

Clinical Practitioners' Attitudes Concerning the Value of Peer-Reviewed Clinical Case Reports: An Opinion Survey

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ABSTRACT. Development and advancement of academic clinical faculty is vital to maintaining excellence in pharmacy teaching; promotions and tenure (or promotion in the case of non-tenure-track faculty) is an essential part of this development. In most schools, promotion and tenure committees generally weigh the peer-reviewed case report as having little significance for scholarship. We undertook an opinion survey of clinical pharmacists to determine whether these reports affect patient care and whether end-users ascribe to them the properties generally accorded scholarly work. Five hundred practitioners were surveyed by mail with questions regarding their practice and their opinions and use of case reports. These pharmacists generally indicated that, although research reports are superior to case reports in routine clinical situations, case reports indeed contribute useful new knowledge to the profession, and they appear to have high expectations for the intellectual integrity of these publications. Most of the responders seek case reports as part of their regular reading and turn to case reports for information when confronted with unusual clinical problems. Responders indicated that case reports are relevant to practice, contain unique material, should contain a scholarly evaluation of previously published work, require scholarly

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ability to prepare correctly, and impact patient care. We conclude that peer-reviewed case reports with literature review should be considered serious scholarship when authors are evaluated for their scholarly activities. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2006 by The Haworth Press, Inc. All rights reserved.]

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INTRODUCTION

Scholarship is an essential element of academic life, universally required of those who enjoy the unique opportunities for inquiry provided by the academic setting. Traditionally, original research is considered the standard of practice for college-level educators; forms of inquiry other than experimental studies usually are thought to be less important. This view may fail to consider the social worth of knowledge gained fortuitously and may underestimate the academic skills and effort required to evaluate and apply such knowledge. A broader view of scholarship may be more appropriate for the faculty of professional schools as they set their academic goals.

Scholarship is broadly defined as work that employs synthesis, integration, and interpretation, is susceptible to peer review, requires a high level of expertise, and impacts a discipline or some community of people (1, 2). We believe that the well-written peer-reviewed clinical case report involves recognition of important phenomena, inquiry into underlying principles, synthesis of experience and published information, formation of conclusions, and formulation of recommendations. This format provides early information that may guide emerging standards of practice.

We believe that it is useful to learn the value clinicians place on peer-reviewed case reports, the extent to which reports modify patient care, and the opinions of clinicians regarding the usefulness of published case reports. A clear understanding of the use made of case reports by clinicians may help to establish the place of this literature form in the planning of academic careers as well as the relative weight to give to these publications when academic performance is evaluated. We surveyed practicing clinical pharmacists to gain insight into these issues. The survey items were developed to answer the following questions:

RELEVANCE: Does the case report address a potentially important problem?

CREDIBILITY: Is the information reported with sufficient analysis of published literature, convincing reasoning, and authoritative conclusions?

IMPACT: Does the information affect treatment decisions in a way that significantly and positively alters the delivery of care?

The answers to these questions may guide clinical academicians in choosing activities that benefit the society which the institution seeks to serve through its scholarly activities.

Initially, we wanted to compare the opinions of physicians with those of clinical pharmacists to determine whether the two disciplines differed with regard to the contribution of case report information to their patient care. However, the response rate from physicians was less than 10%, so there was insufficient information developed to study this question.

METHODS

Survey Instrument Design and Validation

The survey instrument consisted of a single page, printed on buff paper in three columns using landscape format with a three-panel fold; 5 demographic questions, 4 situational questions, and 11 opinion items were used. The opinion items requested responses on a Likert-type scale of 5 points: 1 = strongly disagree, 2 = disagree somewhat, 3 = neutral, 4 = agree somewhat, and 5 = strongly agree.

