CHARACTERISTICS OF IMMUNIZATION PROVIDERS IN RIYADH AND THEIR SELF-PERCEPTION OF COMPETENCY

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Objectives: To study the demographic characteristics of immunization providers in Riyadh City and their self-perception of competency.

Methods: A cross-sectional study was conducted among immunization providers in Riyadh City from August 2003 to March 2004. This study covered 71 institutions: (25 primary health care centers, 30 private clinics and dispensaries, 8 government hospitals and 8 private hospitals). Immunization providers were selected by stratified random process. One hundred and one physicians participated in the study and the data were obtained by self-administered questionnaires, tabulated and analyzed using appropriate statistics.

Results: The participating physicians were mostly pediatricians (50.5%) and general practitioners (38.6%). About 47% of them had had no training in immunization during the preceding 10 years. Self-evaluation revealed that 30.7% of them ranked themselves as excellent, 67.3% as average and 2.0% as poor immunization providers. Self-confidence was associated with specialty, qualification, place of work, years of experience and training on immunization (p<0.05). Most of participating doctors (83.7%) used books as their references. The doctors were least

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confident in vaccinating pregnant and lactating women and the vaccination of travelers to endemic areas.

Conclusion: To improve immunization services, doctors should be trained before being involved in this practice. There should be frequent distribution of national and international protocols with the auditing of the practice to improve and sustain a highly effective service.

Key Words: Vaccination, Immunization provider, Self-Perception and Saudi Arabia.

INTRODUCTION

One of the most important medical developments in the twentieth century has been the control of once common childhood infectious diseases by the administration of highly effective vaccines. The goal of a vaccination program is to prevent disease and thereby promote optimal patient and public health. The reported cases of diphtheria, measles, mumps, pertussis, poliomyelitis, rubella and tetanus have declined by 97 percent or more since 1921 in the United States due to the administration of highly effective vaccines. WHO estimates that three million cases of disease could be avoided annually with an appropriate prevention by vaccination.

Several factors have been cited to explain why both providers and parents choose not to immunize children. Little is known, however, about how physicians' knowledge of vaccine contraindications shapes their beliefs and immunization practices. Several studies have shown that physicians miss valuable opportunities to immunize children in situations that are not true contraindications to vaccination. It is not clear if these missed opportunities stem from a real misunderstanding of contraindication or from the providers' particular beliefs about immunization. Cohen et al. observed that 50% of physicians would not give the MMR vaccine to a child living with a family member who is receiving chemotherapy and one third would not administer it to a child living with an HIV-infected person. Misconceptions about contraindication to vaccine use are frequently the cause of unnecessary delay in the administration of vaccines. A greater understanding of why providers miss opportunities to immunize could lead to focused efforts to change providers' immunization practices. Vaccination for childhood diseases was initiated in Saudi Arabia in the first half of the sixties. Since 1979, birth certificates are withheld for six months until essential vaccinations have been completed. Consequently, the coverage rate of primary immunization in recent years has exceeded 91%. The 2002 vaccination program in Saudi Arabia included BCG, Hepatitis B, oral polio, MMR, Hib and DPT vaccines.

To achieve an effective disease prevention program, we should have qualified doctors, cooperative patients and well-developed health system. Doctors' mistakes and poor knowledge of immunizations could be very harmful. Therefore, it is important to evaluate the competence of immunization providers.

The characteristics of immunization providers in Saudi Arabia have not been evaluated. The objective of this survey was to study the demographic characteristics and self-perception of the competency of immunization providers in health institutions in Riyadh City.

