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Effectiveness of a report writing training program using peer review: evidence from first- year medical students

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Abstract

Background Report writing in class provides basic training for academic writing. However, report writing education in medical schools in Japan has rarely been reported and no teaching strategy has been established for it.

Methods This study developed a report writing program using peer review for first-year medical students consisting of two 120-minute classes. The goal of being able to write reports appropriately was established and presented to students at the beginning of the program. In session 1, students decided on a topic, gathered information, and structured their report. In session 2, students' written reports were peer reviewed. The reports were improved based on the peer reviews. The responses of the pre- and post-program questionnaires were evaluated to determine the program's effectiveness. The other reports that were assigned one month after the program were used as comparison with the reports of students who did not participate. Furthermore, the long-term effects of the program were also evaluated by comparing the results of students from the previous year who did not participate in the program with those of program participants six months after the program.

Results A total of 106 students completed the questionnaire evaluation. The program was rated as being acceptable for the students. Self-assessment of report writing significantly improved after the program. The report scores of program participants ($n=99$) were significantly higher overall and in all domains than were those of non-participants ($n=99$). The self-assessment of students who participated ($n=96$) was significantly higher than that of non-participants ($n=109$). No difference was observed for students' sense of burden in report writing.

Conclusions The report writing skills of medical students can be improved by clearly establishing the goals of report writing and practicing the basic skills of report writing step-by-step. Moreover, the use of peer review may enhance the effectiveness of learning opportunities for report writing.

Keywords Academic writing, Report, Peer review, Medical students

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Background

The act of writing is a valuable tool for fostering learning and scientific thought processes [1]. Academic writing, as presented in reports, essays, dissertations, and journal articles, is necessary for interpersonal communication in all areas of science, including medicine [2]. In Japan, however, various factors such as smaller research budgets, fewer researchers [3], and a lack of academic writing skills among researchers have led to a decrease in the number of research papers published [3]. While training programs for academic writing that include report writing are included in first-year courses at many Japanese universities [4–6], such programs have rarely been reported in Japanese medical schools [7].

Several writing programs for doctors and faculty have been reported [8–10]. Farrin et al. reported on medical students' learning experiences from writing blog posts or "pearls" about their practice on the Pearls4Peers (P4P) website [11]. However, graduate students' academic writing skills remain insufficient due to the lack of an established teaching strategy for academic writing at university. Moreover, informative or explanatory writing is not always adequately emphasized during pre- and postgraduate medical education years, which contributes to a lack of confidence in writing, writing-related anxiety, and cognitive burden among trainees [1].

Research misconduct related to writing articles could be attributed to researchers not learning how to systematically write reports while at university. Thus, writing instruction must not only teach more than simple writing skills, but also foster an attitude of active learning and logical thinking, in which learners ask questions, think, and express themselves [6]. Furthermore, medical education should also cover publication ethics and what constitutes scientific and research misconduct [12].

Report writing is not only an important basis for learning academic writing but also a cognitively demanding learning task for students. Cognitive burden is an important factor in the initiation, implementation, and completion of writing tasks, and must be addressed to significantly improve instruction for writing scientific articles [13]. Although medical students often receive report writing assignments, the rules of writing are implicit and no systematic guidance has been provided to them [14]. Because a formal curriculum for academic writing was lacking at our institution, students had to learn how to write reports by themselves. As a result, their reports were of low quality and often resembled unsubstantiated opinion pieces. Furthermore, plagiarism and other forms of dishonesty were observed, which were problematic. Plagiarism, falsification, and fabrication are considered acts of research misconduct, which are often caused by various factors [12, 15] such as the lack of understanding of and interest in a topic, pressure to attain good grades, laziness, poor time management, and insufficient academic writing skills [16]. Plagiarism, in particular, is influenced by factors such as Internet access, a lack of reference materials, laziness, and poor academic writing skills [17]. Some reports are considered to be written using multiple copy-and-paste, making these irregularities difficult to accurately detect [18].

Report writing assignments are often given in university courses as an opportunity for students to summarize their thoughts, provide evidence, and practice argumentation [6]. However, these assignments often lack an explanation of the purpose and the learning effects that can be gained. Thus, they become a tedious task for students, who may forget that writing can present many benefits and opportunities. It is, therefore, necessary for educators to clarify the objectives of report writing and construct a curriculum with an awareness of the overall learning task. Effective curriculum development is required to teach cognitively demanding skills such as report writing.

The four-component instructional design (4 C/ID) model is based on cognitive load theory, which advances instructional design while preserving the wholeness of complex tasks [19]. 4 C/ID was proposed in the field of medical education in 2006 [20] and the use of the 4 C/ID model in medical education programs has been recommended [21]. Several reports on the implementation of medical education programs using 4 C/ID [22–25] exist. In 4 C/ID, learners are made aware of the task as a whole, while complex tasks are divided into four components: learning tasks, supportive information, procedural information, and part-task practice. Experiential learning, which highlights reflection as an important process, and student peer reviews also play a role in the effectiveness of report writing classes [26–28].

