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ABSTRACT

The need for the incorporation of training in geriatrics and gerontology into basic medical and dental education has recently been recognized. Existing studies which attempt to measure the attitudes of medical and dental students toward the aged are extremely limited. As part of a larger study of attitudes and knowledge among 500 health workers, the attitudes and knowledge of over 275 dental and medical students are examined, at different stages in their professional education, using Rosencranz and McNevin's "Aging Semantic Differential" and Palmore's "Short Quiz on Facts on Aging." The course of medical and dental education displays no significant deterioration or improvement in attitudes toward the aged. Multivariate analysis reveals a complex relationship between knowledge and attitude scores. Preliminary findings suggest that technically oriented professional education may have little impact on student attitudes. (Author)

The Impact of Medical and Dental Education on Student's Attitudes Toward the Aged

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Repeated studies of health workers have found that they regard work with the aged as undesirable or low status, attach less importance to such activities than comparable work with younger age groups, and feel that time invested in older patients will not yield returns commensurate with their efforts (Kastenbaum, 1963, Wolk and Wolk, 1971; Cyrus-Lutz & Gaitz, 1972; Kosberg & Harris, 1976). These studies suggest that health workers' attitudes reflect much of the same negative and stereotypical thinking in regard to the aged exhibited by other segments of the population.

Coe (1967) has suggested health workers' orientations toward the aged reflect professional ideologies peculiar to their specific disciplines (e.g. medicine, nursing, social work, etc.). Internalization of appropriate attitudes and ideologies is an important part of the process of professional socialization which should occur during the period of professional education. The process of socialization into the dominant professions of medicine and, to a lesser extent, dentistry has been studied for some time (Merton, et.al., 1957; Becker, et.al., 1961; More & Kahn, 1960; Rosenberg, 1965; Morris & Sherlock, 1971; Rosen, Marcus & Johnson, 1977). A recurrent theme in much of this research is one of loss of idealism (Eron, 1955; Becker & Geer, 1958; Morris & Sherlock, 1971) as initially idealistic student attitudes become increasingly more cynical in the course of their professional education. Yet, little is known about the attitudes of these students toward the aged or the effect of professional education on their attitudes.

Spence et.al. (1968) reported little change in initially negative student attitudes in the course of medical education Gale and Livesley (1974) report a deterioration in student attitudes toward geriatrics following graduation from medical school. Cicchetti et.al. (1973) report the stability of medical students' attitudes toward the aged in the face of educational experiences designed to improve those attitudes. Several authors reported similar findings when studying dental students (Stiff & Phipps, 1964; Moosbruker & Giddon, 1966; Needham, 1968).

More recent studies by Holtzman, Beck and their colleagues (1977; (1978) suggest that medical and dental students' attitudes may be amenable to change given the development of appropriate educational experiences. Additionally, there are some indications that medical students' interest in the aged is increasing (Lanoie-Blanchette, 1976; Libow, 1977).

Basic Questions

The study reported below was designed to address basic issues related to the attitudes and knowledge of new recruits to medical and dental schools regarding the aged and to assess the impact of professional education on knowledge and attitudes. Specifically, this study addresses the following questions:

1. What attitudes toward the aged are displayed by freshman medical and dental students?
2. What similarities and differences exist in the attitudes of medical and dental students?

3. What relationship, if any, exists between student attitudes and actual knowledge regarding the aged?
4. How are student attitudes modified in the course of professional education?
5. Do attitudes displayed by freshman medical and dental students change in different manners during the course of their different professional educations?

Approach and Instrumentation

The basic approach involved the use of questionnaires administered to all freshman and third year dental and medical students at the Southern Illinois University School of Medicine and the University of Iowa College of Dentistry during the 1977-78 academic year. The Southern Illinois University School of Medicine is one of the few remaining three year medical schools in the country and therefore third year medical students were seniors while third year dental students at Iowa were juniors at the time of this study. Except for freshman medical students, the questionnaires were administered in a group setting. In the case of freshman medical students, questionnaires were distributed with the request that they be returned to a central location. All but two complied with these instructions. Thus, an overall response rate of nearly 100% was achieved. Of the 283 students who were studied, 122 were medical students and 161 were dental students.

