The Efficacy of Intensive Biopsychosocial Teaching Programs for Residents:

A Review of the Literature and Guidelines for Teaching

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Objective: To review research evaluations of intensive biopsychosocial training programs for nonpsychiatry residents, and determine whether this research showed sufficient rigor and consistent beneficial impact to allow initial research-based teaching guidelines.

Data sources: An English-language literature search used MEDLINE (1966–93), Psychological Abstracts (1967–93), and Educational Resource Information Clearinghouse (1966–93) as well as bibliographic reviews from prominent peer-reviewed articles and consultation with an expert.

Study selection: From among several hundred articles about biopsychosocial training, only 12 studies met the selection criteria: at least 100 contact hours of training for nonpsychiatry residents and an evaluation of efficacy.

Data extraction: The three authors independently assessed these 12 studies and made a consensus decision based on explicit criteria. Successful and unsuccessful programs were distinguished from among those classified as quasi-experimental or experimental to identify programs of sufficient rigor to meet the study objective; success was defined as learning beyond knowledge and residents' acceptance of teaching.

Data synthesis: Four successful quasi-experimental or experimental programs showed the following uniquely beneficial features: 1) protected time for residents; 2) teaching that was required, structured, multidimensional, and balanced between learner-centered and teacher-centered approaches; 3) teaching methods that used normal as well as psychosocially disturbed patients, nonpsychiatrist teachers, and special teaching techniques; and 4) inclusion in the curriculum of interviewing, interpersonal skills, doctor–patient relationship, and patient education. Two unsuccessful quasi-experimental or experimental programs were unidimensional and unstructured, and used predominant or isolated teacher-centered approaches. Features found in both successful and unsuccessful programs were experiential teaching, psychiatrist and other mental health professional teachers, use of disturbed patients, training to manage patients' psychosocial problems, teaching directed toward knowledge acquisition, teaching about treatment, and university affiliation.

Conclusions: Four rigorously studied, successful programs showed a common pattern of intensive biopsychosocial teaching that produced, in aggregate, improvement in residents' knowledge, attitudes, skills, and self-awareness. Although there is need for more definitive research, these data are sufficiently compelling and consistent to provide initial, research-based teaching guidelines.

Key words: biopsychosocial model; biopsychosocial teaching; psychosocial teaching; residency; guidelines; literature review; teaching.

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FOLLOWING ENGEL'S IDENTIFICATION of the biopsychosocial model in 1977, teaching about the whole patient increased dramatically in medical schools.[1,2] Notwithstanding encouragement by governing agencies[3–5] and support from program directors and department chairs,[6] implementation of biopsychosocial teaching for residents has been much slower.

Only about half of medical residencies have a requirement for biopsychosocial training, averaging only eight to 13 hours per year; even less time is devoted to elective psychosocial experiences.[6] Nevertheless, many believe that learning these complex new skills will require one month or more of training.[7–14] One reason for such sparse residency teaching may be that no research-based consensus has been articulated about the efficacy of intensive psychosocial training.[15–17]

The purpose of this review was to determine whether rigorously studied, intensive training programs produced a beneficial outcome, and whether there was a common pattern of teaching among successful programs that would permit psychosocial teaching guidelines. Research data, based on principles of educational research,[18–21] are essential to inform learner-centered theoretical approaches[22–24] being proposed as intensive training programs.[11]

METHODS

Peer-reviewed references from our own files and prominent review articles were screened.[7,15,17,25,26] We also consulted with an authority in search of additional references (personal communication with David E. Kern, MD, MPH, 1992). In addition, an extensive computer search of the following bibliographic sources was conducted: MEDLINE (1966 to 1993), Psychological Abstracts (Psychinfo, 1967 to 1993), and Educational Resource Information Clearinghouse (ERIC, 1966 to 1993).

To qualify for review, we required that a program teach biopsychosocial principles to nonpsychiatry residents for a minimum of 100 contact hours and systematically evaluate the program's impact; rather than 160 hours (one month), 100 hours was used, to no avail, in hopes of finding more programs.

