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RESEARCH ARTICLE

How much are the IMRaD structures of diploma theses and original research articles similar? A cross-sectional analysis of diploma theses from the Dental Medicine study in Split

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Objective: To investigate how much the IMRaD structure of diploma theses defended in graduate study of Dental Medicine at University of Split School of Medicine is compatible with that of the original research articles, considering the proportions of IMRaD sections – Introduction, Methods, Results and Discussion.

Materials and methods: 150 diploma theses defended between 2016 and 2021 were collected from the Digital Academic Archives and Repositories (DABAR) and compared with 150 original research articles published in five dental scientific journals during the same period. The length of each IMRaD section in diploma theses and original research articles was measured using the Word Count in MS Office Word and expressed as the number of words. The overall length of IMRaD structure was calculated by adding the length of each IMRaD section. Data were analyzed using descriptive statistics and linear regression.

Results: On average, the overall length of IMRaD structure of diploma theses was longer than that of the original research articles. On average, the longest section in diploma theses was the Introduction (occupied almost 50% the overall length of IMRaD structure). In the average original research article, the Introduction section occupied about 50% of the overall length of IMRaD structure, while the Discussion was the longest section. The highest correlation with the overall length of IMRaD structure in diploma theses was found for Introduction ($R=0.82$; $R^2=0.67$; $P<0.001$). In original research articles, the Discussion section was most highly correlated with the overall length of IMRaD structure ($R=0.62$; $R^2=0.38$; $P<0.001$).

Conclusion: The IMRaD structure of diploma theses defended in graduate study of Dental Medicine in Split differs from the structure of original research articles published in dental scientific journals. Diploma theses have a comparatively longer introduction and shorter discussion section than original research articles.

Key words: academic performance, diploma thesis, education, IMRaD, original research article, writing skills

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Introduction

Before graduation, students of the graduate Study of Dental Medicine at University of Split School of Medicine must prepare and defend their diploma theses. Diploma thesis is a written report of scientific research conducted by each student under the supervision of a selected mentor. The design of diploma theses is based on the standard methodological postulates for writing original research articles derived from the International Committee of Medical Journal Editors (ICMJE) guidelines for writing original research articles [1, 2]. According to these guidelines, original research article reports results of a study based on a clear research question and a defined hypothesis. As such, original research articles must adhere to the IMRaD (Introduction, Methods, Results and Discussion) structure, i.e., they must include four main sections – Introduction, Methods, Results, and Discussion [1]. Each IMRaD section has a specific purpose [1, 3-5]. The Introduction serves to present the background, objective, and main hypothesis of the research. The Methods section should describe the data collection and analytical procedures in sufficient detail to allow other researchers to replicate the study. The Results section contains the list of findings obtained through analytical procedures. In the Discussion section, the relevance of findings (in the context of findings from similar studies and the methodological strengths and limitations) and conclusion are presented. Depending on the complexity of the research topic and study design, the length of the IMRaD sections in original research article may vary. However, it is strongly recommended that the introductory section must be brief and concise [3].

Currently, there are two guidance documents for the preparation of diploma theses at University of Split School of Medicine. These documents – "Guidelines for the preparation of diploma thesis" and "Instructions for writing/formatting of diploma thesis" – are available on the official website of the "Department of Diploma Thesis" [6-8]. There are no specific instructions for writing the Introduction and Discussion sections in either document, except for the definition of the Introduction as a "brief and concise statement of the research background" in the "Guidelines for the preparation of diploma thesis" [7, 9].

We analyzed diploma theses defended at the graduate Study of Dental Medicine at University of Split School of Medicine to investigate whether their IMRaD structure is quantitatively different from the IMRaD structure of original research articles. For this purpose, the length of the main sections within the IMRaD structure of diploma theses and original research articles was compared. Since the topics of the analyzed diploma theses are mostly related to clinical research, we specifically considered the guidelines stated in "Instructions for authors" of several scientific journals that publish original research articles mostly related to clinical research in dental medicine [10-14].

