

Instruction in developmental psychiatry: preliminary findings at the undergraduate level in Brazil

Educação em psiquiatria do desenvolvimento: resultados preliminares em estudantes de graduação no Brasil

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Abstract

Background: Although knowledge on developmental psychiatry is fundamental for the early recognition, treatment, and prevention of mental disorders, this subject has not been incorporated into the medical curriculum or psychiatric practice in Brazil. **Objective:** To evaluate the effect of a short course on developmental psychiatry for undergraduate students and to expand education policies concerning developmental psychiatry in Brazil. **Methods:** Before and after attending an extracurricular 12-hour, 4-day course on the fundamentals of developmental psychiatry, undergraduate health sciences students were tested regarding their knowledge of the subject. The pre-test/post-test included 12 randomly selected multiple-choice questions designed to evaluate knowledge related to developmental psychiatry and was administered together with a questionnaire designed to evaluate students' attitudes. To compare performances between groups, nonparametric analyses of ordinal categorical data were employed. **Results:** The final sample comprised 43 students. The mean post-test score was significantly higher than the mean pre-test score (65.0% vs 39.9%; $p < 0.0001$). We found that strongly positive attitudes correlated with better performance. The 3rd and 4th year medical students performed better than the 1st and 2nd year medical students and the non-medical students. Sex differences favoring males were also observed. **Conclusion:** Our findings encourage additional educational policies related to developmental psychiatry which may result in direct clinical implications.

Descriptors: Psychiatry; Education, medical; Education, medical, undergraduate; Educational measurement; Brazil

Resumo

Contexto: Apesar de vital para o reconhecimento precoce, tratamento e prevenção de transtornos mentais, a psiquiatria do desenvolvimento ainda não foi incorporada à grade curricular ou prática psiquiátrica no Brasil. **Objetivo:** Avaliar o impacto de um curso extracurricular em psiquiatria do desenvolvimento na graduação e a viabilidade de expansão de políticas de ensino em psiquiatria do desenvolvimento no Brasil. **Método:** Antes e após assistirem um curso de 12 horas durante 4 dias sobre fundamentos da psiquiatria do desenvolvimento, estudantes de graduação em saúde responderam um questionário composto por 12 questões de múltipla escolha randomizadas para avaliação de retenção do conhecimento e questões destinadas à avaliação de atitudes. A análise estatística incluiu testes não-paramétricos de variáveis categóricas ordinais. **Resultados:** Em uma amostra final composta por 43 estudantes, verificou-se um desempenho significativamente superior no pós-teste (65.0% vs. 39.9%; $p < 0.0001$). Atitudes positivas em relação ao curso relacionaram-se a um melhor desempenho. Estudantes dos 3º e 4º anos de medicina apresentaram resultados superiores quando comparados aos do 1º e 2º anos de medicina e aos estudantes de outras áreas da saúde. Constatou-se melhor desempenho no sexo masculino. **Conclusão:** Este estudo encoraja políticas de ensino em psiquiatria do desenvolvimento que poderão ter implicações clínicas diretas.

Descritores: Psiquiatria; Educação médica; Educação de graduação em medicina; Avaliação educacional; Brasil

Introduction

Developmental psychiatry (DP) is an interdisciplinary field that employs theories and tools from diverse areas, including bioinformatics, genetics, cellular biology, molecular biology, physiology, psychology, neurology, psychiatry, and developmental epidemiology, with the objective of gaining a more complete

understanding of the origin, maintenance, prevention, and treatment of mental illness¹. Although this field of research, originally known as developmental psychopathology, has existed since the beginning of the 20th century², its fundamental theoretical framework has evolved under the influence of advances

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in psychoanalysis and other areas of developmental psychology. In recent years, DP began to incorporate different neuroscience disciplines and became a priority for the National Institute of Mental Health, which called for investment in research to identify individuals at risk for psychiatric disorders and to develop “effective preemptive interventions”¹.

