Service Quality Measurement

Examination of dental practices sheds more light on the relationships between service quality, satisfaction, and purchase intentions in a health care setting.

By James H. McAlexander, Dennis O. Kaldenberg, and Harold F. Koenig

Service quality has been an important topic to both health care providers and marketers as well as the focus of much recent research because it contributes to the overall success of the health care practice. Service quality can have a significant effect on patient satisfaction. Satisfaction, in turn, has a positive relationship to purchase intentions and customer loyalty.

In addition to its managerial importance, service quality may also have practical implications for the physician/patient relationship. In 1989, Teresa Swartz and Stephen Brown found some evidence that satisfied patients are more likely to adhere to medical recommendations than those who are less satisfied and less likely to file professional malpractice suits.

We explored the applicability and efficacy of the SERVQUAL approach within the health care domain. By comparing the SERVQUAL approach with other conceptualizations and attendant measures of service quality within the dental health care setting, we are extending recent research on service quality and hope to assist health care practitioners with the

Extending the research on service quality in health care, the authors examine the efficacy of four models for measuring service quality and conclude that SERVPERF methods are superior to SERVQUAL methods. Their study found that dental patients' assessments of overall service quality were strongly influenced by assessments of provider performance. Furthermore, an examination into the causal order between perceptions of overall service quality and patient satisfaction reveals such strong reciprocal influences that it's impossible to conclude that one empirically precedes the other. Finally, the authors found that purchase intentions are influenced by both patient satisfaction and patient assessments of overall service quality.

assessment of service quality within their practices.

Defining Quality

The professional sensibilities of the health care practitioner may suggest that service quality is best conceptualized as the provision of appropriate and technically sound care that produces the anticipated effect. However, Swartz and Brown observed that patients' service perceptions frequently differ from those of physicians and, moreover, that physicians often misperceive their patients' evaluations. This "gap" may have detrimental consequences for patient satisfaction and the success of the practice.

Importantly, since research suggests that consumers are reluctant to complain when dissatisfied with services, the existence of this gap may not be noticed until it is too late for the practitioner to remedy a service problem. As a result, the health care provider may bear the burdens of having dissatisfied patients, including negative word of mouth and patient turnover.

Because of its importance, marketing researchers have devoted a great deal of attention to conceptualizing and measuring

"service quality," a concept described as elusive and abstract by researchers A. Parasuraman, Valarie Zeithaml, and Leonard Berry in 1985. Marketers generally view service quality from the perspective of the health care consumer. Marketers understand that patients' perceptions of service quality may be more broadly construed than those of the health care provider and based upon a more holistic assessment of the health care experience.

From the patient's perspective, service quality may include perceptions of technical care, but also such seemingly peripheral concerns as physical facilities, interactions with receptionists, and even brochures.

Reflecting this understanding, Parasuraman, Zeithaml, and Berry developed a conceptual model of service quality that includes the following determinants: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles. This conceptual model of service quality views it as a construct that is similar to an attitude that results from a comparison between a consumer's service expectations and perceptions of the performance they have received on these dimensions.

Measurement Debate

The "expectation/performance" conceptualization of service quality led Parasuraman, Zeithaml, and Berry to develop the SERVQUAL approach for measuring service quality in 1988. This method assesses both the consumer's service expectations and perceptions of the provider's performance. Positioned as a generic method applicable to a wide range of service industries, SERVQUAL has been widely applied and frequently reported in the marketing literature. It is worth noting, however, that none of the services studied as part of the initial development of SERVQUAL were within the health care domain.

Although SERVQUAL has been widely used, just recently it

EXECUTIVE HIGHLIGHTS

♦ The relationships between satisfaction and service quality are strong when examined from either direction—satisfaction affects assessments of service quality and assessment of service quality affects satisfaction.

♦ Over time, even though quality of service performance remains constant, the level of satisfaction likely will decrease because service improvements are needed to continue to impress the patient.

♦ Service quality has a stronger effect on purchase intentions than does patient satisfaction.

♦ Continuous quality improvement efforts require attention to both technical improvements and periodic assessments of patient perceptions of quality.

♦ Health care marketers need to weigh carefully the negative implications of lengthy questionnaires that include assessments of such things as expectations and importance against the limited contribution these data provide for decision making.