Each author independently reviewed the articles that qualified and rated them on their printed contents. A consensus based on explicit criteria was developed. Criteria were derived from recommendations for bio-

psychosocial teaching[7, 9, 16, 18, 22–24, 27] and educational research.[15, 18–21] The top of Figure 1 lists all the teaching criteria and the top of Figure 2 lists all the research criteria.

Described in Figure 1 under program description, type of training was rated as required or elective. Block teaching was defined as training concentrated in a one-to-two-month period; teaching over a longer period was called longitudinal. A program was unstructured when there was no explicit guideline or schedule for the teaching. Trainees were designated by postgraduate year (PGY) of training and whether teaching time was protected from other demands of the residency; occasional night call did not preclude a protected rating. Physician teachers were classified as medical or psychiatric. Most nonphysician teachers were psychologists, but there was a wide range of other mental health professionals. Teacher-centered orientation meant that the teacher was responsible for setting objectives, while learner-centered teaching encouraged residents to influence and determine their own curricula.[22, 24] To the standard objectives of knowledge, attitudes, and skills,[16] self-awareness[8, 38–42] was added as also relevant to training.

Among the criteria for program teaching was whether the focus was on patients with serious psychiatric disturbances or on medical patients without serious psychosocial problems; the ideal program would include both to provide a comprehensive experience. Experiential training (not noted in Fig. 1) was considered to be present when work involved patients, whether real or simulated. Audiotaping and videotaping were the only teaching aids noted. Personal supervision occurred when the teacher directly supervised the learner around personal or professional issues, while group work was iden-

	PROGRAM DESCRIPTION									PROGRAM TEACHING								
PRE/ NONEXPERIMENTAL PROGRAMS	Year Published	No. Trainees*	Total Hours	Type Training	PGY	Teachers	Orientation	Objectives	Patients	Teaching Aids	Techniques	Cognitive	Interviewing	IPS	Education	Treatment	SA	DPR
Greenhill/ Kilgore[28]	1950	47	125–† 250	R L	1-3	M P N	TC	K A S	DIS NDIS		PS	+	+			+		
Bank et al.[29]	1984	9	160	R B	1-3	P N	LC TC	K S	DIS		PS	+	+			+	+	+
Agbayewa/ Leichner[30]	1985	96	160	R B US	1	P†	TC	K A	DIS			+				+†		
Brown/ Harris[31]	1985	8	240–320	R B	2	M P	TC	K S	DIS			+				+		
Hickson/ Mann[32]	1985	12	100†	L	1	P N	TC	K S	DIS			+				+		
Jones et al.[33]	1988	20	520†	R B/L	1	M P	TC	K S	DIS	VT		+	+			+		+
UNSUCCESSFUL PROGRAMS																		
Thompson et al.[34]	1982	21	150†	L US	1-3	P	LC† TC	K S	NONE			+				+		
Schubert et al.[35]	1989	29	60–† 120	E L US	1,3	P	TC	A S	DIS							+		
SUCCESSFUL PROGRAMS																		
Merkel/ Nierenberg[14]	1983	16	900	R B/L	1-3	P N	TC	K S	DIS NDIS		GW PS	+		+		+		+
Breunlin et al.[36]	1991	24	160	R B	1 (T)	M P N	TC LC	S	DIS NDIS	VT	GW PS	+	+	+		+		+
Roter et al.[7, 13]	1990	48	160	R B/L	1 (T)	M P N	TC LC	K S	DIS NDIS	VT	RP SP GW	+	+	+	+	+		+
Smith et al.[8, 37]	1991	48	120–160	R B/L	1 (T)	M P N	TC LC	A S SA	DIS NDIS	AT	RP GW PS	+	+	+	+	+	+	+

FIGURE 1. Summary of teaching in the reviewed programs. *Includes members of control groups; number of actual trainees may be less where there was a control. †Estimated. R = required; L = longitudinal; B = block; US = unstructured; E = elective; PGY = postgraduate year; T = residents' time protected; M = medical; P = psychiatrist; N = nonphysician; TC = teacher-centered; LC = learner-centered; K = knowledge; A = attitudes; S = skills; SA = self-awareness; DIS = psychosocially disturbed; NDIS = not psychosocially disturbed; VT = videotaping; AT = audiotaping; PS = personal supervision; GW = group work; RP = role-play; SP = simulated patients; IPS = interpersonal skills; DPR = doctor–patient relationship; + = present. For complete reference citations, see the reference list.

