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## Chinese Obstetrics and Gynecology Journal Club (COGJOC): A Randomized Controlled Trial of a Journal Club to Improve Medical English in Chinese Medical Professionals

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1 **Chinese Obstetrics and Gynecology Journal Club (COGJOC): A Randomized**  
2 **Controlled Trial of a Journal Club to Improve Medical English in Chinese Medical**  
3 **Professionals**

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16 **Short Title:** RCT of a Chinese Journal Club

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20 **ABSTRACT**

21 **Objective:** To assess whether an intensive journal club model based on articles and  
22 questions from the journal *Obstetrics and Gynecology* could improve comprehension  
23 and written and spoken expression of medical English in a population of Chinese  
24 medical professionals.

25 **Methods:** A volunteer sample of 52 medical professionals who were residents or  
26 postgraduate students at the master and PhD levels at the Heilongjiang University of  
27 Chinese Medicine. After a 3-part baseline examination (multiple choice, written, and  
28 oral) to assess medical English comprehension, participants were randomized to either  
29 1) an intensive treatment arm with 24 journal club sessions or 2) a self-study group. An  
30 intensive journal club met for two hours every other day for 8-consecutive weeks or self-  
31 study. At the conclusion of the 8-week intervention period participants were re-tested  
32 with new questions. Evaluators were blinded to intervention assignments.

33 **Results:** Primary outcome measured was the change in score on the multiple choice  
34 examination. Secondary outcomes included change in written and oral scores with  
35 grading scales used for Test of English as a Foreign Language (TOEFL) tests.  
36 Both groups improved on multiple choice assessment without a statistically significant  
37 difference between groups (90% power; n=25 and 27 for self-study and intervention  
38 groups, respectively). However, there was a statistically significant difference between  
39 groups with respect to both mean improvement in written (difference in means of 3.07  
40 TOEFL score, 95% CI:[1.1,5.0],p=0.003) and speaking scores (difference in means of  
41 1.91 TOEFL score, 95% CI:[0.06, 3.7],p=0.04) favoring the journal club intervention.

42 **Conclusions:** Although reading articles and questions from *Obstetrics and Gynecology*  
43 was associated with an increased number of correct answers on a multiple choice test

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3 44 of medical knowledge in all participants, interacting with colleagues and an English-  
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5 45 speaking facilitator in an intensive journal club environment improved both written and  
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8 46 spoken expression of English medical literature in Chinese medical professionals.  
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10 47 **Trial Registration:** ClinicalTrials.gov NCT01844609  
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For peer review only

## 49 INTRODUCTION

50 English is increasingly becoming the *lingua franca* of medicine. Most international  
51 medical conferences are held in English and the journals with the highest impact are  
52 published in English. However, many international research institutions have driven  
53 growth in participation in international meetings and publication output<sup>1</sup> without  
54 necessarily addressing the challenges facing academicians with limited English  
55 language capabilities who compete to present at international meetings and publish in  
56 these elite international journals. Consequently, there is an acute need for non-English  
57 speaking medical professionals to develop written and oral English communication skills  
58 to participate in these academic endeavors. Previous studies have suggested that  
59 learners succeed when they focus on reading academic texts in their field to learn  
60 typical writing patterns<sup>2,3</sup>.

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62 The purpose of this randomized educational trial was to determine if an intensive journal  
63 club based on articles and specifically-designed materials freely accessible through the  
64 *Obstetrics and Gynecology* website improves comprehension and written and spoken  
65 expression of medical English in a population of Chinese medical professionals.

## 67 METHODS

68 The study population consisted of 52 medical professionals who were residents or  
69 postgraduate students at the master and PhD levels at the Department of Obstetrics  
70 and Gynecology, Heilongjiang University of Chinese Medicine in Harbin, China, who  
71 consented to participate in an 8-week educational intervention. This randomized

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3 72 controlled trial with parallel design was exempt from approval by the Institutional Review  
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5 73 Board at the Pennsylvania State University College of Medicine and by the review board  
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8 74 of the host institution in China at The First Affiliated Hospital, Heilongjiang University of  
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10 75 Chinese Medicine. All participants gave written informed consent with potential harms  
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12 76 cited as possible stress from taking examinations or participating in a journal club.  
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14 77 Participants were eligible if they were Chinese medical professionals specializing in  
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16 78 gynecology (in China the practice of obstetrics and gynecology is split and we focused  
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18 79 on gynecology specialists in this study). The sole exclusion criterion was self-reported  
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20 80 English-speaking fluency. Consenting participants completed a baseline demographics  
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22 81 questionnaire and were randomized to either 1) an intensive treatment arm with 24  
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24 82 journal club sessions led by a bilingual (English and Mandarin) medical student (IKT)  
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26 83 from the United States (US) over the course of 8 weeks (intensive journal club) or 2) a  
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28 84 self-study arm with self-directed learning (self-study). One of the authors (ARK)  
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30 85 developed the randomization scheme using permuted blocks of size 2 to randomly  
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32 86 assign the consenting participants to the intervention groups using an equal allocation  
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34 87 ratio of 1:1 which was unknown to the other authors or participants. Another author  
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36 88 (IKT) matched an alphabetized student roster to this randomization list three days prior  
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38 89 to the first day of the journal club. No other characteristics about the students were  
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40 90 known besides his or her name. Randomization was kept concealed to all study  
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42 91 participants until the intervention groups were assigned.  
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51 92 Participants took a 3-part baseline examination (multiple choice, written, and oral) to  
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53 93 assess medical English comprehension and expression; this format was modeled off of  
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55 94 standardized language exams such as the Test of English as a Foreign Language  
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3 95 (TOEFL). A similar format but different content I post-intervention examination was  
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5 96 repeated at end of study. The multiple choice examination consisted of 15 questions,  
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8 97 with 5 answer choices each, adapted from the Association of Professors of Gynecology  
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10 98 and Obstetrics (APGO) Undergraduate Web-Based Interactive Self Evaluation (uWISE)  
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12 99 practice examinations and was read aloud to all participants during a one hour group  
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14 100 orientation session. Participants did not have access to questions in a written format.  
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17 101 Two additional open-ended questions were selected from one of the *Obstetrics and*  
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19 102 *Gynecology* journal club article's study guide: one was read aloud and students had 10  
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21 103 minutes to provide written responses and the other was read aloud to each student  
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23 104 privately as he or she provided an oral response, which was recorded. At the time of  
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25 105 baseline testing, no articles had been presented at journal club, though the article  
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27 106 selected for the oral examination was one of the first ones listed on the class syllabus  
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29 107 that had been distributed in advance. Similarly, the article selected for the post-exam  
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31 108 was one of the final journal club articles, though students did not know in advance the  
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33 109 identity of the journal club article, all of which were selected from the *Obstetrics and*  
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35 110 *Gynecology* journal.

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41 111 Following baseline examinations, both groups received a class syllabus with 24  
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43 112 selected gynecology articles and stimulus questions from the *Obstetrics and*  
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45 113 *Gynecology* journal club website. Articles spanned over 15 unique gynecology topics as  
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47 114 identified by the APGO Medical Student Educational Objectives<sup>4</sup> (see eTable 1).  
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49 115 Articles were selected based on website availability and perceived student interest of  
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51 116 the journal club facilitator (IKT). Students accessed all material independently from the  
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53 117 *Obstetrics and Gynecology* website. The intensive journal club participants attended  
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3 118 two-hour sessions every other day, which consisted of reading selections of the  
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5 119 assigned article aloud and discussing questions from the website's study guide. The  
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8 120 self-study group followed the same syllabus but did not attend classes. There were no  
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10 121 restrictions on use of translation software, nor was there an accurate way to monitor its  
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12 122 potential use. The self-study students were asked to submit written, ungraded answers  
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14 123 to 2 questions from the study guide for each article by the day it was to be presented in  
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16 124 journal club as a measure of compliance. All data was collected at the host institution in  
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18 125 Harbin, China. The journal club ran for 8 weeks from May through July 2013.

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23 126 The primary outcome measured was the change in score from baseline to post-  
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25 127 intervention on the multiple choice examination. Pre-specified secondary outcomes  
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27 128 included change in score on the written and oral examinations. Two independent,  
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29 129 masked evaluators (WCD and RSL) graded the written and oral examinations based on  
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31 130 a rubric adapted from respective TOEFL exams at the study's conclusion, therefore  
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33 131 feedback was not provided to the participants mid-study. The evaluators were blinded to  
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35 132 the identity of the subject, the group assignment, and whether the exam they were  
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37 133 grading was the baseline or end of study exam.