We were concerned that medical students did not fully understand the purpose of what they should learn through the report writing process and how to write their reports according to academic writing, even for reports in their mother tongue. Another problem was that students were working on their reports in a haphazard manner, as if they were burdensome assignments. Thus, this study conducted a course on report writing with peer review for first-year medical students in Japan based on the 4 C/ID model. We hypothesized that providing a systematic report writing program with peer review to first-year students could improve their report writing skills and reduce their sense of cognitive burden. We then evaluated the long-term effects of the program on students' attitudes toward report writing. The program is expected to help students write high quality reports and to reduce incidences of misconduct.

Methods

Ethical approval

This study was approved by the Ethics Committee of Chiba University (approval no. 3425). The study database was anonymized.

Study design

This descriptive, interventional study compared two groups without randomization. The study analyzed pre- and post-program questionnaires for participants to evaluate the effectiveness of the systematic report writing program with peer review. Additionally, we performed a comparative evaluation of the questionnaires administered to non-participants and participants, along with their reports.

Reports and essays are not clearly defined and may differ depending on the context [29, 30]. In Japan, a report is generally considered to be a document that has a structure and requires argumentation with evidence. In contrast, an "essay," is often used as a free form expression of opinions, thoughts, and impressions. Students in this program were asked to produce evidence-based documents that would serve as the basis for future academic writing, such as case reports and original research papers. In this study, a report is defined as a document that states an argument based on evidence with a certain proofreading, using as evidence of the research on an issue of a certain theme.

Setting

Medical education in Japan

In Japan, students enter medical school after graduating from high school. Japanese medical schools have a six-year curriculum that is standardized throughout the country. Medical school education in Japan is based on the model core curriculum developed by the Ministry of Education, Culture, Sports, Science and Technology [31]. Pre-clinical education includes liberal arts, basic medicine, and clinical medicine, and is presented in stages from the first to the fourth year before clinical clerkship. Regarding academic writing, outcomes in the model core curriculum include "Research Presentation," which requires students to summarize their research in the form of a thesis, report, or conference presentation (Code: RE-04-01) as a competency [31]. The educational methods for research presentation have not been standardized, leaving each university to determine them independently.

Participants

Chiba University has approximately 120 medical students in each academic year. The number of study participants was based on realistic possibilities without calculating the sample size. The participants were recruited from among 116 students who took part in the report writing program from May to June 2023. The participants were informed about the study before the start of the program, and they provided their consent to participate.

To evaluate the long-term effect of the program, the students who participated in the program answered the post-questionnaire in December 2023, six months after the lecture. The control group comprised 118 students who were in their first year at the time. These students had not attended the report writing program but had answered the same questionnaire in December 2022. They were informed about the study before the survey was distributed, and provided their consent to complete the survey.

The format of the entrance exam remained unchanged for students entering in 2022 and 2023. There were also no differences in grades between students in the two years. Moreover, there were no changes in the curriculum of our university between the April and July when reporting assessment was performed, other than the addition of a report writing program.

First-year curriculum and "introductory problem-based learning (iPBL)"

The report writing program was implemented as part of the iPBL class in 2023, which was conducted from May to July for first-year students. The purpose of the iPBL class was to acclimate medical students to active learning at university. In session 1, students were divided into groups to brainstorm and discuss the image of the doctor they should aspire to become. In session 2, a lecture was presented on the diploma policy of Chiba University and the problem-based learning (PBL) processes. Then, students attended the PBL session using medical news articles as the subject matter (Fig. 1). The PBL consisted of three sessions (core sessions 1–3), during which medical students were divided into groups of about seven or eight. News articles were given in fragments at each core session. Students identified questions and decided on their own report themes. At the start of core sessions 2 and 3, students compiled a report to share information on the theme they selected during the previous core session. Additional information on news articles was then provided for further discussion. The topics were different: oral adenovirus type 5 vector SARS-CoV-2 vaccine in 2022, and Recanemab, a drug for dementia in 2023. One faculty member per group participated in the PBL as a facilitator. After the three core sessions, each group decided what to present in the final class. After assigning roles within each group, students completed their presentations on their own time, and were given 180 min to engage in group work. Each group was given five minutes to present during the final class.