The draft survey instrument was evaluated by selected clinical pharmacists to improve its relevance and validity; substantial improvement in the focus and relevance of the instrument resulted from their suggestions. The final version of the survey contained the following opinion items; an abbreviated form for the discussion which follows is shown with each item:

10. Case reports are a regular part of my professional reading. [Regular part of reading]
11. For help with unusual patient care problems, I seek case reports involving similar situations. [Seek for unusual problem]
12. In routine patient care, reports of basic science and clinical research are more useful to me than clinical case reports. [Better in routine problem]

13. In solving unusual clinical problems, reports of basic science and clinical research are more useful to me than case reports. [Better in unusual problem]
14. A case report is useful only if it contains discussion and doesn't just report what happened. [Needs discussion]
15. The information in case reports cannot be safely applied to other (although similar) patients. [Extendable]
16. A good case report must include a thorough discussion of relevant literature. [Needs literature review]
17. Case reports contain information that can't be found in other types of publication. [Unique information]
18. For at least half the drugs used in children, the best information on dosing is found in case reports. [Children's doses]
19. Basing a difficult treatment decision partly on published case reports would strengthen my position if I had to defend that position legally. [Helps legal defense]
20. Writing a good clinical case report requires a high degree of judgment and evaluative skill on the part of the author. [Requires skill]

Sampling Methods

Five hundred questionnaires were mailed to clinical and academic pharmacists and five hundred to physicians; this sample size was chosen on the basis of previous survey work with pharmacists (3, 4). The variability of responses in these studies suggested that with a 5-point scale the median response can be estimated within 15%, with 90% confidence, using a sample of 350 persons from each group. A mailing of 500 instruments was thought adequate to provide a representative sample yielding sufficient information for evaluation.

Systematic sampling of pharmacists was performed using a computerized membership roster of the American College of Clinical Pharmacy (ACCP). The desired sample (500) represented approximately 10% of the number of individuals listed in the roster. Accordingly, one name was selected randomly from the first 10 names, and each 10th name was selected thereafter.

Mailing Procedures

A survey instrument and cover letter was sent by first class post to each person selected, with a prepaid return cover provided. Adhesive postage stamps were used for both mail out and return. This route was chosen over the less expensive bulk mail because there is evidence that

more expensive mail classes affect a better return rate (5, 6). To encourage response, recipients were told that a nominal monetary contribution would be sent to a scholarship fund of the respective professional organization for each returned questionnaire. Such token premiums have been shown to increase return rates (5, 6) without biasing the results (7).

Two weeks after the mailing, a follow-up mailing with a duplicate questionnaire was sent to pharmacists who have not replied to the first mailing. Returns were identified by a code number imprinted on the questionnaire; this number was used only to remove names from the re-mail list. No further contact with non-responders was attempted. Data were entered by each investigator into duplicate computer databases as questionnaires were returned. The survey was closed 8 weeks after the date of the first mailing and no more returns were accepted. After all data were entered, the two data bases were compared by means of the SAS system's Compare Procedure, and the inconsistencies were corrected by referring to the questionnaires, after which a single data base containing corrected information resulted. This double data entry approach served to reduce data entry errors.

Statistical Evaluation

Survey items that were worded in a negative sense (items 3, 4, and 6) were normalized by the following function: $\text{Response}_{\text{normalized}} = 6 - \text{Response}_{\text{actual}}$. This allowed mixing negatively worded and positively worded items to minimize leading, and establishes mean responses greater than 3 as favorable to case reports and mean responses less than 3 as adverse to case reports for all items.

The internal reliability of the survey instrument was assessed by calculating Cronbach's statistic using five survey items with similar or parallel content (items 10, 11, 12, 17, and 18). These were the items that seemed conceptually related most strongly to the core issue and were thus appropriate for reliability evaluation using Cronbach's procedure. The value of 0.55 suggests either that the respondents' opinions on related concepts are only modestly consistent or that our beliefs regarding the relationships of the concepts surveyed were incorrect.

Demographic items were tabulated individually and reported as categorical data (percentages). Likert-type items were tabulated as percentages for presentation as bar graphs. Additionally, the mean and variance of the responses to these items were calculated in order to study relationships among items. Although Likert and Likert-type data are ordinal data for which nonparametric analysis is appropriate, it is widely held

that in survey work with large samples this type data can be treated as continuous data crudely measured and can be analyzed by parametric techniques, provided they are used to support conservative conclusions reported with appropriate cautionary statements. This approach depends on the presence of a central tendency in the five-bar histogram, which would justify the use of parametric statistical tests; central tendency is more likely to develop as sample size increases and as the number of categories in the histogram increases, but there appears to be no definitive literature relating the number of categories and the sample size to the appropriateness of parametric tests.

