

Clinical competence of biopsychosocially trained physicians and controls

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Summary

OBJECTIVE: To assess and compare clinical observations and interpretations by physicians trained in biopsychosocial internal medicine (group A) and a control group (C) of physicians with no such special training.

METHODS: A verbatim first-interview of a 36-year old woman, seen for consultation by RHA, was presented to both groups (A, trained physicians: n = 30, and C, controls: n = 29). The patient's symptoms included: shaky knees, strange sensations in the abdomen and chest, insecurity and dizziness. The symptoms had begun before her final nursing-exam and exacerbated on her mother's 60th birthday two months later. The patient's mother is the sole caretaker for the patient's sister, who also attended the birthday party. The patient's sister is 19 and had been diagnosed with storage disease and is wheelchair-bound. The doctors were asked to record their observations and interpretations while reviewing the case report.

RESULTS: Group A-physicians mentioned and interpreted the physician-patient relationship and the patient's body language as described in the case report more often ($p = 0.002$, Wilcoxon-Mann-Whitney rank sum test (RS)), mentioned physical symptoms more often ($p = 0.0099$, Fisher's exact test (FE)) and more often interpreted illness settings with respect to the patient's fear and guilt (Fisher's exact test, $p = 0.007$ and $p = 0.015$). A precise integrative diagnosis (life events leading to stress, the latter evoking fear and guilt, leading to symptoms of the fight-flight reaction) was suggested by 7 of group A and 4 of group C. Extensive laboratory work-up and requests for consultations were more frequently asked for by the C group ($p = 0.048$, RS).

CONCLUSION: Residency training in biopsychosocial medicine in an Internal Medicine Department increased sensitivity to and interpretation of biological and psychoso-

cial data many years after the training and decreased the extent of work-up and consultation costs. However it only tended to enhance psychosomatic conceptualisation with respect to anxiety/guilt/hyperventilation and conversion symptoms.

Key words: clinical reasoning; medical education; bio-psycho-social; psycho-physiological

Introduction

Beginning in the 1940's, research into the psychosomatic aspects of medicine began to grow. The training of medical students and physicians in the psychosocial aspects of illness did not keep pace with this development. Engel and Romano's curriculum for medical students and physicians at the Strong Memorial Hospital in Rochester, N.Y., (1947) is an exception.

In the last two decades, medical students and residents have been trained at medical schools of western industrialised countries in interviewing techniques and the psychosocial approach to the patient. This training has increased students' and residents' ability to identify medical information, and their accuracy in diagnosis [1–5]. Usually, patients were played by laypersons who had learned to present a disease.

In the Division of Internal Medicine at the University of Berne Medical School about 140 residents were trained in biopsychosocial (bps) internal medicine between 1978 to 2001, based on Engel's "The Clinical Approach to the Patient" [6] and "Psychological Development in Health and Disease" [7]. This group of physicians has recently been followed-up [8] with respect to questions independent from those of the present study. For this study the first 30 of 140 members on a random list were picked and formed the group A. They were compared with physicians without formal training in bps (group C), using a verbatim transcript of a patient, seen in consultation by RHA.

The task of the physicians was comparable to a clinical-pathological conference.

The main hypothesis encompassed the following facets:

Abbreviations:

A = trained in bio-psycho-social internal medicine

C = control-group

WMW = Wilcoxon-Mann-Whitney rank sum test

FE = Fisher's exact test

1. Group A physicians will mention and interpret physician-patient communication and the patient's body language as described in the verbatim text more often than the group C.
2. They will mention and interpret physical signs more often.
3. They will mention and interpret life events more frequently.
4. They will more often mention the patient's health professional background and its impact on the patient.
5. They will mention illnesses in the family and their impact on the patient more frequently.
6. They more often will discuss and discard the differential diagnosis "conversion-symptom".
7. They will be more aware of the meaning of the setting of illness and make the integrative diagnosis (life events > stress > anxiety and guilt > psycho-physiological symptoms of the fight-flight pattern [9]).
8. They will obtain fewer specialty consultations and laboratory evaluations.
9. They will suggest psychosocial counselling more often.

Methods

The initial-interview of the 36-year old patient, sent for consultation was conducted by RHA in the presence of a group of physicians who meet regularly. The interview lasted 20 min. The interviewer had no information on the patient beforehand. The interview was recorded verbatim. It was conducted in an open-ended, semi-structured way [6]. The patient gave permission to use her interview for teaching purposes.