Methods

Data collection

Diploma theses defended in the graduate Study of Dental Medicine in Split were downloaded in PDF format from the digital academic archive and repository (DABAR) [15] during February and March 2022. Original research articles were downloaded in PDF format during September 2022 from the digital repositories of five dental scientific journals: *Journal of Dental Research* (JDR), *Journal of Endodontics* (JOE), *Journal of Oral Pathology and Medicine* (JOP), *Journal of Prosthodontics* (JPD), and *Journal of Clinical Periodontology* (JCP) [16-20]. The selection of journals was based on the journal scope (to match the topics of diploma theses), indexing (CC, WoS, SCI, SCIE), and high SCIMAGO journal ranking in dentistry (from top 100 journals). Original research articles and diploma theses analyzed in this study do not share the same authors. For this study, only original research articles published under an open access license were collected. The analyzed diploma theses and original research articles were defended/published between 2016 and 2021.

The length of the sections of the IMRaD structure in each diploma thesis and original research article was measured and expressed as the number of words (word count) using the Word Count tool in Microsoft Office Word 2016 (Microsoft Corporation, Redmond, WA, USA). Accordingly, the overall length of IMRaD structure was determined by adding the length of the sections of the IMRaD structure. In-text citations, the headings of the sections and subsections were not included in the word count. The number of references (including the number of references cited in the Introduction section) was also recorded. Raw data were recorded in a spreadsheet in Microsoft Office Excel 2016 (Microsoft Corporation, Redmond, WA, USA) (**Supplementary Dataset – Spreadsheet 1**).

Standards for comparison of diploma theses and original research articles

The basis for comparing diploma theses and original research articles was partly derived from the "Instructions for authors" of dental scientific journals in which the analyzed original research articles were published. We also referred to the recommendations for writing original research articles from the relevant literature on the IMRaD structure. Dental scientific journals do not limit the length of individual sections in the IMRaD structure. However, there are clearly defined requirements for the overall length of IMRaD structure in original research articles, which vary from 3000 words (JOP) to 3500 words (JOE, JCP) [10-14]. The requirements for the length of sections in the IMRaD structure are best defined for the Introduction. According to some authors, the Introduction section in original research articles should be between 400 and 600 words, or no more than 15% of the total length of the IMRaD structure [9]. The length of Methods, Results, and Discussion sections is not strictly limited, as it may vary depending on the complexity of study design [21-23].

Statistical analysis

Descriptive statistics

The length and proportions of each section in the IMRaD structure, as well as the overall length of IMRaD structure, were first analyzed with descriptive statistics and expressed as means with 99% confidence interval (CI) for both diploma theses and original research articles. Other parameters such as the total number of references and the percentage of references cited first in the Introduction section were also expressed as means with 99% CI.

Testing differences between IMRaD structure of diploma theses and original research articles

To examine differences in IMRaD structure between diploma theses and original research articles, we used simple and multiple linear regression. To compare the magnitude and significance of possible variations between the observed patterns in the IMRaD structure of diploma theses and original research articles, we created an additional set of simple linear regression models. For each of these models, the proportion of the respective IMRaD section in the overall IMRaD structure was set as the outcome, whereas the predictor was a binary categorical variable for the type of research report (diploma thesis or original research article) coded as a single dummy variable with dummy coding.

The influence of several modifying factors (year of defense, type of research reported, and topic of research related to the branch of dental medicine) on the observed patterns in the IMRaD structure of diploma theses was also analyzed. Three linear regression models were created. The main outcome for each of those models was the length of the IMRaD section, which was found to be most strongly correlated with the overall length of IMRaD structure of diploma theses. The predictors were categorical variables for the modifying factors, which were coded as dummy variables using either dummy coding or effect coding.

Correlation of the length of IMRaD sections and IMRaD structure

The overall length of IMRaD structure was set as the main outcome (dependent variable), whereas the lengths of the sections of the IMRaD structure (Introduction, Methods, Results and Discussion) were set as predictors (independent variables). The regression analyses were performed under the assumption that (on average) the longest section of the IMRaD structure was the one most strongly correlated with the overall length of IMRaD structure itself.

Linear regression was chosen as the only statistical test for the analysis of data according to recommendations by Cohen [24]. The advantages of linear regression over standard approach to hypothesis testing are: (i) it does not assume a normal distribution of the input data; (ii) it is a parametric test, so there is no need to compromise statistical power by using nonparametric tests because of the nonnormality of the data distribution; (iii) it can also be used to compare two (such as t-test) or more group means (such as ANOVA), but (in the latter case) (iv) there is no need for *post-hoc* testing.