Despite the importance of this paradigm in psychiatry, DP has not been incorporated yet into the medical curriculum or psychiatric practice in Brazil, where psychiatric disorders are highly prevalent among children and adolescents, including primarily oppositional and conduct and anxiety disorders³. Therefore, there is an urgent need to train future psychiatrists and health professionals in DP in order to establish its professional identity in a multidisciplinary area^{4,6}. Within this context, a group of scholars and researchers sponsored by the Brazilian government created the *Instituto Nacional de Psiquiatria do Desenvolvimento* (INPD)⁷, which proposes a new paradigm for psychiatry in Brazil, one that is focused on strategies for preventing psychiatric disorders in children and adolescents. The INPD promotes multicenter and multidisciplinary projects involving new methods of identifying children and adolescents at risk for psychiatric disorders, as well as new interventions to prevent or attenuate the expression of such disorders. In addition, the INPD aims to develop teaching strategies to disseminate DP concepts in Brazil, initially at selected universities and eventually nationwide. Specific courses are being developed for undergraduate, medical residency, and postgraduate programs⁷.

The aim of this study was to evaluate the effect of a short course on DP for undergraduate students. These initial results may help to assess the viability of the expansion of DP education policies.

Method

This study involved 53 undergraduate students from the field of health sciences (medicine, psychology, biology, speech therapy, and physical therapy) recruited among those enrolled at the Medical School of the University of São Paulo, a public institution in São Paulo, Brazil. Participants attended an extracurricular 12-hour, non-mandatory course consisting of eight 90-minute lectures on DP fundamentals: developmental psychopathology; genetics and epigenetics of psychiatric disorders; developmental neuroimaging; and epidemiology, clinical features, treatment, and prevention of the main childhood psychiatric disorders. We employed a pre-test/post-test design⁸. Prior to and after the course, the knowledge of the participants was evaluated anonymously with a test comprising 12 multiple-choice questions (5 options each) randomly selected from a database of 30 questions designed by professors at the INPD, all of whom were blinded to the objectives of the test. Additional questions, adapted from the Dundee Ready Educational Environment Measure⁹ and the Postgraduate Hospital Educational Environment Measure¹⁰, were included in order to assess students’ attitudes toward the course: motivation; self-study; lecture comprehension; opinion regarding the appropriateness of the environment; understanding of the relevance of the course; and willingness to participate in future DP research programs. Incentives were: certificates to all completers and possibility to enter a DP research program.

Statistical analyses included nonparametric analysis of ordinal categorical data^{11,12}, which allows the comparison of group performances and analysis of time-effect relationships. This study design was approved by the Academic Ethics Committee of the Medical School of the University of São Paulo and all participants gave written informed consent.

Results

Of the 53 health sciences students initially recruited, 10 declined to complete the evaluations: 6 women (3 medical students and 3 non-medical students) and 4 men (all medical students). Of the 43 completers, 31 were medical students and 11 were students from non-medical fields (psychology, biology, speech therapy, and physical therapy). All completers presented the minimum 75% attendance rate required (mean 87.7%). The mean age was 21.88 ± 4.4 years. Sex distribution is shown in Table 1.

Comparing the mean pre-test and post-test scores (39.9% and 65.0%, respectively), we found that the gain in knowledge on DP was significant ($p < 0.0001$). All participants consistently reported that the course was acceptable, useful, and relevant to their objectives, and demonstrated positive attitudes toward the learning and teaching of DP. As seen in Table 1, the students who had the highest scores for lecture comprehension, self-study, and willingness to participate in future DP research programs also showed significantly greater gains in knowledge ($p < 0.03$, $p < 0.05$, and $p < 0.04$, respectively). Medical students tended to perform better than other undergraduate health sciences students ($p = 0.081$). On average, 3rd and 4th year medical students performed better on the pre-test and post-test than did 1st and 2nd year medical students ($p < 0.01$) and non-medical students ($p < 0.001$). In addition, males performed better than females ($p < 0.05$).

Discussion

To our knowledge, this is the first evidence-based study evaluating instruction in DP among undergraduate students. Formal testing revealed a significant overall gain in knowledge on DP, which was the main objective of this project, because DP has not been a mandatory component of undergraduate health sciences programs in Brazil.