Hypothesis testing was performed to detect differences among practice specialties with regard to issues such as the importance of case reports and how case reports are used in practice. Specific hypotheses that were tested include the following:

1. For each opinion item, the mean response is not neutral.
2. Positive correlation exists among the responses regarding the usefulness of case reports, the necessity for thorough literature search, the actual use of case reports in practice, and the extent of information content in case reports.
3. Clinicians hold the opinion that skill is needed to prepare an effective case report.
4. Clinicians' opinion is that case reports furnish a kind of information not readily available in basic or clinical science studies.
5. The opinion of clinicians is that case reports are more useful in unusual clinical situations than reports of research studies.
6. Practitioners in academic settings use case reports in their practice to the same extent as practitioners in other settings.

Appropriate null hypotheses regarding the neutrality of responses were tested by means of the One-sample *t* Test. Although our data are not repeated measures, this test is appropriate because it tests the hypothesis that the mean is zero (which would be the case after 3 is subtracted from all responses for an item). Associations between responses and demographic variables (e.g., practice specialties) were tested using the Wilcoxon Rank Sum Test. Items that were Yes-No or had categories collapsed into two groups were studied by means of the Chi-square test with Yates' correction for 2×2 tables. An *ad hoc* significance level of < 0.05 was chosen for these tests. Correlation of selected opinion item pairs was studied by examining the correlation matrix of values of Pearson's. For tests of correlation, an *ad hoc* significance level of < 0.001 was chosen.

RESULTS

The response rate from physicians was less than 20%; therefore, we report here the results from the pharmacist mailing. The overall response rate from pharmacists was 52.2% (261 evaluable questionnaires received). The typical responder was a clinical pharmacist with the Pharm.D. degree (85.8%) whose primary practice was a hospital-based clinical practice (31.4%) or a clinical faculty appointment (29.9%). Few very recent or very remote graduates responded; 34.9% were 1-5 years post-degree, 24.5% were 5-10 years post-degree, and 25.7% were 10-20 years post-degree. Most (60.3%) were not board-certified, 33.3% held the BCPS certification, and 6.4% held other certification or multiple certification. Details of the responders' characteristics are given in Table 1. This table shows only four situational items; one question ("I am a pharmacist/I am a physician") was not used because physician data was not analyzed in view of the low response rate.

Table 2 shows the mean of the responses to opinion items. A test of neutrality was performed for each item by means of the Paired-Difference t Test of the null hypothesis H_0 : mean = 0 after each item was normalized to zero by subtracting 3, the neutral value, from each response; this linear transformation is equivalent to testing the null hypothesis H_0 : mean = 3.

Neutrality of Responses: General Tendencies

Although the responses to most items were not strongly positive (>3 is favorable to case reports), all were positive and statistically significantly different from zero except for "Better in Unusual Problem" and "Children's Doses" ($P > 0.05$ for both). The weakest positive response was for the item, "Children's Doses." The responders appeared to be unsure whether or not case reports were the best source of information on children's doses. This item had the largest percentage of neutral responses (68%) of all the opinion items, with only 21.2 % agreeing or strongly agreeing and 16.9% disagreeing or strongly disagreeing.

Because of the large portion of responders who were college faculty members, we studied several responses for differences between faculty and non-faculty practitioners. These two groups were not significantly different with regard to the frequency of reading case reports, the last reading of a case report, or the last use of a case report ($P > 0.05$ for all, Wilcoxon). However, faculty responders were more likely than non-faculty to have published a case report ($P = 0.001$, Chi-square). The

TABLE 1. Characteristics of Responders

Item	N	% of Total
Time since terminal degree		
<1 year	13	5.0
1-5 years	91	34.9
6-10 years	64	24.9
10-20 years	67	25.7
>20 years	26	10.0
Terminal degree		
B.S.	14	5.4
M.S. or Ph.D.	20	7.7
Pharm.D.	224	85.8
M.D. or D.O. †	2	0.8
Other	1	0.4
Professional situation		
Community or private practice	15	5.7
Managed care organization	12	4.6
Government institution	21	8.0
Hospital pharmacist	82	31.4
Medical or pharmacy school faculty	78	29.9
Other	52	19.9
No response	1	0.4
Board certification		
Board of Pharmaceutical Specialties	84	33.5
American Board of Clinical Pharmacology	1	10.4
Other certification	9	3.6
None	152	60.6
More than one	5	2.0

† These individuals indicated that they are also pharmacists.

opinions of faculty responders did not differ significantly from those of non-faculty on any of the opinion items ($P > 0.05$, Wilcoxon).

