

Redefining medical students' disease to reduce morbidity

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Objectives To gain a clearer conceptual understanding of medical students' disease and its impact on students, by separating the process of thinking that one may have a particular illness under study from the emotional distress that may accompany these thoughts.

Method In a questionnaire survey, the responses of 92 first-year and 85 third-year medical students were compared with those of 82 law students, with regard to medical students' disease perception, medical students' disease distress, hypochondriacal beliefs, concerns about health, the value placed on health, and recent visits to doctors in the past 12 months.

Setting The University of Auckland, New Zealand.

Results Both groups of medical students scored higher on medical students' disease perception than law students. First-year students scored higher on medical students' disease distress and hypochondriacal concerns than both law and third-year medical students.

While medical students place a higher value on health, there were no differences with regard to health visits in the past year.

Conclusions The results support the separation of medical students' disease into perceptual and emotional components. This conceptualization of medical students' disease as a normal process rather than a form of hypochondriasis may be used to brief medical students when they enter medical school, in order to reduce the distress associated with the condition. Medical students' disease can also be used as a personally relevant example in teaching about how patients make sense of symptoms.

Keywords Education, medical, undergraduate; hypochondriasis/*psychology; prevalence; adaptation psychological; law; students; comparative study; questionnaires; New Zealand.

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Introduction

Medical students' disease occurs when, in the process of studying an illness, medical students become overly focused on their own bodily symptoms and may falsely believe that they in fact have the illness being studied. Two formative descriptive studies concluded that around 70% to 80% of medical students have a 'positive history' of this disease.^{1,2} The disease was a significant source of stress for students during their medical school careers, and the suggestion was made that more should be done to assist students to cope with this phenomenon.²

In contrast to these earlier findings, two recent studies concluded that the incidence of medical students' disease was exaggerated, as the authors failed to

find higher levels of this phenomenon in medical students when compared with other student groups.^{3,4} We believe there are two reasons for these null findings. First, both these studies measured medical students' disease using questionnaires designed to measure hypochondriacal beliefs in illness populations. Hypochondriacal beliefs involve the pathological fear that one might have a serious disease. Second, they only included students in their third year or clinical years of their training.

We argue that medical students' disease may be better seen as an example of the perceptual process where learning about a disease creates a mental schema or representation of the illness which includes the label of the illness and the symptoms associated with the condition. Once this representation is formed, symptoms or bodily sensations that the individual is currently experiencing which are consistent with the schema may be noticed, while inconsistent symptoms are ignored. This process has been demonstrated in experimental studies where people who were incorrectly told that they had a particular illness tended to

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Key learning points

Medical students' disease is the process of matching one's own symptoms or bodily sensations to known disease labels.

Medical students' disease can be separated into a perceptual process and an emotional process.

The emotional distress attached to medical students' disease occurs largely in the first year of training.

The process of matching personal symptoms to illnesses still occurs in later years of training, but the distress component appears to diminish.

Medical educators should investigate ways of reducing medical students' disease distress in the first year of training.

report symptoms that they believed were congruent with this illness.^{5,6} The reported symptoms are often common ambiguous somatic symptoms which in other situations may be interpreted as normal bodily sensations. Thus, symptom reporting in this context is a normal response to a change in perceptions and the way in which sensory information is processed.

There is an important further element. The generation of illness schema has a parallel emotional component that may be activated at the same time, depending on how convinced the person is that they have the illness, and the emotional distress or anxiety attached to the illness label. This component overlaps with the concept of hypochondriasis, as one of the emotional responses to the illness schema is fear. The separation of the perceptual process from the emotional response is important in understanding when and how medical students' disease is experienced. In this study we hypothesized that the perceptual process of medical students' disease would differentiate medical students from students studying non-medical topics. We also predicted that the emotional component of medical students' disease would be most prevalent at the beginning of the medical training, because the process itself is unfamiliar and students have yet to develop the understanding that it is a normal response to learning about new disease information.