Due to relatively large sample, the significance level was set at $\alpha=0.01$ ($P<0.01$). Statistical analysis was performed in Microsoft Office Excel 2016 (Microsoft Corporation, Redmond,

WA, USA). Raw data and regression matrices used for the statistical analysis are included in the supplementary document (**Supplementary Dataset – Spreadsheets 1-8**).

Results

Composition of diploma theses and original research articles

A total of 150 diploma theses and 150 original research articles were analyzed. Diploma theses included topics from all branches of dental medicine, but the majority (105/150, 70%) was related to endodontics and restorative dentistry, oral medicine, prosthodontics, and pediatric dentistry. Most diploma theses reported results from clinical research (135/150, 90%), while the remainder was related to basic research (15/150, 10%). The sample of original research articles was balanced by selecting 30 original research articles from each dental scientific journal (JDR, JOE, JOP, JPD, JCP) and 25 original research articles per year of publication. Most original research articles were related to clinical research (116/150, 77.33%), whereas the remainder (34/150, 22.66%) addressed basic research topics (**Supplementary dataset – Spreadsheet 1**).

General parameters of the IMRaD structure of diploma theses and original research articles

The overall length of IMRaD structure was higher in diploma theses (mean=5998.84, 99% CI=5770.08, 6277.60) than in original research articles (mean=3094.61, 99% CI=3022.62, 3166.61). The longest section of the IMRaD structure of diploma theses was

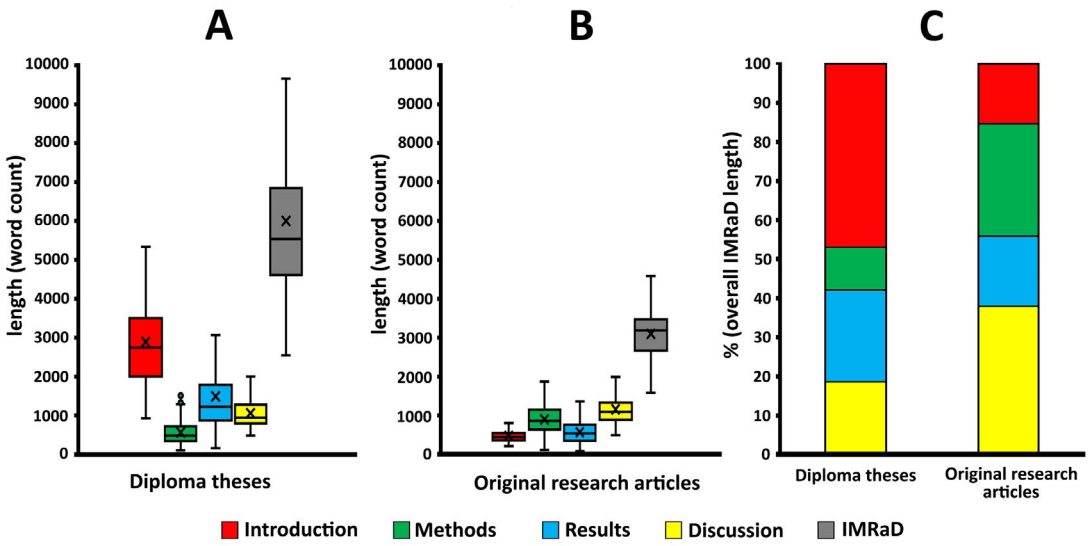

Figure 1. Comparison of general parameters of IMRaD structure of diploma theses and original research articles – the length of IMRaD structure and sections of IMRaD structure (A,B) (whisker-box with mean (x-marks), median, and value range for word count); proportions of IMRaD sections within the overall length of IMRaD structure (**C**) (values are presented as % of the overall IMRaD length by word count).

Introduction (mean=2886.05, 99% CI=2746.75, 3025.35), while the Methods were the shortest (mean=562.32, 99% CI=529.42, 595.22). In contrast, the longest section of the IMRaD structure of original research articles was Discussion (mean=1154.66, 99% CI=1113.31, 1196.02), while Introduction (mean=476.15, 99% CI=457.97, 494.34) was the shortest. The Introduction section occupied nearly half of the total length of the IMRaD structure in diploma theses (mean=47.99%, 99% CI=46.76%, 49.23%), compared to one-sixth (mean=15.83%, 99% CI=15.23%, 16.43%) in original research articles. (**Figure 1**; **Supplementary dataset – Spreadsheet 2**).