The observation that students with high scores for the comprehension of lectures, self-study, and willingness to participate in future DP research programs performed better than other students is supported by previous studies suggesting that students’ attitudes are important determinants of other academic behaviors, specifically the application of knowledge and skills in clinical practice^{4,5}, as well as the search for one’s identity as a researcher⁶. However, motivation and appropriateness of the environment did not correlate with students’ performance. This might be explained by the small sample size, since most students had high scores for those items.

We found that 3rd and 4th year medical students performed better on the pre- and post-tests than 1st and 2nd year medical students and non-medical students, as well as that medical students, in

Table I: Formal testing and attitudes toward developmental psychiatry among undergraduate health sciences students

Variable	Pre-test		Post-test		effect size	
	Average	SD ^a	Average	SD ^a		
Gender						0,0047 ^a
Female (n)= 31	37,73	2,47	63,28	3,06	9,24	<0,0001 ^b
Male (n)= 12	48,44	3,74	71,53	3,9	6,04	0,6365 ^c
Course						0,0819 ^a
Non-medical Students (N= 12)	37,04	5,91	52,38	7	2,43	<0,0001 ^b
Medical Students (N= 31)	41,86	2,31	68,02	3	10,80	0,0917 ^c
Comprehension of theoretical classes						0,0279 ^a
5 (N= 20)	40,42	3,33	73,33	3	10,84	<0,0001 ^b
Less than 5 (N= 23)	37,68	3,55	59,03	4	6,05	0,0203 ^c
Self-study						0,8983 ^a
4 or 5 (N= 11)	34,09	4,56	68,18	3	8,64	<0,0001 ^b
Less than 4 (N = 32)	40,62	2,84	64,65	3	8,00	0,0433 ^c
Comfort						0,4669 ^a
5 (N= 27)	39,81	2,79	67,28	3	9,94	<0,0001 ^b
Less than 5 (N= 17)	37,49	4,63	62,74	5	5,33	0,4063 ^c
Motivation						0,3672 ^a
5 (N= 29)	37,93	2,85	65,23	3	9,40	<0,0001 ^b
Less than 5 (N= 15)	41,07	4,66	66,11	5	5,31	0,1395 ^c
Interest						0,6662 ^a
5 (N= 35)	38,8	2,46	66,9	2	11,55	<0,0001 ^b
Less than 5 (N= 9)	39,58	7,83	60,18	8	2,59	0,1032 ^c

SD: Standard deviation

^agroup effect.^btime effect.^cinteraction effect.

Scores: 1 (minimum) to 5 (maximum), in accordance with the guidelines for the scoring of the Dundee Ready Educational Environment Measure and the Postgraduate Hospital Educational Environment Measure questionnaires.

Effect size: cohen's d

general, performed better than non-medical students. These findings are probably related to the cumulative acquisition of specific psychiatric knowledge or even general problem-solving skills in medical school. Surveys suggest that clinical experience after the 3rd year correlates with increased interest in the field of child psychiatry¹³. However, in the present study these subgroups did not differ regarding their attitudes toward the course.

We found sex differences in terms of knowledge acquisition and retention. The better performance of males might be related to the type of evaluation employed, some authors having argued that multiple-choice testing favors males¹⁴. In addition, all non-medical students in our sample were female, which could constitute a bias.

Further studies involving different forms of evaluation are needed in order to clarify how to best evaluate knowledge acquisition and avoid any bias related to sex.

Through the use of new technologies such as telemedicine, the strategies outlined above could be disseminated to other educational modalities, such as medical residency and postgraduate programs, and this could have a significant impact on DP instruction in Brazil as a whole.

The present study has certain methodological limitations, such as the relatively small sample size, the fact that practical clinical skills were not evaluated, and the possible selection bias, since course attendance was not compulsory and 10 students declined

to participate. Detailed data from non-completers such as “why did they not complete?” would have incremented discussion. Further studies involving larger samples and comparing knowledge gain between the “traditional” psychiatry curriculum and DP, as well as different forms of evaluation, are needed in order to clarify how to best evaluate knowledge acquisition and the possibilities of expanding DP education policies.