Methods

A sample of 92 first-year and 85 third-year medical students at the University of Auckland Medical School

and a comparison group of 82 third-year law students from the same university completed a questionnaire during their normal lecture time. Law students were chosen as a comparison group because previous work using distress-based measures of medical students' disease showed no differences between third-year medical and law students.⁴ The response rate ranged from 81% to 84% for the medical school groups and was 80% for the law group. The demographic characteristics of the three groups are presented in Table 1. As expected, the mean age of the first-year students was significantly lower than the mean ages of the two third-year groups ($F = 25.38$ (2,250), $P < 0.001$), but the two third-year groups were equivalent for age. Chi-squared analyses showed that the groups were comparable with regard to gender ($\chi^2 = 4.69$, $P < 0.10$), but that there were some differences in the ethnic breakdown of the groups ($\chi^2 = 14.65$, $P < 0.02$).

The questionnaire included five scales. These comprised a specially designed 5-item Medical Students' Disease Perception Scale which measured the cognitive experience of medical students' disease, e.g. 'When I hear about an illness, I get symptoms similar to that illness', and a 5-item Medical Students' Disease Distress Scale, e.g. 'When I learn or read about different diseases, I become worried that I may have one of these diseases' (see Appendix for the full scales). The internal reliabilities of these scales were $\alpha = 0.78$ and $\alpha = 0.87$, respectively. Students also completed two scales included in recent studies of medical students' disease, the Health Concern Scale and the Whitley Index.^{3,4} The former measures concerns about health in general, while the latter measures excessive or hypochondriacal anxiety about the experience of symptoms. Students also rated the value they placed on their health on a scale of 1–10, and reported the number of times they had visited a doctor in the previous 12 months. No personal identifiers were used on the questionnaires.

Table 1 Demographic characteristics of participant groups

	Year 3 law students	Year 1 medical students	Year 3 medical students
Age, mean (SD)	23.30 (5.76)	19.02 (2.01)	21.89 (3.72)
Gender, %women	68.7	53.3	56.5
Ethnicity, %			
European	62.7	48.9	68.4
Maori	13.3	14.1	7.1
Polynesian	1.2	6.5	0
Asian	22.9	30.4	23.5

Table 2 Medical students' disease scores and health attitude scores across groups

	Year 3 law students, mean (SD)	Year 1 medical students, mean (SD)	Year 3 medical students, mean (SD)	F*	P
Medical students' disease (MSD)					
Perception	10.09 (3.75)	12.41 (3.92)†	11.87 (3.04)†	7.75	0.001
Distress	9.60 (3.65)	12.00 (4.64)‡	10.55 (4.07)	5.57	0.004
Whitley Index	30.87 (6.70)	34.31 (7.87)‡	30.63 (7.90)	4.45	0.014
Health Concern	14.49 (3.24)	15.21 (2.87)	14.81 (2.99)	0.41	0.67
Health value	7.75 (2.51)	8.52 (1.53)†	8.66 (1.75)†	3.99	0.02
Doctors' visits	3.53 (3.85)	3.28 (4.16)	3.15 (2.29)	0.25	0.78

*F values were computed after controlling for age, gender and ethnicity.

†Significantly different from law students.

‡Significantly different from year 3 medical and law students.

Results

A series of analyses of covariance (ANCOVA) controlling for age, gender and ethnicity were used to assess significant differences between the groups on these measures (see Table 2). Simple contrasts were used to determine where the differences lay. With the demographic factors controlled, both first and third-year medical students scored significantly higher than law students on the Medical Students' Disease Perception Scale. However, only first-year medical students scored higher on Medical Students' Disease Distress and on the Whitley Index. There were no significant differences between the groups on the Health Concern Scale, although both the medical student groups placed significantly greater value on their health. There were no differences between the groups on the number of times they had visited a doctor in the past year.

The only demographic factor to have a significant effect on some of the health perception variables was ethnicity. Ethnicity was a significant covariate in the Medical Students' Disease Perception equation ($F(1,246) = 10.83$, $P < 0.001$), the Medical Students' Disease Distress equation ($F(1,247) = 26.55$, $P <$

0.001) and the Whitley Index equation ($F(2,238) = 13.40$, $P < 0.001$). While these results suggest that cultural as well as situational factors may influence the experience of medical students' disease, we were unable to investigate this further because of the large differences in the sizes of the ethnic groups.

Table 3 presents a correlation matrix of the five psychological variables and self-reported visits to the doctor. This table shows that the two medical students' disease (MSD) variables are highly correlated and that they are also strongly associated with the Whitley Index. Thus, the cognitive process of linking symptoms to disease labels is associated with the emotional reaction to this process. The MSD variables show weaker associations with health concern and no relationship to health value. This data confirm that MSD is to some extent separate from the concept of health anxiety. MSD also appears to be unrelated to self-reported visits to the doctor.