Table 1. Difference between the relative proportion of IMRaD sections and the overall length of IMRaD structure in diploma theses (n =150) compared with original research articles (n=150)

MODELS (variables)		MODELS (parameters)						
				CI (99%)				
Predictor	Outcomes†	y-intercept‡	Coefficient§	Lower	Upper	*t*-stat	R^2	*P*-value††
	Introduction	15.84	32.16	29.43	34.88	30.57	0.76	< 0.001
	Methods	28.56	-18.69	-21.02	-16.35	-20.76	0.59	< 0.001
ToRR*	Results	18.05	5.79	3.12	8.47	5.62	0.09	< 0.001
	Discussion	37.55	-19.27	-21.69	-16.84	-20.60	0.59	< 0.001
	IMRaD**	3094.61	2904.23	2427.67	3380.79	15.79	0.46	< 0.001

* Dummy coded binary categorical variable ToRR (Type of research report) where diploma thesis=1 and original research article=0; expressed as % - the proportion of IMRaD sections in the overall length of IMRaD structure.
† Expressed as % – average proportion of IMRaD sections in the overall length of IMRaD structure in each diploma thesis and original research article.
‡ Expressed as % – the average proportion of individual IMRaD section in the overall IMRaD structure of original research articles.
§ Predictor coefficient expressed as % – corresponds to average IMRaD proportion difference between diploma theses and original research articles; §§ Confidence interval for ToRR coefficient.
†† Significance – simple linear regression models (α=0.01 ($P < 0.01$); Degrees-of-freedom: df=1).
** Outcome variable – y-intercept and coefficient for predictor of this model expressed as word count.

The difference in IMRaD structure between diploma theses and original research articles was found when analyzing the relative proportion of each IMRaD section in the overall length of IMRaD structure (**Table 1**; **Supplementary dataset – Spreadsheet 3**). The proportion of the Introduction section in the IMRaD structure of diploma theses was, on average, 32.16% higher than in original research articles. Conversely, the proportion of Methods and Discussion sections of diploma theses was, on average, smaller compared with those of original research articles (by 18.69% and 19.27%, respectively). No substantial difference was found for the Results section. On average, the overall length of IMRaD structure of diploma theses was almost double than that of original research articles.

Correlation patterns of IMRaD sections and IMRaD structure in diploma theses and original research articles

The correlation between the length of IMRaD sections and the overall length of IMRaD structure was assessed separately for each IMRaD section of diploma theses and original research articles by simple linear regression (8 models) (**Figure 2**; **Supplementary dataset – Spreadsheet 4**). In diploma theses, the strongest correlation with the overall length