Attitude scores for students were obtained through the use of Rosencranz and McNevin's (1969) Aging Semantic Differential. This

thirty-two item, seven point semantic differential consists of bipolar sets of adjectives describing attributes or behavioral characteristics thought to be equally applicable to persons of all ages. Students were asked to respond to the semantic differential in regard to persons over 65 years of age. Items were scored one through seven with a score of one representing the most positive attitude and seven the most negative. An overall attitude score was calculated on an additive basis.

Using factor analysis, Rosencranz and McNevin derived three dimensions from their overall index. These dimensions were labelled instrumental-ineffective (I-I), autonomous-dependent (A-D), and personal acceptability-unacceptability (PA-U). The I-I dimension included pairs of items such as progressive-old fashioned, productive-unproductive, busy-idle, and active-passive. Persons rated positively on the I-I dimension "...would be considered capable of actively pursuing goals, adaptive to change, and, in the current vernacular, suited for 'being where the action is,'" (Rosencranz & McNevin, 1969). The A-D dimension contained pairs of items such as independent-dependent, secure-insecure, organized-disorganized, and certain-uncertain. A person rated positively on this dimension "...should be viewed as contributing at least as much energy to the functioning of his social system as he derives from others for his personal maintenance." The PA-U dimension contained pairs of items such as friendly-unfriendly, pleasant-unpleasant, cooperative-uncooperative.. Persons rated positively on this dimension could be seen as desirable or acceptable in social interaction. Scores on each dimension were calculated in addition to the overall score for the semantic differential.

Knowledge scores for students were obtained through the use of Palmore's (1977) Facts on Aging Quiz. This quiz consists of 25 factual statements which the respondent identifies as true or false. A score for each subject was calculated on the basis of the total number of items missed. Thus, a score of zero would indicate 100% of the items were answered correctly and a score of 25 would indicate all items were answered incorrectly.

Student Attitudes: Similarities and Differences

As a group, medical and dental students displayed a mean overall attitude score of 122.74, slightly more positive than the theoretically neutral score of 128. However, the dental students were also tested on attitudes toward younger individuals for comparison purposes. Dental students had a mean attitude score of 104.44, which was significantly more positive than their attitude toward those over 65 (Beck, et.al., in press). No significant relationship was found between student age and overall attitude scores. This was probably due to the relative homogeneity of the group (M=24.27, SD=2.82).

Female students, accounting for approximately fourteen percent of the total group, displayed significantly more positive overall attitude scores than their male colleagues. This difference was principally accounted for by their more positive rating of the elderly on the I-I dimension. Table 1 summarizes overall differences between male and female students.

When data was grouped by profession (medical vs. dental) and class (freshman vs. upperclassman), little difference between groups was apparent. A multivariate analysis of variance was performed to test the hypothesis of no overall differences. No significant differences were

found between medical students and dental students or between freshmen and upperclassmen. No significant interactive effects were found between class and profession. Thus, attitudes of medical and dental students, regardless of profession or class status, were found to be essentially similar. While the attitudes of upper classmen toward the aged were marginally more negative than freshmen, these differences did not reach significance. Table 2 summarizes these comparisons.

Student Knowledge

As a group, medical and dental students answered approximately one-third of Palmore's Factual Quiz incorrectly (M=8.29, SD=2.47). By way of comparison, undergraduates, graduate students, and faculty tested by Palmore answered incorrectly 35%, 20%, and 10% of the items respectively. No significant differences were found between male and female medical and dental students in terms of mean number of incorrect answers, as shown in line 5 of table 1.

Students were grouped on the basis of profession (medical or dental) and class status (freshman or third year) and a multivariate analysis of variance performed. As table 3 shows, significant differences emerged between medical and dental students and freshman and upperclassmen. In addition, significant interactive effects between profession and class status were also found. These differences are accounted for by third year medical students who, as a group, missed significantly less items than freshman medical or dental students or junior dental students. It should be noted that this same group (third year medical students) was the only group to have experienced a required educational experience

in geriatrics (c.f. Coggan et.al., 1978). In any case, the performance of upperclassmen on Palmore's test of knowledge was not impressive, when compared to their freshman colleagues.