From 140 trained physicians, who work in practice, the first thirty were chosen from a random list of all former residents (group A). Physicians without formal psychosocial training (group C), matched with respect to gender, age, years of experience as physicians, medical specialty and practicing in the neighbourhood of the group A doctors were asked to participate as controls. The aim of the study was explained to the physicians as: "We are interested in how physicians observe and interpret clinical data". Physicians were free to participate or not.

For group A, the residency-duration in the bps-institution was at least 12 months, and the average residency duration was 19 months. They had all been trained in bps-interviewing, and their interviews were supervised. The residents were in charge of a ward with 10 patients as well as three outpatients whom they saw weekly in supervised therapy. The group C physicians had benefited from about 15 hours of bps training as medical students, plus possibly additional courses they had taken in their continuing education. These additional courses were not quantified for the present study. Both groups received the verbatim-interview and an accompanying letter with the following instructions: Work alone, read this interview and jot down your observations and interpretations elicited by reading the text. Write down anything that seems important to you. State your combinations of thoughts. Describe how you arrived at a diagnosis. Mention all diagnoses you have discarded. Outline the laboratory tests which you find necessary. Suggest the specialists you would like to contact. Describe the therapeutic

approach you consider indicated. Send your comments by mail or e-mail to the first-author.

Appendix 1 contains the verbatim interview. Appendix 2 presents the items according to which the physicians' comments were rated.

Group A included 13 women and 17 men, and group C included 11 women and 17 men (1 anonymous response). The average age of the group A was 49.2 years (37–58), and 50.8 (37–67) for group C. The total time of residency in different fields before starting their own practice was eight to ten years in both groups (average time for Switzerland).

Two reviewers not connected with the study but trained in the bps-approach to the patient individually and independently rated the 59 comments, which were presented to them in random order. After the computation of the inter-reviewer-correlation they discussed discrepancies in their ratings and decided on the final rating.

We assessed the following nine areas of contents:

- Mentioning and interpreting physician-patient communication and the patient's body language as described in the interview; items 1–2, 13–14 (for items, see appendix 2).
- Mentioning and interpreting physical signs; items 3–8.
- Mentioning and interpreting the setting of illness; items 9–12.
- Mentioning and interpreting the patient's health professional background; items 15, 16.
- Mentioning and interpreting the illnesses of the aunt and the sister; items 17, 18, 21 and 22.
- Discussing and discarding the diagnosis "conversion-symptom"; item 19.
- Establishing the integrative diagnosis (setting of illness > stress > anxiety and/or guilt > symptoms of shaking knees, strange feeling in the belly and chest, feeling dizzy and feeling insecure); item 23.
- Proposing consultations by specialists, and suggesting extended laboratory work-up; items 24, 25.
- Suggesting psychosocial counselling; item 26.

We did not seek ethical approval for the study. To assess statistical significance of differences in dichotomous variables, Fisher's Exact Test (FE) was used. Differences in continuous outcomes between the 2 groups were assessed using the Wilcoxon-Mann-Whitney Test (WMW). Following the arguments of Perneger, no Bonferroni corrections were applied [10]. Calculations were done using Excel, version 11.6.6 and Stata, version 9.2 for Apple MacIntosh.

Results

The average of the inter-reviewer kappa over all items was 0.65 (SE 0.17); i.e., good.

Results concerning group comparisons are presented in table 1. In the sequel they are presented following the list of facets at the end of the introduction.

Facet 1: Physicians in group A mentioned and interpreted physician-patient communication and the patient's body language significantly more often than those in group C. Group A had a significantly higher overall score (WMW test, $p = 0.002$); mentioned doctor's behaviour more often

(FE test, $p = 0.067$); mentioned the patient's body language more often (FE test, $p = 0.007$) and interpreted it more often (FE test, $p = 0.003$).

Facet 2: Group A physicians did mention physical signs significantly more often (FE tests, $p = 0.010$) but did not interpret these significantly more often (FE tests, $p = 0.182$) than group C physicians.

Facet 3: Both groups of physicians did mention the stressful exam and birthday settings about equally often. However, group A physicians did interpret these life events more frequently in the context of the patient's disease (FE tests, $p = 0.007$ and 0.015).

Facet 4: We did not find significant differences between the two groups of physicians in the frequencies of mentioning the patient's health professional background and its impact on the patient.

Facet 5: There were no significant differences between the two groups of physicians in the frequencies of mentioning illnesses in the family (FE tests, $p = 1.00$ and 0.671) or their impact on the patient (FE tests, $p = 1.00$ and 0.360).

Facet 6: Only a minority of each group of physicians discussed (FE test, $p = 0.072$) and discarded the differential diagnosis "conversion-symptom" (FE test, $p = 0.112$).