METHODS

A cross-sectional study was conducted among immunization providers in Riyadh City during the period of August 2003 to March 2004. The sampling process was stratified by random sampling technique. The field work of the study started after permission to interview doctors in the health facilities was taken from health authorities in Riyadh. They provided us with a written list of various categories of health institutions in Riyadh. This included "primary health care centers, private clinics and dispensaries, government hospitals and private hospitals". The estimated representative sample according to the distribution of providers, patients' coverage rates and the previous reports was 60 health institutions, but 71 institutions were included in the study. Health institutions were stratified according to their activities: government hospitals, private hospitals, primary health care centers, and private clinics. Randomly, 25 primary health care centers were selected from the 74 primary health care centers, 30 private clinics
selected from the 240 private clinics, 8 government hospitals selected from the 12 government hospitals and 8 private hospitals selected from the 12 private hospitals. All immunization providers working in the selected institutions during the study period were invited to participate in the study. One hundred and one physicians out of 115 took part, but 14 of them declined to participate (12.2% refusal rate).

A self-administered questionnaire consisting of 2 pages with 24 items, 11 of which were on demographic characteristics and 13 on self-evaluation in different immunization aspects was presented to each participant. The data were extracted, tabulated and analyzed using the Chi-square test for testing the association between the different variables. Yates corrected P-value was used if needed. EPI-INFO program was used for data analysis.

RESULTS
A hundred and one physicians participated in this study. Their age range was 25-60 years (38.2 ± 7.4 years). Sixty (59.4 %) of them were males and 41 (40.6 %) were females. With regard to their nationalities, 25 (24.8 %) were Saudis and 76 (75.2 %) were non-Saudis. The physicians belonged to various specialties and had varying qualifications. Fifty one (50.5%) were pediatricians and 39 (38.6%) were general practitioners, 27 (26.7%) were diploma holders and about one third (29.7%) had MBBS only. The participating physicians worked in different health institutions. Thirty one (30.7%) were in government hospitals, 27 (26.7 %) in private clinics, 25 (24.8 %) in primary care centers and 18 (17.8%) in private hospitals (Table 1).

Most of the participants (82.2 %) did immunization as a part of their assignment. Although 67 (66.3%) of the participants felt that they needed training in immunization, only 48 (47.5%) had attended such training in the preceding 10 years.

Table 2 compares between physicians' self-evaluation of immunization skills and different demographic factors. Thirty one (30.7%) physicians ranked themselves as excellent, 68 (67.3%) as average and 2 (2%) as poor. Self-evaluation was not associated with age, sex or nationality (p>0.05). However, the state of self-evaluation was associated with specialty. Four (57.1%) of the Family physicians considered themselves as excellent, the majority of Pediatricians 32 (63.7%) and General practitioners 30 (76.9 %) were graded as average, whereas none of the other specialists considered himself excellent (p=0.01). Qualification also affected self-confidence, physicians with PhD 6 (75%) and MS 8 (57.1%) degrees ranked themselves as excellent, whereas those with MBBS 24 (80%) and Diploma 21(77.8%) considered themselves average (p=0.02). Half of the physicians working in private hospitals and clinics 11 (40.7%) were considered excellent. All physicians ranked poor were working in primary care centers (p=0.002). The experience of the physician in immunization was directly and positively related with self-evaluation (p=0.01). Twenty three (44.2%)
Table 2: Factors affecting the doctors' personal evaluation of immunization in Riyadh, 2004

