

The influence of narrated group discussions on the interpretational ability of medical students: a prospective observational study

Inbar Paz^{1,*}, Tali Shafat², Yaniv Almog³

¹Department of Orthopedic Surgery, Hillel Yaffe Medical Center, Israel.

²Department of Internal Medicine, Soroka University Medical Center, Israel.

³Head of Medical Intensive Care Unit, Soroka University Medical Center; Faculty of Health Sciences, Ben-Gurion University of the Negev, Israel

***Corresponding author**

Inbar Paz, Department of Orthopedic Surgery, Hillel Yaffe Medical Center, Israel.

Submitted: 24 Apr 2021; Accepted: 27 July 2021; Published: 05 Aug 2021

Citation: Inbar Paz, Tali Shafat, Yaniv Almog (2021) The influence of narrated group discussions on the interpretational ability of medical students: a prospective observational study. *Medical & Clinical Research* 6(8): 649-652.

Abstract

Background: Clinical decision making is predominantly knowledge-based perception, interpretation under terms of uncertainty. It is unclear whether interpretational ability can be improved. We evaluated the effect of a narrated group-discussions course (NGDC) on the interpretational ability of first-year medical students.

Objective: To evaluate the effect of our course on first year medical students in respect to: a) their interpretational abilities b) their attitude towards studying literature and the core subjects.

Method: Using a pre-post questionnaire, of a semester-long course, among two consecutive classes, the authors evaluated the participant's interpretational ability and depth of understanding when analyzing four complex passages.

Results: Out of 235 students, 146 (62%) responded to both questionnaires. There was a significant increase in the participant's interpretational ability ($P=0.003$). ninety one participants (38%) improved their level of understanding in at least one out of the four passages, and 37 participants (25%) improved in two passages. A multivariate analysis revealed that the improvement in the interpretational ability was associated with younger age ($P=0.034$, CI 95%=0.64-0.98, OR=0.79), positive pre-course attitude and motivation ($P<0.001$, CI 95%=1.43-3.05, OR=2.09), and lack of a prior literature background ($P=0.064$, CI 95%=0.17-1.05, OR=0.43).

Conclusion: Our data suggests that NGDC may improve and refine interpretational ability. Further studies are required to establish the short- and long-term impact of this change and whether it can be translated into better clinical decision making.

Keywords: Interpretational Ability, Medical Education-Undergraduate, Clinical Decision Making, Humanities, Problem Solving.

Introduction

Numerous medical schools worldwide have incorporated a variety of humanities courses into their curricula. Typically, these courses may include literature, philosophy, music and ethics, among others. As in many other educational fields, the impact of these programs on short-term outcomes, such as attitudes or abilities (often times self-reported), and on long-term measurable competencies relevant to the practicing physician (actual knowledge, behavior, decision making), is difficult to assess [1-3]. Moreover, in the broader context of outcomes-based medical education that insists that learning activities should contribute to the development of concrete and measurable competencies (skills, knowledge or attitudes), evaluating and demonstrating the impact of studying humanities on assessable

competencies becomes increasingly significant [4]. Within this conceptual framework, a word of caution is advised. The fact that it is difficult to measure, demonstrate or prove the efficacy of an educational intervention does not necessarily imply that it is irrelevant or worthless [5-7].

Clinical medicine is primarily an exercise in problem solving. In fact, it is predominantly knowledge-based assessment and judgment under terms of uncertainty [8-10]. Clinical reasoning is far less algorithmic and dichotomous than we would like to admit. If it truly was, computers would probably easily outperform human clinicians. As such, there is a substantial element of interpretation in this complex mental exercise [11-13]. It is debatable though,

whether interpretational ability is an acquired skill, and to what extent this skill can be taught and improved.

Humanities in general, and literature in particular, may enhance the ability to face uncertainty and ambiguity, and practice reflective silence and contemplation. These are also important for physicians to be able to identify subtleties, separate the important from the negligible, and contain the gray areas in which patients typically reside [14,15].

We recently introduced a narrated group-discussions course (NGDC) into our first-year curricula, called "Literature Journey". The course is texts-based small group discussions narrated by physicians from different medical fields. Essentially, the texts serve as a platform to foster thorough discussions addressing complex issues such as the meaning of life, end of life, vanity and more.

In order to assess the course impact on interpretational ability, we conducted a pre-post study, using a self-reported questionnaire. We hypothesized that the interpretational ability of the participants will be enhanced by engaging in a repeated exercise in interpretation and attention to subtleties.

Method

Course Description

The course is based on small discussion groups (16 students in each group) narrated by physicians from different medical fields. It addresses complex issues, such as the meaning of life, end of life, vanity and modesty, cynicism, love, choice, inner truth, identity, racism, fulfillment and more. Essentially, the texts serve as a platform to foster thorough discussions addressing these issues. At the end of the course, students are required to submit a written reflective essay related to one of the issues discussed during the course.