PRE/ NONEXPERIMENTAL PROGRAMS	TYPE EVALUATION: Design	Self	Reactive	Nonreactive	Patients	Qualitative	RESULTS: Knowledge	Attitudes	Skills	SA	Pt. Outcome	ACCEPTANCE: Acceptance	How Rated
Greenhill/ Kilgore[28]	N					+			+	+			
Bank et al.[29]	P		+			+	+		+	+		+	D I
Agbayewa/ Leichner[30]	P		+				+	−				−	D I
Brown/ Harris[31]	P		+				+						
Hickson/ Mann[32]	N					+		+	−				
Jones et al.[33]	P			+					−				
UNSUCCESSFUL PROGRAMS													
Thompson et al.[34]	Q		+						−			+	D I
Schubert et al.[35]	Q		+	+				+	+			−	D I
SUCCESSFUL PROGRAMS													
Merkel/ Nierenberg[14]	Q	+	+	+	+		+	+	+		−		
Breunlin et al.[36]	Q		+						+				
Roter et al.[7, 13]	Q E	+	+		+				+		+	+	D I
Smith et al.[8, 37]	Q	+	+			+	+	+	+	+		+	D I

FIGURE 2. Summary of research in the reviewed programs. N = nonexperimental; P = pre-experimental; Q = quasi-experimental; E = experimental; SA = self-awareness; Pt. = patient; D = acceptance rating influenced by program evaluators; I = acceptance independently rated; + = present (type evaluation) or positive; − = negative. For complete reference citations, see the reference list.

tified when members of a teaching group (teacher and residents) systematically interacted around personal and group issues. Role-play and simulated patients were indicated when these techniques were employed. Content of teaching was specified as cognitive when aimed at knowledge acquisition. Interviewing experiences were defined by faculty critique of interviews with real or simulated patients, and could occur with direct observation or review of audio/videotaped interviews. Interpersonal skills training concerned the development of empathic, relationship-building skills and the ability to deal with emotions. Patient education concerned learning about informing patients about and motivating them toward healthier health habits; e.g., smoking cessation. A treatment focus was recorded when teaching was directed toward managing psychosocial issues. Self-awareness training systematically addressed residents' personal, often unrecognized reactions to patients (countertransference). Doctor–patient relationship training was noted when teaching addressed broader dimensions, including the ideal relationship and negotiation.

Research designs were classified in four ways.[21] 1) Nonexperimental programs were not concerned with cause–effect relationships between teaching and outcome and usually were represented by descriptive, qualitative work. 2) Pre-experimental studies were those without control groups, which means they also were unsuitable for evaluating cause–effect relationships. 3) Quasi-experimental studies had training and control groups that were not randomly assigned (nonequivalent controls). 4) Random assignment of trainees characterized true experimental evaluations whether using a pre/post or posttest-only design. Quasi-experimental and experimental programs were used to evaluate cause–effect relationships and derive possible teaching guidelines.[21]

Evaluation measures were classified as self-evaluation when the residents rated their own skills. A measure was reactive if the research itself influenced outcome; e.g., the resident knew she or he was being tested (questionnaire). A measure was nonreactive when the measurement itself did not affect outcome; e.g., an investigator's review of a chart for use of psychosocial words without the resident's awareness of it.[19] The evaluation involved patients when impact on patient outcome was evaluated, as contrasted to evaluation of residents' learning.[8, 15, 25, 43] Qualitative studies were identified when descriptive, largely nonquantitative work occurred.