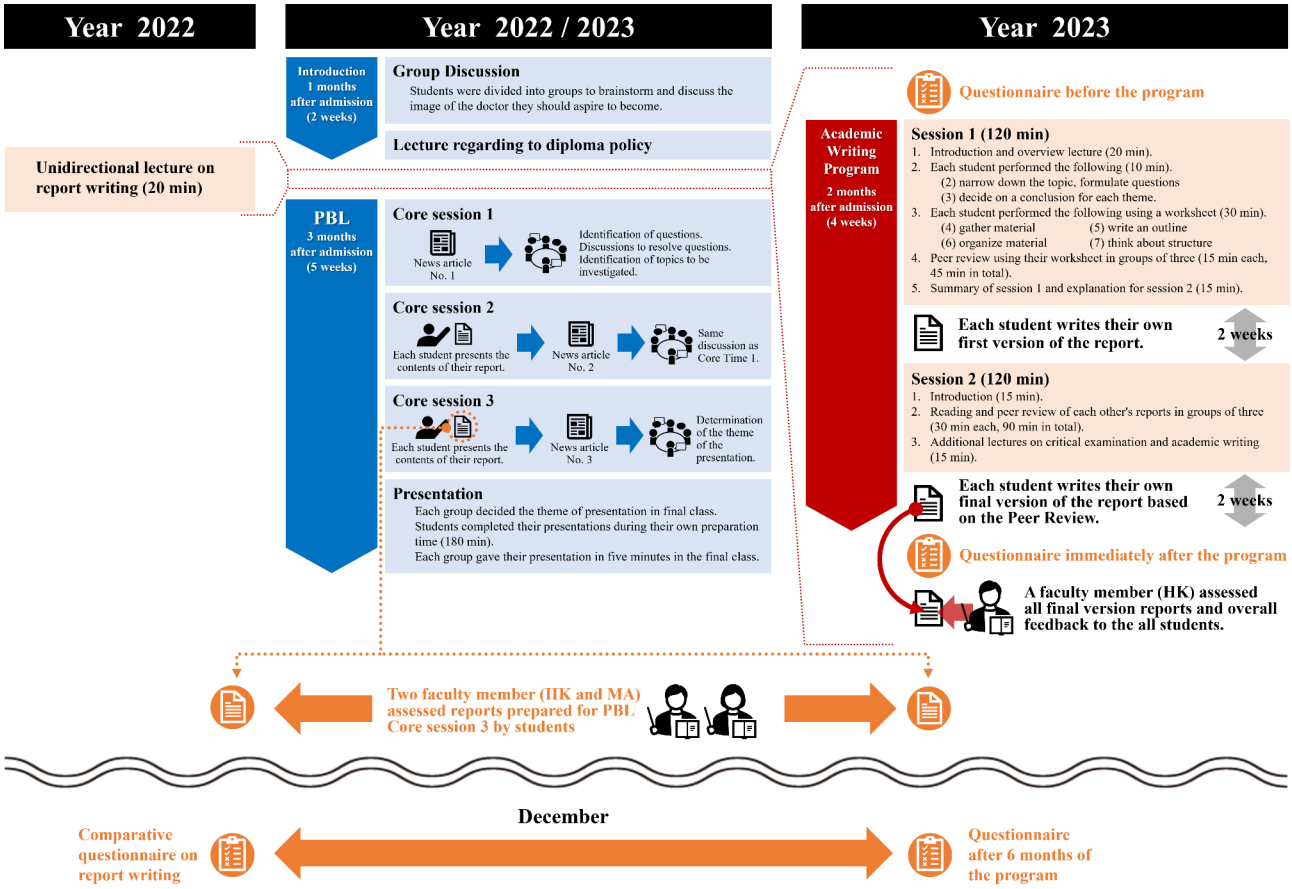

Fig. 1 Schedule of the report writing program in iPBL and evaluation questionnaires. The evaluation of the report writing program and the evaluation for comparison between participants and non-participants are indicated by orange figures and text. iPBL, Introductory Problem-Based Learning, PBL, Problem-Based Learning

Until 2022, only a 20-minute unidirectional lecture on report writing was delivered before core session 1 of the PBL. In 2023, report writing program was then introduced at the same time in iPBL classes. The content of the iPBLs mentioned above remained unchanged except for the different news topics covered in the PBLs.

Report writing program

The program consisted of two 120-minute classes, which combined lectures, individual work, and peer review. Sessions 1 and 2 were conducted two weeks apart. The classes were administered by the two authors (HK and SI). Left side of Figure 1 summarizes the program schedule, report writing assignment, and evaluation questionnaire.

The learning objective was to be able to write an appropriate report. The benefits of report writing were clearly stated and explained to the students. The features of this course are to show the overall image of report writing based on the 4 C/ID [19]. Procedural and supportive information, such as how to decide on a topic, how to make an outline, and how to search for literature, which are necessary for report writing, were made available to the students. Students were then guided through the steps of writing a report, such as formulating questions and gathering information. The worksheets were developed to assist students to keep their direction. Furthermore, peer reviews were applied based on previous reports of expected effectiveness in academic writing programs [27, 28]. Because it was essential that students' products should be understood by the reader, peer reviews could promote awareness of the importance of communicability of reports. In addition, it was easy to implement, even with a limited number of faculty.

The writing program was conducted in Japanese, since we focused on improving the ability to write reports in one's native language.

