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## Concepts of health and illness in entering medical students: First part of a prospective study

### Summary

*The objective of this prospective study is to assess curriculum-related factors which might influence both concepts of health and illness and health behaviour. A representative sample of 546 freshmen enrolled at the University of Berne, entering medical students and a control group of freshmen in other faculties, were surveyed on their subjective concepts of illness and health. The questionnaire described as "Health and Illness Concept Scales" (HICS) was mailed out shortly before the beginning of school, and was returned by 70%. The prospective medical students surveyed were not found to have a typically medical view of health and illness before entering professional training, contrary to the hypothesis of "anticipatory socialisation". Their general concept of illness and health was found to be distinctly naturalistic rather than psychosocial in nature. While psychosocial factors were considered to be rather irrelevant by both cohort of students, individual health behaviour and the ability to recognize warning signs of impending hazard to one's health were given high priority.*

This study describes and analyzes health and illness concepts in beginning medical students. It is the first part of a prospective cohort study on curricular factors influencing health- and illness-related attitudes. The data obtained will be compared to a representative random sample. The authors intend to repeat the survey after the medical students have completed pre-clinical training, and just before the final exams in the sixth year of study.

Becoming a doctor requires the integration of the knowledge base

and the different techniques of the profession, as well as a wide array of contending cultural beliefs about health and illness. In medical training this often leads to a sense of ambiguity or to conflicts<sup>1</sup>, not only for the students but also for the teachers involved.

The concepts of health and illness studies in this paper refer to a wide range of pertinent lay or expert beliefs, both conscious and intuitive. During the past few years increased research attention has been directed to these "subjective theories of illness and health" in

the fields of medical psychology because they are relevant not only to patients' health and illness behaviour but also to physicians' diagnoses and treatment<sup>2-6</sup>.

There is conclusive evidence that patients' health- and illness-related ways of thinking greatly influence their behaviour<sup>7</sup>. On the other hand our knowledge of how and when doctors acquire, modify and consolidate such concepts is rather limited<sup>8</sup>. However, there is little doubt that clinical decision-making involves combining the scientific analysis of the data collected with intuitive, subjective and unscientific assumptions<sup>9</sup>. Thus, the way in which physicians approach clinical practice reflects the present state of medical knowledge, and also prevalent cultural beliefs and personal experiences with health and illness<sup>10</sup>.

The research project presented here focuses on how concepts of health and illness evolve and change during medical training, which takes place at the time of life in which a wide range of role acquisitions is imperative. For students this complex process requires the ability to balance and integrate an enormous body of clinical and didactic experiences, encountered throughout their time in medical school<sup>11</sup>. As an example, medical

training programmes involve formal classroom instruction in diverse fields of specialisation, and encounter with models in the course of observing the faculty engage in clinical practice<sup>12</sup>.

Little attention has yet been devoted to the question of how medical students deal with divergent models of health and illness during their training. How, for instance, do they cope with such competing concepts as the psychosocial and the biological paradigms of medicine prevalent today?<sup>13,14</sup>. Although humanistic attitudes and the impact of psychosocial programmes of study have undergone evaluation<sup>15-19</sup>, their influence on longer-lasting attitudes or on behavioural tendencies have not. Nor has the question been addressed to date as to how medical students deal with their demanding and complex professional training.

According to Anglo-American studies, the decision to study medicine is often made relatively early compared to other career choices<sup>20</sup>. The choice is reportedly based on the social prestige and the "visibility" of the medical profession. Young people have to deal with the fact that particular values and attitudes are expected of them before entering medical school. But there is still little systematic research on "anticipatory socialisation" in medical students<sup>12</sup>. Although there is some evidence that today's medical students have a psychosocial approach, despite the clearly biomedical emphasis in the first part of training, these findings call for confirmation<sup>21</sup>. It would therefore be of great interest to learn more about students' concepts of health and illness, which serve as a cognitive matrix influencing medical socialisation.

Two basic questions will be addressed in the present study: Do medical students have concepts of health and illness different from those of students in other fields of study?

Do medical students consider psychosocial aspects to be more important than naturalistic ones?