To assess the training in programs, knowledge and attitudes, usually obtained with questionnaires, were evaluated. Programs' evaluation of skills could be accomplished via self-assessment questionnaires or direct demonstrations by the resident to an evaluator; e.g., charting psychosocial words and interviewing. In addition, evaluations of self-awareness or countertransference, typically obtained by qualitative means, were recorded. Evaluation of patient outcomes could refer to any outcome, but only ratings of satisfaction were found.

Finally, criteria for so-called "decision-oriented" research (formative evaluation) were included, and it was noted whether this was rated independently or not. Rather than evaluating effectiveness of teaching, it evaluated acceptability of the program to key people, particularly the residents.[16, 20] All data about programs were interpreted and did not rely solely on reported testing.

To extract useful information for possible teaching guidelines, only those programs with quasi-experimental or true experimental designs were considered (Fig. 2). They were separated, in turn, into a successful group and an unsuccessful group. "Success" was operationally defined as: 1) any learning beyond knowledge acquisition and 2) evidence of residents' acceptance of training (if measured). That is, unsuccessful programs had no learning beyond knowledge, nonacceptance by residents, or both.

RESULTS

Twelve studies qualified for review. Six were pre-experimental or nonexperimental, and six were quasi-experimental or experimental. Among the latter group,

four studies were successful: those by Merkel and Nierenberg,[14] Breunin et al.,[36] Roter et al.,[7,13] and Smith et al.[8,37] All showed learning beyond knowledge and the latter two had evidence of acceptance by residents; there was no evidence of acceptance or lack thereof in the first two studies. Regarding the two unsuccessful programs, although learning other than knowledge occurred, the Schubert et al. study[35] was rated unsuccessful because of poor acceptance by residents. The Thompson et al. study[34] was rated unsuccessful because no learning was evident.

The results of the review are summarized in Figures 1 and 2. Below are descriptions of the unique aspects of unsuccessful and successful quasi-experimental or experimental programs. Thompson et al.[34] provided 30 months of longitudinal training in monthly conferences on the biopsychosocial aspects of medicine and weekly case discussions. There was no patient contact but there may have been some learner-centered teaching. Five trained PGY-3 medical residents showed worse psychiatric diagnostic skills than did 16 untrained residents, using a posttraining-only design.

Schubert et al.[35] taught PGY-1 and PGY-3 medical residents during their six to 12 months of medical inpatient ward rotations, using a ward-based consultation–liaison psychiatrist. The psychiatrist made work rounds approximately twice monthly and conducted weekly rounds, both of which were teacher-centered. Residents did not utilize prominent offers to joint the psychiatrist while doing consultations on the ward nor did they engage in easily available informal discussions, eventually leading to discontinuation of these teaching efforts. Sixteen residents on the teaching wards, compared with 13 control residents on other medical wards, exhibited more positive experiences with psychiatry on a posttraining-only questionnaire. Trained residents also had an increased psychiatric consultation rate but did not show better psychosocial charting on pre/post evaluation. The authors noted that more structured, focused teaching should replace their time-consuming, indirect teaching, even though some beneficial impact was noted. Although there was no systematic evaluation of residents' acceptance, it was rated negatively on the basis of residents' behaviors and authors' responses.

Merkel and Nierenberg[14] taught family practice residents using seminars and conferences, inpatient psychiatry rotations, Balint groups, patient supervision, and counseling experiences. Six trained residents and ten untrained control residents from a similar program were evaluated in a posttraining-only design but were not randomly assigned. Trained residents showed better charting of psychosocial diagnoses and more notations concerning counseling or mental health referrals. They also expressed better attitudes toward social factors in illness and a warm doctor–patient relationship. On self-assessment, trained residents indicated greater knowledge of depression and anxiety and more confidence in handling anxiety. The training cannot be rated an unqualified success, however, because it failed to produce learning in several areas. There was no teaching impact on the trained group in awareness of patients' social factors, recognition of emotional factors, knowledge of alcoholism, and confidence in handling alcoholism and depression, in the number of referral sources known, and in patients' satisfaction with care.

