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Self-Perceived Barriers to Eye Care in a Hard-to-Reach Population: The Karachi Marine Fishing Communities Eye and General Health Survey

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PURPOSE. We examined self-reported barriers to eye care among marginalized, hard-to-reach fishing communities in Karachi, Pakistan.

METHODS. The Karachi Marine Fishing Communities Eye and General Health Survey was a cross-sectional survey conducted between March 2009 and April 2010 in fishing communities in Keamari, Karachi, located on the coast of the Arabian Sea. Adults aged ≥ 50 years living on seven islands and coastal areas were interviewed regarding sociodemographic background, experience of eye problems, eye care use, and barriers to access. They also were examined to determine visual acuity with a reduced logMAR chart and underwent a detailed eye examination.

RESULTS. Of 700 people planned to be included in the study, 638 (91.1%) were interviewed and examined. Of these participants, 599 (93.9%) lived in extreme poverty and 84.3% had no school-based education, and 349 (54.7%; 95% confidence interval [CI], 50.8-58.6) of them had never had an eye examination. The common barriers to access identified included a perceived lack of or low need (176/349 or 50.4%), financial hardships (36.4%), "fears" (8.6%), and social support constraints (6.3%). Of those reporting a "lack of need," 21.9% had significant visual loss. Financial hardships, "fears," and social support constraints were more prevalent among women than men. Bengalis compared to Kutchis and Sindhis, and individuals with "poor/fragile" household financial status (self-reported) compared to those with "fine" status, were more likely to cite financial hardships.

CONCLUSIONS. Access to eye care in this marginalized population is substantially hindered by perceived lack of need, financial hardships, and a range of "fears" and anxieties, despite a large unmet need. These barriers should be addressed while paying particular attention to gender, and ethnic and socioeconomic differences.

Keywords: Pakistan, eye health, equity, gender, ethnicity, inequalities, stigma, access, barriers, fishing communities

The World Health Organization (WHO) estimates that 285 million people worldwide have visual impairment.¹ Of these, 246 million have low vision and 39 million are blind. A total of 90% of all visual impairment occurs in low- and middle-income countries (LMICs) where access to eye care services remains uneven, with women, elderly, rural/remote dwellers, the poor, and those with no school-based education being at a substantial disadvantage. Recent population-based surveys in LMICs have described the extent to which cost, perceived lack of need, lack of information about the location of services, transport difficulties, and fears of adverse outcomes could impede access to cataract surgical services.²⁻⁹

The Karachi Marine Fishing Communities Eye and General Health Survey¹⁰ was designed to examine eye disease burden and access to eye care, and to assess eye health outcomes post care in a little-studied population of hard-to-reach fishing communities. The study sought to examine the argument that the Global Initiative for the Elimination of Avoidable Blindness, Vision 2020—The Right to Sight, and other eye health initiatives and

programs (international, national, or subnational) should pay direct attention to marginalized communities and their needs.

Marine fishing is one of the world's most dangerous occupations, with high rates of fatal and nonfatal injuries. These communities often have low literacy rates, and are very poor and isolated.¹¹ We recently reported that 54.7% (95% confidence interval [CI], 50.8-58.6) of people aged ≥ 50 years in these communities had never had an eye examination despite a high burden of visual loss, with ethnic Bengalis being the worst affected among them.¹⁰ We report our findings regarding self-perceived barriers to eye care use and their distribution by gender, ethnicity, and socioeconomic status in that sample.

METHODS

Study Design and Setting

The Karachi Marine Fishing Communities Eye and General Health Survey was a door-to-door, cross-sectional study of

marine fishing communities residing on seven islands and coastal areas in Keamari, one of the 18 towns in Karachi, Pakistan's most populous city, located on the Arabian Sea coast. The methods of this survey have been more fully described elsewhere.¹⁰

Briefly, this survey was undertaken from March 2009 to April 2010 on three islands, Baba, Bhit, and Shams Pir, and four coastal areas, Padar Ground, Kutchi Para, Babri Mosque, and Saddam Chowk. The last two mentioned are located in Machar Colony (literally "Mosquito Colony" in the Urdu language), one of the biggest slums in Karachi, inhabited by Bengali marine fishing communities. These seven areas were selected purposely to enable study of the three major ethnic marine fishing communities residing in Karachi: Kutchi, Bengali, and Sindhi. Common to these sites are high rates of diseases of poverty, and lack of water, sanitation, and other basic services.^{12,13}

Study Participants and Selection Process

The study was focused on males and females ≥ 50 years of age, given that worldwide two-thirds of all visual impairment, including blindness, occurs in this age group. Population lists for sampling were developed from a population census as this information is not available routinely. Maps of the selected localities were obtained from their respective administrative Union Councils. Each locality map was divided into clearly demarcated segments, such that each segment had roughly 150 to 250 households. One segment was selected from each locality map randomly using a lottery method and all households in that segment were listed. This sampling method (compact segment sampling) has been used previously in eye surveys in developing countries.^{3,14} The selected segments had a total of 1319 households which included 1255 people aged ≥ 50 years. Of these, 700 persons, 100 in each site, were selected randomly using random number generator software and were invited to participate in the research. Selected participants who were not present during the data collection period were not replaced in the sample.

Study procedures were explained to eligible individuals and their informed verbal consent was obtained before participation. Permission to conduct this research was obtained from the Federal Ministry of Health, Islamabad, and City District Government, Karachi. Ethical approval for the research was obtained from the Human Research Ethics Committee of The University of New South Wales (HREC 08181). This study adhered to the tenets of the Declaration of Helsinki.