### Methods

#### Subjects and procedures

A total of 1475 students enrolled at the University of Bern (237 in the faculty of medicine, 1238 in the other 8 faculties) for the 1992 school year. Before the beginning of the school year, our questionnaire was sent out to all German-speaking future freshmen in medical school (122 men, 115 women) and to a control group of 309 freshmen (178 men, 131 women). In order to form the control group, 25% of the total number of registrations in each of the other faculties were selected by random sampling. Despite the fact that the students were required to reveal their identity, because of the prospective nature of the study, 81% (n=191) of the medical students and 63% (n=194) of the controls returned the questionnaire correctly filled out after at most one reminder (Figure 1). This amounts to an overall return rate of 70.5%. Although the return rate was found

to be 3.4% higher among the female students than among their male counterparts, the difference is not significant. The questions were answered in the prescribed manner and there were very few missing data per item. Only two not fully completed questionnaires had to be omitted.

#### Questionnaire

The "Health and Illness Concept Scales" (HICS) consist of 7 scales made up a total of 63 items to be appraised and rated on a Likert-type scale from 1 to 5, including various questions on the respondents' sociodemographic background. The first five scales were derived from the "Questionnaire on the Patient's Concept of Illness" (Bischoff & Zenz<sup>6</sup>). This questionnaire has repeatedly been used and tested in different projects, and statistical analysis showed a high internal consistency, discriminatory power (item-test correlation) between 0.5 and 0.75, as well as a high reliability between 0.7 and 0.95<sup>22</sup>.

The respondents were surveyed on general or culturally accepted aspects of illness ("Generally peo-

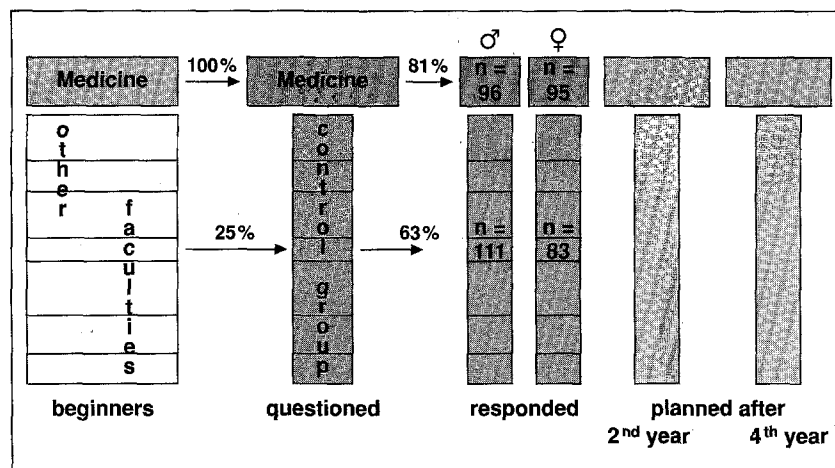


Figure 1. Study design and subjects.

ple become sick if they...”). The first five scales of the HICS can be delineated as follows:

- Psychosocial External (PSE): Sickness is caused by external influences in terms of psychosocial factors.
- Psychosocial Internal (PSI): Sickness is caused by internal influences in terms of personality traits.
- Health Behaviour (HB): Sickness is caused by the way of dealing with one’s own body in terms of unfavourable health behaviour.
- Naturalistic External (NE): Sickness is caused by external naturalistic influences in terms of physical or chemical environmental factors.
- Naturalistic Internal (NI): Sickness is caused by internal naturalistic influences in terms of the perceived state of health or perceived signs of health.

Two further scales were developed by the authors of this study. They focus on self-related aspects of health (“In order to remain healthy, I...” and “I am healthy when I...”, respectively) and address concrete health behaviour. As opposed to the earlier scales, here the respondents were asked about personal health behaviour relevant to their present life:

- Self-related Health Behaviour (SHB): Staying healthy is directly related to significant health behaviour.
- Self-related Health Indicators (SHI): The state of being healthy is indicated by significant psychosocial and biological features.