Facet 7: Similarly, an integrative diagnosis (life events > stress > anxiety and guilt > psycho-physiological symptoms of the fight-flight pattern [9]) was only given by a minority in each group (FE test, $p = 0.506$).

Facet 8: Group A physicians obtained significantly fewer special consultations and laboratory evaluations (WMW test, $p = 0.047$).

Facet 9: Group A physicians suggested psychosocial counselling more often (FE test, $p = 0.026$).

Of the 9 facets we investigated, 3 showed significant differences in the expected direction and two did so partially, while 5 facets did not show any significant differences between group A and C physicians.

At follow-up 16 months after the interview Ms. T. was in good health. She was counselled by her physician.

Discussion

Results

The results of our study suggest that in this small sample, training in bps medicine improves insight into the psychosocial aspects of illness compared to physicians without such training, in MD's under working conditions, and that this continues long after the training. The study also points out areas in need of improvement in biopsychosocial training. The corresponding literature [1–5] shows that psychosocial training focused on communication skills, but not on the topics of our study, and used mainly standard patients.

Mentioning and interpreting the doctor-patient interaction, including the body language of the patient as described in the verbatim interview, was different between the groups. The biomedical model does not focus on behaviours of physicians or patients, whereas this is an important aspect of the bps- approach stressed in training. The more frequent observation and mentioning of important bodily symptoms by the A-physicians is expected, because they were trained in the clinical approach to the patient based on Engel's technique of interviewing [6], which stresses the importance of the seven "dimensions" of a symptom, which are time course, quality, intensity, location, factors increasing

Table 1: Frequency and proportions and interpretations in groups A and C.

Domain	Items no.	Test	Group A (treatment) n = 30	Group C (control) n = 29	p-value
Doctor-patient communication and body language (as described in interview)	1, 2, 13, 14	WMW	RS = 1095	RS = 676	0.002
Behaviour of Doctor	1	FE	17 (56.7%)	9 (31.0%)	0.067
Body language mentioned	13	FE	27 (90.0%)	17 (58.6%)	0.007
Body language interpreted	14	FE	27 (90.0%)	16 (55.2%)	0.003
Physical symptoms mentioned	3, 5, 7	WMW	1065	706	0.01
Physical symptoms interpreted	4, 6, 8	WMW	931	780	0.182
Stressful setting of illness (Exam) observed	9	FE	24 (80.0%)	18 (62.1%)	0.158
Stressful setting of illness (exam) interpreted	10	FE	24 (80.0%)	13 (44.8%)	0.007
Stressful setting of illness (mother's birthday) observed	11	FE	24 (80.0%)	19 (65.5%)	0.252
Stressful setting of illness (mother's birthday) interpreted	12	FE	24 (80.0%)	14 (48.3%)	0.015
Health profession mentioned	15	FE	22 (73.3%)	22 (75.9%)	1.00
Health profession interpreted	16	FE	20 (66.7%)	17 (58.6%)	0.596
Mult.sclerosis of aunt mentioned	17	FE	29 (96.7%)	28 (96.6%)	1.00
Mult. sclerosis of aunt interpreted	18	FE	23 (76.7%)	23 (79.3%)	1.00
Conversion-discussed	19	FE	12 (40.0%)	4 (13.8%)	0.072
Conversion-diagnosis discarded	20	FE	4 (13.3%)	0 (0.0%)	0.112
Disease of sister mentioned	21	FE	26 (86.7%)	27 (93.1%)	0.671
Disease of sister interpreted	22	FE	25 (83.3%)	21 (72.4%)	0.360
Integrated diagnosis	23	FE	7 (23.3%)	4 (13.8%)	0.506
Consultations and extended laboratory tests recommended*	24, 25	WMW	779	991	0.047
Psychosocial counselling suggested	26	FE	29 (96.7%)	22 (75.9%)	0.026

In columns labelled "group A" and "group C" the figures are rank sums when the test column indicates WMW, and counts (%) when the test column indicates FE.
n: group size; WMW: Wilcoxon-Mann-Whitney rank sum test; FE: Fisher's exact test; p: p-value; n.s.: $p > 0.05$.
* Costs based on the contract between health insurance companies and Swiss Medical Society.

or diminishing intensity of symptoms, accompanying symptoms and the social context.

Based on the importance placed on the patient's reactions to the setting of illness in biopsychosocial training, the more frequent interpretation of the setting of illness by the A-physicians was expected. In both groups more than half of the physicians seemed to realise that members of the health profession might behave differently than lay persons when sick.