Conclusion

Methodological limitations aside, this preliminary pre-test/post-test study showed that medical and non-medical undergraduate health sciences students have positive attitudes toward DP instruction and significantly acknowledge gains after attending a short course on DP fundamentals. At the primary care level, mental disorders are currently being identified and treated by

general physicians and other non-psychiatric clinicians. Moreover, in Brazil, DP is not yet a mandatory subject in undergraduate health sciences programs¹⁵. Therefore, our findings encourage additional educational policies on DP. Considering the importance of the new paradigms arising from DP, such as investment in strategies to identify children and adolescents at risk for psychiatric disorders, as well as the development of new interventions to prevent or attenuate their expression, appropriate educational guidelines should be devised and tested in terms of the evidence-based medicine.

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* Modest

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References

- National Institute of Mental Health. *Transformative Neurodevelopmental Research in Mental Illness*. Report of the National Advisory Mental Health Council's Workgroup. 2007.
- Cicchetti D. The emergence of developmental psychopathology. *Child Dev*. 1984;55(1):01-07.
- Fleitlich-Bilyk B, Goodman R. *Prevalence of Child and Adolescent Psychiatric Disorders in Southeast Brazil*. *J Am Acad Child Adolesc Psychiatry*. 2004;43(6):727-34.
- Kelly B, Raphael B, Byrne G. The evaluation of teaching in undergraduate psychiatric education: students' attitudes to psychiatry and the evaluation of clinical competency. *Med Teach*. 1991;13(1):77-87.

5. Sawyer MG, Giesen F, Walter G. Child psychiatry curricula in undergraduate medical education. *J Am Acad Child Adolesc Psychiatry*. 2008;47(2):139-47.
6. Martin A., Bloch M, Pruett K, Stubbe D, Belitsky R, Ebert M, Leckman JF. From too little too late to early and often: child psychiatry education during medical school (and before and after). *Child Adolesc Psychiatr Clin N Am*. 2007;16(1):17-43.
7. Miguel EC. The National Science and Technology Institute in Child and Adolescence Developmental Psychiatry: a new paradigm for Brazilian Psychiatry focused on our children and their future. *Rev Bras Psiquiatr*. 2009;31(2):85-8.
8. Steinert Y, Mann K, Centeno A, Dolmans D, Spencer J, Gelula M, Prideaux D. A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education: BEME Guide No. 8. *Med Teach*. 2006;28(6):497-526.
9. De Oliveira Filho GR, Vieira JE, Schonhorst L. Psychometric properties of the Dundee Ready Educational Environment Measure (DREEM) applied to medical residents. *Med Teach*. 2005; 27(4):343-7 .
10. Wall D, Clapham M, Riquelme A, Vieira J, Cartmill R, Aspegren K, Roff S. Is PHEEM a multi-dimensional instrument? An international perspective. *Med Teach*. 2009;31(11):e521-7.
11. Brunner E, Langer F. Nonparametric analysis of ordered categorical data in designs with longitudinal observations and small sample sizes. *Biom J*. 2000;42:663-675.
12. Singer JM, Poletto FZ, Rosa P. Parametric and Nonparametric Analyses of Repeated Ordinal Categorical Data. *Biom J*. 2004;46:460-473.
13. Malloy E, Hollar D, Lindsey BA. Increasing interest in child and adolescent psychiatry in the third-year clerkship: results from a post-clerkship survey. *Acad Psychiatry*. 2008;32(5):350-6.
14. Haidinger G, Mitterauer L, Rimroth E, Frischenschlager O. Learning strategy or strategic learning? Gender-dependent success in medical studies at the Medical University of Vienna. *Wien Klin Wochenschr*. 2008;120(1-2): 37-45.
15. Andreoli SB, Almeida-Filho N, Martin D, Mateus MD, Mari Jde J. *Is psychiatric reform a strategy for reducing the mental health budget? The case of Brazil*. *Rev Bras Psiquiatr*. 2007;29(1):43-46.