## Results

### Sociodemographic data

Table 1 depicts the sociodemographic information collected. Our

findings on the type of advanced level certificate (called “Matura” in Switzerland) the participating students had taken in their final year of schooling are in line with data collected in the Swiss Census on Formal Education of the Federal Bureau of Statistics<sup>23</sup>. A majority of the male students reported having taken the following subjects: Ancient languages (Type A); economics and commercial issues (Type E), and, above all, mathematics and science (Type C). On the other hand, their female counterparts had opted for three foreign languages (Type D), mathematics and science (Type C), and above all, two modern languages plus Latin (Type B) (46.6%). Medical students had taken science and mathematics (Type C) significantly more often than the control group ( $\chi^2$ ;  $p < 0.0001$ ), Table 1.

All the other sociodemographic characteristics covered failed to show significant group differences. Nevertheless, some group differences are interesting and are therefore worth mentioning. The fathers of the medical students generally have a higher educational level than the fathers of the other students. Conversely, the control group reveals a higher percentage of university trained mothers than the medical students. 15.8% of the respondents failed to provide information about their mothers’ schooling, whereas only 5.2% neglected to do so about their fathers’. 13.1% of the medical students’ fathers were doctors themselves as opposed to only 4.6% of those of the control group. On the whole, a greater percentage of the fathers than the mothers had attended university (29.4% as opposed to 8.6%). Another finding which merits brief mention concerns place of residence: almost half of all the students surveyed were living at home, but medical students reported living on their own more frequently than the control group.

### Health and Illness Concept Scales (HICS)

The HICS answer categories were numerically coded in the same direction so as to make assessment on an interval scale level possible. Data analysis, i.e. calculation of the frequency distribution, the Chi-squared test, the t-test and a factor analysis was carried out with the SAS Statistical Package<sup>24</sup>. All of the items used were shown to be apt and applicable, and the factor structure elicited was in line with Bischof and Zenz’s<sup>6</sup>. Because the HICS-scales consist of different numbers of items they were converted to a 10-point-scale, so as to make them comparable with one another (Table 2). All the scales revealed a normal distribution.

The means of the scales (ranging from 5.9–7.5; SD 0.9–1.3) are depicted in Table 2 and in Figure 2. In a sense, they represent an attitudinal profile of the overall sample surveyed. The means differed markedly from one another (t-test,  $p < 0.001$ ), with the exception of PSE and PSI. Significant correlations (Pearson) were obtained among scales of the “general concept”, particularly between PSE and PSI ( $r = 0.71$ ) and between NE and NI ( $r = 0.58$ ). Within the “self-related concept” the scale SHB yielded significant correlations to a much lesser extent.

There were no significant inter-group differences. A few gender differences were evidenced, as follows: overall only for scale NI ( $\chi^2$ ,  $p < 0.05$ ), overall and within both groups for scale SHB (t-test,  $p < 0.05$ ), only within the medical group for scale SHI (t-test,  $p < 0.05$ ) and only within the control group for scale PSE (t-test,  $p < 0.05$ ).

A further step in data analysis involving examination of the relationships between sociodemographic data and the HICS, with multifactorial analysis (GLM = General Linear Models) and cross tables, yielded only a few results,

