This dimension assesses whether information is based on comprehensive, critically appraised and up-to-date syntheses of the scientific evidence. The mean score was 13.7/20 (SD= 2.2, range: 9-18). The two items with the highest scores were "*Provision of citations to the studies selected*" (3.8/4) and "*Provision of a production or a publication date*" (3.8/4). The item with the lowest score was "*Provision of information about the proposed update policy*" (1.6/4).

The decision aids with the highest scores for the *Evidence* dimension were those of Elkin (33) (18/20), Keevil (35) (18/20), Hersch (24) (17/20), Pace (6) (17/20) and Schonberg (31) (16/20). One decision aid was scored below 10/20 points for this dimension (21).

7. Disclosure dimension assessment (IPDAS score out of 8)

This dimension focuses on transparency and disclosure of conflicts of interest. The mean score was 6.8/8 (SD= 1, range: 4-8). The two items in this dimension had high scores: "*Information about the funding used for the development*" (3.4/4) and "*Information about author credentials or qualifications*" (3.4/4).

The decision aids with the highest scores for the *Disclosure* dimension were those of Barrat (22) (8/8), Elkin (33) (8/8), Hersch (24) (8/8), Keevil (35) (8/8) and Schonberg (31) (8/8). None of the decision aids scored below 4/8 points for this dimension.

#### 8. Plain language dimension assessment (IPDAS score out of 4)

This dimension focuses on the use of plain language. This dimension contains only one item. The mean score was 1.9/4.

The decision aids with the highest scores for the *Plain language* dimension were those of Baena-Canada (17) (4/4), Eden (32) (4/4), Elkin (33) (4/4), Hersch (24) (4/4) and Schonberg (31) (4/4). Thirteen decision aids scored below 2/4 points for this dimension (6,18–23,27,28,30,34–36).

#### 9. DST evaluation dimension assessment (IPDAS score out of 8)

This dimension focuses on the effectiveness of the decision aid. The mean score was 4.3/8 (SD= 2.3, range: 2-8). There were two items in this dimension. The item with the higher score was “*Existence of evidence that the decision aid helps patients improve their knowledge about options’ features*” (2.2/4). The item with the lower score was “*Existence of evidence that the decision aid improves decisional conflict*” (2.1/4).

The decision aids with the highest scores for the *DST evaluation* dimension were those of Hersch (24) (8/8), Mathieu (27) (8/8), Mathieu (36) (8/8), Reder (20) (8/8) and Schonberg (31) (7/8). Ten decision aids scored below 4/8 points for this dimension (6,19,21–23,25,26,34,35,37).

#### 10. Test dimension assessment (IPDAS score out of 36)

This dimension was developed only for screening tests and focuses on the information provided. The mean score was 27.7/36 (SD= 5.2, range: 15-36). The three items with the highest scores were “*Description of what the test is designed to measure*” (3.9/4), “*Information about the chances of having a true positive test result*” (3.7/4) and “*Information about the chances of a having a false positive result*” (3.7/4). The three items with the lowest scores were “*Description of the next steps if*

*the problem is not detected*” (2.4/4), “*Information about the chances of having a false negative result*” (2.6/4) and “*Description of the chances that the disease is detected with and without the use of the test*” (2.6/4).

The decision aids with the highest scores for the *Test* dimension were those of Keevil (35) (36/36), Elkin (33) (32/36), Hersch (24) (32/36), Reder (20) (32/36) and Toledo-Chavarri (19) (32/36). Two decision aids scored below 18/36 points for this dimension (25,26).

## ***Discussion***

From the 22 papers included in this review, 23 decision aids were extracted and analyzed. The classification using the IPDASi demonstrated large variations in decision aid quality. Three decision aids had high overall scores (24,31,33). The 3 dimensions that were best rated were *Disclosure*, focusing on transparency and conflicts of interest; *Information*, focusing on the provision of sufficient details; and *Probabilities*, focusing on the presentation of probabilities. The 3 dimensions with the lowest score were *DST evaluation*, focusing on the effectiveness of the decision aid; *Development*, evaluating whether there were systematic development processes and field testing of the decision aid in real conditions; and *Plain language*, assessing the appropriateness of the decision aid for supporting decision making among patients with low literacy or socially disadvantaged patients.

