Table 1 The ratings of individual DISCERN items ($N = 36$)

DISCERN item	Rating of 1 and 2 (low quality) *N* (%)	Rating of 3 (moderate quality) *N* (%)	Rating of 4 and 5 (high quality) *N* (%)
1) Are the aims clear?	17 (47.2 %)	14 (38.9 %)	5 (13.9 %)
2) Does the leaflet achieve its aims?[a]	0 (0.0 %)	0 (0.0 %)	33 (91.2 %)
3) Is it relevant?	0 (0.0 %)	2 (5.6 %)	34 (94.4 %)
4) Is it clear what sources of information were used to compile the publication (other than the author or producer)?	36 (100 %)	0 (0.0 %)	0 (0.0 %)
5) Is it clear when the information used or reported in the publication was produced?	6 (16.7 %)	30 (83.3 %)	0 (0.0%)
6) Is it balanced and unbiased?	1 (2.8 %)	15 (41.7 %)	20 (55.5 %)
7) Does it provide details of additional sources of support and information?	25 (69.4 %)	6 (16.7 %)	5 (13.9 %)
8) Does it refer to areas of uncertainty?	2 (5.5 %)	5 (13.9 %)	29 (80.6 %)
9) Does it describe how each treatment works?	5 (13.9 %)	9 (25.0 %)	22 (61.1 %)
10) Does it describe the benefits of each treatment?	2 (5.6 %)	16 (44.4 %)	18 (50.0 %)
11) Does it describe the risks of each treatment?	12 (33.3 %)	8 (22.2 %)	16 (44.5 %)
12) Does it describe what would happen if no treatment is used?	18 (50.0 %)	10 (27.8 %)	8 (22.2 %)
13) Does it describe how the treatment choices would affect overall quality of life?	7 (19.4 %)	16 (44.4 %)	13 (36.1 %)
14) Is it clear that there may be more than one possible treatment choice?	14 (38.8 %)	11 (30.6 %)	11 (30.6 %)
15) Does it provide support for shared decision-making?	22 (61.1 %)	10 (27.8 %)	4 (11.1 %)

[a]Not applicable for three leaflets

95 % CI: −26.77, −17.83, $p < 0.001$). Both the Flesch-Kincaid Grade Level (3.80, 95 % CI: 2.74, 4.86, $p < 0.001$) and SMOG index (2.60, 95 % CI: 1.82, 3.38, $p < 0.001$) scores for AAO PILs were significantly higher than BOS PILs (Table 5).

Discussion

It is paramount that written information should be focused at those who would most benefit from them as part of their planned health care and clinicians who utilise this information are confident of its quality [1]. The DISCERN instrument has been developed to aid the production of high-quality evidence-based consumer information by setting standards and providing a reference point for authors [10]. The primary aim of this study was to assess the quality of orthodontic PILs with reference to the DISCERN instrument. When assessed in relation to the DISCERN instrument the quality of PILs used in both medical and dental specialties has been reported to be sub-optimal [14, 16, 17]. The secondary aim was to assess both readability and reading age of PILs. Both variables have been investigated previously in both medical and dental literature with a large variance reported [13, 14, 18–20].

Based on the overall summative score and most frequent score for item 16 (overall quality rating) of the DISCERN instrument, the orthodontic PILs included in this study were deemed to be of moderate quality. The mean overall quality score for the total sample was 44 which is comparable to mean quality score of medical PILs of 35.2 reported by Rees et al. [14]. Similarly, no patient information leaflet achieved a rating of 5 for overall quality (item 16), which is consistent with previous studies [14]. PILs produced by the BOS were of higher quality compared to AAO. Our study has also highlighted deficiencies in the quality of PILs in relation to particular items of the DISCERN instrument. Items assessed as low quality included description of aims (47.2 %), description of sources (100 %), details of additional sources (69.4 %), consequences of no treatment (50 %), possible treatment options (38.8 %), and support for a shared decision process (61.1 %). Similar findings have been reported in an assessment of dental PILs. Lewis and Newton [16] reported deficiencies in reporting aims, reference to sources of information or date of production, risks of treatment, effect of choosing not to have treatment, effect of treatment on overall quality of life, and support for shared decision-making. As part of the informed consent process, patients should now be informed of potential material risks of treatment [8]. PILs have been reported to contribute to the informed consent process [7]. However, in relation to the DISCERN instrument, orthodontic PILs