Study Design and Participants

This was a quantitative, prospective, cohort observational study. The participants (N=146) were students, in their first year of medical school at the Goldman School of Medicine, Ben-Gurion university of the Negev, who started their first year in 2016 (N=71) and 2017 (N=75). The course was defined as mandatory for all first-year medical students.

Data Collection Procedure

The students were given a self-reported questionnaire that was filled anonymously at the first hour of the course and a similar questionnaire at the last session. No incentives were offered. Each participant received a random study code, and anonymity was maintained throughout the data collection and interpretation process. Each participant served as his own control, and we compared the two questionnaires of each participant.

Each questionnaire contained three components: a. personal and demographic data (age, gender, education etc.) b. attitude towards the course, prior background in literature, interest in literature and c. Four passages [16-18] from various sources followed by multiple choice questions offering a variety of alternative interpretations as to the meaning of the paragraph they just read. The study was approved by the Ethical Review Board of Ben-Gurion University.

Variables Measured

In order to measure the interpretational ability, we chose four complex passages from known novels or philosophy books [16-19]. After reading the passage, the participants were asked the following question: What is this text about? We provided 5-6 answers, which could be divided into two uneven categories: a) 'high level of understanding', reflecting abstract or conceptual thinking (one answer) or b) 'low level', a simple reciting of the text using similar words (the remaining four or five options). A positive effect was defined as a change from low level of understanding to a high level of understanding in at least two passages.

Statistical Data Analysis

Categorical data were expressed as absolute numbers and percentages, continuous variables as mean (SD), and ordinal with non-parametric distribution as median and inter-quartile range. Differences between student's perceptions and performance at baseline vs. at the end of intervention were assessed by Wilcoxon test for variables with non-parametric distribution and chi-square test (χ^2) for categorical variables. The association between baseline characteristics and outcome was assessed by Logistic regression analysis and described as odds ratios (OR) and 95% CI. Two-sided p values <0.05 were considered statistically significant. All statistical analyses were conducted using SPSS 25.0 statistical software (IBM Corp Armonk, NY, USA).

Results

Descriptive Statistics

Out of 235 participants, 146 (62%) responded to both questionnaires (pre and post course). Table 1 presents baseline demographic characteristics of the study population, reflecting a fairly heterogeneous sample, of diverse backgrounds. Out of 146 students, 71 (49%) had a stronger background in humanities, as acquired from their high school curriculum.

The median level of pre course interest in literature was 4 (one to five scale), while the median level of pre course positive attitude towards the course was 3 (also one to five scale).

Table 1: Baseline demographic and social characteristics of study population (n=146).

Age (mean±SD)		24 ± 2.1
Gender, n (%)	Female	83 (67)
Country of birth, n (%)	Israel	132 (90)
	Other	14 (10)
Marital status, n (%)	Single	133 (91)
	Married	13 (9)
Level of religious practice, n (%) (N=134)	Religious	31 (23)
	Traditional	20 (15)
	Secular	83 (62)
Background in humanities, n (%)	Yes	71 (49)
	No	75 (51)

The Effect on the Interpretational Ability

The effect of the course on the participant's interpretational ability is depicted in Figure 1. There was a significant increase in the participant's interpretational ability based on the proportions of students who chose the answer reflecting high level of text understanding, in the post course questionnaire (Figure 1, $P \leq 0.006$). 91 participants (38%) improved their level of understanding in at least one out of four of the given texts, and 37 participants (25%) improved in two texts.

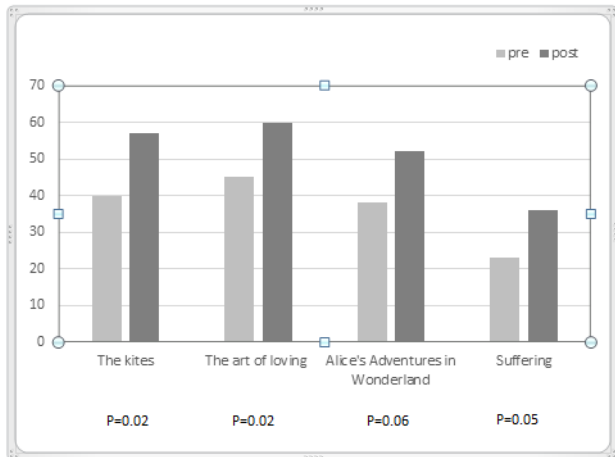


Figure 1: Interpretational Ability-Comparison of the proportions of students who chose the answer reflecting high level of text understanding, in the pre and post course questionnaires (n=146).