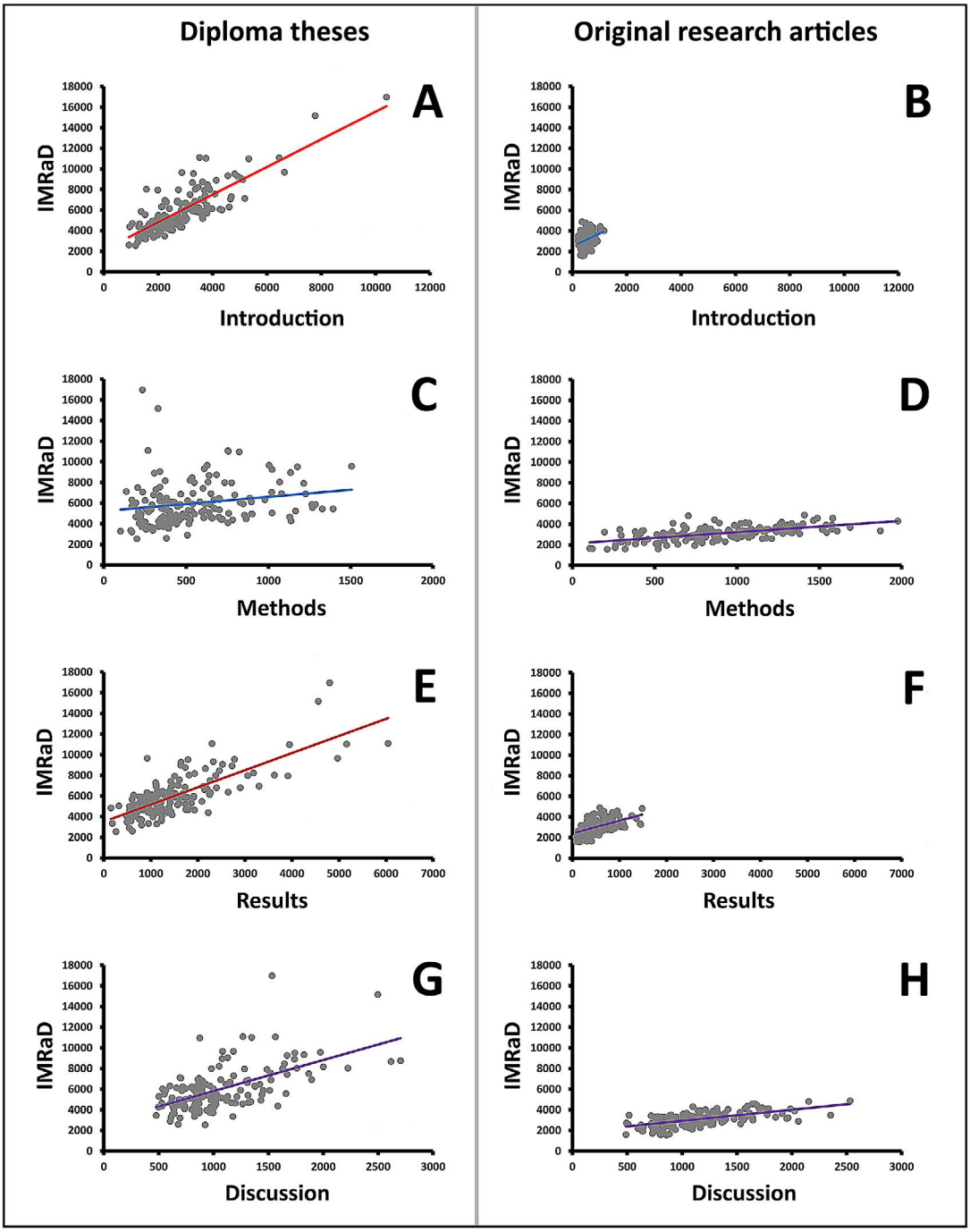

Figure 2. Scatter plots for correlation patterns of the length of IMRaD sections with the overall length of IMRaD structure in diploma theses **(A,C,E,G)** and original research articles **(B,D,F,H)** by word count. In contrast to original research articles, the length of the Introduction section in diploma theses shows a very high variability. For illustration purposes, the axes are scaled to match the highest value of the length of the individual IMRaD sections (x-axis) and the overall length of IMRaD structure (y-axis) measured in the entire subsample.

of IMRaD structure was found for Introduction (R^2=0.671; P<0.001), followed by Results (R^2=0.59; P<0.001). The Discussion section correlates weakly (R^2=0.35; P<0.001), whereas the Method section does not correlate at all with the overall length of IMRaD structure (R^2=0.04; P=0.016). The correlation pattern between IMRaD sections and IMRaD structure seems to be more balanced in original research articles. In original research articles, the strongest correlation with the overall length of IMRaD structure was found for the

Discussion section (R^2=0.38; P<0.001), followed by Methods (R^2=0.37; P<0.001) and Results (R^2=0.29; P<0.001). The original research articles' Introduction section did not correlate with the overall length of IMRaD structure (R^2=0.09; P<0.001).

The influence of modifying factors on the observed patterns in the IMRaD structure of diploma theses

Considering that the length of the Introduction section was the most important predictor of the overall length of IMRaD structure of diploma theses, it was necessary to determine how established the style of writing diploma theses with lengthy introduction is and whether there is evidence of a change in trend during the observed period. It was also investigated whether there were differences depending on the type of research reported in diploma thesis (clinical/basic) and the topic of diploma thesis in relation to a particular branch of dental medicine. According to the models, modifying factors show no discernible influence on the variability of the length of Introduction section in diploma theses. Therefore, writing diploma theses with lengthy introduction was widespread throughout the period studied, regardless of the type of research or the topic of the research reported in diploma thesis (**Table 2**; **Supplementary dataset – Spreadsheets 5-7**).