Study Variables

Age of participants was ascertained through the event calendar method¹⁵ as many people in the pilot study had failed to satisfactorily answer the question "How old are you?" Participants were asked if they clearly remembered the following events: the creation of Pakistan (1947), the first (1965) and second (1971) wars between Pakistan and India, the creation of Bangladesh (1971), or the execution of Prime Minister Zulfikar Ali Bhutto (1979). If yes, they were asked how old they were when that particular event happened.

Ethnicity, defined as Kutchi, Sindhi, Bengali, Barmi, Mohajir (Urdu-speaking), or other, was ascertained by the question: "What is your ethnicity?" Measures of socioeconomic status (SES) included self-reported education level, occupation, household income, and self-reported financial status of the household. Perceived need was assessed by the question: "Do you have any eye or vision problems?" Positive and negative responses were recorded. Eye care use was elicited by asking "When was the last time you had an eye examination by an eye

doctor?" Self-perceived barriers to access were explored by asking those who had reported never having had an eye examination to list the reasons for this. Visual impairment, recorded for each eye and then for the better eye, was grouped based on presenting visual acuity as: none ($\geq 6/12$), mild ($<6/12-6/18$), moderate ($<6/18-6/60$), or severe ($<6/60-3/60$) visual impairment, and blindness ($<3/60$).¹⁶ In those participants in whom eye disease was diagnosed, referrals and care were provided through the not-for-profit Adamjee Eye Hospital, Karachi, Pakistan.

Data Collection Process

The study protocol was standardized before implementation. This included training of the assessment team and piloting. Our survey team comprised a study coordinator (interviews and managing study team), supervisor (managing equipment and supplies), refractionist (visual acuity measurements), ophthalmologist (eye examination), two local female workers (recruitment, translation where necessary, and assistance in vision testing), two local guides/social workers (community participation and household identification), and an ophthalmic technician (coordinating eye care). Next, a central survey workstation was established in each of the seven survey sites where interviews and eye examination were held: Baba Island (Office of Union Council), Bhit Island (a religious school), Padar Ground (a community center), Kutchi Para (a community center), Babri Mosque (the headquarters of a political party), and Saddam Chowk and Shams Pir Island (the headquarters of local fishermen). The same team traveled to each site and performed the same roles, using the same protocol.

Each subject underwent interview, autorefractometry, visual acuity measurement, and ophthalmic examination. Those who reported diabetes or whose vision was $<6/12$ in either eye not attributable to cataract, refractive error, or several other identifiable causes, underwent dilated posterior segment examination. The Reduced LogMAR chart was used to assess visual acuity because it is considered more accurate than Snellen's chart.¹⁶ All data were recorded on a survey instrument specifically designed for this survey.

Statistical Methods

All data were entered in Microsoft Access (Microsoft Corporation, Redmond, WA, USA) databases by two trained data entry operators independently of each other. The two data files were compared in FoxPro (Microsoft Corporation) and inconsistencies in data entry edited by consulting the original data. Next, data were checked against 10% original forms to verify quality. Data were analyzed using SPSS for Windows version 19.0 (IBM SPSS, Inc., Chicago, IL, USA). For the present analysis, age was categorized into three groups: 50 to 59, 60 to 69, and ≥ 70 years, and, for some, into two: 50 to 59 and ≥ 60 years.

Responses to the open-ended question regarding self-reported financial status of the household enabled grouping into two categories: "fine" and "poor/fragile." Per capita income was calculated by dividing total household income by the number of people living in the household and structured into quartiles to create four groups of near-equal size. For ease of comparison, information on income in Pakistan rupees was converted into US dollars using mid-year exchange rate in 2009 (1 US dollar = 80.70 Pakistan rupees).

The frequencies and proportions of people who had never had an eye examination were computed for the total study sample and subgroups. Content analysis was performed to classify responses into thematic categories concerning self-perceived barriers. These included perceived lack of need, financial hardships, "fears," social support constraints, coex-

TABLE 1. Demographic and Socioeconomic Characteristics of Survey Participants ($n = 638$)

| Characteristic | Male, $n = 314$ | | Female, $n = 324$ | | All, $n = 638$ | |
|---|-----------------|------|-------------------|------|----------------|------|
| | Frequency | % | Frequency | % | Frequency | % |
| Age group, y | | | | | | |
| 50-59 | 159 | 50.6 | 188 | 58.0 | 347 | 54.4 |
| ≥60 | 155 | 49.4 | 136 | 42.0 | 291 | 45.6 |
| Marital status | | | | | | |
| Married | 271 | 86.3 | 182 | 56.2 | 453 | 71.0 |
| Widowed/separated/divorcee | 39 | 12.4 | 135 | 41.7 | 174 | 27.3 |
| Never married | 4 | 1.3 | 7 | 2.2 | 11 | 1.7 |
| Ethnicity* | | | | | | |
| Kutchi | 133 | 42.4 | 171 | 52.8 | 304 | 47.6 |
| Bengali | 92 | 29.3 | 76 | 23.5 | 168 | 26.3 |
| Sindhi | 68 | 21.7 | 59 | 18.2 | 127 | 19.9 |
| Others | 21 | 6.7 | 18 | 5.6 | 39 | 6.1 |
| Work status | | | | | | |
| Marine fishing | 133 | 42.4 | 0 | .0 | 133 | 20.8 |
| Other occupation | 103 | 32.8 | 101 | 31.2 | 204 | 32.0 |
| “Housewife” | 0 | .0 | 187 | 57.7 | 187 | 29.3 |
| Retired/do not do any work | 53 | 16.9 | 13 | 4.0 | 66 | 10.3 |
| Unable to do any work | 25 | 8.0 | 23 | 7.1 | 48 | 7.5 |
| Education† | | | | | | |
| Any | 81 | 25.8 | 19 | 5.9 | 100 | 15.7 |
| None | 233 | 74.2 | 305 | 94.1 | 538 | 84.3 |
| Financial status of the household‡ | | | | | | |
| “Fine” | 65 | 20.7 | 58 | 17.9 | 123 | 19.3 |
| “Poor/fragile” | 249 | 79.3 | 266 | 82.1 | 515 | 80.7 |
| Daily per capita income of the household, US dollars§ | | | | | | |
| ≤0.36 | 80 | 25.5 | 72 | 22.2 | 152 | 23.8 |
| 0.37-0.52 | 89 | 28.3 | 79 | 24.4 | 168 | 26.3 |
| 0.53-0.77 | 75 | 23.9 | 84 | 25.9 | 159 | 24.9 |
| ≥0.78 | 70 | 22.3 | 89 | 27.5 | 159 | 24.9 |

* Others included 8 Barmis, 3 Balochs, 8 Muhajirs, 18 Pakhtuns, and 2 Punjabis.