Knowledge and Attitudes

A frequently stated argument in the ongoing dialogue regarding the desirability of including training in geriatrics in basic medical and dental education is that inclusion of such instruction will lead to more positive student attitudes and indirectly to an increased willingness of young professionals to serve aged patients. A latent assumption inherent in this line of reasoning is that a link exists between accurate knowledge and positive attitudes regarding the aged. In order to test this assumption, the authors studied the relationship between student attitudes and knowledge scores.

Palmore suggests that an analysis of errors made on his knowledge quiz items may serve as an indirect measure of age bias.

> Errors on some items probably indicate a negative bias toward the aged, for example, if someone says it is true that a majority of old people are senile (#1), it probably indicates a negative image of the aged. On the other hand, errors on other items probably indicate a positive bias toward the aged; for example, if someone denies that the five senses tend to decline in old age (#2), it probably indicates an unrealistically favorable image of old age (1977).

According to Palmore, 16 items may be classified as indicating a negative bias if answered incorrectly, five, a positive bias, and 4 no bias positive or negative. He suggests that by calculating the mean percent of anti and pro errors and subtracting the mean percent of anti errors from the mean percent of pro errors a rough indirect measure of bias may be derived.

Following Palmore's suggestion, the authors calculated indirect measures of bias for each group. As table 4 shows, errors of all groups except third year medical students tended to be in the negative direction indicating a negative bias. Third year medical students' errors appear to be slightly positive in direction.

The use of Palmore's approach to indicate bias from his knowledge quiz is troublesome for two reasons. First, in looking at percent pro errors and percent anti errors separately, it is difficult to separate the bias present from simple lack of knowledge. Second, while subtracting mean percent anti from mean percent pro does give one a sense of valence of the attitude, it is generally considered inappropriate to perform arithmetic operations on percentages which are not derived from the same denominator. Since percent pro has a denominator of five and percent anti a denominator of sixteen, the results of the operation may not generate valid indicators of attitude. The use of some weighting procedures or another method of analysis may be useful in this instance. In this paper, the alternate method of analysis employed is an analysis of covariance, which is then compared to the results obtained by using the subtraction of percentage method.

The analysis of covariance presented in table 5 indicates that medical and dental students' errors on pro items are not significantly different, when adjusted for variance in their scores on the anti items. However, table 6 indicates that the groups are significantly different in errors on anti items even when adjusted for the variance in their pro scores. Furthermore, the use of Duncan's multiple range test on the data in table 6 indicates that the difference found is due to the

lower scores of the third year medical students. The scores for the other three groups were not different from each other. Thus, the results of this analysis are similar to the results in table 4, but in this instance, one can only say that third year medical students have less negative bias than the other groups and not a positive bias as indicated in table 4.

The results obtained using Palmore's technique to indicate bias (table 4) and our modification (table 5 & 6) are contrary to results obtained using the semantic differential, in which no significant differences between groups emerged (table 2). The similarity of the results on anti errors in table 6 and the knowledge results presented in table 3 may clarify the lack of consistency noted above. Table 6 shows that third year medical students have significantly less anti bias, while table 3 indicates that they also have significantly more knowledge. Since the third year medical students were the only group to experience an educational program in geriatrics, the ability of the pro and anti items to measure bias separately from simple lack of knowledge must be questioned. Thus, while the instrument may be a valid measure of knowledge, its utility in measuring bias toward the elderly must be investigated further.

In order to further explore the relationship between attitudes and knowledge, correlations between attitude and knowledge scores were calculated. Analysis revealed a moderate direct relationship between overall attitude and knowledge scores ($r=.26$, $p < .001$). Additionally, similar correlations were found between knowledge and all dimensional scores. Thus, positive attitudes were associated with correct information regarding the aged. When grouped by profession and class, the relationship between student attitudes and knowledge scores becomes less clear. As

table 7 shows, significant correlations of moderate strength were found between attitudes and knowledge for freshman dental students and third year medical and dental students. Similarly, with the exception of the PA-U dimension in the case of third year medical students, all dimensional scores were moderately, positively correlated with knowledge scores for freshman dental and third year dental and medical students. In the case of freshman medical students, similar patterns were observed but these relationships did not reach significance.

Discussion & Conclusions

This paper began by articulating some basic ideas and questions regarding the relationship between professional education and attitudes toward the aged. At this point, it is instructive to return to these ideas and questions by way of evaluating the implications of the findings reported above.