Session 1 (120 min)

The report writing process was divided into the following eight steps: (1) planning a timetable for submission; (2) focusing the topic and formulating questions; (3) deciding on the final conclusion; (4) gathering material; (5) outlining; (6) organizing material; (7) thinking about

structure; (8) writing [32]. Each process was regarded as a part-task in 4 C/ID and was practiced by the students. Themes for assignments on familiar topics with easily retrieved information were determined in advance, thereby reducing the load on the students. In addition, three different report topics were set for peer review. Students chose one of the following three themes for their report: (a) discuss nail clipping or tooth brushing; (b) state your opinion on the pros and cons of wearing a mask; or (c) describe what you gained through university entrance examinations.

At first, students were given an overview of report writing, which focused on writing reports within reports, and the basic rules of writing were explained for 20 min. Second, students were divided into groups of three. As first assignment, each student performed steps (2) and (3) for each of the selected themes using the individual worksheet for 10 min (Fig. 2A). Then, as second task, they performed steps (4)–(7) according to the worksheet for 30 min. After completing the worksheet, as a peer review phase, each student gave a 5-minute presentation on it to the other two students in their group. Self- and peer reviews were conducted using the assessment part of the worksheet (Fig. 2B, C), followed by an exchange of opinions. Finaly, faculty summarized the main points of the content of the session 1 and explained the style of writing reports, how to include citations, followed by session 2. As homework, based on the worksheet results, each student wrote a 2,000-character report in Japanese. 2000 Japanese characters is equivalent to about 800–1200 English words.

Session 2 (120 min)

At first, a brief review of session 1 was given as an introduction, followed by explanation of the peer review for 15 min. Then, the same three-person groups from session 1 were given 10 min to read their group members' reports, five minutes to evaluate them using the self- and peer assessment parts (Fig. 3A, B), and 15 min for self-assessment and feedback from peers (Fig. 3C). This 30-minute procedure was carried out among the three students and their opinions were shared within the group to improve their own reports (total 90 min). Then, students were given additional lectures on critical examination and academic writing for 15 min.

After session 2, the students revised their reports based on the peer reviews and submitted the final versions to Google classroom® two weeks later. The final submissions were assessed by one author (HK), and feedback was given to the whole group instead of individual students.

Data collection

Evaluation of the effect of the program

The following questions regarding students' self-assessment of report writing and their sense of burden were asked before, immediately after, and six months after the program (May, June, and December 2023, respectively) (S. Table 1): (A, B, C1) "How would you rate the self-assessment of your report writing?", and (A, B, C2) "How burdened do you feel by assignments that require you to write reports?" The questions were scored on a 5-point Likert scale ranging from 1 [Very low (A, B, C1); Very

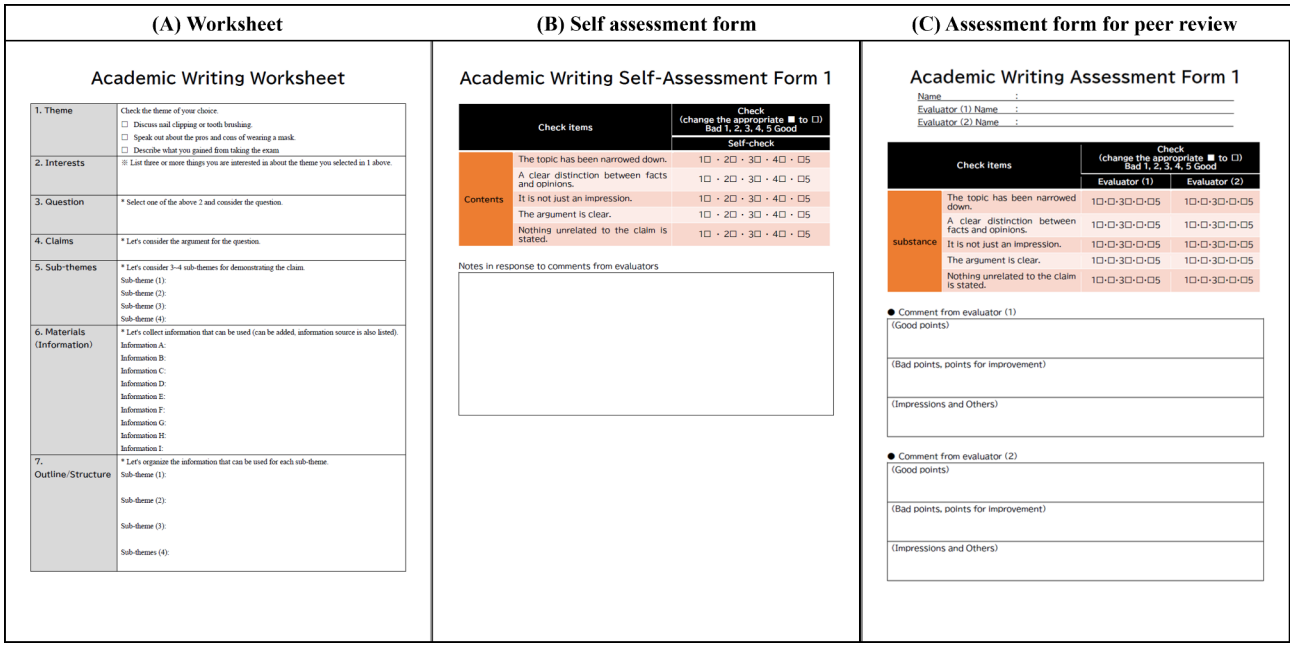

Fig. 2 Work sheet, self-assessment sheet, and assessment sheet for peer review in session 1