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43 134 Each evaluator independently graded the written responses on two tasks (language use  
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45 135 and topic development) from 0 to 5 for a total maximum score of 10. Masked evaluators  
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47 136 assigned written scores to students based on the associated student ID number only;  
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49 137 written responses were presented and evaluated in a random order. The spoken  
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51 138 responses were graded on three tasks (delivery, language use, topic development) from  
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53 139 0 to 4 for a total maximum score of 12. Masked evaluators assigned speaking scores  
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55 140 to students based on their verbalized student ID number only; recorded responses were



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3 141 presented in a random order and not segregated by treatment group. A higher score  
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5 142 indicated a greater comprehension and fluency of written or spoken English,  
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8 143 respectively.  
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11 144 The primary outcome for this study was the change in the number of correct answers  
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13 145 from baseline to post-intervention on the multiple choice examination. Prior to study  
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15 146 initiation, we judged that a difference in the means of 3 points between the two groups  
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17 147 was an educationally meaningful difference, based on a 15-point exam. Further, we  
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19 148 assumed the standard deviation would be 3 points. Based on these assumptions, a  
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21 149 sample size of 23 participants per group provided 90% power to detect a difference of 3  
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23 150 points between the two groups using a two-sided test having a significance level of  
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25 151 0.05. However, we anticipated a 10% attrition rate for the participants during the study;  
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27 152 therefore, the total sample size was increased to 52 participants.  
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34 153 Linear mixed-effects models were used to assess differences between and within  
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36 154 groups with respect to the primary outcome (change in multiple choice scores) and  
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38 155 secondary outcomes (change in writing and speaking scores). Linear mixed-effects  
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40 156 models are an extension of regression models that account for the within-subject  
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42 157 correlation inherent in longitudinal studies. Inter-rater reliability between the two  
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44 158 independent evaluators for the writing and speaking examinations was assessed using  
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46 159 the weighted Kappa statistic. All hypothesis tests were two-sided and all analyses were  
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48 160 performed using SAS software, version 9.3 (SAS Institute Inc., Cary, NC).  
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## 54 162 **RESULTS**

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3 163 Fifty-two Chinese medical professionals participated in the study with 46 completing all  
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5 164 aspects of the study (Fig 1). Recruitment began in March 2013 and ended in May  
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8 165 2013. Participants were recruited from a pool of 60 students by attending OB/GYN  
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10 166 physicians at the host institution, and recommended by their attending physicians to  
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12 167 participate in this educational summer experience. Six participants failed to complete  
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14 168 the study (4 in the intensive group and 2 in the self-study group) for an 11.5% attrition  
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16 169 rate. Participants were either lost to follow-up or were unable to complete the course  
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18 170 and attend the final day of testing due to conflicting professional duties. Compliance for  
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20 171 the self-study group, as measured by electronic submission of two study guide  
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22 172 questions per article, dropped from 100% the first week, down to 60% (15 out of 25) by  
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24 173 mid-study to 20% (5 out of 25) by the study conclusion at 8 weeks. In comparison,  
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26 174 attendance for the intensive group dropped from 100% the first week, down to 96% (26  
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28 175 out of 27) by mid-study to 77% (20 out of 27) by study conclusion.  
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36 177 Results of baseline characteristics between the two cohorts show similar levels of self-  
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38 178 reported English proficiency, as well as other demographic characteristics including  
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40 179 age, highest degree conferred, and years of formal English instruction (**Table 1**).  
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42 180 Both groups improved in mean number of correct multiple choice responses, but there  
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44 181 was no statistically significant difference between groups (**Table 2**). However, there was  
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46 182 a statistically significant difference between groups with respect to both mean written  
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48 183 scores and speaking scores (**Table 2**; For self-study and intensive groups, respectively:  
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50 184 mean correct written score (SD) on pre-test 5.52 (2.36) and 4.72 (3.10); mean correct  
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52 185 written score (SD) on post-test 4.72 (2.32) and 6.98 (2.20); mean correct speaking  
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3 186 score on pre-test 5.33 (2.37) and 5.63 (2.36); mean correct speaking score on post-test  
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5 187 4.89 (2.70) and 7.11 (2.16)).  
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9 188 There was also a statistically significant improvement within the intensive group across  
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11 189 all three language competencies (**Table 3**). There was a statistically significant  
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13 190 improvement within the self-directed group on the multiple choice examination, but not  
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15 191 for writing or speaking components  
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19 192 For this study, inter-rater reliability of the two independent raters for evaluating pre- and  
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21 193 post-examination written scores had a weighted kappa value of 0.67 (95% CI: (0.55,  
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23 194 0.79)) and 0.71 (95% CI: (0.62, 0.81)), respectively. Weighted kappa scores for pre- and  
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25 195 post-examination speaking scores were slightly lower at 0.58 (95% CI: (0.45, 0.72)) and  
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27 196 0.57(95% CI: (0.42, 0.72)), respectively.  
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## 34 198 **DISCUSSION**

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36 199 Our study results suggest that a journal club significantly and selectively improves both  
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38 200 written and verbal medical English proficiency of Chinese OB/GYN health professionals  
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40 201 as assessed by a significant improvement in respective TOEFL scores. This suggests  
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42 202 that holding frequent journal clubs may offer one method of increasing oral  
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44 203 comprehension and speaking skills in foreign medical professionals. However, other  
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46 204 factors such as the students' concurrent clinical training may also play a role in  
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48 205 individual content-specific test performance.  
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54 206 One objective of our study was to determine if participating in a journal club would  
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56 207 improve knowledge base and comprehension over independently reading journal  
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3 208 articles and answering stimulus questions. A large study by the Royal College of  
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5 209 Physicians and Surgeons of Canada demonstrated that out of possible activities,  
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8 210 reading medical literature most frequently stimulated self-directed learning activities  
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10 211 leading to a greater likelihood of changing practice patterns, in spite of available  
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12 212 educational seminars and opportunities for group discussion with peers, as in a journal  
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14 213 club setting<sup>5</sup>. The American Medical Association (AMA) even issues a standard  
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16 214 certificate based on structured or less-structured learning experiences, of which self-  
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18 215 directed reading is a credible option for continuing medical education<sup>6</sup>. On the other  
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20 216 hand, a randomized controlled trial suggested that surgeons who participated in an  
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22 217 internet-based journal club improved their critical appraisal skills more than the control  
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24 218 group that only read clinical articles, possibly due to the lack of accountability in self-  
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26 219 directed learning<sup>7</sup>.

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33 220 Another aim was to objectively quantify a potential difference in reading, oral, and  
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35 221 spoken comprehension between the two groups as assessed by multiple choice and  
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37 222 modified TOEFL tests. While studies have described the journal club's effectiveness in  
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39 223 teaching critical appraisal as measured by subjective self-assessments or self-created  
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41 224 pre- and post-tests<sup>8-11</sup>, little research has evaluated the journal club method as a vehicle  
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43 225 for specifically improving oral and spoken comprehension of medical English. Further, a  
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45 226 literature review found no evidence of a randomized trial that quantifies the journal  
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47 227 club's impact in an international academic setting, specifically as a tool for teaching  
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49 228 medical English and improving oral and written comprehension for non-English  
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51 229 speakers, though commentary has explored the benefits of and barriers to organizing  
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53 230 journal clubs in developing countries<sup>12</sup>.

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3 231 The strengths of the study include its randomized design, its reproducible model, the  
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6 232 use of objective journal article study guides from the *Obstetrics and Gynecology*  
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8 233 website, and the standardized TOEFL grading rubric. Articles selected for the  
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10 234 intervention spanned over 15 unique topics in gynecology. This provided an appropriate  
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13 235 and broad academic context for health professionals to learn both medical vocabulary  
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15 236 and grammatical structures. Additionally, both pre- and post-intervention examinations  
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17 237 were adapted from uWISE, a professional question bank used by some students to  
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20 238 prepare for the National Board of Medical Examiners (NBME) subject examination in  
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22 239 obstetrics and gynecology. The grading rubrics for both the written and speaking  
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24 240 portions were adapted from respective TOEFL rubrics with comparable score reliability  
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26 241 estimates. Weighted kappa scores for the pre-and post-examination written scores were  
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28 242 0.67 and 0.71, respectively and for the pre- and post-examination speaking scores were  
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30 243 0.58 and 0.57, respectively. Score reliability estimates for the TOEFL writing and  
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32 244 speaking exams are comparable at 0.74 (Standard Error of the Mean (SEM)=2.76) and  
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34 245 0.88 (SEM=1.62), respectively<sup>13</sup>. The preferred TOEFL kappa value between  
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36 246 automated and human scoring is 0.70, which represents the threshold at which signal  
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38 247 outweighs noise in prediction<sup>14</sup>.