† Any education included one or more years of school-based education.

‡ Financial status of the household was examined by asking survey participants how their household financial status was. Their responses to this open-ended question were grouped into two categories: “fine” and “poor/fragile.”

§ The distribution of survey participants into income groups is based on quartile analysis. Information on income was collected in Pakistan rupees and for ease of comparison, converted into US dollars using mid-year exchange rate in 2009 (1 US dollar = 80.70 Pakistan rupees).

isting health problems, health seeking behavior/belief problems, lack of information about the location of available services, geographic access issues, distrust in health systems, and “cultural” issues. Frequencies and percentages were computed for each response category for gender, ethnicity, and socioeconomic status. These proportions were compared across subgroups using the χ^2 or Fisher’s exact test, as appropriate.

Further analysis examined evidence of eye problems, visual impairment, and blindness among those with perceived lack of need for an eye examination ($n = 160$) relative to those who mentioned other reasons ($n = 173$). Subsequently, a multiple logistic regression analysis was performed to identify factors independently associated with perceived lack of need for an eye examination (yes/no) among individuals who reported not having had an eye examination in the past ($n = 333$). Covariates with $P \leq 0.2$ in the univariate analysis were selected for the multivariate analysis, statistical significance for which was set at $P < 0.05$.

RESULTS

Of 700 sampled persons, 638 (91.1%) were interviewed and examined (Table 1). Reasons for nonparticipation included being away from home ($n = 45$), refusals ($n = 16$), and mental illnesses ($n = 1$). Of study participants, 314 (49.2%) were men and 324 (50.8%) women; 304 (47.6%) were ethnic Kutchis, 168 (26.3%) Bengali, and 127 (19.9%) Sindhis. Overall, 93.9% (95% CI, 91.7–95.6) participants lived in extreme poverty (<US \$1.25 per day), 80.7% reported their household financial status as “poor/fragile,” and 84.3% had no formal school-based education (Table 1).

Overall, 349 (54.7%; 95% CI, 50.8–58.5%) of the survey participants reported never having had an eye examination (hereafter termed “never users,” Table 2). When asked why they had not done so, 306 (87.7%) cited one, 42 (12.0%) two, and only one person (0.3%) three reasons. As shown in Table 3, the most commonly reported perceived barrier to access was “lack of need or low need” (50.4% or 176/349), followed by financial hardships (36.4%), “fears” (8.6%), social support

TABLE 2. Proportion of Participants Who Reported Never Having Had an Eye Examination, by Gender (*n* = 638)

| Characteristic | Male | | Female | | All | |
|---|-------------|---|-------------|---|-------------|---|
| | Interviewed | Never Had Eye Examination Frequency (%) | Interviewed | Never Had Eye Examination Frequency (%) | Interviewed | Never Had Eye Examination Frequency (%) |
| All | 314 | 189 (60.2) | 324 | 160 (49.4) | 638 | 349 (54.7) |
| Age group, y | | | | | | |
| 50-59 | 159 | 104 (65.4) | 188 | 104 (55.3) | 347 | 208 (59.9) |
| ≥60 | 155 | 85 (54.8) | 136 | 56 (41.2) | 291 | 141 (48.5) |
| Marital status | | | | | | |
| Married | 271 | 167 (61.6) | 182 | 96 (52.7) | 453 | 263 (58.1) |
| Widowed/separated/divorcee | 39 | 18 (46.2) | 135 | 63 (46.7) | 174 | 81 (46.6) |
| Never married | 4 | 4 (100.0) | 7 | 1 (14.3) | 11 | 5 (45.5) |
| Ethnicity* | | | | | | |
| Kutchi | 133 | 60 (45.1) | 171 | 71 (41.5) | 304 | 131 (43.1) |
| Bengali | 92 | 72 (78.3) | 76 | 55 (72.4) | 168 | 127 (75.6) |
| Sindhi | 68 | 44 (64.7) | 59 | 29 (49.2) | 127 | 73 (57.5) |
| Others | 21 | 13 (61.9) | 18 | 5 (27.8) | 39 | 18 (46.2) |
| Work status | | | | | | |
| Marine fishing | 133 | 85 (63.9) | 0 | 0 | 133 | 85 (63.9) |
| Other occupation | 103 | 63 (61.2) | 101 | 63 (62.4) | 204 | 126 (61.8) |
| “Housewife” | 0 | 0 | 187 | 83 (44.4) | 187 | 83 (44.4) |
| Retired/do not do any work | 53 | 24 (45.3) | 13 | 6 (46.2) | 66 | 30 (45.5) |
| Unable to do any work | 25 | 17 (68.0) | 23 | 8 (34.8) | 48 | 25 (52.1) |
| Education† | | | | | | |
| Any | 81 | 43 (53.1) | 19 | 6 (31.6) | 100 | 49 (49.0) |
| None | 233 | 146 (62.7) | 305 | 154 (50.5) | 538 | 300 (55.8) |
| Financial status of the household‡ | | | | | | |
| “Fine” | 65 | 45 (69.2) | 58 | 28 (48.3) | 123 | 73 (59.3) |
| “Poor/fragile” | 249 | 144 (57.8) | 266 | 132 (49.6) | 515 | 276 (53.6) |
| Daily per capita income of the household, US dollars§ | | | | | | |
| ≤0.36 | 80 | 42 (52.5) | 72 | 36 (50.0) | 152 | 78 (51.3) |
| 0.37-0.52 | 89 | 56 (62.9) | 79 | 42 (53.2) | 168 | 98 (58.3) |
| 0.53-0.77 | 75 | 43 (57.3) | 84 | 41 (48.8) | 159 | 84 (52.8) |
| ≥0.78 | 70 | 48 (68.6) | 89 | 41 (46.1) | 159 | 89 (56.0) |
| Self-reported eye/vision problem | | | | | | |
| No | 80 | 60 (75.0) | 51 | 31 (60.8) | 131 | 91 (69.5) |
| Yes | 234 | 129 (55.1) | 273 | 129 (47.3) | 507 | 258 (50.9) |
| Diabetes | | | | | | |
| Yes | 18 | 4 (22.2) | 32 | 13 (40.6) | 50 | 17 (34.0) |
| No | 296 | 185 (62.5) | 292 | 147 (50.3) | 588 | 332 (56.5) |
| Visual impairment | | | | | | |
| No | 218 | 138 (63.3) | 176 | 90 (51.1) | 394 | 228 (57.9) |
| Yes | 96 | 51 (53.1) | 148 | 70 (47.3) | 244 | 121 (49.6) |

