

Prescribers' perspectives of the socioeconomic status and important indicators affecting prescribing behavior in a developing country

Research Article

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Abstract: Patients suffer differential prescribing behavior as a function of their socioeconomic status. The current study was conducted in a qualitative and two observational phases in Lahore metropolitan area to investigate physician's perspectives of patients' socioeconomic status and the important indicators influencing prescribing behavior. Semi-structured interviews were conducted with physicians ($N=20$) from 2 hospitals, 2 diabetes care centers and 2 private clinics and scripts were analyzed for socioeconomic indicators. In the second phase, the opinions of a panel of prescribers ($N=43$) on the influence socioeconomic indicators on prescribing behavior were elicited. In the third phase a bipolar 5-point Likert rating scale was used to elicit the importance of indicators for physicians ($N=100$) originated from urban and rural areas. In the interviews physicians gave 15 potential socioeconomic indicators. Following the two Delphi rounds, consensus was reached on 11 (73.3%) of the indicators, the remaining 4 (26.7%) were highly disputable. Bivariate analysis showed that literacy, educational background, compliance, dress and appearance were important indicators at the time of clinical decision making for physicians originating from urban areas than for physicians originating from rural areas. Physicians originating from urban and rural areas perceived the socioeconomic status differently.

Keywords: Socioeconomic status • Prescribing • Behavior • Delphi technique • Consensus

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1. Introduction

In routine practice, physicians make a wide range of patient management decisions including drug prescribing. Clinically, a physician's choice of a drug may differ depending on a patient's pathophysiology or idiosyncrasy. However, physician decisions are also influenced by nonclinical factors related to patient's socioeconomic status [1]. Studies showed that physicians' perception about racial or social stereotypes leads to differentials in screening and treatment strategies and disparities in healthcare delivery [1,2]. Previous studies have identified pro-rich inequities in all stages of healthcare delivery in terms of incidence and prevalence of morbidity and mortality [3], waiting times [4], diagnosis [5], laboratory investigations [6], treatment strategies [7], medicine prescribing and utilization behavior [8].

Globally, authorities are trying to uproot disparities in healthcare delivery. However, this objective is not feasible without profound understanding of the causes behind such inequities. Previous studies linked certain socioeconomic indicators and disparities in healthcare delivery. A common feature in those studies was that patient sample characteristics and certain elements in the healthcare delivery were often correlated and study samples were classified based on investigator-defined socioeconomic indicators [3-8]. Disparities often originate from the way physicians perceive a patient's socioeconomic status [1,9]. The socioeconomic indicators affecting the physician's prescribing behavior were insufficiently investigated from a prescriber's point of view, particularly in a developing country with a complex socioeconomic and healthcare delivery infrastructure like Pakistan. In the present study, we are reporting physician's perspectives of the patient socioeconomic status, indicators and their importance at the time of prescription writing.

2. Methodology

2.1. Interviews

To investigate physician's perspectives of the socioeconomic status, we thought it was necessary to conduct a qualitative study to explore physician's views on the dimensions of the socioeconomic status. In the first phase, we conducted semi-structured interviews with physicians ($N=20$) from 2 hospitals, 2 diabetes care centers, and 2 private clinics in Lahore metropolitan area. Physicians were persuaded and recruited on the basis of their clinical experience of at least 5 years. The sample was diversi-

fied purposefully to cover public and private healthcare settings in different neighborhoods. Physicians were provided written description of the study and were requested to sign informed consent. Physicians were assured of their anonymity. The study protocol and ethics were approved by the Board of Advance Studies and Research of the Islamia University of Bahawalpur.

Interview guidelines

Interview guidelines were developed and pre-tested in a pilot trial on 3 outsider physicians. Necessary revisions and changes were made after pre-testing. Later, irrelevant questions were removed or modified, exploratory questions were added when necessary to ensure the generation of meaningful responses. During the pilot interviews, physicians felt unease due to audio-taping, therefore, we decided not to audio-tape further interviews. The pilot study lasted 4 weeks in which physicians were interviewed 4 times. The first 2 interviews were audio-taped.