Multivariate analysis (logistic regression) revealed that the improvement in the interpretational ability (defined as improvement in the interpretation of two passages) was associated with younger age ($P=0.034$, CI 95%=0.64-0.98, OR=0.79), positive pre course attitude and motivation ($P<0.001$, CI 95%=1.43-3.05, OR=2.09), and the lack of a prior literature background ($P=0.064$, CI 95%=0.17-1.05, OR=0.43), low level of pre course interest in literature ($P=0.010$, CI 95%=0.37-0.88, OR=0.57). The correlation between participants' characteristics and their positive change in interpretational ability is shown in Table 2.

Table 2: Multivariate analysis (logistic regression) of post course improvement in text interpretation (at least two passages) (n=146).

Variable	OR	95% CI	P value
Age (years)	0.79	0.64-0.98	0.034
Extended humane/art studies at high school	0.43	0.17-1.05	0.064
Level of interest and motivation to study literature as part of the medical education-pre-course	2.09	1.43-3.05	<0.001
pre course interest in literature	0.57	0.37-0.88	0.01

Discussion

Our data suggests that NGDC may improve and refine interpretational ability. Clinical medicine is primarily an exercise in problem solving under terms of uncertainty that requires attention to subtleties and interpretation of data from various sources into a testable hypothesis. Clinical reasoning is far less algorithmic and dichotomous than we probably would like to admit [8-10]. How would we otherwise explain why expert physicians, with similar training and experience, come to a different conclusion as to what the patient's problem might be, even though they look at exactly the same data base? There are obviously, several components comprising the answer (actual experience, level of teaching, knowledge base and more), but we propose that an additional important one is the ability to notice and gather subtle clues, merge and interpret them within a specific context, into a testable diagnostic hypothesis. It is debatable though, whether this interpretational ability is an acquired skill or rather a born gift, and to what extent this ability could be taught and improved.

Studies addressing this question directly are very difficult to conduct, and empirical data is lacking. Moreover, it is unclear whether developing and improving interpretational ability in one semantic field (i.e. literature) could be translated and applied into a completely different one (i.e. clinical problem solving). Our data suggests that practicing interpretation of complex passages can significantly improve the students' ability in this respect. We are very aware that there is a substantial difference between interpretation of passages and the complex arena of clinical decision making.

Our study was not designed and therefore did not show that participants that improved their interpretational ability perform better during their clinical years or even more importantly, will become better clinicians. Whether practicing interpretation as described here, could be translated into a measurable competence at the bedside while making clinical decisions will have to be addressed by future studies. Furthermore, it is conceivable that the impact of this kind of mental exercise could be enhanced by being practiced over several years as an integral part of the curriculum and not as a single semester-long course.

Limitations

The present study has significant limitations. The overall response rate was 61, which is not uncommon for this kind of methodology. It relied on students that were physically present at the beginning of the first lesson and at the end of the last meeting of the course. It could be argued that the profile of students choosing to be present and collaborate invites pre-selection bias.

As mentioned above, the method we used to evaluate the effect on the interpretational ability was by splitting the presented optional interpretations into two categories. Obviously, literature is characterized by ambiguity and gray shades and not by definite answers. There is no truly a correct answer when analyzing a literature text. One can argue that such splitting to right and wrong interpretations contradicts the very essence of humanities. Therefore, doubt still remains whether the observed change in the answers provided reflects a true improvement in the skill it pretends to measure, i.e., interpretational ability. This dialectic

relationships between humanities (and specifically literature) and evidence-based medicine, is what makes it so difficult to prove the effect of the first on the last.

This study was not designed and therefore no conclusions could be drawn as to the possible connection between the positive change described in the interpretational ability and the participants future performance as clinicians.

Conclusion

Our study should be viewed as hypothesis generating that requires further research. A critical role of medical education is to train excellent decision makers while facing incomplete data base. This elusive ability is difficult to teach, difficult to master and difficult to assess. It would be of value if we could show that practicing interpretation and attention to details in a different field (literature) can improve clinical acumen at the bedside.

As in almost any other acquired capability, repeated practice improves on given talent. Thus, practicing NGDC over several years or even throughout the whole Medical School might have a much more pronounced and lasting effect, refining and deepening the interpretational ability of the students. Such a more pronounced effect might be easier to detect and measure. The ultimate goal, as previously suggested, is to determine whether and to what extent such an effect on interpretational ability could be incorporated into bedside clinical decision making.

We propose a future randomized controlled trial in which the class will be randomly divided into two groups. The study group will participate in NGDC throughout the whole Medical School training, while the control group will not. Upon completion of the program the clinical performance of both groups will be evaluated and compared by using an acceptable methodology. If such an effect could be demonstrated, it would be a meaningful contribution to this perplexing field of teaching clinical decision making.

Acknowledgement

No grants of funds had been given to any of the authors of this article.

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