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41 248 One of the limitations of our study is the appropriateness of using this multiple choice  
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43 249 test to evaluate medical knowledge acquisition and language comprehension. Since the  
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45 250 clinical question stems are modeled on US-based examinations that test knowledge of  
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47 251 guidelines and treatment, they may not have been an appropriate test vehicle for a  
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49 252 population of Chinese medical professionals with limited education in western medicine.  
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52 253 These participants have an undergraduate educational background in Traditional  
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3 254 Chinese Medicine (TCM), with a curriculum that is 40% western medicine-based.  
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6 255 Though this strengthens the integration of eastern and western medicine, it may have  
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8 256 limited the efficacy of our experimental training module. Additional limitations include the  
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10 257 disparate journal club attendance and compliance rate of the self-directed control group.  
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14 258 The *Obstetrics and Gynecology* journal club may provide an efficient vehicle for learning  
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16 259 both written and spoken English and content-specific medical knowledge. Further  
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18 260 research should assess the effect of advanced native student facilitators on medical  
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21 261 English improvement in a journal club setting, as this may be a more sustainable model  
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23 262 with potentially greater reproducibility than utilizing bilingual U.S. professionals. Future  
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25 263 directions may also focus on using the journal club model to teach manuscript  
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27  
28 264 preparation for both basic and clinical OB/GYN research to English based medical  
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30 265 journals.

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38  
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40  
41  
42 269 Hongying Kuang and Feng-Juan Han recruited the participants. Allen R Kunselman  
43  
44 270 served as statistician. William C Dodson was a consultant for this educational trial.  
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3 275 Competition) in Heilongjiang Province Universities.(3) “Longjiang Scholarship” chair  
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6 276 professor for Dr. Richard S Legro in Heilongjiang Province during the year of 2010-  
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8 277 2013. (4) the National Key Discipline of Chinese Medicine in Gynecology during the  
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10 278 year of 2009–14  
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12  
13 279 **Data sharing statement:** We state that all data are available for this international  
14  
15 280 cooperative educational project. For this manuscript, IKT and ARK take responsibility for  
16  
17 281 the integrity of the data and the accuracy of the data analysis.  
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## 22 23 24 283 REFERENCES

- 25  
26 284 1. Hu Y, Huang Y, Ding J et al. Status of Clinical Research in China. *The Lancet*  
27  
28 285 2011;377(9760):124-5.  
29  
30 286 2. Okamura A. Two types of strategies used by Japanese scientists, when writing  
31  
32 287 research articles in English. *Syst* 2006;34(1):68-79.  
33  
34 288 3. Zhu W. Source articles as scaffolds in reading to write. *J of Asian Pacific Comm*  
35  
36 289 2005;15(1):129-152.  
37  
38 290 4. Association of Professors of Gynecology and Obstetrics. Medical Student  
39  
40 291 Educational Objectives. 9th ed. Crofton, MD: Association of Professors of  
41  
42 292 Gynecology and Obstetrics; 2009.  
43  
44 293 5. Campbell C, Parboosingh J, Gondocz T, Babitskaya G, Pham B. Study of the factors  
45  
46 294 influencing the stimulus to learning recorded by physicians keeping a learning  
47  
48 295 portfolio. *J of Contin Educ Health Prof* 1999;19(1):16-24.  
49  
50 296 6. Holm HA. Should doctors get CME points for reading? *BMJ* 2000; 320(7232):394-5.  
51  
52  
53  
54  
55  
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3 297 7. Macrae HM, Regehr G, McKenzie M, Henteleff H, Taylor M, Barkun J, et al.  
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5  
6 298 Teaching practicing surgeons critical appraisal skills with an Internet-based journal  
7  
8 299 club: A randomized, controlled trial. *Surgery* 2004;136(3):641-6.  
9  
10  
11 300 8. Cramer JS, Mahoney MC. Introducing evidence based medicine to the journal club,  
12  
13 301 using a structured pre and post test: a cohort study. *BMC Medical Education*  
14  
15 302 2001;1:6.  
16  
17  
18 303 9. Horneff JG, Baldwin K, Ahn J. The Value of Journal Clubs in Orthopaedic Resident  
19  
20 304 Education. *Univ of Penn Ortho J* 2010;20:154-9.  
21  
22  
23 305 10. Akhund S, Kadir MM. Do community medicine residency trainees learn through  
24  
25 306 journal club? An experience from a developing country. *BMC Med Educ* 2006;6:43.  
26  
27  
28 307 11. Linzer M, Brown JT, Frazier, LM, DeLong ER, Siegel WC. Impact of a medical  
29  
30 308 journal club on house-staff reading habits, knowledge, and critical appraisal skills. A  
31  
32 309 randomized control trial. *JAMA* 1988;260(17):2537-41.  
33  
34  
35 310 12. Tucker J, Gao X, Wang S, Chen Q, Yin Y, Chen X. Organising an English journal  
36  
37 311 club in the developing world. *Postgrad Med J* 2004;80:436-7.  
38  
39  
40 312 13. TOEFL iBT Research. Reliability and Comparability of TOEFL iBT Scores. Series 1,  
41  
42 313 Volume 3. Princeton, NJ: Educational Testing Services; 2011.  
43  
44  
45 314 14. Ramineni C, Trapani CS, Williamson DM, Davey T, Bridgeman B. Evaluation of the  
46  
47 315 e-rater Scoring Engine for the TOEFL Independent and Integrated Prompts.  
48  
49 316 Princeton, NJ: Educational Testing Services; 2012.  
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318 **Table 1:** Baseline demographic and characteristics of both cohorts as self-reported on  
 319 questionnaire prior to study randomization.

Demographic Characteristic	Self-Study (n=25) n (%)	Intensive (n=27) n (%)
Students with PhD degree	6 (24)	6 (22)
<5 years of formal English instruction	4 (16)	1 (4)
English proficiency		
Novice	4 (16)	7 (26)
Intermediate	20 (80)	18 (67)
Advanced	1 (4)	2 (7)
Age (years)*	27.3 ± 3.7	26.8 ± 2.8
Female students	22 (88%)	26 (96%)

320 \*data reported as mean (standard deviation)

321

322 **Table 2:** Mean differences in examination score between pre-intervention and post-  
 323 intervention examinations between Self-Study and Intensive journal club groups.  
 324 (Multiple choice score out of 15 possible points, Writing out of 10 possible TOEFL  
 325 points, Speaking out of 12 possible TOEFL points).

Method	Self-Study Mean (SD) [n=23]	Intensive Study Mean (SD) [n=23]	Difference in means (95% CI)	P-value
Multiple choice	1.04 (2.14)	1.91 (2.02)	0.87 (-0.37, 2.11)	0.164
Writing	-0.80 (3.25)	2.26 (3.30)	3.07 (1.12, 5.01)	0.003
Speaking	-0.43 (3.71)	1.48 (2.39)	1.91 (0.06, 3.77)	0.043

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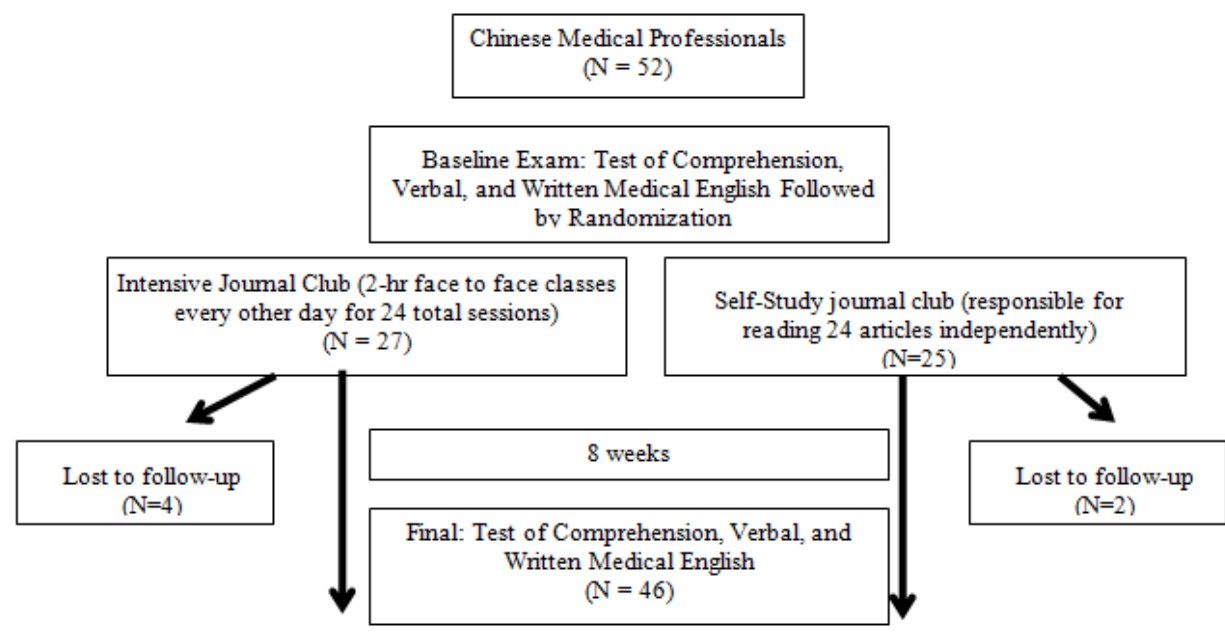
327 Table 3: Mean differences in examination score between pre-intervention and post-intervention  
 328 examinations within Self-Study and Intensive journal club groups. (Multiple choice score out of 15  
 329 possible points, Writing out of 10 possible TOEFL points, Speaking out of 12 possible TOEFL points).