* Others included 8 Barmis, 3 Balochs, 8 Muhajirs, 18 Pakhtuns, and 2 Punjabis.

† Any education included one or more years of school-based education.

‡ Financial status of the household was examined by asking survey participants how their household financial status was. Their responses to this open-ended question were grouped into two categories: “fine” and “poor/fragile.”

§ The distribution of survey participants into income groups is based on quartile analysis. Information on income was collected in Pakistan rupees and for ease of comparison, converted into US dollars using mid-year exchange rate in 2009 (1 US dollar = 80.70 Pakistan rupees).

constraints (6.3%), health seeking behavior/belief problems (2.6%), coexisting health problems (2.3%), and lack of information about the location of available services (2.3%). A higher proportion of men compared to women (66.1%; 95% CI, 59.1-72.5 vs. 31.9%; 95% CI, 25.1-39.5; $P < 0.001$) cited no need, no eye/vision problem, or low need, as reasons for not having had an eye examination in the past. The three other

major barriers to access were significantly more prevalent among women than men: financial hardships (45.0%; 95% CI, 37.5-52.7 vs. 29.1%; 95% CI, 23.1-36.0; $P < 0.01$), “fears” (16.3%; 95% CI, 11.3-22.8 vs. 2.1%; 95% CI, 0.6-5.5; $P < 0.001$), and social support constraints (12.5%; 95% CI, 8.2-18.6 vs. 1.1%; 95% CI, 0.04-4.03; $P < 0.001$). Social support related constraints included no one at home to assist with childcare,

TABLE 3. Gender Differences in Self-Perceived Barriers to Eye Care Among Those Who Reported Never Having Had an Eye Examination ($n = 349$)

| Self-Perceived Barrier* | Male, $n = 189$ Frequency (%) | Female, $n = 160$ Frequency (%) | All, $n = 349$ Frequency (%) | P^\dagger |
|--|----------------------------------|------------------------------------|---------------------------------|-------------|
| Perceived lack of need‡ | 125 (66.1) | 51 (31.9) | 176 (50.4) | <0.001 |
| Financial hardships§ | 55 (29.1) | 72 (45.0) | 127 (36.4) | <0.01 |
| “Fears”¶ | 4 (2.1) | 26 (16.3) | 30 (8.6) | <0.001 |
| Social support constraints | 2 (1.1) | 20 (12.5) | 22 (6.3) | <0.001 |
| Coexisting health problems | 3 (1.6) | 5 (3.1) | 8 (2.3) | 0.339 |
| Health seeking behavior/belief problems** | 8 (4.2) | 1 (0.6) | 9 (2.6) | <0.05 |
| Lack of information about the location of available services | 1 (0.5) | 7 (4.4) | 8 (2.3) | <0.05 |
| Geographic access problems | 2 (1.1) | 2 (1.3) | 4 (1.1) | 0.867 |
| Distrust in health systems†† | 4 (2.1) | 0 (0) | 4 (1.1) | 0.064 |
| “Cultural” issues ‡‡ | 0 (0) | 2 (1.3) | 2 (0.6) | 0.123 |

* Because of multiple responses, respondents were able to indicate more than one reason, hence, percentages add up to more than 100%. Of 638 participants, 349 persons who never had an eye examination were included. Of 349 persons, 306 (87.7%) cited one, 42 (12.0%) mentioned two, and one person (0.3%) mentioned three reasons.

† P values were computed by χ^2 test. Where the expected cell values in the table fell below 5, Fisher's exact test (2-tailed) was used. $P < 0.05$ indicates statistical significance.

‡ Perceived lack of need included “did not have an eye problem,” vision was fine, eyes were fine/healthy, no need felt, or the need was not great.

§ Financial hardships included “lack of money to afford eye care” and lack of time due to work responsibilities.

¶ “Fears” cited included fears of operation, doctor, hospital, injections, closed and crowded spaces, violence in the city, police, and being diagnosed with new diseases.

|| Social support constraints included lack of someone at home to take care of kids/patient/young daughters, “difficulty walking,” language barriers, “lack of escort,” and anxiety.

** Health seeking behavior/belief problems included fatalistic attitudes and “old age” and belief that nothing can be done about decreased vision/eye problems.