Breunlin et al.[36] taught pediatric interns many aspects of behavioral pediatrics in outpatient, inpatient, and community settings. There was an intensive interviewing experience, close personal supervision by both psychiatry and pediatric mentors, field trips, and seminar work. Thirteen nonrandomly assigned interns were trained and compared with 11 untrained interns using a pre/post design. The trained group showed better conceptual skills in observing a specially prepared videotape, but there was no significant difference in their observational or executive skills.

The Hopkins group[7,13] and the Michigan State group[8,37] conducted similar one-month block programs for interns beginning after the first quarter of the academic year. Unique features of the Hopkins program were its attention to community resources and its use of simulated patients. The Michigan State program addressed interns' self-awareness and how their unrecognized personal responses affected the doctor–patient relationship. Evaluation of 24 trained and 24 untrained Hopkins residents initially involved nonrandom assignment, but the majority were randomly assigned. A pre/post self-assessment evaluation showed significant improvement for defined learning objectives. A single-blinded post-only design obtained two months after training focused on residents' interaction with a simulated patient. The trained residents asked more open-ended questions and fewer leading questions, summarized main points more frequently, did more psychosocial counseling, and were rated as having better communication skills by the simulated patient. More accurate diagnoses and management also were recorded in the patients' simulated charts. Evaluation of the Michigan State program involved pre/post comparison of 28 nonrandomly assigned (quasi-experimental) trainees with 20 untrained interns in the same program and in another very similar program. Significantly higher scores were obtained in the training group for knowledge, attitude, and self-assessment of skills questionnaires; attitudinal improvement persisted for a mean of 15 months on follow-up testing. On rigorous qualitative evaluation, all trainees were able to identify previously unrecognized, potentially harmful personal responses.

DISCUSSION

There were 12 programs with intensive biopsychosocial teaching and some evaluation. Six were quasi-experimental or experimental in design and therefore

satisfactory for interpreting cause–effect relationships (between teaching and its outcome) and considering possible teaching guidelines. Two of these programs were unsuccessful and characterized by unidimensional, unstructured, and predominant or singular teacher-centered approaches. Features common to the four successful and two unsuccessful programs were experiential teaching, psychiatric teachers, use of psychosocially disturbed patients in teaching, teaching about knowledge and treatment, and university affiliation. It is important that these dimensions did characterize the successful programs and that their value not be discounted, particularly experiential teaching.

Four successful programs were remarkably similar and uniquely characterized by protected time for residents and teaching that was multidimensional, required, and structured and that comprised a balance of learner-centered and teacher-centered approaches. Other distinguishing features of successful programs were the prominent use of these teaching methods: including normal as well as disturbed patients, nonpsychiatrist teachers, and special teaching techniques (audio/videotaping, personal supervision, group work, role-play, and simulated patients). The following teaching content occurred only in successful programs: interviewing, interpersonal skills, patient education, and the doctor–patient relationship.

In addition to a beneficial impact of teaching, some successful programs also were defined, as one condition for designating them effective, by acceptance of teaching by residents. Therefore, in addition to their curricular and methodologic attributes, they also considered residents' needs, treated them humanely, and recognized their many other duties and interests.

There are, to be certain, many potential shortcomings in this review. Notwithstanding our use of a consultant and a highly skilled medical librarian searching three different bibliographic sources, the possibility that we omitted some intensive programs cannot be excluded. Nor does the study consider the work being done on less intensive training programs (fewer than 100 hours), where, for example, Kern et al.[7] have reviewed impressive results of training. Also of concern is the potential that we have biased the review in favor of teaching approaches we espouse. Here, we can only defer to the reader's independent assessment.