It has been suggested that professionals' orientation toward the aged reflect discrete professional ideologies and that the internalization of appropriate professional ideologies and attitudes is one important function of professional education. Further, it has been suggested that one byproduct of professional education is the development of a cynical outlook among initially idealistic recruits and by extension, an expectation that these recruits will become increasingly more negative in their orientation toward the aged. Thus, we might expect recruits to different professions to be somewhat different in terms of their orientation toward the aged initially and for these differences to increase as they are socialized into the respective attitudes and ideologies of their chosen profession.

Contrary to what one might expect, medical and dental students were essentially similar in their overall attitudes upon entry into professional training. Further, third year students were also essentially similar in attitudes indicating little differentiation attributable to differences in training. While attitudes of third year students were marginally more negative than freshman students, these differences did not approach significance. Comparisons of dimensional scores also failed to reveal significant changes. Thus, it would be difficult to attribute the responsibility for attitudes toward the aged to professional education in general. Further, it would be difficult to find support for the argument that differential professional education accounts for hypothesized differences in professional orientation toward the aged (at least as measured in terms of attitudes).

The relationship between attitudes and factual knowledge is more complex. Neither medical nor dental students distinquished themselves in terms of their ability to differentiate fact from fiction in regard to the aged, although third year medical students did show more ability to do so statistically. This was probably in part attributable to their formal training in geriatrics. While, for the group as a whole, positive attitudes and accurate knowledge were found to be positively correlated, this correlation did not reach statistical significance among freshman medical students.

Thus, while we may tentatively conclude that attitudes and accurate knowledge regarding the aged are linked, the exact nature of the link remains unclear, since third year medical students had the best knowledge

scores; produced significant correlations between knowledge and attitude, but exhibited attitudes that were no different statistically from the other groups.

Conclusions about the utility of using professional training to improve the knowledge base in order to improve attitudes toward the aged must wait for further studies as it is evident that the nature and content of specific training experiences and their impact on positive and negative attitudes needs to be explored in depth.

Summary

Repeated studies of health workers have shown that these workers' attitudes reflect much of the same negative and stereotypical thinking regarding the aged exhibited by other segments of the population. This study sought to establish baseline data on the attitudes and knowledge of medical and dental students regarding the aged and to examine questions regarding the relationship between these attitudes and knowledge.

Data was gathered via the administration of questionnaires to all medical and dental students at the Southern Illinois University School of Medicine and the University of Iowa College of Dental Medicine. Attitudes were measured using Rosencranz and McNevin's (1969) Aging Semantic Differential with knowledge measured through the use of Palmore's (1977) Facts on Aging Quiz.

Medical and dental students were found to be remarkably similar in terms of attitudes with female students exhibiting significantly more positive attitudes than their male colleagues. No significant differences were found between medical and dental students. Similarly,

no significant differences were found between the scores of upperclassmen and freshmen on the attitude scale suggesting that attitudes did not deteriorate in the course of professional education.

As a group, medical and dental students answered approximately one-third of the knowledge items incorrectly. Third year medical students scored significantly better than all other groups tested.

A complex relationship was demonstrated to exist between attitudes and knowledge. Positive attitudes were moderately correlated with accurate knowledge for some, though not all, groups tested. The relationship between knowledge and specific attitude components was explored.

Further research is suggested, before conclusions regarding the utility of using professional training to improve attitudes and behavior toward the aged are drawn.

TABLE I

COMPARISONS OF KNOWLEDGE AND ATTITUDES OF MEDICAL AND DENTAL STUDENTS TOWARD THE ELDERLY BY SEX

Mean Scores

Item	Males	N	Females	N	t	d.f.	p
Instrumental-Ineffective	40.44	236	37.40	40	2.9431	274	0.0035
Autonomous-Dependent	33.70	237	31.98	40	1.5086	275	0.1325
Personally Acceptable-Unacceptable	49.66	238	46.60	40	1.7772	276	0.0766
Overall Semantic Differential	123.78	236	115.98	40	2.3384	274	0.0201
Knowledge (Total Wrong)	8.28	241	8.37	41	-0.2094	280	0.8343
Age	24.28	242	24.17	41	0.2399	281	0.8105