| Item                | Personal evaluation |          |          | Total No. (%) | p-value |
|---------------------|---------------------|----------|----------|---------------|---------|
|                     | Excellent No. (%)   | Average No. (%) | Poor No. (%) |               |         |
| Age:                |                     |          |          |               |         |
| 25 - 34             | 5 (15.6)            | 26 (81.3) | 1 (3.1)  | 32 (31.7)    | 0.23    |
| 35 - 44             | 19 (38.8)           | 29 (59.2) | 1 (2.0)  | 49 (48.5)    |         |
| > 44                | 7 (35.0)            | 13 (65.0) | 0 (0.0)  | 20 (19.8)    |         |
| Sex:                |                     |          |          |               | 0.21    |
| Male                | 18 (30.0)           | 42 (70.0) | 0 (0.0)  | 60 (59.4)    |         |
| Female              | 13 (31.7)           | 26 (63.4) | 2 (4.9)  | 41 (40.6)    |         |
| Specialty:          |                     |          |          |               | 0.01    |
| Family medicine     | 4 (57.1)            | 3 (42.9)  | 0 (0.0)  | 7 (6.9)      |         |
| Pediatrician        | 19 (37.3)           | 32 (62.7) | 0 (0.0)  | 51 (50.5)    |         |
| G. P.               | 8 (20.5)            | 30 (76.9) | 1 (2.6)  | 39 (38.6)    |         |
| Others              | 0 (0.0)             | 3 (75.0)  | 1 (25.0) | 4 (4.0)      |         |
| Nationality:        |                     |          |          |               | 0.26    |
| Saudi               | 5 (20.0)            | 20 (80.0) | 0 (0.0)  | 25 (24.8)    |         |
| Non Saudi           | 26 (34.2)           | 48 (63.2) | 2 (2.6)  | 76 (75.2)    |         |
| Qualification:      |                     |          |          |               | 0.02    |
| MBBS                | 5 (16.7)            | 24 (80.0) | 1 (3.3)  | 30 (29.7)    |         |
| Board               | 7 (31.8)            | 15 (68.2) | 0 (0.0)  | 22 (21.8)    |         |
| Diploma             | 5 (18.5)            | 21 (77.8) | 1 (3.7)  | 27 (26.7)    |         |
| PhD                 | 6 (75.0)            | 2 (25.0)  | 0 (0.0)  | 8 (7.9)      |         |
| MS                  | 8 (57.1)            | 6 (42.9)  | 0 (0.0)  | 14 (13.9)    |         |
| Place of work:      |                     |          |          |               | 0.00    |
| Governmental hospital | 5 (16.1)           | 26 (83.9) | 0 (0.0)  | 31 (30.7)    |         |
| Private hospital    | 9 (50.0)            | 9 (50.0)  | 0 (0.0)  | 18 (17.8)    |         |
| Primary health care center | 6 (24.0)    | 17 (68.0) | 2 (8.0)  | 25 (24.8)    |         |
| Private clinic      | 11 (40.7)           | 16 (59.3) | 0 (0.0)  | 27 (26.7)    |         |
| Years of experience: |                   |          |          |               | 0.01    |
| < 1 yr              | 0 (0.0)             | 12 (85.7) | 2 (14.3) | 14 (13.9)    |         |
| 1–3 yrs             | 2 (10.5)            | 17 (89.5) | 0 (0.0)  | 19 (18.8)    |         |
| 4–6 yrs             | 6 (37.5)            | 10 (62.5) | 0 (0.0)  | 16 (15.8)    |         |
| > 6 yrs             | 23 (44.2)           | 29 (55.8) | 0 (0.0)  | 52 (51.5)    |         |
| Reason for choosing this work: |   |          |          |               | 0.75    |
| Interest            | 5 (27.8)            | 13 (72.2) | 0 (0.0)  | 18 (17.8)    |         |
| Assigned work       | 26 (31.3)           | 55 (66.3) | 2 (2.4)  | 83 (82.2)    |         |
| Having training on immunization in the last 10 yrs: | |          |          |               | 0.01    |
| Yes                 | 22 (42.3)           | 30 (57.7) | 0 (0.0)  | 53 (52.5)    |         |
| No                  | 9 (18.8)            | 37 (77.1) | 2 (4.2)  | 48 (47.5)    |         |
| Total               | 31 (30.7)           | 68 (67.3) | 2 (2.0)  | 101 (100)    |         |