Our review reveals a paradox: while decision aid should be designed for individuals in all populations, the dimension that assesses readability (*Plain language*) had the weakest rating (1.9/4), so most of the decision aids were not adapted to support decision making for patients with low literacy. In addition, the selection and quality of the research evidence (*Evidence*) were not explained sufficiently. Only 3 authors reported field testing of their decision aids by practitioners in real conditions (*Development*). Some of the decision aids were not built to support the discussion with the practitioner (*Decision guidance*).

Based on this review, further research should focus on developing online decision aids rather than paper-based tools. Among the top ten decision aids, six were online. Online decision aids were well rated in almost all dimensions, including the *Information*, *Probabilities*, *Values*, *Decision guidance*, *Disclosure*, and *Test* dimensions, and two dimensions were particularly relevant when focusing on the shared decision-making process, namely, the *Values* and *Decision guidance* dimensions.

- Interpretation in light of the literature

Communication about risk is a challenge. Various decision aids included pictographs and more than one way of visualizing the probabilities (20,24,27,31,33,35,36), and the assessment of the *Information* and *Probabilities* dimensions showed better results for these decision aids (20,24,27,31,33,35,36).

This conclusion is consistent with various recommendations from previous authors who focused on risk communication. Ancker and Trevena reported that pictographs might be easier to understand than natural frequencies (38,39). Pictographs allow comparison of the positive and negative features of the available options and can describe the features with as much detail. Presenting risks as population figures (20,33,35) has also been reported to be an alternative (40). Finally, using verbal translations of numeric risks (20,24,27,31,36) may help people better comprehend risk messages (41).

Only six decision aids (17,24,29,31–33) were adapted to support decision making for patients with low literacy or socially disadvantaged patients, even though these populations have a greater risk of advanced cancer (42).

Another review confirms that health literacy has rarely been considered for the design of decision aids. However, in the small number of studies where the literacy needs of patients have been attended to, the results are encouraging. (43) Decision aids improve outcomes in socially disadvantaged groups: it increases knowledge, informed choice and participation in decision-making.

About the impact of adapted low-literacy level, some studies suggested that despite knowledge levels being lower in disadvantaged groups pre-intervention, disparities between groups tended to disappear post-intervention, particularly when the intervention was adapted to disadvantaged groups' needs. (44)

To develop decision aids adapted to low-literacy patients, techniques are known : reducing the amount of text, replacing technical language with lay language, simplifying medical diagrams, integrating illustrations. (45,46)

However, a review about the readability of decision aids (for general health problems) stated that authors did not consistently reports how they designed it for low-literacy patients and if they measured health literacy of patients when they test the decision aid. (44,47)

The online decision aids had better scores for the *Values* and *Decision guidance* dimensions than the paper-based decision aids. These two dimensions are particularly relevant for shared decision-making processes, as they focus on whether the patient has the opportunity to be involved in the decision process and whether his or her values and preferences are integrated in the process. A high level of interactivity is likely crucial to help patients clarify their values and preferences. Online decision aids support a deliberative decision-making process despite the absence of a clinical encounter with a practitioner. Coorey and Kruse reported that electronic health care records could improve patient empowerment (48,49) and increase interest in preventive procedures (50). On the one hand, online decision aids allow the patient to provide personal information (age, risk factors, preferences, views of benefits and harms, and fears), access alternative formats for information delivery (videos, pictures) , use for interactive learning, (51) personalize the decision-making process (33,35) and make a step-by-step decision (20,33–36).

When comparing Web-based decision with printed decision aids, for prostate cancer screening, no differences were found for knowledge, decisional conflict, participation in decision, or screening behavior. (52)

On the other hand, most online decision aids also allow the patient to print a summary containing individualized information. This printed paper version can help the patient discuss his or her options with a practitioner, taking into consideration personal characteristics and values (20,33–36).

However, this presupposes access to a computer or, at least, a connected smartphone, have computer literacy and may introduce skill barriers, which in turn, may exclude underprivileged groups. (44)

An in-between way is to have online and paper-based tools. Web-based decision aids could be supplemented with a simplified paper-based version for use during the clinical consultation. Similarly, paper-based decision aid could also have a digital complement, providing additional details for patients that may want them. (53)

While a shared decision-making process should rely on interaction with the physician (9), surprisingly, only Schonberg, Hersh and Elkin reported field testing of their decision aids with practitioners who counseled patients who were facing the decision. Women expect that a family physician will spend as much time as necessary to explain the benefits and limitations of breast cancer screening (54).