TABLE 2

ANALYSIS OF VARIANCE ON MEAN ATTITUDE SCORES OF MEDICAL AND DENTAL STUDENTS TOWARD THE ELDERLY

		Attitude Dimension		
Group	N	I-I	A-D	PA-U
All Medical Students	118	39.52	33.40	48.51
All Dental Students	159	40.38	33.57	49.77
All Freshmen	160	39.44	33.21	48.40
All Upperclassmen	117	40.79	33.88	50.37
Medical Freshmen	68	39.01	32.78	47.26
Medical Upperclassmen	50	40.20	34.24	50.00
Dental Freshmen	92	39.75	33.53	49.24
Dental Upperclassmen	67	41.24	33.61	50.49

multivariate ANOVA for test of the hypothesis of no overall differences

1. Differences between medical and dental students in all attitude dimensions — $F_{(3,271)}=0.76$, $p=0.52$

2. Differences between freshmen and upperclassmen — $F_{(3,271)}=1.32$, $p=0.27$

3. Interaction between classes and professions — $F_{(3,271)}=0.58$, $p=0.63$

TABLE 3

ANALYSIS OF VARIANCE ON MEAN KNOWLEDGE SCORES OF MEDICAL AND DENTAL STUDENTS

Professional Group	Class					
	Freshmen	N	Upperclassmen	N	All	N
Medical Students	8.16	69	6.42	53	7.40	122
Dental Students	9.00	92	8.91	69	8.96	161
All Students	8.64	161	7.83	122		

ANOVA for test of hypothesis of no differences

1. Difference between medical and dental students $F_{(3,279)}=36.13$ $p=.0001$

2. Differences between freshmen and upperclassmen $F_{(3,279)}=10.87$ $p=.0011$

3. Interaction between classes and professions $F_{(3,279)}=8.90$ $p=.0031$

TABLE 4

PRO- AND ANTI- AGED ERRORS ON
KNOWLEDGE QUIZ BY PROFESSION AND YEAR

Group	Mean % Pro Errors	N	Mean % Anti Errors	N	% Pro Minus % Anti	N
Freshman Medical	19.70	66	31.35	64	-10.04	61
Freshman Dental	26.09	92	33.63	92	- 7.54	92
Third Year Medical	23.70	54	21.46	53	+ 1.93	53
Third Year Dental	19.71	69	34.51	69	-14.80	69

TABLE 5

ANALYSIS OF COVARIANCE ON MEAN NUMBER OF PRO ELDERLY ERRORS FOR MEDICAL AND DENTAL STUDENTS

Group	Mean	N
Freshman Dental	1.304	92
Third Year Medical	1.170	53
Freshman Medical	1.066	61
Third Year Dental	0.985	69

Hypothesis that groups are not significantly different on mean number of pro elderly errors when adjusted for scores on anti items was not rejected at .05 level (F=1.72:p=.1610).

TABLE 6

ANALYSIS OF COVARIANCE ON MEAN NUMBER OF ANTI ELDERLY ERRORS FOR MEDICAL AND DENTAL STUDENTS

Group	Mean	N
Third Year Dental	5.522	69
Freshman Dental	5.380	92
Freshman Medical	5.016	61
Third Year Medical	3.434	53

Hypothesis that groups are not significantly different on mean number of anti elderly errors when adjusted for scores on pro items was rejected at .05 level ($F=11.53: p < .0001$).

TABLE 7

CORRELATIONS BETWEEN KNOWLEDGE SCORES AND ATTITUDE SCORES
(SEMANTIC DIFFERENTIAL AND COMPONENTS)
FOR MEDICAL AND DENTAL STUDENTS

		Instrumental-Ineffective		Autonomous-Dependent		Personal Acceptability-Unacceptability		Total Semantic Differential	
Group	N	r	p	r	p	r	p	r	p
First Year Medical	66	0.20	.104	0.21	.093	0.10	.414	0.19	.128
Third Year Medical	54	0.32	.021	0.33	.018	0.21	.143	0.31	.031
First Year Dental	92	0.26	.012	0.21	.044	0.31	.002	0.32	.002
Third Year Dental	69	0.24	.049	0.41	.001	0.28	.023	0.35	.004

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