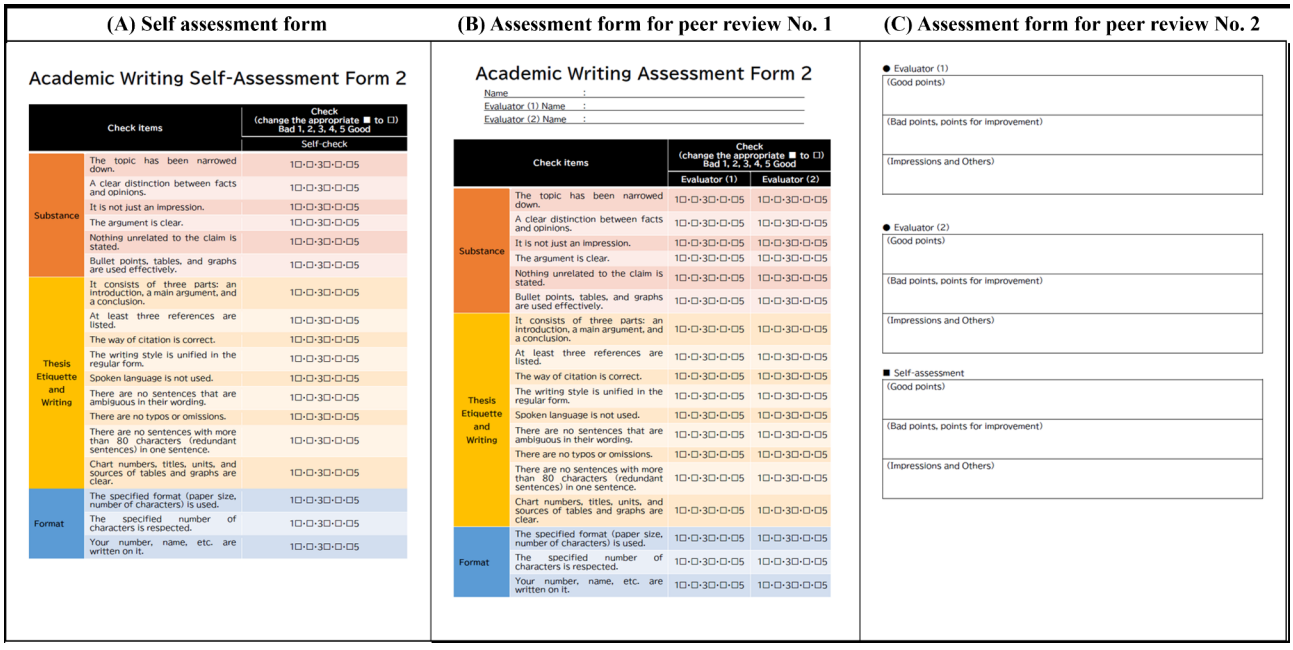

Fig. 3 Self-assessment sheet and assessment sheet for peer review in session 2

burdensome (A, B, C2)] to 5 [Very high (A, B, C1); Not at all burdensome (A, B, C2)].

To evaluate the program's effect on the students, quantitative data were obtained from their responses to the questionnaire immediately after the program (S. Table 1): (B3) "How useful was the program?", (B4) "How difficult was the group work?", (B5) "Did you gain any new knowledge from the program?", (B6) "What were the good aspects of the program?", and (B7) "What were the weak points of the program and what can be improved?" Questions B3-5 were scored on a 5-point Likert scale ranging from 1 [Not useful at all (B3); Very easy (B4); Did not gain at all (B5)] to 5 [Very useful (B3); Very difficult (B4); Very much gained (B5)]. Questions B6-7 were answered in an open-ended format.

These questionnaires combining a Likert scale and free-text items were designed for the exploratory purpose of evaluating program effectiveness. A Likert scale format was used for ease of answering the questions. The questionnaire items were created under the supervision of physicians specializing in medical education (MA and SI).

In December 2022, one year before the program was conducted, questions B1-2 were answered by first-year students who had not participated in the program (hereafter "non-participants"). The responses of both program participants and non-participants were compared.