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has been subject to criticism by several researchers. In 1990, James Carman, for example, expressed concern over the measurement of service quality across multiple service functions, the treatment of the expectations measurement, and the omission of importance in the measurement of service quality. In 1992, Emin Babakus and Gregory Boller questioned SERVQUAL's applicability across a wide variety of services, its dimensionality, the appropriateness of operationalizing service quality as a "gap" score, and the specific measurement properties associated with SERVQUAL.

J. Joseph Cronin and Steven Taylor, however, argued in 1992 that both the conceptualization and operationalization of SERVQUAL are inadequate. Conceptually, they point out confusion in the literature over the relationship between service quality and consumer satisfaction.

They concluded, moreover, that although service quality has been conceptually described as a construct that is similar to an attitude, the SERVQUAL operationalization is more consistent with the conceptualization and operationalization found within the consumer satisfaction/dissatisfaction paradigm. This distinction has importance to both academicians and practitioners because it has bearing on the nature of the relationships between service quality, customer satisfaction, and, ultimately, purchase intentions.

In their empirical findings, Cronin and Taylor specifically explored the relationship between service quality, satisfaction, and purchase intention. Furthermore, they compared SERVQUAL's efficacy with attitude-based methods (as applied in consumer satisfaction/dissatisfaction research) of measuring service quality. An attitude-based conceptualization would argue for either an importance-weighted evaluation of specific service attributes or even just an evaluation of performance on specific service attributes.

The service quality models they examined were (1) a performance measure, (2) a performance measure weighted by importance, and (3) SERVQUAL weighted by importance. Their analysis suggests that service quality is an antecedent of customer satisfaction and that satisfaction has a stronger influence than does service quality on purchase intentions.

They further found that the unweighted measurement of performance explained more variance and was a more parsimonious model of service quality than the other measures; this conclusion supports the attitude-based conceptualization of service quality.

To the health care professional, the recent debate surrounding the expectations/performance conceptualization and the usefulness of SERVQUAL raises several important considerations. First, the confusion over the relationship between service quality, customer satisfaction, and purchase intentions have relevance for managerial considerations.

Second, given the specific criticisms of SERVQUAL, there are general questions about its relative merit vis-a-vis other service quality assessments (e.g., performance only). Also, as a practical issue, because SERVQUAL was generated outside the domain of health care and has had only limited examination in the health care literature, the recent criticism suggests that additional research is necessary to better gauge its applicability to the provision of health care.
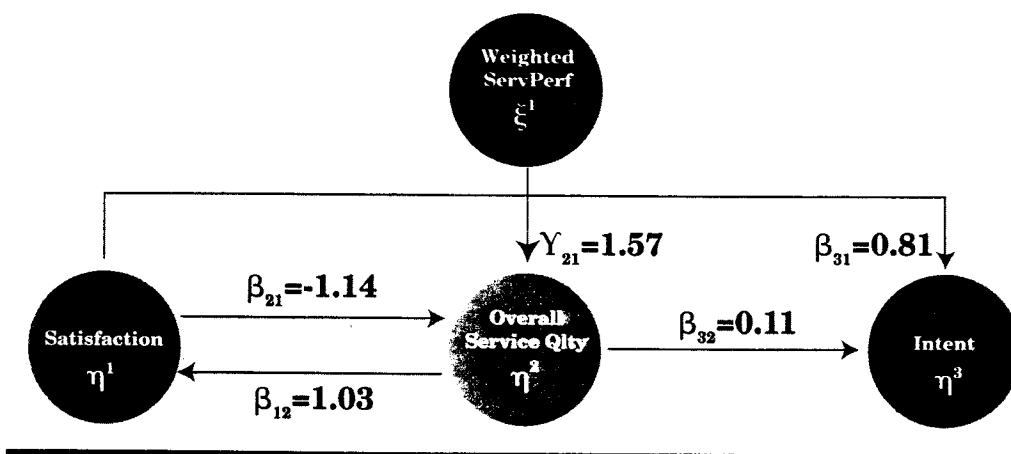
The provision of health care is different from the previously studied services (e.g., product repair, retail banking, fast food, and dry cleaning) in many important ways. Health care services tend to be more involving for the patient than many other services, and the relationship between patient and health care provider may be very intimate and extend over many

EXHIBIT 1

LISREL Coefficients for the Weighted SERVPERF Model

paid by the insurance company) was $700.