	Total	Men	Women	Controls	Medical students
<i>Pre university school type*</i>					
Other type	7.0	6.8	7.3	13.9	0.0
A: old languages	3.9	4.4	3.4	3.6	4.2
B: languages with Latin	36.4	27.5	46.6	35.6	37.2
C: natural sciences	25.7	34.8	15.2	18.0	33.5
D: modern languages	5.7	3.4	8.4	5.2	6.3
E: economics	21.3	23.2	19.1	23.7	18.9
<i>Way of living</i>					
No comment	2.6	1.5	3.9	2.6	2.6
Alone	20.3	21.3	19.1	16.5	24.1
With partner	14.0	12.1	16.3	17.5	10.5
With peers	16.4	14.5	18.5	15.0	18.8
With parents	43.4	46.4	39.9	45.4	41.4
Not yet known	3.4	4.4	2.3	3.1	3.7
<i>Education of fathers</i>					
No comment	5.2	3.9	6.7	5.7	4.7
Professional school	44.2	46.9	41.0	47.9	40.3
Intermediate school	9.9	10.1	9.6	10.8	8.9
Technical high school	11.4	11.1	11.8	8.3	14.7
University	29.4	28.0	30.9	27.3	31.4
<i>University-degree of fathers</i>					
No degree	70.1	71.0	69.1	72.2	68.1
Theology	1.3	1.0	1.7	1.5	1.0
Law	2.9	2.9	2.8	2.1	3.7
Economics	1.6	1.5	1.7	1.5	1.6
Pharmacy	0.8	1.0	0.6	0.5	1.1
Philosophy	3.6	4.8	2.3	4.6	2.6
Natural sciences	3.1	1.9	4.5	2.6	3.7
Education	2.3	2.9	1.7	4.6	0.0
Technical sciences	5.4	4.8	6.2	5.7	5.2
Medicine	8.8	8.2	9.6	4.6	13.1
<i>Education of mothers</i>					
No comment	15.8	13.5	18.5	15.5	16.2
Professional school	54.0	55.6	52.3	54.6	53.4
Intermediate school	19.0	19.8	17.0	16.5	21.5
Technical high school	2.6	3.9	1.1	2.1	3.1
University	8.6	7.3	10.1	11.3	5.8
<i>University-degree of mothers</i>					
No degree	92.2	93.7	90.5	90.2	94.2
Law	0.8	0.5	1.1	1.0	0.5
Philosophy	1.8	1.5	2.3	2.6	1.0
Natural sciences	1.0	1.5	0.6	2.1	0.0
Education	1.8	0.5	3.4	1.5	2.1
Technical sciences	0.2	0.0	0.6	0.5	0.0
Medicine	2.1	2.4	1.7	2.1	2.1

\* only pre-university school types yielded significant differences between controls and medical students and between men and women,  $p < 0.0001$ .

**Table 1.** Socio-demographic data,  $n = 385$ , men = 206, women = 179.

		Total n = 385		Men n = 206		Women n = 179		Controls n = 194		Medical St. n = 191	
		mean	SD	mean	SD	mean	SD	mean	SD	mean	SD
<i>General concept</i>											
Psychosocial external	PSE	5.9	1.0	5.9	1.1	6.0	0.9	5.9	1.0	6.0	1.0
Psychosocial internal	PSI	5.9	1.1	5.9	1.2	5.9	1.1	5.9	1.2	5.9	1.1
Naturalistic external	NE	7.0	0.9	7.0	1.0	7.0	0.9	7.1	0.9	7.0	1.0
Naturalistic internal	NI*	6.8	0.9	6.9	0.9	6.8	0.8	6.8	0.9	6.9	0.9
Health behaviour	HB	6.5	0.9	6.5	1.0	6.5	0.9	6.5	0.9	6.5	0.9
<i>Self-related concept</i>											
Health behaviour	SHB*	7.5	1.2	7.4	1.2	7.7	1.1	7.5	1.2	7.4	1.3
Health indicators	SHI	7.5	1.3	7.4	1.3	7.5	1.4	7.4	1.4	7.5	1.3

\* differences between men and women,  $p < 0.05$ .

**Table 2.** Health and illness concept scales (HICS).

and statistically weak ones at that. Students living alone scored relatively high on the SHB and the PSI scales, whereas those who share an apartment with peers or who live with their parents tended to score poorly ( $p < 0.05$ ). An active health behaviour and an emphasis on the internal psychosocial aspects involved might be relevant psychological developmental indicators. However, this hypothesis calls for separate treatment.

## Discussion

Both the sample of beginning medical students and the random samples can be considered to be representative in the light of the satisfactory return rates evidenced (81% and 63%, respectively). The return rates were particularly good in view of the fact that the survey could not be conducted anonymously due to the prospective design of the study. The medical students probably participated in the study more willingly than the control group because of the medically-related subject matter dealt with. Further evidence for the re-

presentative nature of both participating samples is the resemblance between the distribution of the "Matura" types in the study and data reported in the Swiss Census on Formal Education Scale<sup>23</sup>. The tendency of medical doctors to recruit among their own ranks was confirmed by the study as well: 13.1% of the medical students' fathers were doctors themselves, as opposed to only 4.6% of the fathers of the other participating students.