Report assessment

As there was no report writing program in 2022, reports produced for core session 3 during the PBL, which takes place in the second half of the iPBL, were adopted as a comparison for the reports. The reports written for core session 3 of the iPBL, where the theme was determined in core session 2, were compared between program participants and non-participants. The reports were assessed using the scoring rubrics for writing described by Jacob et al. [33]. The scoring method was based on five aspects: content, organization, vocabulary, language use, and mechanics. Each aspect was rated on a four-point scale (excellent to very good, good to average, fair to poor, and very poor). Content, organization, vocabulary, language use, and mechanics were allocated 30 (4 levels; 30, 25, 20, 15), 20 (20, 16, 12, 8), 20 (20, 16, 12, 8), 25 (25, 19, 13, 7), and 5 (5, 4, 3, 2) points, respectively. The total score was 100 points, and a score of 34 points corresponded to very poor in all cases.

Two authors (HK and MA) independently rated the reports from non-participants and participants. The authors' scores displayed a non-normal distribution, and the Spearman's rank correlation coefficient was 0.891 ($p<0.001$). The two authors calculated and compared the averages of the scores of the program participants and non-participants that were assessed.

In addition to these evaluations, citation methods, such as the presentation of the reference locations, inclusion of citations, and number of reliable references, were also assessed (S. Table 2).

Statistical analysis

Continuous variables are shown with mean value and standard deviations (SD) for clarity, regardless of

distribution. The continuous variables were compared between the groups using the Mann–Whitney U test and the proportions of categorical variables were compared using Pearson's chi-square test. A p-value < 0.05 was considered statistically significant. All statistical analyses were performed using JMP Pro 15.0 software (JMP Statistical Discovery LLC, Cary, NC, USA) and SAS software version 9.4 (SAS Institute, Cary, NC, USA).

Results

A total of 116 medical students participated in the program during the study period. Ten students were excluded: Eight provided insufficient responses to the questionnaire before and immediately after the program, and two did not agree to data collection. The final sample included 106 students (18.7±1.3 years old, 81 males and 25 females) for questionnaire evaluation and report assessment.

Evaluation of the education program

The 106 students responded to the questionnaires before and immediately after the program. Figure 4 summarizes the two groups' results for self-assessment and perceived burden. The program was evaluated as highly useful (4.4±0.7), and the degree of difficulty was adequate (3.3±0.7). In addition, many students were able to gain new knowledge (4.4±0.7) (Fig. 4A). The responses for (B6) included understanding the basics of report writing (n=52, 49.1%), peer review (n=32, 30.2%), learning how to cite literature (n=7, 6.6%), a combination of lecture and practice (n=6, 5.7%), knowing the purpose of report writing (n=5, 4.7%), and sharing opinions with others (n=5, 4.7%). By contrast, the responses for (B7) included uneven difficulty of the three topics of the report assignment (n=22, 20.8%), a long time allocated for peer review (n=22, 20.8%), hearing only the opinions of students in the group (n=5, 4.7%), and insufficient educational content on report writing techniques (n=5, 4.7%). Few students had concerns about the validity and reliability of peer assessments (n=3, 2.8%), and dissatisfaction with the lack of individual feedback on their reports by faculty (n=3, 2.8%).

Self-assessment of report writing before and immediately after the class improved significantly (Before 2.6±0.9 vs. After 2.9±0.9, p<0.001) (Fig. 4B). However, no significant changes in students' self-identified sense of burden were found (Before 2.2±1.0 vs. After 2.1±0.9, p=0.205) (Fig. 4C).

Among the 106 students, 96 (90.5%) responded to a post-survey to evaluate the long-term effect of the program. Self-assessment (2.8±0.9) did not change from self-assessment immediately after the program (p=0.075) and remained significantly better than that before the program (p<0.001) (Fig. 4B). Additionally, sense of burden (2.1±1.0) did not change before and immediately after the program (p=0.279, p=0.205, respectively) (Fig. 4C). The self-assessment results of program participants were significantly higher than those of the 109 non-participants (participants, 2.8±0.9 vs. non-participants, 2.4±0.9, p<0.001) (Fig. 4B). However, no difference was observed in the sense of burden between the two groups (participants, 2.1±1.0 vs. non-participants, 1.9±0.9, p=0.301) (Fig. 4C).

Report assessment

Table 1 summarizes the assessment results of the reports in core session 3 of the PBL for program participants and non-participants. Compared to non-participants, program participants had significantly higher overall scores (participants, median 76.0 [IQR, 69.0–82.0] vs. non-participants, median 63.5 [60.0——73.5]) and scores in each domain (content, organization, vocabulary, language use, and mechanics).

Moreover, scores for methods and number of citations in reports by participants were also significantly higher than were those in reports by non-participants (p<0.001 and p<0.001, respectively).

Discussion

This study is the first to evaluate the effectiveness of a practical writing program in Japan using the 4C/ID model and peer review for first-year medical students. The two main findings are as follows: First, this program with peer review that focused on report writing improved the quality of medical students' reports. Second, the program improved medical students' self-assessment of report writing without increasing their sense of burden.