Interviews were semi-structured, guided with open-ended questions and prompted explanatory questions when needed. The interview commenced by a question on how the patient's socioeconomic status affects the physician's clinical decision making. Physicians were then asked to describe how they would classify their patients into socioeconomic classes and based on what indicators.

All interviews were conducted by a researcher pharmacist and verbatim transcribed in English. At the end of the interview, each physician was requested to read and approve his interview script. Interviewees completed their demographic details including their background, practice settings and clinical experience.

Script analysis

Interview scripts were analyzed for physician's defined socioeconomic indicators. Scripts describing socioeconomic indicators were identified, underlined, summarized and rephrased into statements for uniformity and understandability. Both original script and rephrased statements were sent back to each corresponding interviewee for comments and approval.

2.2. Delphi technique

The second phase of the study was observational in which the statements describing socioeconomic indicators given by physicians were compiled into a questionnaire. We used a two round Delphi technique to persuade and elicit the opinions of a panel of prescribers if they were of the opinion that these socioeconomic sta-

tus indicators influence their prescribing behavior.

We persuaded physicians working at 2 hospitals, 2 diabetes care center, and 5 clinics to participate in this phase of the study. Physicians were recruited from Lahore metropolitan area in the period between January 2007 and March 2009. Similar to the first phase, recruitment was based on the physician's clinical experience of at least 5 years; physicians were different from those who participated in the semi-structured interviews.

According to the Delphi technique, each participant was asked to indicate his agreement with the proposed statement that the said indicator often influenced physician's prescribing behavior using a scale numbered from 1 (total disagreement) to 9 (total agreement), a space was left below each statement and participants were encouraged to include written comments [10].

Statements reached consensus i.e. median score of 9 were separated and the rest of statements with median score of 8 and less were included in a repeat version. Participants were asked to reconsider their scores having studied the whole respondents' scores. Participants were provided with the median scores and interquartile range including their own, and comments by other anonymous respondents related to each particular statement. Inclusion of comments and summary of responses was done purposefully to increase the number of reasoned responses and to decrease the number of rounds required to reach consensus [11]. The scores of each participant were treated equally, and each participant remained anonymous to the remainder throughout the study.

Consensus definition

In Delphi technique there is no standard definition of consensus, nevertheless, the definition can be developed according to the needs of the study [12,13]. In the current analysis, we used the following definitions:

- a. Consensus: was said to have occurred if the median score of at least 70% of the respondents was between the interquartile range of 1-3 or 7-9. However, 1-3 indicated consensus on the exclusion of the indicator i.e. the indicator does not influence physician's prescribing behavior, and 7-9 indicated consensus on the inclusion, i.e. the indicator influences physician's prescribing behavior.
- b. Partial agreement or equivocal: was said to have occurred if the median score was between the interquartile range of 4-6.

2.3 Determinants of patient's socioeconomic status

The socioeconomic status is believed to be perceived differently by individuals originating from urban or rural

areas. To test the importance of the socioeconomic status indicators that reached consensus in the Delphi technique for physicians originated from urban and rural areas, we conducted the third phase in which we contacted physicians ($N=100$) working for two public hospitals located in the Lahore metropolitan area; physicians were selected on the basis of owning or working in private clinic simultaneously, of those physicians ($n=50$) originated from Lahore urban area, whereas the rest ($n=50$) originated from rural areas. In this observational phase, we used a bipolar 5-point Likert rating scale to measure the importance of the socioeconomic indicators. Physicians were asked: "How would you describe the importance of the said indicator in classifying a patient in a certain socioeconomic class?". Respondents had to indicate their responses on a descending scale of 5. In which, 1 indicated high importance and 5 indicated no importance at all. Since the patient's socioeconomic status was mentioned in the statement, from a conservative point of view, we considered the scale as positively skewed. A response was considered important if the respondent indicated high importance, otherwise, the response was considered not important.