Table 2. The influence of modifying factors on the observed variability in the length of the Introduction section of diploma theses

Modifying factors	"Dummy" variables (Predictors/categories)	Predictors		Model parameters		
		Coefficient*	*P*-value	R^2	*P*-value†	df‡
Year of defense	2016§	/	/	**0.151**	**0.002**	5
	2017	-327.72	0.146			
	2018	-362.44	0.16			
	2019	206.43	0.246			
	2020	1111.07	< 0.001			
	2021.	101.14	0.634			
Type of research reported	Clinical research††	/		**0.039**	**0.015**	1
	Basic research	-429.69	0.015			
Research topic (branch of dental medicine)	Oral medicine**	/	/	**0.057**	**0.327**	7
	Endodontics	294.07	0.238			
	Pediatric dentistry	10.68	0.969			
	Prosthodontics	-123.31	0.646			
	Oral surgery	-504.98	0.187			
	Orthodontics	-205.09	0.575			
	Periodontology	859.04	0.033			
	Forensic dentistry	-108.07	0.787			

* Expressed as number of words - designates difference from estimated baseline value of Introduction section length.
† Significance - simple and multiple linear regression models with the length of Introduction section as the main outcome (expressed as word count).
‡ Degrees-of-freedom. §Referent category / effect coding – omitted "dummy" variable (modifying factor "Year of defense") (2016; n=23); estimated baseline value=2879.72 (mean length of Introduction section of all diploma theses)
†† Referent category/dummy coding – omitted "dummy" variable (modifying factor "Type of research reported") (n=135); estimated baseline value=2542.29 (mean length of Introduction section of diploma theses reporting clinical research).
** Referent category / effect coding – omitted "dummy" variable (modifying factor "Research topic") (n=32); estimated baseline value=2917.18 (mean length of Introduction section of all diploma theses).

Comparison of referencing in IMRaD structure and Introduction section of diploma theses and original research articles

On average, the total number of references cited in IMRaD structure of siploma theses (mean=38.65; 99% CI=36.69, 40.62) was slightly higher than in IMRaD structure of original research articles (mean=33.9; 99% CI=32.74, 35.06) (R^2=0.02; *P*=0.007). The difference between the number of references cited in Introduction section of diploma theses (mean=28.9; 99% CI=27.17, 30.63) and original research articles (mean=16.94; 99% CI=16.09, 17.79) was statistically significant (R^2=0.18; *P*<0.001). The difference in the proportion of references cited in Introduction section from the total number of references in diploma theses (mean=73.41%; 99% 99% CI=71.59, 75.23) and original research articles (mean=50.49%; 99% CI=48.57, 52.42) was also statistically significant (R^2=0.29; *P*<0.001) (**Figure 3A**; **Supplementary Dataset – Spreadsheet 8**). Despite the large variability, the proportion of Introduction section of diploma theses did not correlate with the total number of references (R^2=0.01; P=0.373) or with the number of references cited in the Introduction section (R^2=0.05; P=0.007). The overall length of IMRaD structure of diploma theses did not correlate with the total number of references (R^2=0. 11; *P*<0.001) or with the number of references cited in the Introduction section (R^2=0.08; *P*<0.001). In original research articles there was also no correlation between the proportion of Introduction, total number of references (R^2=0.02; *P*=0.079) and references cited in Introduction (R^2=0.09; *P*<0.001), between the overall IMRaD structure and the total number of references (R^2=0.01; *P*=0.513) and references first cited in the Introduction section (R^2=0.02; *P*=0.037) (**Figure 3 B-E**; **Supplementary Dataset – Spreadsheet 8**).