This study focused on report writing as a learning task by clarifying its benefits. The results revealed that the participants found the program to be acceptable. As they gained a better understanding of the benefits of report writing for their future clinical experience and the publication of their research, they became more intrinsically motivated. The program also improved their self-assessment of report writing and the quality of their reports.

In the present program, the participants understood the necessary steps for report writing and wrote their reports considering each step as part-task practice. Although this increased their workload more than report writing without adequate instruction, it did not increase their sense of burden in this study. The worksheets required for the program's report writing process may have been influenced by the reduction in cognitive load. Although report writing is a cognitively demanding activity [13], careful scaffolding may enable learners to work without increasing their workload. While learners must identify and define their own needs and learning goals in self-directed learning [34], it is also important for faculty

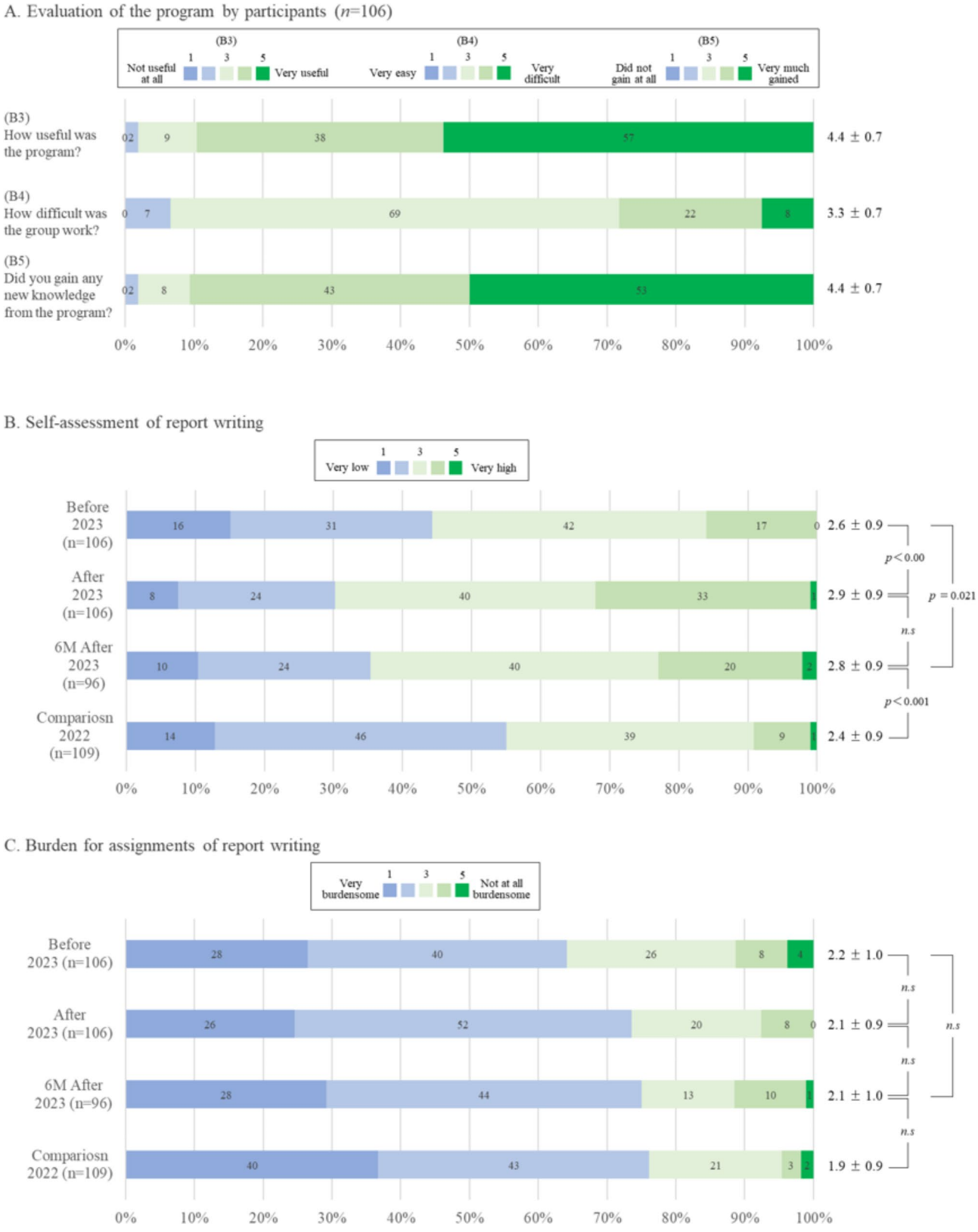

Fig. 4 **(A)** Evaluation of the program by participants, **(B)** Self-assessment of report writing, **(C)** Burden for assignments or report writing. M, months; n.s., not significant

Additional file

Table 1 Comparison of the assessment results of the reports in core session 3 of the introductory problem-based learning between program participants and non-participants