†† Distrust in health systems included other's bad experiences at the service.

‡‡ “Cultural” issues included “no permission from husband” or purdah.

sick family member, young daughters with no one to accompany them, or inability to obtain leave. Women voiced fears of eye operations and their poor outcomes; fears of hospitals, doctors and injections; fears of being in a crowded or closed environment; and fears of violence in the city.

While none of the 349 never users mentioned lack of availability of service as a barrier, eight (2.3%) people (seven women) mentioned lack of information about service locations as a barrier. One woman each cited difficulty in getting permission from her husband or purdah (the practice in certain societies of screening women from men or strangers). Distrust in health systems and coexisting health problems were reported by four and eight persons, respectively.

There also were significant differences in the distribution of the two most cited reasons, lack of need and financial constraints, by ethnicity and socioeconomic status (Tables 4, 5). Perceived lack of need for an eye examination was more prevalent among Sindhis (69.9%; 95% CI, 58.5–79.2) compared to Kutchis (55.0%; 95% CI, 46.4–63.2) and Bengalis (32.3%; 95% CI, 24.8–40.9). By contrast, financial hardships were more prevalent among Bengalis (52.0%; 95% CI, 43.4–60.5) compared to Kutchis (31.3%; 95% CI, 24.0–39.7) and Sindhis (19.2%; 95% CI, 11.7–29.9). Similarly, individuals with self-reported “poor/fragile” financial status of the household compared to those self-assessed as “fine” were more likely to cite financial hardships (41.3%; 95% CI, 35.7–47.2 vs. 17.8%; 95% CI, 10.6–28.3; $P < 0.001$), while less likely to cite lack of need (45.7%; 95% CI, 39.9–51.6 vs. 68.5%; 95% CI, 57.1–78.0; $P < 0.01$) as barriers (Table 5).

Tables 6 and 7 show the results of subgroup analyses of evidence of significant eye problems among those with perceived lack of need for an eye examination. Of them, 55.0% had at least one self-reported eye problem and 21.9% had significant visual loss (<6/12) in their better eye at presentation. Next, a multiple logistic regression analysis identified factors associated with perceived lack of need for

an eye examination (yes/no), as shown in Table 8. These included gender ($P < 0.001$), ethnicity ($P < 0.001$), presenting vision ($P = 0.013$), and the presence of at least one self-reported eye problem ($P < 0.001$). Ethnic Bengalis, women, those with significant visual loss, and those with self-reported eye problems were substantially less likely to cite lack of need as a reason for not having had an eye examination in the past compared to their respective reference groups.

DISCUSSION

We present the results of content analysis of self-perceived barriers to eye care seeking identified by a hard-to-reach and marginalized population, which often is neglected in policy and health research. The barriers most frequently cited were perceived lack of need (50.4%), financial hardships (36.4%), “fears” (8.6%), and social support constraints (6.3%). Women were more likely to report financial hardships, “fears,” and social support constraints, while men were more likely than women to report no need to seek eye care.

The WHO estimates that two-thirds of all visual impairment, including blindness, worldwide occurs in people 50 years of age or older and that much of it is avoidable.¹⁷ Therefore, adequate and regular access to eye care is of particular importance in this age group. In our study, perceived lack of need was the main barrier to seeking an eye examination. Indeed, one of every five people who cited lack of need or low need had significant visual loss (<6/12 in the better eye at presentation), while more than half of them had at least one eye disease symptom, indicating substantial discordance between population-perceived needs and medically defined needs.

The perceived lack of need we identified can be attributed to misperceptions that visual loss is a normal part of aging and, in most cases, untreatable. It also may be related to the interplay between individual, sociodemographic, and socio-

TABLE 4. Ethnic Differences in Self-Perceived Barriers to Eye Care Among Those Who Reported Never Having Had an Eye Examination ($n = 349$)

| Self-Perceived Barrier* | Ethnicity | | | | P† |
|---|------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|--------|
| | Kutchi, $n = 131$ Frequency (%) | Bengali, $n = 127$ Frequency (%) | Sindhi, $n = 73$ Frequency (%) | Others, $n = 18$ Frequency (%) | |
| Perceived lack of need‡ | 72 (55.0) | 41 (32.3) | 51 (69.9) | 12 (66.7) | <0.001 |
| Financial hardships§ | 41 (31.3) | 66 (52.0) | 14 (19.2) | 6 (33.3) | <0.001 |
| “Fears”¶ | 15 (11.5) | 3 (2.4) | 9 (12.3) | 3 (16.7) | <0.05 |
| Social support constraints | 9 (6.9) | 12 (9.4) | 0 (0) | 1 (5.6) | 0.068 |
| Coexisting health problems | 1 (0.8) | 4 (3.1) | 3 (4.1) | 0 (0) | 0.350 |
| Health-seeking behavior/belief problems** | 3 (2.3) | 5 (3.9) | 1 (1.4) | 0 (0) | 0.598 |
| Lack of information about the location of available services | 0 (0) | 7 (5.5) | 1 (1.4) | 0 (0) | 0.022 |
| Geographic access issues | 3 (2.3) | 1 (0.8) | 0 (0) | 0 (0) | 0.438 |
| Distrust in health system†† | 0 (0) | 4 (3.1) | 0 (0) | 0 (0) | 0.070 |
| “Cultural” issues‡‡ | 0 (0) | 1 (0.8) | 1 (1.4) | 0 (0) | 0.620 |

* Because of multiple responses, respondents were able to indicate more than one reason, hence, percentages add up to more than 100%. Of 638 participants, 349 persons who never had an eye examination by an eye doctor were included. Of 349 persons, 306 (87.7%) cited one, 42 (12.0%) mentioned two, and one person (0.3%) mentioned three reasons.