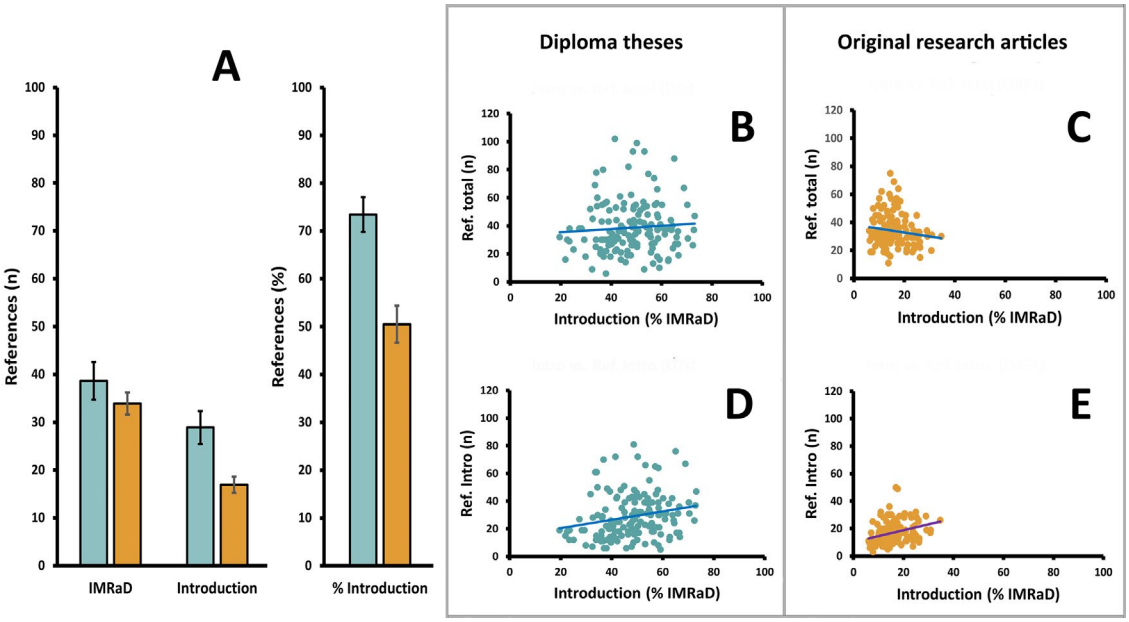

Figure 3. Referencing patterns within the IMRaD structure of diploma theses and original research articles (**A-E**). Means with 99% Cis for the number of references cited in the IMRaD structure and in the Introduction section (including the percentage of references cited in Introduction section) (**A**). The correlation patterns of length of Introduction section with the total number of references in diploma theses (**B,C**), or the number of references cited in the Introduction section of original research articles (**D,E**) (scatter plots - values on x-axis correspond to the relative length of the Introduction section in the overall IMRaD structure expressed in %; values for number of references are plotted on y-axis); diploma theses (blue), original research articles (orange)

Discussion

In diploma theses, the Introduction section occupied almost half of the overall length of IMRaD structure. In contrast, the Introduction section in original research articles was short, while the longest section was the Discussion section. According to findings, writing diploma theses with lengthy introduction was a widespread phenomenon throughout the period studied, regardless of the type of research or the topic of research reported in diploma thesis. One of the reasons may be the length requirements for diploma thesis on MEFST, which require the length of about 40-60 pages [6, 8]. Quantitatively, the IMRaD structure of diploma theses defended in graduate Study of Dental Medicine in Split is not similar to the IMRaD structure of original research articles published in dental scientific journals deviating significantly from the standards set for original research articles set in the journals' instructions for authors [10-14].

Referencing patterns of diploma theses may indicate a lack of skill in presenting research background and contextualizing research findings

Given the cross-sectional design of the study, we can only speculate about the reasons for this discrepancy between the IMRaD structure of diploma theses and original research articles. The lengthy Introduction section, the high proportion of references cited in the Introduction section, and the lack of correlation between the length of the Introduction section and the number of references cited in the Introduction section imply that students may have difficulty teasing out the facts necessary to present the background of the research question and justify the main hypothesis on which diploma thesis is based, which should be the purpose of Introduction section when writing a report on original research [9, 25, 26]. The relative brevity of the Discussion section in the diploma theses compared to the original research articles suggests that students may not fully understand what it means to place their research findings in a broader context of already published findings on the topic. Although there may be some overlap, distinguishing between the literature relevant to the Introduction section and the literature relevant to placing the actual research findings in a broader context requires skill and experience both in the specific field of research and in writing research reports. Graduate students do not have these skills, so mentor guidance and support are strongly needed. According to some authors, the Introduction section of clinical research original research articles should contain up to 10 references, which is far less than the average of 29 references in the diploma theses analyzed in this study [3, 9].