Parameter	Participants 2023 (*n* = 99)	Non-participants 2023 (*n* = 99)	*p*-value
Total (maximum 100), mean ± SD	76.0 ± 9.8	66.1 ± 11.2	< 0.001
Content (maximum 30), mean ± SD	24.6 ± 2.8	21.8 ± 3.2	< 0.001
Organization (maximum 20), mean ± SD	15.0 ± 2.6	15.0 ± 2.8	< 0.001
Vocabulary (maximum 20), mean ± SD	15.0 ± 2.3	12.7 ± 2.3	< 0.001
Language use (maximum 25), mean ± SD)	17.4 ± 3.6	15.2 ± 3.7	< 0.001
Mechanics (maximum 5), mean ± SD	3.9 ± 0.5	3.6 ± 0.6	< 0.001
Citing			
Methods of citing, n (%)			< 0.001
4	19 (19.2)	4 (4.0)	
3	45 (45.4)	32 (32.3)	
2	33 (33.3)	59 (59.6)	
1	2 (2.0)	4 (4.0)	
Number of reliable references, n (%)			< 0.001
4	75 (75.8)	51 (51.5)	
3	18 (18.2)	23 (23.2)	
2	4 (4.0)	21 (21.2)	
1	2 (2.0)	4 (4.0)	

SD, standard deviation

members to clearly inform them about the purpose of an assignment and provide the appropriate instructions.

Becoming proficient in academic writing in English is necessary for publishing research results in internationally recognized journals [35]. However, acquiring this skill is difficult even for native English speakers, much less for speakers of English as a second/foreign language [36]. It has been suggested that learners need writing support in the process of acquiring academic writing [35]. Academic writing education in Japan lags far behind that in Europe and the United States in both Japanese and English [37]. In fact, Japanese high school students lack educational opportunities for academic writing in Japanese [38]. A survey of Japanese university students on their ability to translate between Japanese and English suggests that a lack of Japanese language proficiency can affect their English performance [39]. Therefore, academic writing skills in one's native language must be improved before proceeding to write case reports and scientific papers in English.

Peer review was used in this program to evaluate and improve the students' own reports. Program participants considered the peer review process effective and acceptable despite their lack of experience in report writing. Peer review may promote metacognition through self-assessment and reflection by enabling students to check on each other's learning status and share information on how to search for better literature to be applied to clinical problems. However, students may also find it difficult to be critical when evaluating their peers' essays [40]. Since the purpose of assessment in this study was made clear by preparing the assessment form in advance, the students were able to engage in peer review without resistance. A few program participants were concerned about the lack of feedback from faculty. However, providing individual feedback on reports can be burdensome for faculty members, making this system difficult to implement. On the contrary, peer review among students can be easily conducted and implemented even with inadequate resources, such as faculty and time [27, 28].

The present study has some limitations. First, as it was conducted in only one medical school in Japan, its effects on and comments from the participants are subject to cultural bias. Second, regarding research design, this single-site study used a small sample of participants in an uncontrolled environment and relied partly on students' self-assessments for data collection. Future research could use a larger sample size of students across different schools and regions to increase sample diversity. Third, the questionnaire items may not fully represent participants' emotions and attitudes because their validity and reliability have not been confirmed. Fourth, since the topics of the PBLs that required the reports for comparison between participants and non-participants were different in 2023 and 2022, the report assignments were not standardized. Therefore, the assessors were not completely blinded because they were able to ascertain whether participants or non-participants wrote the reports based on the content of their reports. In addition, the report evaluation criteria [33] were developed for English reports and have not been validated for Japanese reports. Fifth, the long-term effects of report plagiarism have not been

verified and it was not possible to verify whether report plagiarism and other forms of cheating were reduced.

Conclusions

Report writing is an important first step in academic writing for medical students. The results from this study suggest that the report writing skills of medical students can be improved by clearly stating the goals of report writing and practicing the part-tasks of report writing step-by-step. Moreover, peer reviews may enhance the effectiveness of learning opportunities for report writing. By providing the program in the early years of medical school, subsequent report writing assignments can become more meaningful learning opportunities for students.

Abbreviations

4C/ID four-component instructional design

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-024-06041-6.

Supplementary Material 1: table 1. Questionnaire items in surveys for the group work. table 2. Assessment criteria for citations in reports.

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Author contributions

HK and MA contributed to the conception of the study design, analysis of all samples, data interpretation, and writing of the manuscript. HT, MO and YK helped in the acquisition of data. KS, IS, NA, TT, SY and YK helped in data interpretation and also contributed to designing the study. SI conceived the study design, helped in data interpretation, and prepared the original draft of the manuscript. All authors read and approved the final manuscript.

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Data availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Chiba University (approval no. 3425). Informed consent was obtained from the participants prior to the study for the survey that was documented on the Web. All methods were performed in accordance with relevant guidelines and regulations.

Consent for publication

Not Applicable.

Competing interests

The authors declare no competing interests.

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