Method	Difference in Self-Study means (95% CI) [n=23]	Improvement in score	P-value	Difference in Intensive Study means (95% CI) [n=23]	Improvement in score	P-value
Multiple choice	1.04 (0.17, 1.92)	6.9%	0.021	1.91 (1.04, 2.79)	12.7%	<0.001
Writing	-0.80 (-2.18, 0.57)	-5.3%	0.245	2.26 (0.89, 3.64)	15.0%	0.002
Speaking	-0.43 (-1.75, 0.88)	-2.8%	0.507	1.48 (0.17, 2.79)	9.9%	0.028

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1 **Figure 1.** Flow chart of study design.



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review only

**eTable 1:** List of articles selected from the Obstetrics and Gynecology Journal. Articles spanned 15 unique gynecology topics as identified by the APGO Medical Student Educational Objectives

First Author	Title	APGO Topic
Hansen, M	Assisted Reproductive Technology and Major Birth Defects in Western Australia	Infertility
Twijnstra, Andries R	Predictors of Successful Surgical Outcome in Laparoscopic Hysterectomy	Gynecological Procedures
Edwards, Digna R. Velez	Periconceptional Over-the-Counter Nonsteroidal Anti-inflammatory Drug Exposure and Risk for Spontaneous Abortion	Spontaneous Abortion
Moorman, Patricia G	Effect of Hysterectomy With Ovarian Preservation on Ovarian Function	Gynecological Procedures
Grimm, Christoph	Treatment of Cervical Intraepithelial Neoplasia With Topical Imiquimod: A Randomized Controlled Trial	Cervical Disease and Neoplasia
Gariepy, Aileen M	Reliability of Laparoscopic Compared With Hysteroscopic Sterilization at 1 Year: A Decision Analysis	Family Planning
Dmitrovic, Romana	Continuous Compared With Cyclic Oral Contraceptives for the Treatment of Primary Dysmenorrhea: A Randomized Controlled Trial	Dysmenorrhea
Kaunitz, Andrew M	Levonorgestrel-Releasing Intrauterine System or Medroxyprogesterone for Heavy Menstrual Bleeding: A Randomized Controlled Trial	Abnormal Uterine Bleeding
Diamond, Michael P	Endometrial Shedding Effect on Conception and Live Birth in Women With Polycystic Ovary Syndrome	Infertility
Timmermans, Anne	Endometrial Thickness Measurement for Detecting Endometrial Cancer in Women With Postmenopausal Bleeding: A Systematic Review and Meta-Analysis	Endometrial Hyperplasia and Carcinoma
Tanmahasamut, Prasong	Postoperative Levonorgestrel-Releasing Intrauterine System for Pelvic Endometriosis-Related Pain: A Randomized Controlled Trial	Endometriosis
Badalian, Samuel S	Vitamin D and Pelvic Floor Disorders in Women: Results From the National Health and Nutrition Examination Survey	Pelvic Organ Prolapse
Paraiso, Marie Fidela R	Laparoscopic Compared With Robotic Sacrocolpopexy for Vaginal Prolapse: A Randomized Controlled Trial	Gynecological Procedures
Castle, Philip E	Relationship of Atypical Glandular Cell Cytology, Age, and Human Papillomavirus Detection to Cervical and Endometrial Cancer Risks	Cervical Disease and Neoplasia
Semere, Luwam G	Endometrial Intraepithelial Neoplasia Clinical Correlates and Outcomes	Endometrial Hyperplasia and Carcinoma
Jaakkola, Susanna	Endometrial Cancer in Postmenopausal Women Using Estradiol-Progestin Therapy	Menopause

Dinger, Jürgen	Effectiveness of Oral Contraceptive Pills in a Large U.S. Cohort Comparing Progestogen and Regimen	Family Planning
Tuomikoski, Pauliina	Effect of Hot Flushes on Vascular Function: A Randomized Controlled Trial	Menopause
Penninx, Josien P.M	Bipolar Radiofrequency Endometrial Ablation Compared With Hydrothermablation for Dysfunctional Uterine Bleeding: A Randomized Controlled Trial	Abnormal Uterine Bleeding
Jakobsson, Maija	Loop Electrosurgical Excision Procedure and the Risk for Preterm Birth	Preterm Labor
Parker, William H	Ovarian Conservation at the Time of Hysterectomy and Long-Term Health Outcomes in the Nurses' Health Study	Gynecological Procedures
Hefler, Lukas	The Intraoperative Complication Rate of Nonobstetric Dilation and Curettage	Induced Abortion
Partridge, Edward	Results From Four Rounds of Ovarian Cancer Screening in a Randomized Trial	Ovarian Neoplasms
Connolly, AnnaMarie	Reevaluation of Discriminatory and Threshold Levels for Serum $\beta$ -hCG in Early Pregnancy	Maternal Fetal Physiology

Peer review only



## CONSORT 2010 checklist of information to include when reporting a randomised trial\*

Section/Topic	Item No	Checklist item	Reported on page No
<b>Title and abstract</b>			
	1a	Identification as a randomised trial in the title	1
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	3
<b>Introduction</b>			
Background and objectives	2a	Scientific background and explanation of rationale	4
	2b	Specific objectives or hypotheses	4
<b>Methods</b>			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	5
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	
Participants	4a	Eligibility criteria for participants	5
	4b	Settings and locations where the data were collected	7
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	6-7
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	7
	6b	Any changes to trial outcomes after the trial commenced, with reasons	
Sample size	7a	How sample size was determined	8
	7b	When applicable, explanation of any interim analyses and stopping guidelines	N/A
<b>Randomisation:</b>			
Sequence generation	8a	Method used to generate the random allocation sequence	5
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	5
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	5
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	5
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those	7

CONSORT 2010 checklist

Page 1

		assessing outcomes) and how	
	11b	If relevant, description of the similarity of interventions	N/A
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	8
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	N/A
<b>Results</b>			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	19
	13b	For each group, losses and exclusions after randomisation, together with reasons	8-9
Recruitment	14a	Dates defining the periods of recruitment and follow-up	8
	14b	Why the trial ended or was stopped	N/A
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	14
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	15-16
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	15-16
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	N/A
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	N/A
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	5
<b>Discussion</b>			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	12
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	12-13
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	12-13
<b>Other information</b>			
Registration	23	Registration number and name of trial registry	3
Protocol	24	Where the full trial protocol can be accessed, if available	3
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	1

\*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see [www.consort-statement.org](http://www.consort-statement.org).



# BMJ Open

## Chinese Obstetrics and Gynecology Journal Club (COGJOC): A Randomized Controlled Trial

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2015-010178.R1
Article Type:	Research
Date Submitted by the Author:	10-Dec-2015
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<b>Primary Subject Heading</b>:	Medical education and training
Secondary Subject Heading:	Obstetrics and gynaecology, Communication
Keywords:	MEDICAL EDUCATION & TRAINING, GYNAECOLOGY, OBSTETRICS, REPRODUCTIVE MEDICINE

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Manuscripts

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3 1 **Chinese Obstetrics and Gynecology Journal Club (COGJOC): A Randomized**  
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6 2 **Controlled Trial**  
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31 14 **Key words:** Medical education, medical English, journal clubs

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33 15 **Clinicaltrials.gov ID:** NCT01844609  
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3 17 **ABSTRACT**  
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5 18 **Objectives:** To assess whether a journal club model could improve comprehension and  
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8 19 written and spoken expression of medical English in a population of Chinese medical  
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10 20 professionals.

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12 21 **Setting and Participants:** The study population consisted of 52 medical professionals  
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15 22 who were residents or postgraduate students at the master and PhD levels at the  
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17 23 Department of Obstetrics and Gynecology, Heilongjiang University of Chinese Medicine  
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19 24 , China

20  
21 25 **Intervention:** After a 3-part baseline examination to assess medical English  
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23 26 comprehension, participants were randomized to either 1) an intensive journal club  
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25 27 treatment arm or 2) a self-study group. At the conclusion of the 8-week intervention  
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27 28 participants (nIRB=52) were re-tested with new questions.

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29 29 **Outcome measures:** Primary outcome was the change in score on the multiple choice  
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31 30 examination. Secondary outcomes included change in scores on the written and oral  
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33 31 examinations with modified grading scales used from the Test of English as a Foreign  
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35 32 Language (TOEFL).

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37 33 **Results:** Both groups improved on multiple choice assessment without a statistically  
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39 34 significant difference between groups (90% power). However, there was a statistically  
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41 35 significant difference between groups with respect to both mean improvement in written  
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43 36 (95%CI:[1.1,5.0],p=0.003) and speaking scores (95%CI:[0.06, 3.7],p=0.04) favoring the  
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45 37 journal club intervention.

46  
47 38 **Conclusion:** Interacting with colleagues and an English-speaking facilitator in a journal  
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49 39 club environment improved both written and spoken expression of English medical  
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51 40 literature in Chinese medical professionals. Implications include using journal clubs as a

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3 41 self-sustainable teaching model to improve fluency in medical English for international  
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6 42 colleagues.