However, health professionals reported barriers to using decision aids, either related to time constraints or to a lack of applicability. Field testing among patients is worthwhile. Two studies showed that time constraints, combined with the amount of information included in the intervention, tended to limit participants' interaction with the intervention. Participants did not have the time to review all sections, and those in the low-literacy group were occasionally overwhelmed by the amount of information available. (44,47) In this context, it is crucial that researchers who develop decision aids for women who are eligible for mammographic screening test their tools in real conditions with general practitioners and patients who face the breast screening decision (55).

The evidence and scientific data provided by decision aids should be high-quality, up-to-date, and centered on patients and professional needs (56). In a previous review, Feldman concluded that decision aid producers tend to rely more heavily on medical experts' than patients' guidance (57). In our review, we determined that decision aids focused mainly on false positives rather than false negatives. A remaining question is to what extent incomplete information on probabilities or test accuracy might lead to information distortion (58).



- Strengths and limitations

Three strengths of this study are listed below.

First, this review is original. This is the first systematic review to assess the quality of decision aids for women who are at average risk of breast cancer and eligible for mammographic screening using international criteria. Four high-quality reviews had previously been performed, focusing on the impact of decision aids on various variables: informed choice (59), knowledge (60), intentions to undergo mammography (61) and the decision-making process (62). However, none focused on the quality of the decision aids itself. Another publication proposed an inventory of the key elements of shared decisions (specific content, type of communication and framework) (63). Finally, Jimbo et al. analyzed 73 decision aids focusing on cancer screening (64), but the most recent study in their review was published in 2010. Moreover, the authors did not rigidly apply the IPDAS criteria to the decision aids, and they included high-risk women, but screening participation is not comparable between women at average risk of breast cancer and those at high risk, who possibly have specific concerns related to the disease.

Second, our review was a systematic review based on the PRISMA quality guidelines.

Third, the assessment of the decision aids was based on the IPDASi, which is an internationally recognized scoring system of decision aid quality.

This review also has limitations. First, scoring with the IPDASi may be subjective because of the broad items. We strengthened the quality evaluation by including two rounds of double-blind scoring. Second, some articles were not available, either because the authors were still working on them or because we did not receive an answer from the authors.

Third, we did not assess the quality of the evidence (which is usually appropriate in a systematic review) (65) because the decision aid quality was independent of the related article quality, so all types of studies were included.

- Clinical practice guidelines

There are variations in the institutional guidelines for mammographic breast cancer screening depending on the country and organization. This work will help physicians select high-quality decision aids in these situations. The use of a high-quality decision aid should favor the implementation of shared decision making for women who are at average risk of breast cancer and eligible for mammographic screening (13).

### *Conclusion*

Through the use of the IPDASi, this review highlighted the strengths and weaknesses of the existing decision aids for women who are at average risk of breast cancer and eligible for mammographic screening. The review provided a classification of the existing decision aids. IPDASi criteria should also be used as a unavoidable guide when for creating a new tool.

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**Table 1: Quality of decision aids developed for women at average risk of breast cancer eligible to mammography screening, an assessment according to the International Patient Decision Aid Standards instrument.**