Board certification did not appear to influence responder's responses on any opinion item. Since nearly all those who indicated that they held some board certification indicated that their board was the Board of Pharmaceutical Specialties (BPS), the group holding BPS certification was compared to responders indicating no board certification. There were no significant differences between boarded and non-boarded practitioners on any opinion item ($P > 0.05$, Wilcoxon).

Practitioners with more than 10 years of practice since the terminal degree were more likely to seek case reports for unusual problems ($P = 0.0007$, Wilcoxon); there was a progressive increase in agreement

TABLE 2. Neutrality of Responses

Statement	Mean \pm S.D.	P†	Agree or Strongly Agree
Regular part of reading	3.24 \pm 0.98	0.0001	45.5%
Seek for unusual problem	3.84 \pm 1.01	0.0001	73.5
Better in routine problem	2.09 \pm 1.03	0.0001	10.1
Better in unusual problem	3.00 \pm 0.99	0.8497	36.5
Needs discussion	3.95 \pm 1.08	0.0001	71.6
Extendable	3.40 \pm 0.83	0.0001	49.6
Needs literature review	4.26 \pm 0.86	0.0001	84.3
Unique information	3.70 \pm 0.86	0.0001	64.4
Children's doses	3.06 \pm 0.80	0.3004	21.2
Helps legal defense	3.44 \pm 0.90	.0001	54.3
Requires skill	4.13 \pm 0.78	0.0001	86.8

† For H_0 : mean response = 3.

with the statement that case reports must review the literature with each incremental category of time since the terminal degree ($P = 0.0107$, Wilcoxon).

Impact and Relevance to Practice

Case reports are a regular part of reading for 45.5% of responders, with 73.5% agreeing or strongly agreeing that they seek case reports for help with unusual problems and 64.4% agreeing or strongly agreeing that case reports furnish unique information (Table 3). Agreement that case reports are sought for unusual problems correlated modestly but significantly with case reports being a part of regular reading ($\rho = 0.482$, $P = 0.0001$). Although the responders were generally positive on the issue of extendability of the case report's information to other patients (mean response 3.40 ± 0.83 , $P = 0.0001$), only 49.6% agreed or strongly agreed that the information is extendable. Surprisingly, an opinion that case report information is extendable did not correlate with seeking case reports for unusual problems ($\rho = 0.162$, $P = 0.0114$). Correlation between seeking for an unusual problem had negligible correlation with the opinion that case reports contain unique information ($\rho = 0.212$), despite the "significant" P value of 0.0009.

Responders generally held favorable opinions regarding their utility in supporting decisions in a legal defense (mean 3.44 ± 0.90 , $P = 0.0001$); 54% agreed or strongly agreed that case reports would be useful in this setting.

TABLE 3. Correlations Between Item Pairs

Statement Pairs		Pearson ρ	P [†]
Regular part of reading	Seek for unusual problem	0.482	0.0001
Regular part of reading	Extendable	0.146	0.0193
Seek for unusual problem	Better in unusual problem	0.255	0.0001
Seek for unusual problem	Extendable	0.162	0.0114
Seek for unusual problem	Unique information	0.212	0.0009
Better in routine problem	Better in unusual problem	0.275	0.0001
Needs discussion	Needs literature review	0.411	0.0001
Needs literature review	Requires skill	0.294	0.0001
Unique information	Pediatric doses	0.176	0.0059

[†]Probability for greater value of ρ .