2.4 Analysis

Following each Delphi round, scores were counted and the interquartile range and median score were determined for each questionnaire item. Likert scores were counted separately for the 50 physicians originated from urban and another 50 physicians originated from rural areas. Physicians were further divided into two groups, above and below 50 years old. Bivariate analysis was carried out and odds ratios were calculated using two-tailed Fisher's exact tests. Data were analyzed GraphPad Prism® 4.0 software and statistical significance was considered when the p value was * <0.05; ** <0.01; *** <0.001.

3. Results

3.1 Interviews and socioeconomic indicators

In the qualitative phase of the study, we interviewed 20 physicians, of those, 14 (70%) were males and the rest of 6 (30%) were females. The sample's clinical experience spanned a range of 5-25 years with a median of 8.5 years; physicians' characteristics like specialty, grade and employer are presented in Table 1. All physicians interviewed had good basic concepts of the dimensions of the socioeconomic status, and all agreed that the socioeconomic status of the patient had implications on their prescribing behavior "..... I always ask

Table 1. Characteristics of the study physicians.

	Physicians participated in interviews	Physicians participated in Delphi technique	Physicians originated from urban and rural areas
N	20	42	100
Male, n (%)	14 (70%)	29 (69%)	72 (72%)
Female, n (%)	6 (30%)	13 (31%)	28 (28%)
Clinical experience in years, median (range)	8.5 (5-25)	9 (5.5-24)	11 (6-26)
Specialty			
Endocrinology, n (%)	9 (45%)	11 (26.2%)	14 (14%)
Medicine, n (%)	5 (25%)	9 (21.4%)	16 (16%)
Generalist, n (%)	6 (30%)	5 (11.9%)	31 (31%)
Psychiatry	-	3 (7.1%)	8 (8%)
Gynecology	-	4 (9.5%)	7 (7%)
Cardiology	-	3 (7.1%)	9 (9%)
Urology	-	3 (7.1%)	6 (6%)
Pulmonologist	-	2 (4.8%)	5 (5%)
Pediatrics	-	2 (4.8%)	4 (4%)
Grade			
Professor, n (%)	3 (15%)	3 (7.1%)	7 (7%)
Associate professor, n (%)	-	3 (7.1%)	9 (7%)
Assistant professor, n (%)	2 (10%)	5 (11.9%)	13 (13%)
Consultant, n (%)	2 (10)	14 (33.3%)	24 (24%)
Registrar, n (%)	7 (35%)	13 (31%)	18 (18%)
Resident, n (%)	6 (30%)	4 (9.5%)	29 (29%)
Employer			
Teaching hospital, n (%)	13 (65%)	29 (69.1%)	100 (100%)
Diabetic care center, n (%)	5 (25%)	5 (11.9%)	-
Clinic, n (%)	2 (10%)	8 (19%)	-

Table 1 lists the gender of all participant physicians in the three phases of the study, their range of experience in years, their practice specialties, grades and employers.

my patients what they do for a living. It's very easy to categorize patients into socioeconomic classes in this society.....on the basis of their professions I can judge if they can afford the medicines I am going to prescribe for them" 47 year-old medicine specialist. Physicians agreed that differentials in term of drug choice existed based on socioeconomic status of the patient *".....I know some brands are expensive and the poor cannot afford. I always keep that in my mind when I prescribe them medicines....I have to consider if the patient can afford the treatment for long term, you know diabetes is a chronic disease"* 52 year-old endocrinologist.

3.2 Delphi technique and consensus

Following interviews scripts analyses, we identified 15 physician-defined indicators of the socioeconomic status, these indicators are listed in Table 2. We persuaded 50 physicians to participate in the panel of prescribers,

of those, 42 (84%) agreed to participate. The sample included 11 (26.1%) academicians, 14 (33.3%) consultants, 13 (31%) registrars and 4 (9.5%) residents. The participant characteristics are shown in Table 1. In the first Delphi round, of the 15 indicators included, consensus was reached on 3 (20%) indicators as defined by a median score of 9 indicating a total agreement of all respondents, 8 indicators had median scores spanning between 7 and 8. Partial agreement was reached on the remaining 4 indicators. Following the second Delphi round, further 8 (53.3%) indicators reached consensus as per definition, having a median score lying in an interquartile range with 7-9 as lower and upper limits respectively. Results of the two round Delphi are shown in Table 2.