There may be shortcomings as well in our interpretation of what defines a "successful" program. Although, in retrospect, it had no impact on the findings of our review, we did not consider acquisition of knowledge alone a sufficient indication of success. It is the easiest domain for cognitively oriented physicians and does not always correlate well with skill and attitude improvement.[44]

On the other hand, we did not require that the ultimate measure of a teaching program, demonstration of benefit to the patient,[8, 15, 21, 25, 43] be the sole criterion of success. In formulating our definition of success, we believed that demonstration of improvements in learners' skills and attitudes is, itself, evidence of significant learning. Also, improved skills and attitudes are reliable indicators that learning will, indeed, be used in practice.[45, 46] As noted, the Roter et al. work did show a beneficial impact on patient outcome.[13]

Nevertheless, although successful programs clearly show that residents learn the material being taught, many measures were reactive. Some believe more compelling evidence of residents' learning would be its demonstration using nonreactive measures,[19] as in the Merkel and Nierenberg study.[14] Further, only two programs showed a positive impact on residents' attitudes.[8, 14] Attitudinal change, particularly a sense of self-efficacy, is a strong correlate of actual behavioral change.[45, 46] A related problem is that only two studies determined residents' acceptance of the teaching[7, 8]; the pitfalls in not ensuring this were seen in unsuccessful studies.[30, 35] Only one successful study, by Smith et al.,[8, 37] used rigorous qualitative means to show an impact on self-awareness, believed by many to be crucial to learning and to influencing residents' attitudes.[8, 38–42, 45, 46] Further, only one study[8] evaluated the long-term impact of teaching, showing persistence of attitudinal change a mean of 15 months after training.

These limitations point to many future research needs.[8] Among them are complete randomization of trainees to teaching and control groups, use of nonreactive as well as reactive measures, more precise measures of specific attitudinal change, use of rigorous qualitative measures to evaluate components of teaching not amenable to quantitative measures, determining persistence of learning, and evaluating impact of teaching on the patient rather than the resident—which should include measures of health status and functional outcome as well as satisfaction and compliance. In addition, assessment of alternative teaching interventions (e.g., longitudinal programs) as well as of individual teaching components will be essential.

On the other hand, stringent requirements for ideal research pose many obstacles and should not discourage teachers from some program evaluation, and from publishing the results. Only in this way can we progress toward a more sophisticated and scientifically mature approach in educating our residents.

The study's shortcomings preclude definitive teaching recommendations. The question we now ask is whether current data allow temporary guidelines—until more conclusive work is available. Because four programs designed to allow cause–effect interpretations are similar in process and content of teaching, and because they show consistent improvement in many key dimensions (attitudes, knowledge, and skills), a common pattern of intensive training that results in significant learning for residents has been identified. That is, the programs in aggregate, rather than any single program, have common qualities that can serve as guidelines.

This leads us to recommend the following research-based guidelines for intensive biopsychosocial training of residents: 1) that one month of training be required without competing duties (data suggest the intern level starting sometime after the first quarter of the academic year); 2) that learners' unique interests be foremost and facilitated in a skilled, ongoing way; 3) that these be balanced with teachers' multidimensional objectives for interviewing, interpersonal work, the doctor–patient relationship, the diagnosis and management of biopsychosocial problems, and patient education; 4) that both learners' and teachers' objectives be taught primarily in an experiential way in structured circumstances; 5) that medical physicians join psychiatrists and other mental health professionals as teachers and that they use audio/videotaping, personal supervision, group work, and role-play for teaching; and 6) that the focus of teaching be on both normal and psychologically disturbed patients; both outpatient and inpatient settings are recommended. Although supported by only one study in this review,[8] other data[38–40, 47–49] as well as subjective assessments of effective programs[11, 41, 42, 50, 51] argue strongly for a self-awareness component. Of note is that these recommendations are consistent with some non–research-based guidelines.[11, 52] Adequate funding and other support, program leadership, and a conducive institutional milieu are additional features that will be necessary to establish successful programs.[8, 11]

Research-based guidelines should encourage wider implementation of biopsychosocial training for residents,* as recommended by the American Board of Internal Medicine, the American Board of Family Practice, and the American Board of Pediatrics.[3–5]

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*Curricula, teaching methods, and evaluative tools can be found in most material presented here, or can be obtained from the authors cited. Curricula and teaching packets that embody these research findings also are available from the American Academy of Physician and Patient (AAPP), 300 Chestnut Avenue, Suite 320, Baltimore, MD 21211; and the Association of Program Directors in Internal Medicine (APDIM), 700 Thirteenth Street, NW, Suite 250, Washington, DC 20005.

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