The fact that more of the medical students participating in the study had taken science (Matura Type C) during their last years of school is in line with the large body of recent evidence<sup>25,26</sup> for their overwhelming interest in the natural sciences.

The most striking result of this survey is that the subjective concepts of health and illness are virtually identical in both samples, as assessed by HICS (Figure 2). Unlike Shuval and Adler<sup>12</sup>, we were unable to find "anticipatory socialisation" in medical students; at least it does not emerge from the beliefs concerning health and illness that we assessed. Such con-

cepts can be assumed to be dependent on the variables age, gender and education<sup>27</sup>, yet they are definitely not the reason for studying medicine. Rather a pronounced interest in science, the wish to help others, to be self-reliant, and to possess social prestige tend to motivate a young person to choose the medical profession<sup>28</sup>. In other words, neither an overwhelming interest in the curriculum itself, nor a particular "theory" of health and illness seem to be the prime incentives involved in the career choice. Rather, the desire to become a doctor is what actually motivates young people to enter and get through medical school<sup>12</sup>. Naturalistic (NI, NE) i.e. climatic, ecological and biological factors are considered to be the most influential in shaping the onset of illness and its prospective course. Self-management of symptoms and health (HB), the recognition of signs and symptoms of illness, and the development of personal initiative in staying healthy and fit are considered to be secondary. The importance of psychosocial factors (PSI, PSE) such as emotional and interpersonal problems, coping

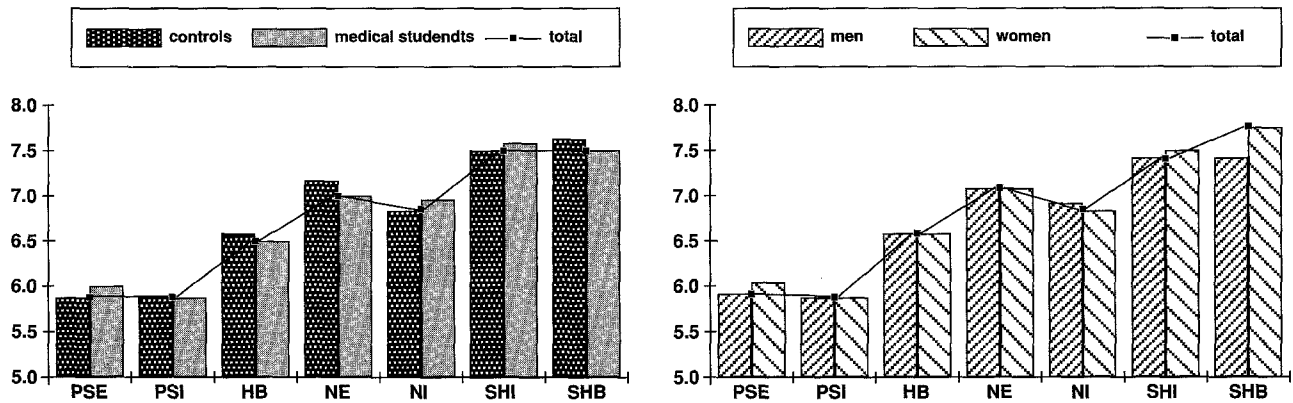


Figure 2. Health and illness concept scales, means,  $n=385$ .

style and life events are ranked lowest. The subjective concept of illness held by this sample is thus distinctively naturalistic (biological-physical). Social and psychological factors seem to be less important than was originally postulated.

As a hypothesis, it might be suggested that the medical students' naturalistic approach is the result of an emerging awareness of the ecological interplay between the individual and his environment. Moreover, and possibly more important, it seems that only the experience of being seriously ill makes people aware of the relevance of psychosocial aspects of health and illness.

The findings of this study are not consistent with Dornbush's results<sup>21</sup>, in which beginning medical students showed a pronounced psychosocial attitude towards illness and health. However, closer consideration of the ATSIM Scales (Attitudes Towards Social Issues in Medicine) revealed an exclusive focus on attitudes towards psychosocial issues in medicine, rather than an assessment of a lay theory of health and illness, as used in this study.