In both groups the diagnosis of multiple sclerosis in the family was mentioned and discussed; in group A more often with respect to a model for conversion symptoms, and in group C more frequently as a disease running in the family. The infrequent discussion of a possible conversion symptom indicates that even the A-physicians are not familiar enough with this concept. It is unfortunate that only seven A-physicians and four C-doctors came up with the comprehensive bps-diagnosis: illness settings, leading to stress with feelings of anxiety/guilt, these affects evoking psycho-physiological reactions. This indicates an insufficient comprehension of psychosomatic concepts even for the bps-trained physicians (i.e. Cannon's fight-flight reaction) [9].

Although a lack of psychosomatic conceptualisation is evident even in group A, the bps-trained physicians were more aware of the importance of the stress of settings of illness, of the observation of bodily symptoms, and of the described non-verbal behaviour. The bps-training also seems to lead to fewer requests for consultations and laboratory work-up.

The A-physicians recommended counselling more often. Even if the C-doctors did not mention and discuss as many of the psychosocial items observable in the interview, two thirds nevertheless seemed to have a hunch of the indication for counselling in the case presented.

Literature

It has been shown that in medical schools of western industrialised countries students and residents have been trained in communicating with standard patients [1–5]. The training has stimulated the patients' narrative by repeating their statements, and by verbalising their feelings for example. It has also increased the medical information identified and the accuracy of the diagnosis. In 2004 [11], the United States Medical Licensing Examination started a clinical-skills examination, which included history taking, and doctor-patient communication as necessary for licensure. Patients and examiners graded the student's skills. In the same year Bogdonoff et al. [12] and Hallok et al. [13] questioned if such an examination could assess doctor-patient communication. In 2007 Tamblin et al. [14] showed an inverse correlation between low scores in patient-doctor communication and later complaints were made to medical regulatory authorities, including doctors in the first two to 12 years of practice. The students and doctors were studied immediately after the training period. In our study the training effect was evaluated by means of the narrative of a real patient and this occurred 5 to 28 years after the training.

Limitations

Selecting study participants randomly from the group of bps trained and non-bps trained GPs might have been preferable. However, dropouts would likely destroy any advantages of random selection. Matching is a recognised alternative means to limit bias. A video-interview might have been more suitable than the verbatim text, which we used. The affects and the non-verbal behaviour might have reached the viewer more genuinely. However, we would have had to show the video in an auditorium to the 59 physicians in the same session. Arranging such a meeting was impossible. The presentation of only one patient limits the conclusions of our study. The illness selected is very often encountered by practicing physicians (the estimated prevalence of similar patients seen in practice is 30 to 50% [15]). The patient interview chosen encompasses stressful settings of illness (social), the affective reactions of the patient (psycho) and accompanying bodily symptoms (bio), which means therefore that the clinical situation presented a bps problem. Therefore we assume that clinical observation and interpretation could be assessed satisfactorily; and, as we have already mentioned, limited to a specific disturbance, a psycho-physiological disorder.

The comments on the interview by the physicians should have preferably been written down at one time rather than mailing the results, which would have given the individuals the same amount of time in a controlled situation. This was impossible, as discussed in the first paragraph of the discussion.

Two further points should be discussed:

- a) Could a genuine interest in psychosocial aspects of illness of the physicians who volunteered for the bps programme, have enabled them to comment on the interview in the way they did, independently of the biopsychosocial training? In view of the months of teaching necessary to help the residents to interview properly, to examine the seven dimensions of each symptom, to observe non-verbal behaviour, to elucidate settings of illness and to interpret them, this leads us to discard this possibility as improbable.
- b) In the statistical evaluation of results, we did not use the Bonferroni corrections as might be suggested by some. With reference to this, we follow the arguments of Perneger and others [10]. Perneger summarises a long running discussion on Bonferroni corrections, stating that corrections of *p*-values punish comprehensive studies looking at many facets of a complex problem. This evidently applies to the process of teaching medical residents and the present study.

Conclusions

Clearly, our study does not permit precise quantification of the effects of extensive bps training. However, some effects appear to persist in the long term. Residency in bps-training appears to shorten the time between onset of psycho-physiological symptoms and the establishment of an appropriate diagnosis and therapy: The A group suggested counselling more often than the C-group immediately after having read the case report, despite the fact that only a quarter of the A-group grasped the theoretical concept represented by the clinical data. Moreover, the cost for extended work-up and consultations of group C was 13 times that of group A. On the other hand, counselling adds to the

cost, but in our case it is the appropriate therapy. It would be attractive to extrapolate these numbers, based on the frequency of patients similar to the case presented here seen by general practitioners and internists.

Our study suggests that bps training can have a persistent effect over many years. Further research is needed to fully elucidate the benefits of bps training.