† P values were computed by χ^2 test. Where the expected cell values in the table fell below 5, Fisher's exact test (2-tailed) was used. $P < 0.05$ indicates statistical significance.

‡ Perceived lack of need included “Did not have an eye problem,” vision was fine, eyes were fine/healthy, no need felt, or the need was not great.

§ Financial hardships included “lack of money to afford eye care” and lack of time due to work responsibilities.

¶ “Fears” cited included fears of operation, doctor, hospital, injections, closed and crowded spaces, violence in the city, police, and being diagnosed with new diseases.

|| Social support constraints included lack of someone at home to take care of kids/patient/young daughters, “difficulty walking,” language barriers, “lack of escort,” and anxiety.

** Health seeking behavior/belief problems included fatalistic attitudes and “old age” and belief that nothing can be done about decreased vision/eye problems.

†† Distrust in health systems included other's bad experiences at the service.

‡‡ “Cultural” issues included “no permission from husband” or purdah.

TABLE 5. Differences in Household Financial Status in Self-Perceived Barriers to Eye Care Among Those Who Reported Never Having Had an Eye Examination ($n = 349$)

| Self-Perceived Barriers† | Self-Reported Financial Status of the Household* | | | P‡ |
|--|--|--|---------------------------------|--------|
| | “Fine,” $n = 73$ Frequency (%) | “Poor/Fragile,” $n = 276$ Frequency (%) | All, $n = 349$ Frequency (%) | |
| Perceived lack of need§ | 50 (68.5) | 126 (45.7) | 176 (50.4) | 0.001 |
| Financial hardships¶ | 13 (17.8) | 114 (41.3) | 127 (36.4) | <0.001 |
| “Fears” | 8 (11.0) | 22 (8.0) | 30 (8.6) | 0.418 |
| Social support constraints** | 2 (2.7) | 20 (7.2) | 22 (6.3) | 0.159 |
| Coexisting health problems | 3 (4.1) | 5 (1.8) | 8 (2.3) | 0.243 |
| Health-seeking behavior/belief problems†† | 3 (4.1) | 6 (2.2) | 9 (2.6) | 0.353 |
| Lack of information about the location of available services | 0 (0) | 8 (2.9) | 8 (2.3) | 0.141 |
| Geographic access issues | 0 (0) | 4 (1.4) | 4 (1.1) | 0.301 |
| Distrust in health system‡‡ | 1 (1.4) | 3 (1.1) | 4 (1.1) | 0.840 |
| “Cultural” issues§§ | 0 (0) | 2 (0.7) | 2 (0.6) | 0.466 |

* Financial status of the household was examined by asking survey participants how their household financial status was. Their responses to this open-ended question were grouped into two categories: “fine” and “poor/fragile.”

† Because of multiple responses, respondents were able to indicate more than one reason, hence, percentages add up to more than 100%. Of 638 participants, 349 persons who never had an eye examination by an eye doctor were included. Of 349 persons, 306 (87.7%) cited one, 42 (12.0%) mentioned two, and one person (0.3%) mentioned three reasons.

‡ P values were computed by χ^2 test. Where the expected cell values in the table fell below 5, Fisher's exact test (2-tailed) was used. $P < 0.05$ indicates statistical significance.

§ Perceived lack of need included “Did not have an eye problem,” vision was fine, eyes were fine/healthy, no need felt, or the need was not great.

¶ Financial hardships included “lack of money to afford eye care” and lack of time due to work responsibilities.

|| “Fears” cited included fears of operation, doctor, hospital, injections, closed and crowded spaces, violence in the city, police, and being diagnosed with new diseases.

** Social support constraints included lack of someone at home to take care of kids/patient/young daughters, “difficulty walking,” language barriers, “lack of escort,” and anxiety.

†† Health seeking behavior/belief problems included fatalistic attitudes and “old age” and belief that nothing can be done about decreased vision/eye problems.

‡‡ Distrust in health systems included other's bad experiences at the service.

§§ “Cultural” issues included “no permission from husband” and purdah.

TABLE 6. Prevalence of Eye Disease Symptoms Among Participants Who Cited Lack of Need as the Only Reason for Not Having Had an Eye Examination ($n = 160$) in Comparison With Those Who Cited Other Reasons ($n = 173$)

| Variable | Cited Reason | | |
|--|--|---|-----------------------------------|
| | Lack of Need Alone, $n = 160$ Frequency (%) | Other Reasons, $n = 173$ Frequency (%) | Total, $n = 333$ Frequency (%) |
| At least 1 eye problem | 88 (55.0) | 157 (90.8) | 245 (73.6) |
| Type of self-reported eye problem | | | |
| Vision problems | | | |
| Near vision problem | 41 (25.6) | 66 (38.2) | 107 (32.1) |
| Distance vision problem | 15 (9.4) | 23 (13.3) | 38 (11.4) |
| Near and distance vision problems | 6 (3.8) | 18 (10.4) | 24 (7.2) |
| Cloudy vision | 11 (6.9) | 33 (19.1) | 44 (13.2) |
| Difficulty recognizing face/bus number | 5 (3.1) | 14 (8.1) | 19 (5.7) |
| Trouble with night vision | 4 (2.5) | 11 (6.4) | 15 (4.5) |
| Headache due to vision problems | 4 (2.5) | 6 (3.5) | 10 (3) |
| Reduced vision in 1 eye | 4 (2.5) | 3 (1.7) | 7 (2.1) |
| Total loss of vision in both eyes | 0 (0) | 4 (2.3) | 4 (1.2) |
| Diplopia, double vision | 3 (1.9) | 1 (0.6) | 4 (1.2) |
| Glare | 1 (0.6) | 1 (0.6) | 2 (0.6) |
| Floaters | 0 (0) | 1 (0.6) | 1 (0.3) |
| Reduced vision due to diabetes | 0 (0) | 1 (0.6) | 1 (0.3) |
| Dry/itchy eyes | | | |
| Watering eyes | 12 (7.5) | 17 (9.8) | 29 (8.7) |
| Burning eyes | 2 (1.3) | 3 (1.7) | 5 (1.5) |
| Itchy eyes | 5 (3.1) | 4 (2.3) | 9 (2.7) |
| Scratchy eyes | 0 (0) | 3 (1.7) | 3 (0.9) |
| Painful eyes | 4 (2.5) | 1 (0.6) | 5 (1.5) |
| Dirty discharge | 1 (0.6) | 0 (0) | 1 (0.3) |
| Other | | | |
| Fleshy growth in the eye | 0 (0) | 1 (0.6) | 1 (0.3) |