Measures

Our approach, consistent with other relevant applications of the SERVQUAL method, was to develop performance measures that corresponded to the 10 dimensions of the original conceptualization of service quality from which SERVQUAL was derived.

Owing to idiosyncracies of this health care setting, the final research instrument was a modification of SERVQUAL created through consultation with the participating dentists and reflected dimensions that they believed to be important to their dental prac-

years. These and other differences suggest that the determinants and measurement of service quality may be unique.

tices, such as painless treatment.

For each of the performance measures, we included measures of expectation and importance in order to accomplish comparisons similar to those made by Cronin and Taylor in 1992. These items are presented on page 40. Questions also were included to assess global satisfaction with services and future purchase intentions. These measures allowed us to construct and evaluate the same models of service quality, satisfaction, and purchase intention that Cronin and Taylor examined (see Exhibit 1).

Dental Care Study

Method

In the summer of 1991, we placed a query in a Western U.S. dental newsletter seeking the participation of dentists interested in having a free patient satisfaction study completed for their practice. Participating dentists would provide the names of all patients and a cover letter which we would send to those patients. We promised to complete all other details of the research process and provide the dentist with a report of the findings relative to his or her practice.

Two independent general practice dental offices were selected on the basis of the ease with which patient information (name, address, age, insurance coverage, date of last appointment) could be made available in machine-readable form. A total of 966 adult patients were selected for the study.

One week following the mailing of the dentist's letter of introduction, we mailed a questionnaire, cover letter, and postage-paid envelope to the patients. Two weeks following this mailing, a post-card reminder was sent, both to thank the patients who had returned the questionnaire and to encourage those who had not to do so immediately. After roughly six weeks, a total of 346 usable questionnaires had been returned, for a response rate of 36%.

The respondents were recent patients; 82% had seen the dentist in the last six months, 93% in the last year. Sixty-three percent of the patients were female, 37% came from a household where the total income (before taxes) was greater than $50,000, and 69% had dental insurance. Because only adult patients were selected, the median age was 41. And the median amount spent on dental services during the past two years (including dollars

Results

One goal of this analysis was to extend into the health care domain recent research that reconsiders the measurement of service quality. Specifically, we extended Cronin and Taylor's work by examining the relationship between service quality, satisfaction, and purchase intention. Also, we explored whether the SERVQUAL method measures perceptions of overall service quality better than these other methods: a SERVQUAL measurement weighted by importance, a measurement of performance only (SERVPERF), and performance measure weighted by importance (weighted SERVPERF).

The appropriateness of each method (i.e., SERVQUAL vs. SERVPERF) for measuring service quality and the relationships between the different constructs (i.e., purchase intention) were analyzed using structural equation techniques (LISREL 7). Our data analysis first examined the reliability and unidimensionality of the four scales used to measure service quality (see Exhibit 2). The reliability of each of the four scales met or

EXHIBIT 2

Measurement Properties of Four Measures of Service Quality

Service quality scale	Cronbach's alpha	Eigenvalues			
SERVQUAL	0.82	4.6	1.3	1.2	1.0
Weighted SERVQUAL	0.82	4.5	1.3	1.2	1.0
SERVPERF	0.91	6.7	1.2	.94	.85
Weighted SERVPERF	0.88	5.8	1.3	1.0	.88

exceeded Nunnally's guideline for basic research (α = .80). In addition, each of the four scales exhibited a significant drop between the first and second eigenvalue when factor analyzed, indicating that each was unidimensional.

Given the acceptable levels for measurement properties, we started the analysis. The individual scale items were summed to create the value for each scale; this value is the observable independent variable in the LISREL model. The sample size was sufficient for PRELIS to compute the asymptotic covariance matrix as an input to the generally weighted least squares estimation procedure of LISREL. Generally weighted least squares estimation will produce asymptotically correct standard errors and chi-square values when variables do not meet normality conditions.

Each of the four models was estimated with identical specifications; the only difference was the measure of service quality included in the model: SERVQUAL, weighted SERVQUAL, SERVPERF, or weighted SERVPERF.