Discussion

These findings support the separation of medical students' disease into perceptual and emotional distress

Table 3 Correlation matrix of the medical students' disease (MSD) variables, health attitude variables and visits to the doctor

	MSD- perception	MSD- distress	Whitley Index	Health concern	Health value	Visits to doctors
MSD-perception	—	0.77*	0.62*	0.29*	0.09	0.07
MSD-distress	—	—	0.78*	0.32*	0.07	0.05
Whitley Index	—	—	—	0.47*	0.10	0.19*
Health Concern	—	—	—	—	0.39*	0.07
Health value	—	—	—	—	—	0.00
Visits to doctor	—	—	—	—	—	—

* $P < 0.001$

components. While these processes are clearly related, by separating the process of thinking that one may have an illness from the emotional distress that may accompany these thoughts, we were able to distinguish both first and third-year medical students from law students. The distress component of medical students' disease and heightened hypochondriacal concerns seemed to be most prevalent in first-year medical students, which may explain why previous studies of students in their later years of training have been unable to document significant differences.^{3,4} Medical students' disease appears to emerge right at the beginning of the programme, when students are introduced to certain illnesses as clinical examples of concepts presented in the basic sciences. Our results suggest that by the third year the anxiety component of medical students' disease is no longer significant, but that students still tend to experience symptoms which relate to illnesses they have heard about. It may be that by this stage students have sufficient experience of the process or have developed coping strategies so that they longer get unduly upset by it.

Interestingly, medical students' disease did not appear to relate to doctor visits. This suggests that the negative impact of medical students' disease is largely psychological distress. This distress seems to be directly related to fears that one might have a specific illness or anxiety about the experience of symptoms rather than concern about health in general, as congruently with previous studies, there were no differences between the groups on the Health Concern Scale.

The relationships between type of student and medical students' disease were independent of any demographic differences. Neither age nor gender appeared to be related to medical students' disease, suggesting that it is the situational factor of being in the first-year medical school class rather than a developmental factor that is important. Ethnicity appeared to have some association with medical students' disease, suggesting that further research in this area may be important in terms of picking up students who may be particularly vulnerable.

The results of this study are pertinent to medical educators for two reasons. First, the results suggest that an intervention which briefs students on medical students' disease when they enter medical school may help to lessen the distress that can develop when this process occurs. Medical school poses a number of unique stressors to undergraduate students, such as arduous intellectual demands, cadaver dissection and, for many, a first exposure to illness and death. Dealing with medical students' disease in an appropriate, educational manner may assist with one of these stressors. If

medical students' disease is presented as a part of an explainable process rather than a form of pathological hypochondriasis, it may allow the issue to be more readily addressed.

Medical students' disease also offers students a unique learning opportunity for understanding the psychology of physical symptoms. Medical students' disease is a classic example of the processes many patients experience when they are given a disease label or diagnosis. For instance, if you tell a patient that they have elevated blood pressure they will tend to report symptoms that are congruent with his or her beliefs about symptoms of hypertension.⁶ Similarly, when medical students learn about a disease such as diabetes they may begin to be aware of symptoms such as thirst or increased urination. Thus teaching may incorporate medical students' disease as a personally relevant example of how the perception of normal symptoms can be strongly influenced by mental schema.

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Contributors

RMM had the original idea for the study, led the design of the study, and carried out the data analysis. KJP obtained ethical approval for the project. Both authors developed the questionnaire, collected the data and prepared the manuscript.

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Appendix

MSD-Perception

1. When I experience symptoms, I try to match these symptoms to an illness I have read or heard about.
2. When I hear about an illness, I get symptoms similar to that illness.
3. I find that when I hear about a new illness, I think for a while that I have that illness.
4. When I hear about diseases, I think I have them.
5. When I experience symptoms, I attempt to find out what disease they may be related to.

MSD-Distress

1. I get concerned when I experience symptoms in case I have a serious illness.
2. When I learn or read about different diseases, I become worried that I may have one of these diseases.
3. I often fear that I may have a serious illness.
4. I find myself worrying that I might have a disease I have just heard or read about.
5. If a disease is brought to my attention, I worry about getting it myself.