TABLE 7. Prevalence of Visual Impairment, Blindness, and the Degree of Self-Reported Visual Disability Among Participants Who Cited Lack of Need Alone and Those Who Cited Other Reasons For Not Having Had an Eye Examination in the Past

| Variable | Cited Reason | | |
|--|--|---|-----------------------------------|
| | Lack of Need Alone, $n = 160$ Frequency (%) | Other Reasons, $n = 173$ Frequency (%) | Total, $n = 333$ Frequency (%) |
| Presenting visual acuity | | | |
| $\geq 6/12$ | 125 (78.1) | 93 (53.8) | 218 (65.5) |
| $< 6/12-6/18$ | 15 (9.4) | 26 (15.0) | 41 (12.3) |
| $< 6/18-6/60$ | 17 (10.6) | 40 (23.1) | 57 (17.1) |
| $< 6/60-3/60$ | 3 (1.9) | 8 (4.6) | 11 (3.3) |
| $< 3/60$ | 0 (0) | 6 (3.5) | 6 (1.8) |
| Total | 160 (100) | 173 (100) | 333 (100) |
| Degree of difficulty in near work | | | |
| No difficulty | 91 (57.2) | 46 (26.9) | 137 (41.5) |
| Some difficulty | 33 (20.8) | 25 (14.6) | 58 (17.6) |
| A lot of difficulty | 15 (9.4) | 26 (15.2) | 41 (12.4) |
| Cannot do at all | 20 (12.6) | 74 (43.3) | 94 (28.5) |
| Total | 160 (100) | 173 (100) | 333 (100) |
| Degree of difficulty recognizing faces | | | |
| No difficulty | 124 (78.0) | 71 (41.5) | 195 (59.1) |
| Some difficulty | 18 (11.3) | 32 (18.7) | 50 (15.2) |
| A lot of difficulty | 6 (3.8) | 15 (8.8) | 21 (6.4) |
| Cannot do at all | 11 (6.9) | 53 (31) | 64 (19.4) |
| Total | 159 (100) | 171 (100) | 330 (100) |

TABLE 8. Univariate and Multiple Logistic Regression Analysis of Factors Associated With the Perception of Lack of Need Among Individuals Who Reported Not Having Had an Eye Examination in the Past ($n = 333$)

| Characteristic | Subjects | Cited Reason | | Crude Odds Ratio (95% CI) | Adjusted Odds Ratio (95% CI) |
|---|----------|---|--|------------------------------|---------------------------------|
| | | Lack of Need Alone, $n = 160$ Frequency (%) | Other Reasons, $n = 173$ Frequency (%) | | |
| Age, y | | | | | |
| 50-59 | 200 | 87 (43.5) | 113 (56.5) | 1.0 | 1.0 |
| 60-69 | 82 | 49 (59.8) | 33 (40.2) | 1.93 (1.14-3.25) | 2.22 (1.12-4.40) |
| ≥70 | 51 | 24 (47.1) | 27 (52.9) | 1.15 (0.62-2.14) | 1.38 (0.59-3.24) |
| All | 333 | 160 (48.0) | 173 (52.0) | | |
| <i>P</i> value* | | | | 0.048 | 0.073 |
| Gender | | | | | |
| Male | 179 | 115 (64.2) | 64 (35.8) | 4.35 (2.74-6.91) | 4.84 (2.71-8.65) |
| Female | 154 | 45 (29.2) | 109 (70.8) | 1.0 | 1.0 |
| <i>P</i> value | | | | <0.001 | <0.001 |
| Ethnicity | | | | | |
| Kutchi | 128 | 69 (53.9) | 59 (46.1) | 1.0 | 1.0 |
| Bengali | 122 | 36 (29.5) | 86 (70.5) | 0.36 (0.21-0.6) | 0.24 (0.12-0.47) |
| Sindhhi | 68 | 46 (67.6) | 22 (32.4) | 1.79 (0.97-3.31) | 1.34 (0.62-2.90) |
| Others | 15 | 9 (60.0) | 6 (40.0) | 1.28 (0.43-3.81) | 0.85 (0.24-3.01) |
| <i>P</i> value | | | | <0.001 | <0.001 |
| Financial status of the household† | | | | | |
| “Fine” | 69 | 46 (66.7) | 23 (33.3) | 2.63 (1.51-4.59) | 1.93 (0.94-3.97) |
| “Poor/fragile” | 264 | 114 (43.2) | 150 (56.8) | 1.0 | 1.0 |
| <i>P</i> value | | | | 0.001 | 0.072 |
| Daily per capita income of household, US dollars‡ | | | | | |
| ≤0.36 | 74 | 27 (36.5) | 47 (63.5) | 1.0 | 1.0 |
| 0.37-0.52 | 92 | 50 (54.3) | 42 (45.7) | 2.07 (1.11-3.88) | 1.8 (0.82-3.94) |
| 0.53-0.77 | 79 | 38 (48.1) | 41 (51.9) | 1.61 (0.84-3.08) | 1.5 (0.66-3.42) |
| ≥0.78 | 88 | 45 (51.1) | 43 (48.9) | 1.82 (0.97-3.43) | 1.18 (0.52-2.68) |
| <i>P</i> value | | | | 0.128 | 0.468 |
| Presenting vision | | | | | |
| ≥6/12 | 218 | 125 (57.3) | 93 (42.7) | 3.07 (1.90-4.96) | 2.35 (1.19-4.61) |
| <6/12 | 115 | 35 (30.4) | 80 (69.6) | 1.0 | 1.0 |
| <i>P</i> value | | | | <0.001 | 0.013 |
| Presence of ≥1 eye symptom/problem | | | | | |
| No | 88 | 72 (81.8) | 16 (18.2) | 8.03 (4.40-14.65) | 6.79 (3.35-13.73) |
| Yes | 245 | 88 (35.9) | 157 (64.1) | 1.0 | 1.0 |
| <i>P</i> value | | | | <0.001 | <0.001 |