The standardized parameter estimates are quite similar across all models, as are the goodness of fit index (GFI) estimated by LISREL and the Tucker-Lewis index (see Exhibit 3). Significant differences do not appear between the models until one examines the adjusted goodness of fit index (AGFI), Bentler and Bonett's 1980 delta, and McDonald and Marsh's 1990 RNI fit measure. The SERVQUAL models exhibit significantly lower fit values for AGFI, delta, and RNI. The SERVPERF models exhibit better fit on all the indices, with the weighted SERVPERF model performing marginally better.

Like Cronin and Taylor's investigation, our examination also allows us to explore the relationship between service quality, purchase intention, and customer satisfaction. Inasmuch as the weighted SERVPERF provides superior fit, we used that model to examine these relationships.

We found a nonrecursive relationship between overall service quality, η^2, and patient satisfaction, η^1 (Exhibit 1, path β_{12} and path β_{21}). Additionally, we found that patient satisfaction, η^1, has a significant effect on purchase intentions, η^3 (Exhibit 1, path β_{31}).

We also found that service quality, η^2, has a significant effect on purchase intentions, η^3 (Exhibit 1, path β_{32}). Although the *direct* impact of patient satisfaction on purchase intentions is greater than that of overall service quality on purchase intentions (compare path β_{32} and path β_{31} in Exhibit 1), overall service quality has a greater *total effect* on purchase intentions ($\{\beta_{32} + [\beta_{12} \eta \beta_{31}]\}$=0.94, $\{\beta_{31} + [\beta_{21} \eta \beta_{32}]\}$ = .68). Our results are quite similar to those of Cronin and Taylor's; the magnitude and direction of the LISREL coefficients are virtually identical.

Performance Superiority

This study compares four different methods for measuring service quality. Within a health care setting, using a measure of service quality designed for that setting, our results partially confirm those reported by Cronin and Taylor in 1992.

Specifically, the results show that models that measure service quality as performance (without expectation considerations) are superior to models that measure service quality as a function of performance and expectation (the SERVQUAL approach). Including importance assessments improves the predictive power of the SERVPERF model, insomuch as a marginally better fit is obtained by weighting the performance items by importance scores.

As a practical consideration, though, the researcher must decide whether to subject a respondent to twice the number of items for a fit which is only *marginally* better. The inclusion of the importance measures increases questionnaire length and,

EXHIBIT 3

Standardized Estimates and Fit Indices of Four Models of Service Quality

Parameter	SERVQUAL LISREL Estimate/ t-value	Weighted SERVQUAL LISREL Estimate/ t-value	SERVPERF LISREL Estimate/ t-value	Weighted SERVPERF LISREL Estimate/ t-value
β_{21}	-2.352 / -2.794	-2.563 / -2.824	-1.732 / -2.647	-1.135 / -2.251
β_{12}	1.190 / 13.469	1.211 / 13.037	1.119 / 15.180	1.027 / 11.865
β_{31}	0.828 / 15.366	0.831 / 15.383	0.817 / 14.275	0.805 / 14.275
β_{32}	0.089 / 2.117	0.087 / 2.074	0.099 / 2.251	0.109 / 2.424
γ_{31}	2.882 / 3.653	3.133 / 3.659	2.341 / 3.922	1.570 / 4.043
χ^2	4.57(p=0.032)	5.48(p=0.019)	1.98(p=0.159)	0.41(p=0.522)
GFI	0.971	0.967	0.988	0.988
AGFI	0.706	0.665	0.876	0.876
RMR	0.015	0.020	0.013	0.013
Δ[a]	0.891	0.867	0.971	0.971
T-L[b]	0.967	0.959	0.992	0.992
RNI[c]	0.901	0.872	0.984	0.984

[a] Delta fit index from Bentler and Bonett (1980).
[b] Tucker-Lewis fit index from Tucker and Lewis (1973).
[c] RNI fit index from McDonald and Marsh (1990).

as a result, may preclude asking other pressing research questions and have detrimental consequences for the survey's overall response rate.

As another important conclusion, these findings raise further questions about the SERVQUAL methodology. Our study adds to the growing body of evidence that suggests shortcomings of the method. The inclusion of expectations in the measure of service quality, which has been criticized both conceptually and empirically by others, did not add to the predictive power of the model.