The majority of the comments were made on the rest of the 4 (26.7%) indicators; however, comments were highly disputable. *"....I would prescribe the right and affordable treatment regime for my patient regardless of his/her ignorance or adequate knowledge of his/her disease state"* commented a 50 year-old endocrinologist. We decided not to undertake any further rounds since it was clear from the respondents' comments that consensus would not be reached in a third round, moreover, the response rate approached 100% in the second round.

3.3 Important indicators and determinants of patient's socioeconomic status

Importance of indicators that reached consensus in the two round Delphi was tested with the help of a sample of physicians originated from urban and rural areas. The sample included different clinical specialties; characteristics of the sample are shown in Table 1.

Following bivariate analysis with chi-square, indicators like literacy and educational background (OR=5.4, CI: 1.7-17.6, $p<0.01$), compliance to drug, diet intake and exercise (OR=2.7, CI: 1.1-6.3, $p<0.05$), dress and appearance (OR=3.1, CI: 1.3-7.7, $p<0.05$) were more important indicators for physicians originating from urban areas, whereas social network was a more important indicator (OR=0.3, CI: 0.1-0.7, $p<0.01$) for physicians originating from rural areas (Table 3). When tested between age groups of physicians originating from the similar backgrounds; interestingly, education was a more important indicator for older (above 50 years old) urban and young rural (under 50 years old) originating physicians than for older rural originating physicians. On the contrary, the social network was less important indicator for younger than for older rural originating physicians.

Table 2. Physician defined socioeconomic indicators.

		Round 1			Round 2			
		Interquartile range			Interquartile range			
Category	Indicator	Lower limit	Median score	Upper limit	Lower limit	Median score	Upper limit	Decision
Economic and occupation	Occupation	8	9	9	not included	not included	not included	Consensus
	Salary or income	9	9	9	not included	not included	not included	Consensus
	Wealth and luxury (car and internet)	5	7	8	6	8	8	Consensus
	Ability to pay: consultation, medicines, laboratory tests	8	9	9	not included	not included	not included	Consensus
Education and knowledge	Literacy and educational background	6	8	8	6	8	9	Consensus
	Compliance: medicine, diet and exercise	6	7	7	7	8	8	Consensus
	Awareness, willingness to know and follow-ups	6	7	8	6	7	9	Consensus
Social and personal attributes	Dress and appearance	6	7	7	6	7	8	Consensus
	Social network	7	7	8	7	7	9	Consensus
	Substance abuse	5	7	8	6	8	9	Consensus
	Moral	6	8	8	6	8	9	Consensus
Knowledge and behavior	Knowledge about his disease	3.75	5	7	4	5	7	Equivocal
	Health behavior	4	6	8	5	5	7	Equivocal
Social and personal attributes	Personality	3.5	5	6	5	6	7	Equivocal
	Language and body language	4	6	8	4	5	7	Equivocal

Table 2 shows the sections of the questionnaire compiled after the qualitative phase of the study (semi-structured interviews); the questionnaire contained 15 prescriber defined socioeconomic indicators grouped under 5 sections. Physicians were asked to indicate their agreements if these indicators often affected their prescribing behavior. The table shows the interquartile ranges and median scores for round 1 and round 2.

Table 3. Importance of socioeconomic indicator as determinant of the patient's socioeconomic status.