Without a qualitative analysis of the content, we cannot say to what extent the narrative sections of the diploma theses (e.g., the Introduction section) relate to findings from original scientific research as opposed to textbook knowledge. According to the principles for writing original research articles, the latter must be avoided [27-29]. Considering this, mentors, and evaluators of should emphasize the importance of the "target audience" during the evaluation of diploma theses before their final approval. Although diploma theses defended in graduate Study of Dental Medicine are stored in a public repository and are fully accessible to anyone, the potential readership will most likely consist of professionals in the field who are familiar with technical terms and textbook concepts. It would

be interesting to investigate whether the differences in the IMRaD structure of diploma theses and original research articles revealed in this study are related to students' and mentors' perceptions of who they think should/could read diploma theses.

Improving the IMRaD structure of diploma theses in Study of Dental Medicine in Split - what can we learn from the guidelines for authors in dental scientific journals?

The observed features of the IMRaD structure of diploma theses defended in the graduate Study of Dental Medicine in Split can be partially related to the lack of clarity in the official guidelines for writing/formatting of diploma theses [2, 6-8]. Although the Department of Diploma Thesis website states that the design of diploma thesis is based on standard methodological postulates for writing original research articles, both the old and updated versions of the guidelines for writing/formatting of diploma thesis do not include instructions on how to draft the Introduction and Discussion sections [6-8]. In addition, the length of diploma thesis is not specified, except for the soft upper limit of 40 to 60 pages of double-spaced text with no restrictions on the number of figures, tables, and references. In contrast, the instructions for authors of the five dental scientific journals in which the original research articles analyzed here were published include a strict limit on the length of the original research article. The limit is stated either as a word count (between 3000 and 3500 words), or by the total number of pages for the manuscript text (up to 10 double-spaced pages) [14]. Similarly, there are restrictions on the total number of figures and tables in original research articles of up to 10 figures and tables.

Although we did not analyze the content of diploma theses, it is highly unlikely that the research reported in diploma theses have more complex design than that reported in original research articles and that it could not be described within the limitations set for original research articles in dental scientific journals. Interestingly, the average length of diploma theses defended in graduate Study of Dental Medicine in Split is almost twice the average length of original research articles. This could be due, in part, to the soft upper limit on the length of diploma thesis in the guidelines for writing/formatting of diploma thesis. In addition, the comparison of the relative length of IMRaD sections in diploma theses and original research articles may be indicative of one of the most common practices used by inexperienced authors when writing research reports. Namely, stretching out the narrative sections of the IMRaD structure, especially when the research (by design) is methodologically limited, is frequently done by inexperienced authors [27-30]. In the diploma theses defended in the graduate study of Dental Medicine in Split, the narrative section of choice is the Introduction section. Unfortunately, most mentors and members of review committees for diploma theses do not seem to discourage students from such practice. It would be interesting to investigate whether students, mentors, and evaluators consider proper IMRaD structuring to be a more important determinant of the quality of diploma thesis than the overall length of diploma thesis.

Based on the analysis of the relative length of individual sections within the IMRaD structure, the IMRaD structure of diploma theses defended in graduate Study of Dental Medicine in Split does not match the IMRaD structure of original research articles published in dental scientific journals. Because of the cross-sectional design of this study, the causal factors

for the observed patterns in the IMRaD structure of diploma theses require further investigation. The fact that we analyzed only original research articles with open access could be considered a possible limitation. However, original research articles published in the same dental journal are subject to the same manuscript preparation rules, regardless of open access or restricted access policy. Current guidelines for writing/formatting of diploma thesis should be more detailed, especially regarding the organization of narrative sections within the IMRaD structure. The instructions for authors of scientific journals from relevant research areas could serve as a suitable template for diploma thesis guidelines. This, in turn, could improve the writing experience, evaluation and quality of diploma theses at the graduate Study of Dental Medicine of University of Split School of Medicine.

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Data sharing statement: Raw data and regression matrices used for the statistical analysis are included in the supplementary document.

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Additional material: This article contains electronic supplementary material which is available for download at **st-open.unist.hr**.

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