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8 43 **Trial Registration ID:** NCT01844609

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10 44 Strengths and Limitations:

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13 45 • Limited sample size of students nominated by clinical professors  
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15 46 • Asked about but did not quantify history of prior formal English language  
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17 instruction in baseline questionnaire  
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20 48 • Poor compliance rate of written answers to questions from self-study group  
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22 49 • Pre- and post-test examinations modeled off standardized Tests of English as a  
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24 Foreign Language (TOEFL) exams  
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27 51 • Appropriateness of using multiple choice tests modeled on US based  
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29 examinations to evaluate medical knowledge of Chinese medical professionals.  
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## 32 53 INTRODUCTION

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34 54 English is increasingly becoming the *lingua franca* of medicine. Most international  
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36 medical conferences are held in English and the journals with the highest impact are  
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38 published in English. However, many international research institutions have driven  
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40 56 growth in participation in international meetings and publication output [1] without  
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42 necessarily offering sustainable solutions for academicians with limited English  
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44 58 language capabilities who compete to present at international meetings and publish in  
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46 59 these elite international journals, thus limiting global scholarship and exchange with  
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48 non-native speakers [2]. In Chinese higher education, for example, there is significant  
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50 60 pressure to publish in English academic journals for many doctoral science students [3,  
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52 61 4]. But amidst the rapid growth of international publications by Chinese scientists, which  
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3 64 now ranks 5th in the world in volume [5], instruction on writing within specialist  
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5 65 disciplines is still lacking and language remains a barrier for many students who wish to  
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8 66 convey their discipline-specific concepts in English while avoiding plagiarism and an  
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10 67 industry of literacy brokers [6].

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12 68 Consequently, there is an acute need for non-English speaking medical professionals to  
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14 69 develop written and oral English communication skills to participate in these academic  
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17 70 endeavors. Previous studies have suggested that needs in learning the English  
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19 71 language are better met when applied towards some discipline-specific focus rather  
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21 72 than mastering English to achieve language fluency [5]. The purpose of this randomized  
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23 73 educational trial was to therefore determine if an intensive journal club based on articles  
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25 74 and specifically-designed materials freely accessible through the Obstetrics and  
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27 75 Gynecology website improves comprehension and written and spoken expression of  
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29 76 medical English in a population of Chinese medical professionals. Ultimately, the policy  
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31 77 implication is that this may facilitate opportunities for international colleagues to engage  
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33 78 with native English speakers and encourage academic collaboration and innovative  
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35 79 methods for teaching English for a specific purpose (ESP).

## 36 37 38 39 40 41 80 **MATERIALS AND METHODS**

42  
43 81 The study population consisted of 52 medical professionals who were residents or  
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45 82 postgraduate students at the master and PhD levels at the Department of Obstetrics  
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47 83 and Gynecology, Heilongjiang University of Chinese Medicine in Harbin, China, who  
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49 84 consented to participate in an 8-week educational intervention. Participants had limited  
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51 85 experience with Western medicine. This randomized controlled trial with parallel design  
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53 86 was exempt from approval by the Institutional Review Board at the Pennsylvania State  
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3 87 University College of Medicine (45 CFR 46.101(b)(1)) and by the review board of the  
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5 88 host institution in China at The First Affiliated Hospital, Heilongjiang University of  
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8 89 Chinese Medicine based on its classification as educational instruction and strategy  
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10 90 research. All participants gave written informed consent with potential harms cited as  
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12 91 possible stress from taking examinations or participating in a journal club. Tests results  
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14 92 were anonymized and performance was kept strictly confidential so as not to impact the  
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16 93 student's professional reputation.

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19 94 Participants were eligible if they were Chinese medical professionals specializing in  
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21 95 gynecology (in China the practice of obstetrics and gynecology is split and we focused  
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23 96 on gynecology specialists in this study). The sole exclusion criterion was self-reported  
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25 97 English-speaking fluency. Consenting participants completed a baseline demographics  
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27 98 questionnaire and were randomized to either 1) an intensive treatment arm with 24  
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29 99 journal club sessions led by a bilingual (English and Mandarin) medical student (IKT)  
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31 100 from the United States over the course of 8 weeks or 2) a self-study arm with self-  
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33 101 directed learning. One of the authors (ARK) developed the randomization scheme to  
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35 102 randomly assign the consenting participants to the intervention groups using an equal  
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37 103 allocation ratio of 1:1 which was unknown to the other authors or participants. Another  
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39 104 author (IKT) matched an alphabetized student roster to this randomization list three  
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41 105 days prior to the first day of the journal club. No other characteristics about the students  
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43 106 were known besides his or her name. Randomization was kept concealed to all study  
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45 107 participants until the intervention groups were assigned.

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47 108 Participants took a 3-part baseline examination (multiple choice, written, and oral) to  
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49 109 assess medical English comprehension and expression; this format was modeled off of  
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3 110 standardized language exams such as the Test of English as a Foreign Language  
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5 111 (TOEFL). A similar format but different content post-intervention examination was  
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8 112 repeated at end of study. The multiple choice examination consisted of 15 questions,  
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10 113 with 5 answer choices each, adapted from the Association of Professors of Gynecology  
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12 114 and Obstetrics (APGO) Undergraduate Web-Based Interactive Self Evaluation (uWISE)  
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14 115 practice examinations and was read aloud to all participants during a one hour group  
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16 116 orientation session. Sample test questions are provided as supplemental information.  
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18 117 Participants then selected one of five multiple choice answers and recorded their  
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20 118 responses. Participants did not have access to questions in a written format. Two  
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22 119 additional open-ended questions were selected from one of the *Obstetrics and*  
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24 120 *Gynecology* journal club article's study guide: one was read aloud and students had 10  
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26 121 minutes to provide written responses and the other was read aloud to each student  
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28 122 privately as he or she provided an oral response, which was recorded. At the time of  
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30 123 baseline testing, no articles had been presented at journal club, though the article  
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32 124 selected for the oral examination was one of the first ones listed on the class syllabus  
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34 125 that had been distributed in advance. Similarly, the article selected for the post-exam  
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36 126 was one of the final journal club articles, though students did not know in advance the  
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38 127 identity of the journal club article. Test questions addressed vocabulary, grammatical  
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40 128 competence, knowledge of content manner and verbal fluency.  
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49 129 Following baseline examinations, both groups received a class syllabus with 24  
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51 130 selected gynecology articles and stimulus questions from the *Obstetrics and*  
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53 131 *Gynecology* journal club website. Articles spanned over 15 unique gynecology topics as  
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55 132 identified by the APGO Medical Student Educational Objectives [7]. Articles were  
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3 133 selected based on website availability and perceived student interest of the journal club  
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6 134 facilitator (IKT). Students accessed all material independently from the *Obstetrics and*  
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8 135 *Gynecology* website. The intensive journal club participants attended two-hour sessions  
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10 136 every other day, which consisted of reading selections of the assigned article aloud and  
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12 137 discussing questions from the website's study guide. The self-study group followed the  
13  
14 138 same syllabus but did not attend classes. There were no restrictions on use of  
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16 139 translation software, nor was there an accurate way to monitor its potential use. The  
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18 140 self-study students were asked to submit written, ungraded answers to two questions  
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20 141 from the study guide for each article by the day it was to be presented in journal club as  
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22 142 a measure of compliance. All data was collected at the host institution in Harbin, China.  
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25 143 The journal club ran for eight weeks from May through July 2013.  
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30 144 The primary outcome measured was the change in score from baseline to post-  
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32 145 intervention on the multiple choice examination. Pre-specified secondary outcomes  
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34 146 included change in score on the written and oral examinations. Two independent,  
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36 147 masked evaluators (WCD and RSL) graded the written and oral examinations based on  
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38 148 a rubric adapted from respective TOEFL exams at the study's conclusion, therefore  
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40 149 feedback was not provided to the participants prior to the study's conclusion. The  
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42 150 evaluators were blinded to the identity of the subject, the group assignment, and  
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44 151 whether the exam they were grading was the baseline or end of study exam.  
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50 152 Each evaluator independently graded the written responses on two tasks (language use  
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52 153 and topic development) from zero to five for a total maximum score of 10. Masked  
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54 154 evaluators assigned written scores to students based on the associated student ID  
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56 155 number only; written responses were presented and evaluated in a random order. The  
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3 156 spoken responses were graded on three tasks (delivery, language use, topic  
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6 157 development) from zero to four for a total maximum score of 12. Masked evaluators  
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8 158 assigned speaking scores to students based on their verbalized student ID number  
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10 159 only; recorded responses were presented in a random order and not segregated by  
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12 160 treatment group. A higher score indicated a greater comprehension and fluency of  
13  
14 161 written or spoken English, respectively.