While HICS scales 1–5 assess a general concept of health and illness, the Self-Related Health Behaviour (SHB) and the Self-

Related Health Indicators (SHI) deal with the respondents' own personal well-being. The fact that both scales cover a combination of naturalistic and psychosocial aspects is possibly responsible for the related greater importance assigned to individual health behaviour. In this sense the general and the self-related concepts could be assured to be consistent despite significant differences. But this has to be tested in greater detail in the second part of this longitudinal study.

At first glance, the results obtained in this study appeared to be somewhat disappointing. Neither were the concepts of health and illness held by medical students found to substantially differ from those of the control group (the hypothesis of "anticipatory socialisation"), nor was there any confirmation of the hypothesis that future medical students would consider psychosocial aspects more important. The very few findings of differences between men and women let us assume that gender is not a crucial factor for HICS-concepts.

In conclusion, it can be stated that our Swiss sample of freshmen in general shows a rather uniform concept of health and illness. This uniformity provides a good starting-point for testing, in the second phase of this study, whether the

assessed concepts change according to the curriculum chosen. It remains to be seen whether extending the scope of the present pre-clinical training at the medical school of Berne, to include a psychosocial medical curriculum<sup>14</sup>, will prove to be fruitful from the point of view of enabling medical students to consider health and illness not only from a biological but also from a psychosocial viewpoint. In the second part of this prospective study we shall find out whether there is an increased psychosocial focus in the medical-student cohort as opposed to the control group.

## Zusammenfassung

### Gesundheits- und Krankheitskonzepte vor Studienanfängern im Fach Medizin

Die Studie ist als prospektive Langzeitstudie zur Untersuchung curriculumspezifischer Einflüsse auf Gesundheits- und Krankheitskonzepte sowie auf Gesundheitsverhalten geplant. Alle Studienanfänger der Universität Bern im Fach Medizin und eine etwa gleich grosse Kontrollgruppe von Studienanfängern aus allen anderen Fächern sind nach ihren subjektiven Gesundheits- und Krankheitskonzepten befragt worden. Der unmittelbar vor Semesterbeginn zugesandte Fragebogen, die „Health and Illness Concept Scales“ (HICS), beantworteten 70% der 546 Studenten und Studentinnen umfassenden repräsentativen Stichprobe. Die Hypothese, dass die Medizinstudenten im Sinne einer „antizipatorischen Sozialisation“ bereits vor Studienbeginn medizin-relevante Gesundheits- und Krankheitskonzepte entwickelt haben, konnte nicht bestätigt werden. Es zeigte sich, dass unter dem Aspekt eines allgemeinen Krankheitskonzeptes signifikant häufiger naturalistische Ursachen attribuiert worden sind. Psychosoziale Faktoren waren hingegen für beide Kohorten von deutlich geringerem Wert. Dem eigenen Gesundheitsverhalten und der Wahrnehmung gesundheitsgefährdender Signale messen die befragten Studenten andererseits einen hohen Stellenwert zu.

## Résumé

### Concepts de santé et maladie d'étudiants en médecine au début des leurs études

L'étude est planifiée comme une étude prospective de longue durée pour l'analyse des influences spécifiques du curriculum sur les concepts de santé et l'hygiène de vie. Tous les étudiants débutant leurs études à la faculté de médecine de l'université de Berne et un groupe témoin et composé de débutants de toutes les autres facultés, ont été questionnés sur leurs concepts subjectifs de santé et de maladie. Septante pourcent (70%) des 546 étudiantes et étudiants que comprenait l'échantillonnage représentatif ont répondu au questionnaire, les «Health and Illness Concept Scales» (HICS), envoyé juste avant le début du semestre. L'hypothèse, selon laquelle les étudiants en médecine, dans le sens d'une «socialisation anticipatoire», développeraient des concepts de santé et de maladie médicalement importants dès avant le début de leurs études, n'a pas pu être confirmée. Cependant, il est apparu que sous l'aspect d'un concept de maladie général, des causes naturalistes étaient attribuées significativement plus souvent. Les facteurs psycho-sociaux étaient par contre de valeur nettement moindre pour les deux cohortes. Par ailleurs, les étudiants questionnés accordent une grande importance à leur propre hygiène de vie et à la perception de signaux dangereux pour la santé.

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