Table 3: Association between doctors' needs to have training in immunization and self-evaluation in Riyadh, 2004

| Do you feel that you need training in vaccination? | Yes No. (%) | No. (%) | Total No. (%) | p-value |
|--------------------------------------------------|-------------|---------|---------------|---------|
| **Self-evaluation:**                             |             |         |               | 0.01    |
| Excellent                                        | 14 (45.1%)  | 17 (54.9%) | 31 (30.7%)    |         |
| Average                                          | 51 (75.0%)  | 17 (25.0%) | 68 (67.3%)    |         |
| Poor                                             | 2 (100%)    | 0 (0.0%)  | 2 (2.0%)      |         |
| Total                                            | 67 (66.3%)  | 34 (33.7%) | 101 (100)%    |         |

of the doctors with more than six years experience considered themselves as excellent whereas those with less than one year of experience ranked themselves as poor. About 40% of the physicians ranked as excellent had received training in immunization during the preceding 10 years while all physicians ranked as poor had had no training in immunization during the same period (p= 0.01).
Figure 1: Sources of physicians’ information on immunization in Riyadh, 2004

Table 4: References used by doctors in Riyadh as indicated in evaluation, 2004

| Type of references          | Excellent No. (%) | Average No. (%) | Poor No. (%) | Total No. (%) |
|-----------------------------|-------------------|-----------------|--------------|---------------|
| Books                       | 27 (32.9)         | 54 (65.9)       | 1 (1.2)      | 82 (83.7)     |
| International protocols     | 18 (60.0)         | 12 (40.0)       | 0 (0.0)      | 30 (30.6)     |
| National protocols          | 13 (36.1)         | 22 (61.1)       | 1 (2.8)      | 36 (36.7)     |
| Journals                    | 11 (35.5)         | 20 (64.5)       | 0 (0.0)      | 31 (31.6)     |
| Internet                    | 1 (33.3)          | 2 (66.7)        | 0 (0.0)      | 3 (3.1)       |
| Lectures                    | 0 (0.0)           | 2 (100)         | 0 (0.0)      | 2 (2.0)       |

Table 5: Doctors' satisfaction with different immunization situations in Riyadh, 2004

| Situation                                  | Satisfied No. (%) | Feeling some difficulties No. (%) | Poor No. (%) |
|--------------------------------------------|-------------------|----------------------------------|--------------|
| Doses of immunization                      | 83 (82.2)         | 13 (12.9)                        | 5 (5.0)      |
| Contraindications of immunization          | 76 (75.2)         | 19 (18.8)                        | 6 (5.9)      |
| Vaccine combination                        | 74 (73.3)         | 20 (19.8)                        | 7 (6.9)      |
| Storage of immunization                    | 72 (71.3)         | 20 (19.8)                        | 7 (6.9)      |
| Immunization of preterm child              | 72 (71.3)         | 25 (24.8)                        | 4 (4.0)      |
| Immunization of a child who missed some doses | 71 (70.3)         | 28 (27.7)                        | 2 (2.0)      |
| Immunization of child with allergy         | 62 (61.4)         | 34 (33.7)                        | 5 (4.9)      |
| Immunization of immunocompromised child    | 58 (57.4)         | 34 (33.7)                        | 9 (8.9)      |
| Immunization of child with specific condition | 58 (57.4)         | 33 (33.0)                        | 10 (9.9)     |
| Immunization of pregnant woman             | 50 (49.5)         | 28 (27.7)                        | 23 (22.7)    |
| Immunization of lactating woman            | 46 (45.5)         | 26 (25.7)                        | 29 (28.7)    |
| Immunization of travelers to endemic areas | 46 (45.5)         | 35 (34.7)                        | 20 (19.8)    |

Table 3 shows the relation between doctors' perceived need to have training in immunization and self-evaluation. All the doctors who were poor in self-evaluation and 14 (45.1%) who ranked excellent and 51 (75%) ranked average considered that training in immunization will have a positive impact on their work.

Figure 1 shows physicians' sources of information about immunization. The most common source was books, whereas lectures and
the internet were the least frequently used (2.0% and 3.1%, respectively).