* The *P* values are from univariate and multiple logistic regression. $P < 0.05$ indicates statistical significance.

† Financial status of the household was examined by asking survey participants how their household financial status was. Their responses to this open ended question were grouped into two categories: “fine” and “poor/fragile.”

‡ The distribution of survey participants into income groups is based on quartile analysis. Information on income was collected in Pakistan rupees and for ease of comparison, converted into US dollars using midyear exchange rate in 2009 (1 US dollar = 80.70 Pakistan rupees).

cultural factors, along with the responsiveness of health systems to population concerns and the level of health literacy within the community. Over the past two decades, population-based surveys across several LMICs, including in Pakistan,¹⁸⁻²⁵ have consistently shown a lack of felt need to be a predominant barrier to seeking cataract surgery among people with cataract. This is all the more concerning given that cataract is the world's leading cause of visual impairment, including blindness. More recent studies demonstrate little improvement in these data.

Financial hardships were major barriers to eye care in this population, especially for ethnic Bengalis, women, and those living in poor households. On some levels, this is not surprising given the lack of healthcare insurance and the high out-of-

pocket health care expenses relative to income of the population. Of people in this population, 93.9% (95% CI, 92.0-95.7) lived in extreme poverty (<US \$1.25 per day) and most people needed to pay out-of-pocket for health care services in the city. These barriers should be recognized and addressed as there appears to be a common perception that the city of Karachi, in which these communities live, has one of the highest concentrations of health care facilities in the country, including a number that provide free or subsidized eye care services. Ethnic Bengalis had some of the lowest rates of eye care use, and were less likely to cite lack of need as a barrier compared to other groups. This suggests that they would be receptive to ophthalmic care if the provision of services were to be financially accessible.

Various “fears,” notably of enclosed spaces and overcrowded places, prevented a significant proportion of the surveyed population from seeking eye care. Of those who cited “fears,” 86.7% were women, which also could be related to the relatively poor outcome of cataract surgery among women than men. We found that women were substantially more likely to have borderline or poor visual outcome after cataract surgery than men (Ahmad et al.¹⁰ unpublished observations, 2014). To dispel these “fears,” access to appropriate eye health-related education and information, a long-ignored aspect of eye care in LMICs, must be promoted as should improvement in quality of cataract surgery and other eye care services.

Our results also suggested that a significant number of participants did not trust the health system and that this deterred them from seeking eye care. Such distrust often stems from negative experiences in health systems, such as instances of poor processes (insensitivity, carelessness, lack of respect, and excessive waiting) or poor outcomes (lack of benefit from or adverse consequences of interventions), resulting in delays in, or absence of, care seeking and reliance on alternative treatments. More detailed examination of the context in which such distrust occurs and what can be done about it is warranted.²⁶

In contrast with previous reports,¹⁸ neither service availability nor their geographic access was a significant concern for this population. Both of these factors have been shown to be important barriers to the uptake of cataract surgery in LMICs. The study population is positioned in close proximity to a significant number of health facilities, including those providing eye care services.

The strengths of this analysis include exploring a largely neglected dimension of eye health in LMICs, a relatively large population-based sample of a hard-to-reach marginalized population, and the use of an open-ended question to examine barriers to care, carefully analyzed using content analysis, and investigating differences in barriers by gender, ethnicity, and socioeconomic status.

Our analysis has several limitations, however. First, we did not have an adequate control population with which to compare the results of our study population. Fishing communities often are self-contained communities, largely isolated from mainstream society. Although attempts were made to collect representative samples from the mainstream nonfishing populations in Karachi, the prevailing security situation did not allow this. Second, approximately 12% of the participants cited more than one reason for nonuse of services and we did not ascertain which was the primary cause at the time of data collection. Finally, the self-reported nature of our survey may have led to an overestimate or underestimate of the true magnitude of some of the barriers.

In summary, this study identified barriers to access to eye care encountered by a marginalized and hard-to-reach population with large unmet needs, and about whose eye health very little is known. For the vast majority of people in this population, access to eye care services was hindered by perceived lack of need, financial hardships, “fears,” and distrust of health care systems. These were compounded by significant variations by gender, ethnicity, and socioeconomic status. Our findings are drawn from people aged ≥ 50 years, an age group that accounts for approximately two-thirds of all visual impairment, including blindness, worldwide. The knowledge deficits identified by this study underscore the need for effective health education, information programs, and health literacy more generally. These should stress the importance of regular eye examinations, especially in the presence of deteriorating vision, for older adults while addressing misconceptions, such as that visual loss is a normal part of aging and, in most cases, untreatable.

Such barriers should be addressed with particular attention to financial needs of women, ethnic Bengalis, and those with low socioeconomic status. Additional surveys in fishing populations and other marginalized populations in LMICs are needed to better assess and more rapidly address the under-recognized needs of these marginalized populations.

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