Indicator	OR (95% CI)						
	All physicians originated from urban vs. rural areas	A vs. B	A vs. C	A vs. D	B vs. C	B vs. D	C vs. D
Occupation	0.84 (0.3-2.7)	0.88 (0.4-1.4)	0.82 (0.4-1.9)	0.91 (0.7-1.5)	0.79 (0.5-1.1)	1.1 (0.9-1.5)	0.8 (0.6-0.9)
Salary or income	0.57 (0.1-2.5)	0.62 (0.3-1.6)	0.7 (0.4-1.6)	0.65 (0.4-1.2)	0.6 (0.4-1)	0.64 (0.3-0.7)	0.63 (0.3-0.8)
Wealth and luxury (car and internet)	0.5 (0.2-1.6)	0.51 (0.3-1.5)	0.6 (0.3-1.5)	0.8 (0.5-1.8)	0.71 (0.4-1.9)	1 (0.8-1.9)	0.7 (0.4-1.3)
Ability to pay: consultation, medicines, laboratory tests	2.1 (0.9-5)	1 (0.5-2.2)	0.9 (0.7-1.8)	0.95 (0.6-2)	0.85 (0.6-1.6)	1.3 (0.8-1.7)	0.87 (0.4-1.9)
Literacy and educational background	5.4** (1.7-17.6)	1.4 (0.9-2.1)	3.1* (2.1-7.4)	1.9 (1.3-2.6)	4** (3.1-7.9)	1.7 (1.4-2.9)	0.2** (0.08-3)
Compliance: medicine, diet and exercise	2.7* (1.1-6.3)	0.8 (0.4-1.6)	2.8* (2.2-6.8)	1.8 (1.6-3.3)	2.6* (2.3-3.5)	1.9 (1.4-2.7)	0.3* (0.09-0.4)
Awareness, willingness to know and follow-ups	1.6 (0.7-3.7)	1.3 (0.9-1.8)	0.9 (0.6-2.1)	0.93 (0.6-2.2)	0.84 (0.5-2)	0.7 (0.5-1.5)	1.4 (0.6-2.3)
Dress and appearance	3.1* (1.3-7.7)	1.7 (1.5-2.1)	3.8* (3.2-7.1)	2.8* (1.9-4.2)	2.7* (1.4-3.7)	3.2* (2.4-5.4)	1.8 (1.4-2.9)
Social network	0.3** (0.1-0.7)	0.6 (0.4-0.9)	0.2* (0.07-0.3)	0.4* (0.09-0.5)	0.2* (0.07-0.4)	0.4* (0.09-0.5)	0.7 (0.3-0.9)
Substance abuse	0.8 (0.4-1.9)	1.1 (0.4-1.9)	0.9 (0.6-1.8)	0.98 (0.5-2.1)	1.2 (0.7-1.8)	1 (0.6-2.1)	0.91 (0.6-1.4)
Moral	0.9 (0.4-2)	0.97 (0.6-1.8)	0.84 (0.6-2)	0.92 (0.5-2.1)	0.83 (0.4-1.9)	1.4 (0.8-2)	0.9 (0.6-1.5)

A, urban >50 years; B, urban <50 years; C, rural >50 years; D, rural <50 years

Table 3 shows the importance of indicators for 50 physicians originated from urban and another 50 physicians originated from rural areas. Likert scores were counted separately for the 50 physicians originated from urban and another 50 physicians originated from rural areas. Odds ratios were calculated from two-tailed Fisher's exact tests and the statistical significance was considered when the *p* value was * <0.05; ** <0.01; *** <0.001.

4. Discussion

In our current three phase study, we are reporting physicians' perspectives of patients' socioeconomic status. Similarly, socioeconomic indicators influencing physician's patient management decision making, particularly drug prescribing behavior, and the important determi-

nants of the patient's socioeconomic status for physicians originating from urban and rural areas are also reported in this investigation. To the best of our knowledge, this is the first study in Pakistan and the region to investigate the patient's socioeconomic status from the prescriber's perspectives.

Qualitative studies are helpful in eliciting preliminary broad themes, patterns and concepts in socioeconomic studies, particularly in the absence of specifically described and validated frameworks in similar context [9]. In the second phase, we used the Delphi technique as one of the most commonly employed techniques to gauge consensus in clinical decision making, the technique has the advantage of avoiding personal dominance often associated with group discussion [14,15]. The suitability of method and reliability of the Delphi technique were assured by the diversified study sample recruited in terms of clinical experience, specialties represented, and relatively high response rates. The mean scoring rate of at least 84% of the respondents was considerably higher than rates used in other studies using Delphi technique [10]. Nevertheless, these results reflect the views of a panel of prescribers that included academicians and specialized practitioners with considerable clinical experience rather than a random sample of physicians.