Table 4 compares between doctors' self-evaluation and their sources of information about immunization. Eighteen (60%) of the doctors who were using international protocols as their references evaluated themselves as excellent.

Table 5 reports doctors' satisfaction with their knowledge and practice in different immunization situations. The doctors were least satisfied with the vaccination of pregnant women 23 (22.7%), lactating women 29 (28.7%) and travelers to endemic areas 20 (19.8%).

DISCUSSION
The aim of this paper was to study the demographic characteristics and self-perception of the competence of immunization providers and to give an overall recommendation to improve the immunization service.

The listing of the characteristics of the participating physicians noticed that male to female ratio was 3:2. A similar result was reported in a study done by Cohen et al. Although Family physicians were involved in immunization, Pediatricians constituted about half of the providers. Similarly, in the United States, Pediatricians were two to three times more involved in immunization than Family Physicians. This finding seems to be in agreement with schedule of immunization which takes place during the early years of childhood.

Effective immunization services depend on the providers' good knowledge and proper qualification. In this study about one third of the immunization providers had no qualification beyond the MBBS. However, in the USA, Prislin et al, reported better results and considered the knowledge of their immunization providers satisfactory. Immunization providers in the private health centers were fewer than in the public ones. The majority of the children were vaccinated in government institutions while in the USA, children were vaccinated four times more in the private sector than in the public sector. This finding may be explained by the fact that the free health services provided by the government here increases the patients' attendance in government institutes.

Doctors' self-confidence was influenced by their specialty. Pediatricians were more confident in dealing with immunization than other specialists. Other investigators had drawn similar conclusions. Pediatricians differ from Family physicians in terms of training, practice settings, and continuing medical education courses they take. This reflects on their immunization practices and attitudes. The self-confidence of the doctors was also influenced by their qualification. Holders of PhD and MS were more confident than the rest. This could be attributed to their advanced knowledge and years of experience. However, Szilagyi et al, observed that physicians who were recent graduates of medical schools were more confident than older graduates. Another factor affecting the doctors' self-confidence is the place of work. The study showed that doctors working in private health centers were more confident than those working in government ones. This is probably because of the more rigorous recruitment specifications, better training, good supervision and better facilities in most private institutions. Most of the physicians believed that their confidence and performance improved in places with better facilities.

Physicians depended more on books than other resources as their source of information about immunization. This may be due to the easy availability and acquisition of books. Very confident doctors depended more on international protocols that carry recently updated information. However, national protocols were not sufficiently utilized by immunization providers. Similar findings were reported by others.

Training in immunization has been acknowledged as having a good impact on the doctors' confidence and performance. Fortunately, more than two thirds of the participating doctors realized their need to have training in immunization.

Immunization providers were concerned about the vaccination of pregnant and lactating women and travelers to endemic areas. However, appropriate traveler advice and immunizations can tilt the odds in the travelers' favor. Half of the doctors participating in this study were Pediatricians who did not deal with such situations frequently.

Though this study dealt with an important issue, there were many limitations to it. The dependent variable (competency level) was subjective on the part of the respondent. A
physician may consider himself "excellent" but may not be so. The study represented self-reported practices that did not reflect what physicians actually did in their offices. The result of self-perception could be validated by another study related to their knowledge, attitude and practice on immunization. Furthermore, these results cannot be generalized to cover all of the country.

In conclusion, immunization in Riyadh is mainly conducted by males, Pediatricians and doctors with no postgraduate qualification. Self-confidence is relatively higher among Pediatricians, holders of PhD and MS, physicians working in private hospitals and those with more than four years of experience. National and International protocols were less frequently used. The majority of immunization providers did not have enough experience in dealing with situations not related to childhood immunization.

To improve immunization services, physicians should be given the appropriate training. This training would have a positive impact on their performance. Frequent distribution of national and international protocols on immunization, as well as proper regular auditing practice would hopefully improve and sustain an effective service.

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