Credibility and Quality Issues

The majority of responders indicated that research literature was superior to case reports in routine patient care problems (70.3% agreeing or strongly agreeing); the mean response was significantly different from neutral (2.09 ± 1.03 , $P = 0.0001$). For unusual problems, opinion appeared to be approximately equally divided as to whether case reports were superior to research reports (36.5% of responders agreeing or strongly agreeing that research reports were better, 31.7% disagreeing or strongly disagreeing, 31.8% neutral). The mean response was not significantly different from neutral (3.00 ± 0.99 , $P = 0.85$), but there was weak correlation of seeking case reports for unusual problems with the opinion that case reports were better for unusual problems ($\rho = 0.255$, $P = 0.0001$).

Responders appear to have high expectations for the content of "good" case reports. They agreed or strongly agreed that the report should discuss, rather than merely report, events (71.6%), and that extensive review of the literature was required (84.3%). Those who thought that case reports should contain discussion were more likely to believe that the case report also needs a thorough literature review ($\rho = 0.411$, $P = 0.0001$).

Most (86.8%) agreed or strongly agreed that a high degree of skill is required to write a good case report, and these responses correlated weakly with the belief that a literature review was necessary ($\rho = 0.294$, $P = 0.0001$).

DISCUSSION

In this survey, the typical responder was a clinical pharmacist with a Pharm.D. degree having a hospital-based practice or clinical faculty appointment.

The first question asked by this survey was whether clinicians believe that case reports address a potentially important problem (relevance). Based on the survey results, we conclude that clinicians believe that case reports provide unique information and are sought by practitioners to solve unusual problems.

The second question we asked was whether a useful case report would contain sufficient analysis of published literature, convincing reasoning, and authoritative conclusions (credibility). The survey showed that clinicians expect case reports to contain a literature review and discussion, and thus the report requires skill in preparation. The responders appear to have high expectations of what constitutes an acceptable case report.

Last, we asked whether case reports were actually used, that is, did the information affect patient care (impact)? The responders indicated that they felt strongly enough about the relevance of case reports to make them a regular part of reading. Most reported that they routinely seek case reports for help with an unusual situation, perhaps when information from full clinical trials is inadequate. More than half reported that the use of case reports would be helpful in answering legal challenges. Although the majority of responders indicated that research literature is a better source of information than case reports for routine problems, they were equally divided in whether case reports are better than research reports for unusual situations. Also reflecting the importance of case reports to clinical practice was the fact that practitioners with more than ten years of practice were more likely to seek case reports for unusual situations. This response may reflect lack of knowledge of sources for this information on the part of responders. This response may reflect lack of knowledge of sources for this information, underscoring the findings of Wilson (8) that this aspect of drug information is deficient.

The question regarding the utility of case reports as a guide to pediatric dosing had the largest percentage of neutral responses of all questions.

Case reports, widely considered the simplest form of descriptive study, have contributed to the advancement of medicine for many years. In the last five years, 197,000 case reports have been published in medical literature according to a Medical Subject Heading (MeSH) search of MEDLINE. DeAmici and associates examined the trend in anesthesia case reports during a 17-year period and found that 74.2% of case re-

ports were first cited within two years of publication. They also reported that the typical article quoting the case report was, in the majority of cases, an original article (9).

The findings of these authors suggest that clinicians view the peer-reviewed case report as a work of synthesis and analysis that provides unique information useful in making patient-care decisions, and that they have high expectations for the quality of these publications. The fact that responders who identified themselves as clinical faculty were more likely to have published a case report may reflect the perceived importance of case reports to clinical practice and academic scholarship. The legitimacy of the case report as a desirable scholarly work therefore seems to be underscored by our study.

Many clinical faculty find that because of the greater amount of time spent in clinical practice and teaching, they have less time to devote to scholarly work (10). One survey of clinician-educators reported that three-fifths of the clinical faculty member's time is devoted to clinical practice (11). A large practice and/or teaching load with limited time for research challenges clinical faculty members to find ways to make significant contributions of new knowledge.

Scholarship has been redefined by Boyer to include scholarship of application, scholarship of discovery, scholarship of integration, and scholarship of teaching (12). As the definition of scholarly activity evolves, it is increasingly important to recognize all forms of scholarship in order to legitimize the full scope of academic work (12). Although the scholarly work of integration and application of observations to patient care may be of a type unfamiliar to non-clinicians, the academic institution's encouragement of this scholarship of application may both increase the visibility of clinical faculty members and help promote the public service contributions of the academic community.

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