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18 162 Prior to study initiation, we judged that a difference in the means of three points  
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20 163 between the two groups was an educationally meaningful difference, based on a 15-  
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22 164 point exam. Further, we assumed the standard deviation would be three points.  
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24 165 Based on these assumptions, a sample size of 23 participants per group provided 90%  
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26 166 power to detect a difference of three points between the two groups using a two-sided  
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28 167 test having a significance level of 0.05. However, we anticipated a 10% attrition rate  
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30 168 for the participants during the study; therefore, the total sample size was increased to  
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32 169 52 participants.

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38 170 Linear mixed-effects models were used to assess differences between and within  
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40 171 groups with respect to the primary outcome (change in multiple choice scores) and  
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42 172 secondary outcomes (change in writing and speaking scores). Linear mixed-effects  
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44 173 models are an extension of regression models that account for the within-subject  
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46 174 correlation inherent in longitudinal studies. Inter-rater reliability between the two  
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48 175 independent evaluators for the writing and speaking examinations was assessed using  
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50 176 the weighted Kappa statistic. All hypothesis tests were two-sided and all analyses were  
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52 177 performed using SAS software, version 9.3 (SAS Institute Inc., Cary, NC).

## 53 178 **RESULTS**

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3 179 Fifty-two Chinese medical professionals participated in the study with 46 completing all  
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6 180 aspects of the study. Recruitment began in March 2013 and ended in May 2013.  
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8 181 Participants were recruited from a pool of 60 students at the host institution and  
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10 182 introduced by their attending physicians to this educational summer experience. Six  
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12 183 participants failed to complete the study (4 in the intensive group and 2 in the self-study  
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14 184 group) for an 11.5% attrition rate. Participants were either lost to follow-up or were  
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16 185 unable to complete the course and attend the final day of testing due to conflicting  
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18 186 professional duties. Compliance for the self-study group, as measured by electronic  
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20 187 submission of two study guide questions per article, dropped from 100% the first week,  
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22 188 down to 60% (15 out of 25) by mid-study to 20% (5 out of 25) by the study conclusion at  
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24 189 8 weeks. In comparison, attendance for the intensive group dropped from 100% the first  
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26 190 week, down to 96% (26 out of 27) by mid-study to 77% (20 out of 27) by study  
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28 191 conclusion. The facilitator (IKT) sent email reminders directly to students and also asked  
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30 192 attending physicians to encourage participation of students to mitigate further non-  
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32 193 compliance. All students completed the post-test, regardless of compliance level and  
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34 194 their results were included in the final analyses.  
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36 195 Results of baseline characteristics between the two cohorts show similar levels of self-  
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38 196 reported English proficiency, as well as other demographic characteristics including  
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40 197 age, highest degree conferred, and years of formal English instruction (Table 1). Of  
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42 198 note, study participants are overwhelmingly female because culturally, practicing  
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44 199 obstetricians and gynecologists remain predominantly female in China and therefore the  
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46 200 department's population represents that distribution. Both groups improved in mean  
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48 201 number of correct multiple choice responses, but there was no statistically significant  
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3 202 difference between groups (Table 2). However, there was a statistically significant  
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6 203 difference between groups with respect to both mean written scores and speaking  
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8 204 scores (Table 2; For self-study and intensive groups, respectively: mean correct written  
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10 205 score (SD) on pre-test 5.52 (2.36) and 4.72 (3.10); on post-test 4.72 (2.32) and 6.98  
11  
12 206 (2.20); mean correct speaking score (SD) on pre-test 5.33 (2.37) and 5.63 (2.36); on  
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14 207 post-test 4.89 (2.70) and 7.11 (2.16)).

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17 208 There was also a statistically significant improvement within the intensive group across  
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20 209 all three language competencies (Table 3). There was a statistically significant  
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22 210 improvement within the self-directed group on the multiple choice examination, but not  
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24 211 for writing or speaking components

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28 212 Table 4 listed articles selected from the Obstetrics and Gynecology Journal. Articles  
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30 213 spanned 15 unique gynecology topics as identified by the APGO Medical Student  
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32 214 Educational Objectives

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36 215 For this study, inter-rater reliability of the two independent raters for evaluating pre- and  
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38 216 post-examination written scores had a weighted kappa value of 0.67  
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40 217 (95%CI:(0.55,0.79)) and 0.71 (95%CI:(0.62,0.81)), respectively. Weighted kappa scores  
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42 218 for pre- and post-examination speaking scores were slightly lower at 0.58  
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44 219 (95%CI:(0.45,0.72)) and 0.57(95%CI:(0.42,0.72)), respectively.  
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## 50 221 **DISCUSSION**

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52 222 Our study results suggest that a journal club significantly and selectively improves both  
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54 223 written and verbal medical English proficiency of Chinese OB/GYN health professionals  
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56 224 as assessed by a significant improvement in respective TOEFL scores. This suggests  
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3 225 that holding frequent journal clubs may offer one method of increasing oral  
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6 226 comprehension and speaking skills in foreign medical professionals. However, other  
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8 227 factors such as the students' concurrent clinical training may also play a role in  
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10 228 individual content-specific test performance.  
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14 229 One objective of our study was to determine if participating in a journal club would  
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16 230 improve knowledge base and comprehension over independently reading journal  
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18 231 articles. A large study by the Royal College of Physicians and Surgeons of Canada  
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20 232 demonstrated that out of possible activities, reading medical literature most frequently  
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22 233 stimulated self-directed learning activities leading to a greater likelihood of changing  
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24 234 practice patterns, in spite of available educational seminars and opportunities for group  
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26 235 discussion with peers, as in a journal club setting [8]. On the other hand, a randomized  
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28 236 controlled trial suggested that surgeons who participated in an internet-based journal  
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30 237 club improved their critical appraisal skills more than the control group that only read  
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32 238 clinical articles, possibly due to the lack of accountability in self-directed learning [9]. In  
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34 239 regards to writing skills, a few studies have reported previous strategies used by non-  
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36 240 native scholars to write for English publications which include using a mentoring service  
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38 241 provided by the journal, attending a writer's workshop provided by a professional  
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40 242 society, recruiting visiting scholars or commissioning fee-for-service editors [2, 5].  
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42 243 Though these solutions are beneficial, there is still a need for students to cultivate  
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44 244 transferrable and sustainable writing skills themselves that are adapted to fit the local  
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46 245 context and constraints of their academic needs. Part of the continuing difficulties in  
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48 246 language acquisition in Chinese higher education is that historically, there has been a  
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50 247 division between science and technology teaching and English language teaching,  
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3 248 further limiting opportunities for collaboration. A journal club as a vehicle for language  
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5 249 acquisition seeks to combine both disciplines.  
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9 250 Another aim was to objectively quantify a potential difference in reading, oral, and  
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11 251 spoken comprehension between the two groups as assessed by multiple choice and  
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13 252 modified TOEFL tests. While studies have described the journal club's effectiveness in  
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15 253 teaching critical appraisal as measured by subjective self-assessments or self-created  
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17 254 pre- and post-tests [10-13], little research has evaluated the journal club method as a  
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19 255 vehicle for specifically improving oral and spoken comprehension of medical English.  
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21 256 Further, a literature review found no evidence of a randomized trial that quantifies the  
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23 257 journal club's impact in an international academic setting, specifically as a tool for  
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25 258 teaching medical English and improving oral and written comprehension for non-English  
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27 259 speakers, though commentary has explored the benefits of and barriers to organizing  
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29 260 journal clubs in developing countries [14].  
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36 261 The strengths of the study include its randomized design, its reproducible model, the  
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38 262 use of objective journal article study guides from the *Obstetrics and Gynecology*  
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40 263 website, and the standardized TOEFL grading rubric. The breadth of articles provided  
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42 264 an appropriate and broad academic context for health professionals to learn both  
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44 265 medical vocabulary and grammar. Additionally, both pre- and post-intervention  
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46 266 examinations were adapted from uWISE, a professional question bank used by some  
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48 267 medical students to prepare for the National Board of Medical Examiners (NBME)  
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50 268 subject examination in obstetrics and gynecology. The grading rubrics for both the  
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52 269 written and speaking portions were adapted from respective TOEFL rubrics with  
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54 270 comparable score reliability estimates. Weighted kappa scores for the pre-and post-  
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3 271 examination written scores were 0.67 and 0.71, respectively and for the pre- and post-  
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5 272 examination speaking scores were 0.58 and 0.57, respectively. Score reliability  
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8 273 estimates for the TOEFL writing and speaking exams are comparable at 0.74 (Standard  
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10 274 Error of the Mean [SEM]=2.76) and 0.88 (SEM=1.62), respectively [15]. The preferred  
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12 275 TOEFL kappa value between automated and human scoring is 0.70, which represents  
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14 276 the threshold at which signal outweighs noise in prediction [16].  
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18 277 One of the limitations of our study is the appropriateness of using this multiple choice  
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20 278 test to evaluate medical knowledge acquisition and language comprehension. Since the  
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22 279 clinical question stems are modeled on US-based examinations that test knowledge of  
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24 280 guidelines and treatment, they may not have been an appropriate test vehicle for a  
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26 281 population of Chinese medical professionals with limited education in western medicine.  
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28 282 These participants have an undergraduate educational background in Traditional  
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30 283 Chinese Medicine (TCM), with a curriculum that is 40% western medicine-based.  
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32 284 Though this strengthens the integration of eastern and western medicine, it may have  
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34 285 limited the efficacy of our experimental training module. Additional limitations include the  
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36 286 disparate journal club attendance and compliance rate of the self-directed control group.  
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38 287 The *Obstetrics and Gynecology* journal club may provide an efficient vehicle for learning  
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40 288 both written and spoken English and content-specific medical knowledge. Further  
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42 289 research should assess the effect of advanced native student journal club facilitators on  
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44 290 medical English improvement, as this may be a more sustainable model with potentially  
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46 291 greater reproducibility than utilizing bilingual U.S. professionals. Future directions may  
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48 292 also focus on using the journal club model to teach manuscript preparation for both  
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50 293 basic and clinical OB/GYN research in English based medical journals and more  
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3 294 broadly, to also evaluate the effect of interactive educational activities on learning  
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6 295 outcomes within professional contexts  
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9 **296 CONFLICT OF INTEREST**