As Parasuraman, Berry, and Zeithaml noted in 1991, however, the measurement of expectations can serve a diagnostic function for managers. Nonetheless, we observed that in this health care setting, patients have uniformly high expectations across all SERVQUAL dimensions, which brings into question the diagnostic utility of the expectation measurement. It could be the case that, because our society esteems professional service providers, consumers have very high quality expectations.

Clearly, the decision to include expectation questions depends on the research objective. But, since repeated empirical studies have questioned the effectiveness of expectations measures, a manager should have strong justification before adding them to the instrument and bearing the negative consequences of a lengthy questionnaire.

In our investigation, we were able to explore the causal order of the satisfaction-service quality relationship, an issue which has been the focus of recent discussion. We found that the magnitude of the relationships between satisfaction and service quality are equally strong when examined in either direction: satisfaction affects assessments of service quality, and assessments of service quality affect satisfaction.

Like Cronin and Taylor, we found a positive path relationship between overall service quality and satisfaction, but a negative path relationship between satisfaction and overall service quality. This counter-intuitive finding might be explained using insights from a total quality management perspective.

For example, the quality of service performance may be such that it leads to a high level of patient satisfaction. In our study, 64% of patients "strongly agreed" that they were "very satisfied" and 61% strongly agreed that the service provided was "of the highest quality." Over time, even though the quality of service performance remains constant, the level of satisfaction likely will decrease because service *improvements* are needed to continue to impress the patient.

Thus, service quality will be positively related to satisfaction, but once this relationship is established, satisfaction will not remain constant (and likely will decrease or be negatively related) unless continual improvements are made in the quality of the service performance.

Our analysis also allowed us to investigate the roles of satisfaction and service quality on purchase intentions. We found that both overall service quality and patient satisfaction significantly affect purchase intentions. Service quality, when considering both its direct and indirect relationships (through its influence on satisfaction), has a somewhat stronger effect on purchase intentions than does patient satisfaction.

Taken together, our findings concerning the relationships between satisfaction, service quality, and purchase intentions suggest that health care practitioners must pay heed to the importance of both overall service quality and patient satisfaction. Neglecting one dimension at the expense of another would be counterproductive.

As a practical issue, a focus on patient satisfaction necessitates a continuing program of research with patients to monitor satisfaction. Continuous quality improvement will require attention to both technical improvements and periodic assessments of patient perceptions of quality.

Future Research

Our research, taken within a single health care setting adds to the growing literature which calls for a reexamination of how marketers treat service quality. Since the measurement of service quality appears to be dependent upon the type of service examined, future research should focus on other health care settings. For example, nursing homes, hospitals, or optometric practices may yield idiosyncratic results.

Specifically, our findings question the value of including expectations in the assessment of service quality. Future research is needed to determine the diagnostic or other uses for expectation measurements. For example, it is conceivable that different market segments might have different service expectations and, as a result, practitioners may be able to use such measures as a part of positioning strategies.

Finally, our research sheds some light on the relationships between service quality, satisfaction, and purchase intentions. The Cronin and Taylor model has been an appropriate starting point for examining these relationships, but needs additional study. In particular, additional work is needed to understand the negative relationship between satisfaction and service quality.

As Taylor and Cronin recently pointed out in *JHCM* (Spring 1994 issue), the literature has been inconsistent in its conceptualization of these constructs. Moreover, the empirical evidence has been equivocal in distinguishing satisfaction and service quality. Clearly, this is an area that needs further exploration. Our interpretation would suggest that a longitudinal study be undertaken to better illuminate this relationship.

We also would tend to agree with Taylor and Cronin in that consumers may be unable to distinguish between service quality and satisfaction in a fashion that researchers seem to think they should. This would suggest the need for additional conceptual grounding in the thoughts and perceptions of consumers through alternative research methods (e.g., depth interviews). We might discover that, from the perspective of the consumer, service quality and customer satisfaction are synonymous terms. **JHCM**

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DENTAL STUDY QUESTIONNAIRE

EXPECTATION QUESTIONS

DIRECTIONS: Please show the extent to which you think dental practices, in general, should possess the following features. For each statement, please show the extent to which you believe dental practices should have the feature described in the statement. If you strongly agree that a dentist or a dental practice should possess a feature, circle number 7. If you strongly disagree circle number 1. If your feelings are not strong, circle one of the numbers in the middle. There are no right or wrong answers.