|                              | Dimensions assessed by the IPDAS instrument |                      |               |                            |                    |                 |                  |                         |                         |             | Overall quality     |
|------------------------------|---|----------------------|---------------|----------------------------|--------------------|-----------------|------------------|-------------------------|-------------------------|-------------|---------------------|
|                              | Information<br>/32                          | Probabilities<br>/32 | Values<br>/16 | Decision<br>Guidance<br>/8 | Development<br>/24 | Evidence<br>/20 | Disclosure<br>/8 | Plain<br>language<br>/4 | DST<br>Evaluation<br>/8 | Test<br>/36 | Total score<br>/188 |
| Mean (SD <sup>1</sup> )      | 26,1 (4,1)                                  | 25,0 (6,0)           | 9,4 (3,1)     | 5,0 (2,4)                  | 12,6 (5,3)         | 13,7 (2,2)      | 6,8 (1,0)        | 1,9 (1,2)               | 4,3 (2,3)               | 27,7 (5,2)  | <b>132,6 (23,8)</b> |
| Hersch and al, 2015          | 31  | 32                   | 11            | 5                          | 24                 | 17              | 8                | 4                       | 8                       | 32          | <b>172</b>          |
| Schonberg and al, 2014       | 31  | 31                   | 10            | 8                          | 23                 | 16              | 8                | 4                       | 7                       | 30          | <b>168</b>          |
| Elkin and al, 2017           | 29  | 27                   | 13            | 8                          | 21                 | 18              | 8                | 4                       | 6                       | 32          | <b>166</b>          |
| Keevil and al, 2017          | 32  | 32                   | 12            | 8                          | 9                  | 18              | 8                | 1                       | 2                       | 36          | <b>158</b>          |
| Mathieu and al, 2010         | 29  | 31                   | 13            | 8                          | 16                 | 14              | 7                | 1                       | 8                       | 31          | <b>158</b>          |
| Reder and al, 2015           | 32  | 30                   | 14            | 8                          | 12                 | 12              | 7                | 1                       | 8                       | 32          | <b>156</b>          |
| Mathieu and al, 2007         | 29  | 32                   | 9             | 8                          | 11                 | 14              | 7                | 1                       | 8                       | 31          | <b>150</b>          |
| Wong and al, 2015            | 27  | 26                   | 12            | 5                          | 14                 | 15              | 7                | 2                       | 6                       | 26          | <b>140</b>          |
| Baena-Canada and al, 2015    | 28  | 24                   | 11            | 2                          | 12                 | 14              | 5                | 4                       | 6                       | 30          | <b>136</b>          |
| Healthwise and al, 2016      | 27  | 31                   | 11            | 8                          | 6                  | 12              | 7                | 1                       | 2                       | 31          | <b>136</b>          |
| Webster and al, 2007         | 28  | 20                   | 10            | 5                          | 19                 | 11              | 7                | 1                       | 4                       | 31          | <b>136</b>          |
| Nekhlyudov and al, 2009      | 27  | 26                   | 13            | 6                          | 14                 | 13              | 4                | 2                       | 2                       | 28          | <b>135</b>          |
| Toledo-Chavarri and al, 2017 | 28  | 26                   | 6             | 4                          | 14                 | 13              | 7                | 1                       | 2                       | 32          | <b>133</b>          |
| Eden and al, 2015            | 21  | 25                   | 9             | 5                          | 17                 | 12              | 7                | 4                       | 5                       | 27          | <b>132</b>          |
| Bourmaud and al, 2016        | 27  | 23                   | 11            | 4                          | 12                 | 9               | 7                | 1                       | 2                       | 30          | <b>126</b>          |
| Petrova and al, 2015         | 21  | 28                   | 5             | 2                          | 8                  | 12              | 7                | 3                       | 4                       | 29          | <b>119</b>          |
| Rimer and al, 2001, 2002     | 21  | 18                   | 10            | 6                          | 11                 | 13              | 7                | 1                       | 5                       | 26          | <b>118</b>          |
| Pasternak and al, 2011       | 25  | 14                   | 10            | 3                          | 14                 | 13              | 7                | 1                       | 4                       | 26          | <b>117</b>          |
| Pace and al, 2014            | 26  | 20                   | 5             | 3                          | 6                  | 17              | 7                | 1                       | 2                       | 23          | <b>110</b>          |
| Barratt and al, 2005         | 23  | 25                   | 4             | 2                          | 6                  | 15              | 8                | 1                       | 2                       | 23          | <b>109</b>          |
| Marshall and al, 2005        | 21  | 23                   | 4             | 2                          | 8                  | 13              | 5                | 2                       | 2                       | 15          | <b>95</b>           |
| Marshall and al, 2003        | 21  | 23                   | 4             | 2                          | 7                  | 13              | 5                | 2                       | 2                       | 15          | <b>94</b>           |
| Fuller and al, 2015          | 17  | 8                    | 9             | 2                          | 6                  | 12              | 7                | 1                       | 2                       | 21          | <b>85</b>           |

<sup>1</sup>Standard Deviation