10  
11 297 The corresponding author also notes no support from any organization for  
12  
13  
14 298 the submitted work and no financial relationships from any organizations.

15  
16 299 **AUTHOR'S CONTRIBUTIONS:** IKT designed study, prepared data collection tools and  
17  
18 300 surveys, conducted journal club, collected data, and drafted and revised the paper.

19 301 WCD designed study, served as blind evaluator of data and drafted and revised the  
20  
21 302 paper. ARK wrote the statistical analysis plan, cleaned and analyzed the data and  
22  
23  
24 303 revised the paper. HK and FJH were international contacts in the setting where the  
25  
26 304 research was conducted and helped to enroll participants and implement the journal  
27  
28 305 club. RSL designed study, served as blind evaluator of data and drafted and revised the  
29  
30  
31 306 paper. He is guarantor. XW designed study, served as international contact at research  
32  
33  
34 307 setting and helped to enroll participants in the journal club.  
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43  
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46 312 Competition) in Heilongjiang Province Universities 3) Thousand Talents Program,  
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48 313 University of Chinese Academy of Sciences.  
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3 315 **Disclosure statement:** The authors report no conflict of interest, no support from  
4  
5  
6 316 any organization for the submitted work, no financial relationships with any  
7  
8 317 organisations that might have an interest in the submitted work in the  
9  
10  
11 318 previous three years and no other relationships or activities that could  
12  
13 319 appear to have influenced the submitted work.

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16 320 Poster Presentation at the 62<sup>nd</sup> Annual Meeting of the American Congress of  
17  
18 321 Obstetricians and Gynecologists Chicago, IL, April 24-8, 2014  
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21 322 **Data sharing:** No additional data available.  
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324 **REFERENCES**

325 [1] Hu Y, Huang Y, Ding J, Liu D, Fan D, Li T et al. Status of Clinical Research in China.  
326 *The Lancet* 2011;377:124-5.

327  
328 [2] Flowerdew J. Problems in writing for scholarly publication: The case of Hong Kong.  
329 *Journal of Second Language Writing* 1999; 8(3)243-264.

330  
331 [3] Li, Y and Flowerdew J. Shaping Chinese novice scientists' manuscripts for  
332 publication. *Journal of Second Language Writing* 2007;16:100-117.

333  
334 [4] Flowerdew J. Some thoughts on English for Research Publication Purposes (ERPP)  
335 and related issues. *Language Teaching*, Available on CJO 2013.

336  
337 [5] Cargill M, O'Connor P, Li Y. Educating Chinese scientists to write for international  
338 journals: Addressing the divide between science and technology education and English  
339 language teaching. *English for Specific Purposes* 2012;31:60-69.

340  
341 [6] Lillis T and Curry MJ (2010). *Academic writing in a global context: The politics and*  
342 *practices of publishing in English*. London: Routledge.

343  
344 [7] Association of Professors of Gynecology and Obstetrics. *Medical Student*  
345 *Educational Objectives*. 9th ed. Crofton, MD: Association of Professors of  
346 *Gynecology and Obstetrics*; 2009.

347  
348 [8] Campbell C, Parboosingh J, Gondocz T, Babitskaya G, Pham B. Study of the factors  
349 influencing the stimulus to learning recorded by physicians keeping a learning portfolio.  
350 *J of Contin Educ Health Prof* 1999;19(1):16-24.

351  
352 [9] Macrae HM, Regehr G, McKenzie M, Henteleff H, Taylor M, Barkun J, et al.  
353 *Teaching practicing surgeons critical appraisal skills with an Internet-based journal club:*  
354 *A randomized, controlled trial*. *Surgery* 2004;136(3):641-6.

355  
356 [10] Cramer JS, Mahoney MC. Introducing evidence based medicine to the journal club,  
357 using a structured pre and posttest: a cohort study. *BMC Medical Education* 2001;1:6.

358  
359 [11] Horneff JG, Baldwin K, Ahn J. The Value of Journal Clubs in Orthopaedic Resident  
360 *Education*. *Univ of Penn Ortho J* 2010;20:154-9.

361  
362 [12] Akhund S, Kadir MM. Do community medicine residency trainees learn through  
363 journal club? An experience from a developing country. *BMC Med Educ* 2006;6:43.

364  
365 [13] Linzer M, Brown JT, Frazier, LM, DeLong ER, Siegel WC. Impact of a medical

- 1  
2  
3 366 journal club on house-staff reading habits, knowledge, and critical appraisal skills. A  
4 367 randomized control trial. *JAMA* 1988;260(17):2537-41.  
5 368  
6  
7 369 [14] Tucker J, Gao X, Wang S, Chen Q, Yin Y, Chen X. Organising an English journal  
8 370 club in the developing world. *Postgrad Med J* 2004;80(946):436-7.  
9 371  
10 372 [15] TOEFL iBT Research. Reliability and Comparability of TOEFL iBT Scores. Series 1,  
11 373 Volume 3. Princeton, NJ: Educational Testing Services; 2011.  
12 374  
13 375 [16] Ramineni C, Trapani CS, Williamson DM, Davey T, Bridgeman B. Evaluation of the  
14 376 e-rater Scoring Engine for the TOEFL Independent and Integrated Prompts. Princeton,  
15 377 NJ: Educational Testing Services; 2012.  
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380 **Figure 1.** Flow chart of study design.

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For peer review only

384 **Table 1:** Baseline demographic and characteristics of both cohorts as self-reported on  
 385 questionnaire prior to study randomization.

Demographic Characteristic	Self-Study (n=25) n (%)	Intensive (n=27) n (%)
Students with PhD degree	6 (24)	6 (22)
<5 years of formal English instruction	4 (16)	1 (4)
English proficiency		
Novice	4 (16)	7 (26)
Intermediate	20 (80)	18 (67)
Advanced (but not fluent)	1 (4)	2 (7)
Age (years)*	27.3 ± 3.7	26.8 ± 2.8
Female students**	22 (88%)	26 (96%)

386 \*data reported as mean (standard deviation)

387

388 **Table 2:** Mean differences in examination score between pre-intervention and post-  
 389 intervention examinations between Self-Study and Intensive journal club groups.  
 390 (Multiple choice score out of 15 possible points, Writing out of 10 possible TOEFL  
 391 points, Speaking out of 12 possible TOEFL points).

Method	Self-Study Mean (SD) [n=23]	Intensive Study Mean (SD) [n=23]	Difference in means (95% CI)	P-value
Multiple choice	1.04 (2.14)	1.91 (2.02)	0.87 (-0.37, 2.11)	0.164
Writing	-0.80 (3.25)	2.26 (3.30)	3.07 (1.12, 5.01)	0.003
Speaking	-0.43 (3.71)	1.48 (2.39)	1.91 (0.06, 3.77)	0.043

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393 **Table 3:** Mean differences in examination score between pre-intervention and post-  
 394 intervention examinations within Self-Study and Intensive journal club groups. (Multiple  
 395 choice score out of 15 possible points, Writing out of 10 possible TOEFL points,  
 396 Speaking out of 12 possible TOEFL points).