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Appendix 1

The verbatim interview (A: interviewer, P: patient; March 2007)

A: Are you comfortable enough for an interview of about 20 minutes?

P: Yes, but I feel somehow insecure.

A: Is this feeling related to the group of physicians, who are attending our interview?

P: Yes, a little bit, ... I usually am on the other side ...

A: I am not sure what you mean by this.

P: I am a practical nurse and I have completed my nurses' training recently.

A: How do you feel this insecurity?

P: I feel a sort of lightheadedness, difficult to describe, ... as if my feet would no more rest secured on the floor. It certainly is not vertigo.

A: Do you notice additional symptoms?

P: A feeling of nausea in my stomach.

A: Further symptoms?

P: On December 19th, as the symptoms set in, I felt a strange feeling ascending from my belly into my chest and the shaking of my knees.

A: Any discomforts in the face? (The interviewer thinks of symptoms, accompanying hyperventilation).

P: No ... yes indeed, a month later I had a tooth repaired in the left upper jaw ... since that time I notice episodically a strange feeling in the cheek ... I thought of a Neuralgia of the Trigeminal nerve.

A: Did you ever observe that a certain behaviour – a change in positioning your head or your body, had an influence on your dizziness.

P: No ... I haven't.

A: Did you ever notice an increase of your dizziness in certain moments?

P: Let's see ... on December 19th when the dizziness appeared for the first time ..., two days before the final exam, ... which I was sure I would pass ... and in February of this year on the 60th birthday of my mother ...

A: Did you ever notice insecurity and dizziness in certain situations in your former life?

P: No.

(The patient talks quietly and in a relaxed manner. At the beginning of the interview she had grasped her left upper arm with her right hand and vice versa. Now she releases the grasping, the hands rest on her thighs.)

A: You have mentioned your mother's 60th birthday ... who else was present?

P: My younger brother, three years my junior, and my 19 year old sister. She is severely handicapped. She suffers from a storage disease and behaves like a patient with Alzheimer's. She is bound to the wheel chair. Mother carries the main load of her care. I work full time, I have a husband and a son. I contribute only a little to the care, about once a week while my mother goes shopping.

(The hands of the patients again grasp her upper arms. The arms are elevated to the level of her chin. She stops talking for about 15 seconds. Her eyes show an empty look.)

A: What about health in other members of your family?

P: A thing which has frightened me enormously is the illness of my aunt, my father's sister. She has multiple scler-

osis. She suffers severely, she is ataxic, has difficulties with her coordination ...

A: With respect to your own discomforts you have also thought of having multiple sclerosis yourself.

P: Yes ... that's true, it has occupied my mind very much.

A: At the present time it seems to me that this specific fear has diminished.

P: Yes, that's true ... I also feel a lot better now (March 2007) than in December and January ...

A: In connection with your sister's illness a question has come to my mind, how it must feel to lead a life of success in your job, your family with your husband and son, compared to the life of your sister with her bleak destiny ...

P: Yes ... (both arms are again elevated to the level of her face) ...

A: Well ... our time is nearly up. Did I miss anything of importance to you which you would like to add?

P: No ... it doesn't feel like that, ... nothing of importance comes to my mind.

A: We, the attending doctors and I will now review the interview. If we come up with any ideas, which will add to the care by your doctor, he will inform you and discuss it with you ... by the way ... how did you feel during our interview?

P I felt comfortable, it went well.

A: And your insecurity during the beginning of our interview?

P: It has diminished.

A: Okay. I say good-bye to you.

Appendix 2

The Rating protocol (rated "present" or "absent")

1. Comment of the doctor's behaviour.
2. ... of the patient's behaviour.
3. Sensation of patient's feeling in her belly mentioned.
4. ... discussed with respect to anxiety.
5. Shaking of the knees mentioned ...
6. Discussed with respect to anxiety.
7. Hyperventilation discussed as a differential diagnosis.
8. Hyperventilation discussed as belonging to the diagnosis.
9. Situation two days before the exam mentioned...
10. ... its possible importance discussed.
11. 60th birthday of her mother mentioned.
12. ... its possible significance discussed.
13. Non-verbal behaviour as described in the text mentioned ...
14. ... its meaning discussed.
15. Health profession mentioned ...
16. ... its possible significance discussed.
17. Multiple sclerosis of her aunt mentioned.
18. ... as a source of anxiety discussed.
19. Possibility of a conversion symptom discussed.
20. ... conversion symptom discarded.
21. Suffering of the sister mentioned...
22. ... as a source of guilt feelings discussed.
23. Integrative diagnosis established.
24. Consultation requested.
25. Extensive laboratory work-up suggested.
26. Counselling suggested.