During the different stages of our study, participating physicians agreed that patient's socioeconomic status influenced their drug prescribing behavior. Such affirmation came in line with studies conducted in Nigeria and England in which prescribers admitted that the patient's socioeconomic status affected their medicine prescribing behavior and tended to prescribe cheaper medicines on long repeat prescription intervals aiming to economize therapy for patients who paid the charges of prescription [3,16]. Physicians assured that the differential in drug prescribing behavior was in favor of patients, claiming to be prescribing affordable drugs.

Individuals in the lower socioeconomic segments of a society suffer cumulative effects of living at the disadvantaged edge of several conceptual dimensions central to contemporary theory in social epidemiology [17-19]. Previous studies showed that physicians perceived low socioeconomic status patients differently and often negatively [1]. Woo *et. al.* investigated first and second year medicine students' perspectives of socioeconomic status. Students watched a video in which an actor played the roles of high and low socioeconomic status patients in two different scenes [2]. Differentiation was made by clothing, accessories, language and script. Students thought that the low socioeconomic status patient would be less compliant and less likely to come for the scheduled follow up [2]. Similarly in our study, physicians mentioned important indicators like patient's occupation, salary and income, in addition to patient's ability to pay healthcare charges. Furthermore, these indicators were equally important for physicians regardless of their urban or rural origins. Our results indicated that social network was the more important indi-

cator for physicians originating from rural areas than for physicians originating from urban areas. This particularity could be explained by the socio-structural differentials existing between urban and rural societies.

Physicians are individuals in any society; therefore, they seem to have their generalizations and stereotyping in line with the main stream society. Factors affecting physician's perspectives of the socioeconomic status are complex in nature; moreover, they are still largely unexplained. Such factors are affected by physician's personal history, childhood circumstances, schooling, work environment, experience, and physician's socioeconomic status indicators [2,19].

Our findings show that a prescriber pays attention to the patient's socioeconomic status at the time of clinical management decision making including prescribing medications; however, the clinical benefits and risks of such differential prescribing have not been investigated. Although prescribers were defendants claiming differentials were in the favor of the patient, in ideal clinical practice patients should not be screened differently.

Physicians seem to prescribe cheaper medicines to poorer patients. If the quality of the cheaper medicines is equivalent to their expensive counterparts, this seems to result in extra financial charges to be afforded by the rich. However, the quality of medicine in the developing country has been severely criticized since, according to an estimate, fake medicines constitute up to 25% of medicines consumed in developing countries [20]. To uproot inequities in healthcare delivery, recently, medical schools recognized the need to increase training in cultural competence and causes of healthcare disparities [21].

4.1 Limitations of the study

Our results may be interpreted considering the following limitations. Firstly, although the scoring rate during the two Delphi rounds was higher than previous studies included a panel of physicians, the sample size was considerably small; a larger sample should have given more reliable data. Secondly, although half of the sample recruited originated from rural areas, all physicians studied and lived in urban areas; the new living circumstances could affect their perception of the socioeconomic status. Finally, physicians in Pakistan are subject to widely criticized dubious industry-led promotional campaigns; each firm persuades physicians to prescribe its own branded medicines. There is a possibility of biased conclusions due to the complex physician-industry relationship since general practitioners consider the pharmaceutical industry as a primary source of information [22,23].

5. Conclusion

Based on our findings, it can be concluded that inequities in healthcare delivery occur in clinical practice since physicians perceive socioeconomic status differently. Also, it seems that physicians pay important attention to patient's socioeconomic status and, hence, screen them differently when making clinical management decisions including prescribing drugs. Patient's occupation, income, wealth, ability to pay healthcare charges, education and certain social and personal attributes are

important indicators influencing physician's prescribing behavior. Further studies are still needed to help designing and implementing strategies to eliminate inequities in healthcare delivery.

Conflict of interests

Authors have nothing to declare.

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