Method	Difference in Self-Study means (95% CI) [n=23]	Improvement in score	P-value	Difference in Intensive Study means (95% CI) [n=23]	Improvement in score	P-value
Multiple choice	1.04 (0.17, 1.92)	6.9%	0.021	1.91 (1.04, 2.79)	12.7%	<0.001
Writing	-0.80 (-2.18, 0.57)	-5.3%	0.245	2.26 (0.89, 3.64)	15.0%	0.002
Speaking	-0.43 (-1.75, 0.88)	-2.8%	0.507	1.48 (0.17, 2.79)	9.9%	0.028

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398 **Table 4:** List of articles selected from the Obstetrics and Gynecology Journal. Articles  
 399 spanned 15 unique gynecology topics as identified by the APGO Medical Student  
 400 Educational Objectives

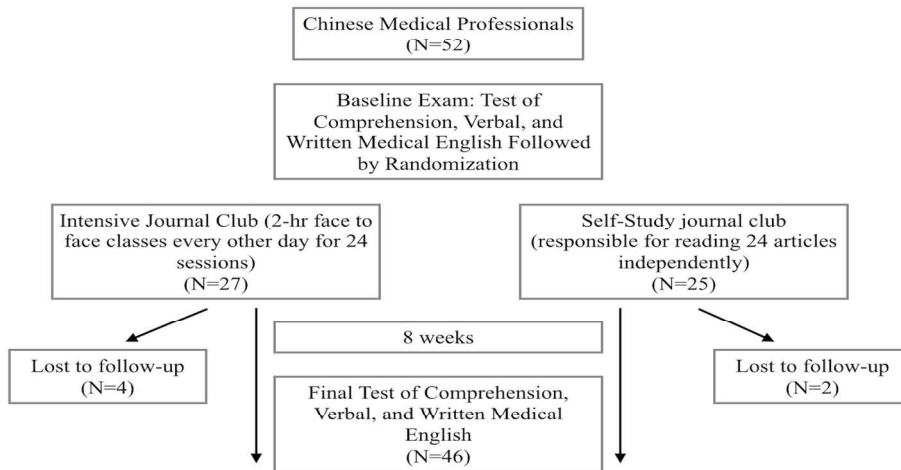
First Author	Title	APGO Topic
Hansen, M	Assisted Reproductive Technology and Major Birth Defects in Western Australia	Infertility
Twijnstra, Andries R	Predictors of Successful Surgical Outcome in Laparoscopic Hysterectomy	Gynecological Procedures
Edwards, Digna R. Velez	Periconceptional Over-the-Counter Nonsteroidal Anti-inflammatory Drug Exposure and Risk for Spontaneous Abortion	Spontaneous Abortion
Moorman, Patricia G	Effect of Hysterectomy With Ovarian Preservation on Ovarian Function	Gynecological Procedures
Grimm, Christoph	Treatment of Cervical Intraepithelial Neoplasia With Topical Imiquimod: A Randomized Controlled Trial	Cervical Disease and Neoplasia
Gariepy, Aileen M	Reliability of Laparoscopic Compared With Hysteroscopic Sterilization at 1 Year: A Decision Analysis	Family Planning
Dmitrovic, Romana	Continuous Compared With Cyclic Oral Contraceptives for the Treatment of Primary Dysmenorrhea: A Randomized Controlled Trial	Dysmenorrhea
Kaunitz, Andrew M	Levonorgestrel-Releasing Intrauterine System or Medroxyprogesterone for Heavy Menstrual Bleeding: A Randomized Controlled Trial	Abnormal Uterine Bleeding
Diamond, Michael P	Endometrial Shedding Effect on Conception and Live Birth in Women With Polycystic Ovary Syndrome	Infertility
Timmermans, Anne	Endometrial Thickness Measurement for Detecting Endometrial Cancer in Women With Postmenopausal Bleeding: A Systematic Review and Meta-Analysis	Endometrial Hyperplasia and Carcinoma
Tanmahasamut, Prasong	Postoperative Levonorgestrel-Releasing Intrauterine System for Pelvic Endometriosis-Related Pain: A Randomized Controlled Trial	Endometriosis
Badalian, Samuel S	Vitamin D and Pelvic Floor Disorders in Women: Results From the National Health and Nutrition Examination Survey	Pelvic Organ Prolapse
Paraiso, Marie Fidela R	Laparoscopic Compared With Robotic Sacrocolpopexy for Vaginal Prolapse: A Randomized Controlled Trial	Gynecological Procedures
Castle, Philip E	Relationship of Atypical Glandular Cell Cytology, Age, and Human Papillomavirus Detection to Cervical and Endometrial Cancer Risks	Cervical Disease and Neoplasia
Semere, Luwam G	Endometrial Intraepithelial Neoplasia Clinical Correlates and Outcomes	Endometrial Hyperplasia and Carcinoma
Jaakkola, Susanna	Endometrial Cancer in Postmenopausal Women Using Estradiol-Progestin Therapy	Menopause

Dinger, Jürgen	Effectiveness of Oral Contraceptive Pills in a Large U.S. Cohort Comparing Progestogen and Regimen	Family Planning
Tuomikoski, Pauliina	Effect of Hot Flushes on Vascular Function: A Randomized Controlled Trial	Menopause
Penninx, Josien P.M	Bipolar Radiofrequency Endometrial Ablation Compared With Hydrothermablation for Dysfunctional Uterine Bleeding: A Randomized Controlled Trial	Abnormal Uterine Bleeding
Jakobsson, Maija	Loop Electrosurgical Excision Procedure and the Risk for Preterm Birth	Preterm Labor
Parker, William H	Ovarian Conservation at the Time of Hysterectomy and Long-Term Health Outcomes in the Nurses' Health Study	Gynecological Procedures
Hefler, Lukas	The Intraoperative Complication Rate of Nonobstetric Dilation and Curettage	Induced Abortion
Partridge, Edward	Results From Four Rounds of Ovarian Cancer Screening in a Randomized Trial	Ovarian Neoplasms
Connolly, AnnaMarie	Reevaluation of Discriminatory and Threshold Levels for Serum $\beta$ -hCG in Early Pregnancy	Maternal Fetal Physiology

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Figure 1. Flow chart of study design



flowchart of the study

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3 A 23 year-old G2P1 with 6 weeks amenorrhea presents with lower abdominal pain and vaginal bleeding.  
4 Her temperature is 102.0°F (38.9°C) and the cervix is 1 cm dilated. Uterus is 8-week size and tender.  
5 There are no adnexal masses. Urine pregnancy test is positive. What is the most likely diagnosis?

- 6  
7 A. Threatened abortion  
8 B. Missed abortion  
9 C. Normal pregnancy  
10 D. Septic abortion  
11 E. Ectopic Pregnancy

12  
13 A 23 year-old G1P0 at 6 weeks gestation undergoes a medical termination of pregnancy. One day later,  
14 she presents to the emergency room with bleeding and soaking more than a pad per hour for the last 5  
15 hours. Her blood pressure on arrival is 110/60; heart rate 86. On exam, her cervix is 1 cm dilated with  
16 active bleeding. Hematocrit on arrival is 29%. Which of the following is the most appropriate next step in  
17 the management of this patient?

- 18  
19 A. Admit for observation  
20 B. Repeat hematocrit in 6 hours  
21 C. Begin transfusion with O-negative blood  
22 D. Give an additional dose of prostaglandins  
23 E. Prepare her for a dilation and curettage

24  
25 A 24 year-old G1P1 comes to the office requesting contraception. Her past medical history is  
26 unremarkable, except for a family history of endometrial cancer. She denies alcohol, smoking and  
27 recreational drug use. She is in a monogamous relationship. She wants to significantly decrease her risk of  
28 having a gynecological malignancy. Of the following, what is the best method of contraception for this  
29 patient?

- 30  
31 A. Female condoms  
32 B. Male condoms  
33 C. Copper containing intrauterine device  
34 D. Combined oral contraceptives  
35 E. Cervical cap  
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**CONSORT 2010 checklist of information to include when reporting a randomised trial\***

Section/Topic	Item No	Checklist item	Reported on page No
<b>Title and abstract</b>			
	1a	Identification as a randomised trial in the title	1
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	3
<b>Introduction</b>			
Background and objectives	2a	Scientific background and explanation of rationale	4
	2b	Specific objectives or hypotheses	4
<b>Methods</b>			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	5
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	
Participants	4a	Eligibility criteria for participants	5
	4b	Settings and locations where the data were collected	7
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	6-7
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	7
	6b	Any changes to trial outcomes after the trial commenced, with reasons	
Sample size	7a	How sample size was determined	8
	7b	When applicable, explanation of any interim analyses and stopping guidelines	N/A
<b>Randomisation:</b>			
Sequence generation	8a	Method used to generate the random allocation sequence	5
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	5
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	5
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	5
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those	7

CONSORT 2010 checklist

Page 1

		assessing outcomes) and how	
	11b	If relevant, description of the similarity of interventions	N/A
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	8
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	N/A
<b>Results</b>			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	19
	13b	For each group, losses and exclusions after randomisation, together with reasons	8-9
Recruitment	14a	Dates defining the periods of recruitment and follow-up	8
	14b	Why the trial ended or was stopped	N/A
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	14
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	15-16
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	15-16
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	N/A
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	N/A
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	5
<b>Discussion</b>			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	12
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	12-13
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	12-13
<b>Other information</b>			
Registration	23	Registration number and name of trial registry	3
Protocol	24	Where the full trial protocol can be accessed, if available	3
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	1

\*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see [www.consort-statement.org](http://www.consort-statement.org).