E1.	A dentist's physical facilities should be visually appealing.	1	2	3	4	5	6	7
E2.	A dentist should be dependable.	1	2	3	4	5	6	7
E3.	A dentist's employees should be willing to help you.	1	2	3	4	5	6	7
E4.	You should feel safe in your transactions with a dentist.	1	2	3	4	5	6	7
E5.	A dentist should give you individual attention.	1	2	3	4	5	6	7
E6.	You should be able to schedule an appointment with a dentist for a time that is convenient.	1	2	3	4	5	6	7
E7.	A dentist should be competent.	1	2	3	4	5	6	7
E8.	A dentist should communicate well with patients.	1	2	3	4	5	6	7
E9.	A dentist should make dental treatments as painless as possible.	1	2	3	4	5	6	7
E10.	A dentist should treat you with respect.	1	2	3	4	5	6	7
E11.	A dentist's charges should not be too high.	1	2	3	4	5	6	7
E12.	You should be able to trust a dentist.	1	2	3	4	5	6	7
E13.	A dentist should provide service of the highest quality.	1	2	3	4	5	6	7
E14.	A dentist's office staff should always act in a professional manner.	1	2	3	4	5	6	7
E15.	A dentist's should take every precaution required to protect me from infectious diseases.	1	2	3	4	5	6	7

IMPORTANCE QUESTIONS

DIRECTIONS: Please rate the following in terms of their importance to you in your selection of a dentist. (7-point scale where 1 is least important and 7 is most important).

I1.	Visually appealing physical facilities.	1	2	3	4	5	6	7
I2.	A dependable dentist.	1	2	3	4	5	6	7
I3.	Helpful employees.	1	2	3	4	5	6	7
I4.	Safe transactions.	1	2	3	4	5	6	7
I5.	Individual attention.	1	2	3	4	5	6	7
I6.	Ability to schedule an appointment that is convenient.	1	2	3	4	5	6	7
I7.	A competent dentist.	1	2	3	4	5	6	7
I8.	A dentist who communicates well.	1	2	3	4	5	6	7
I9.	Painless dental treatments.	1	2	3	4	5	6	7
I10.	Being treated with respect.	1	2	3	4	5	6	7
I11.	Cost of treatment.	1	2	3	4	5	6	7
I12.	A dentist I can trust.	1	2	3	4	5	6	7
I13.	Service of the highest quality.	1	2	3	4	5	6	7
I14.	An office staff that acts in a professional manner.	1	2	3	4	5	6	7
I15.	Protection from infectious diseases.	1	2	3	4	5	6	7

PERFORMANCE QUESTIONS

DIRECTIONS: The following set of statements relates to your feelings about Dr. [Name]. For each statement, please show the extent to which you believe Dr. [Name] or his practice has the feature described in the statement. If you strongly agree , circle number 7. If you strongly disagree, circle number 1. If your feelings are not strong, circle one of the numbers in the middle.

P1.	Dr. [Name]'s physical facilities are visually appealing.	1	2	3	4	5	6	7
P2.	Dr. [Name] is not dependable.	1	2	3	4	5	6	7
P3.	Employees of Dr. [Name] are always willing to help you.	1	2	3	4	5	6	7
P4.	You feel safe in your transactions with Dr. [Name].	1	2	3	4	5	6	7
P5.	Dr. [Name] gives you individual attention.	1	2	3	4	5	6	7
P6.	I can usually schedule an appointment for a time that is good for me.	1	2	3	4	5	6	7
P7.	Dr. [Name] is very competent.	1	2	3	4	5	6	7
P8.	Dr. [Name] communicates well with me.	1	2	3	4	5	6	7
P9.	Dr. [Name] makes dental treatments as painless as possible.	1	2	3	4	5	6	7
P10.	Dr. [Name] always treats me with respect.	1	2	3	4	5	6	7
P11.	The fees Dr. [Name] charges are too high.	1	2	3	4	5	6	7
P12.	I trust Dr. [Name].	1	2	3	4	5	6	7
P13.	The service Dr. [Name] provides is of the highest quality.	1	2	3	4	5	6	7
P14.	Dr. [Name]'s office employees always act in a professional manner.	1	2	3	4	5	6	7
P15.	Dr. [Name] takes every precaution required to protect me from infectious diseases.	1	2	3	4	5	6	7