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A case of childhood vaccination barrier: migrant and seasonal farmworkers

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Aim: The Expanded Program on Immunization has proven to be one of the most effective public health strategies. However, the literature contends that medically disadvantaged groups have been associated with less compliance with vaccination calendars and schedules. The aim of this cross-sectional survey was to investigate the vaccination coverage of the children of migrant and seasonal farmworkers (MSFs) and to identify their specific barriers to vaccination.

Materials and methods: A total of 168 children aged 12–23 months were recruited to the study from a primary healthcare center. Data were collected through a structured questionnaire targeting the issues of infant vaccination status, the reasons for vaccination failure, and sociodemographic data about the children and their families.

Results: Childhood vaccination coverage in MSF children was found to be low (49.4%). Significantly, a relationship was found between having a vaccination card and vaccination coverage ($P < 0.05$). The majority of reasons for a child's vaccination failure as reported by caregivers were related to overall insufficient knowledge of vaccination. Other important reasons for failures in the vaccination of MSF children that were reported by caregivers were neglect and laboring in the agricultural field.

Conclusion: Migrant and seasonal farmwork seems to be a barrier in accessing primary healthcare services.

Key words: Child, vaccination, migrant workers, agriculture

1. Introduction

The Expanded Program on Immunization (EPI) has proven to be one of the most effective public health strategies, resulting in a dramatic reduction in the incidence of many communicable diseases. However, the literature contends that immigrants, some rural populations, and minorities have been associated with less compliance with vaccination calendars and schedules (1,2).

The EPI started its operations in Turkey in 1981 when all vaccinations were provided free of charge in the primary healthcare centers located throughout Turkey (3). According to the 2008 Turkish Demographic and Health Survey Report, the complete vaccination coverage rate for children aged between 12 and 23 months in Turkey was 74.6% (4). However, in the Southeast Anatolia region, complete vaccination coverage was below the national average (66.7%), indicating a large gap in service utilization (4,5). Many studies have examined the barriers to childhood immunization, such as families' lack of knowledge or inaccurate perceptions about vaccines, inadequate transportation, inconvenient office hours, long queues, poverty, missed opportunities, religious and cultural factors, family size, the number of siblings, family mobility, health staff's attitudes, parents' education level, minority status, race, and political instability (5–11). Existing studies also reveal that, in general, children of migrant farmworkers rarely enjoy preventive care (10,12); however, there are only a few studies defining the magnitude of risk that these immunization rates pose. Farmworkers' health service utilization is limited by their migrant lifestyles, lack of enabling resources, linguistic and cultural differences, lack of documentation, and the limited number of healthcare facilities in the agricultural areas of the world. Mobility also makes follow-up care (e.g., growth monitoring and immunization) and long-term care (e.g., for tuberculosis or diabetes) difficult to provide (13).

Determining a population's vaccination status, identifying medically disadvantaged groups, and targeting vaccination barriers are critical steps in improving the intervention programs that promote vaccination in a health district.

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The aim of this cross-sectional survey was to investigate the vaccination coverage of the children of migrant and seasonal farmworkers (MSF) and to identify their specific barriers to vaccination.

2. Materials and methods

2.1. Study area

This cross-sectional survey was conducted from January to March 2008 in Şanlıurfa, in southeastern Turkey. Şanlıurfa, where MSFs mostly live, is located in the Southeast Anatolia Region, one of the least developed regions of the country.

2.2. Study population

The average MSF household size per family is 8.4 ± 2.8. Of the father population, 58.9% have completed primary school, whereas only 7.1% of the mother population have a primary school degree (14). Furthermore, 84.8% of the MSFs have an annual income of US$306–1829 (15).

The total number of MSF families is estimated to be 124,630, constituting 25% of Şanlıurfa's urban population. Some MSF families work annually for a single employer during the harvest season and return home at the end of the season. Others "follow the crops", moving a few times per season between 23 different cities to perform specialized work such as hoeing beets or harvesting cotton (16).

This survey was carried out within the catchment areas of the Ertuğrulgazi Primary Healthcare Center, which provides health services to communities characterized by poverty, low income, and low education level, with nearly 70% of families working as MSFs.

2.3. Definitions

A MSF is defined as an individual whose principal employment is in agriculture, who moves from farm to farm between cities, and who has established a temporary home on a seasonal basis within the past 1 year.

The term "illiterate" refers to people who have never gone to regular school, some of whom may possess reading skills.

Many MSF families use the free health services card, a health insurance instrument that the Turkish government furnishes to people with low income.

2.4. Sample size determination

Children aged 12–23 months were recruited for this study.

Sample size was calculated using the table provided by Lwanga and Lemeshow (17). In this calculation, the anticipated complete vaccination coverage proportion (P) of 0.65 (4,5) was used, with a precision of 0.08 based on the 95% confidence interval. We inflated the sample size by design effect 1.2 to account for the cluster sampling (18), resulting in a sample size of 168.

The streets were used as cluster sampling units. We identified 12 streets for each of the 12 clusters and constructed tables of random numbers out of the streets in the study areas. A total of 12 clusters were determined, each of which included 14 participants. After explaining to the household what the study aimed to accomplish and what we needed them to do, we asked them if they wanted to participate. When people did not want to participate, we went to the next household. By this method, we continued our search for participants until we achieved 14 MSF children for each cluster.

2.5. Variables

The dependent variable was vaccination coverage. For the purposes of this study, "complete vaccination status" comprises 1 dose each of the Bacillus Calmette–Guérin (BCG) and measles–mumps–rubella vaccines, and 3 doses each of the oral polio vaccine, diphtheria–tetanus–pertussis, hepatitis B, and *Haemophilus influenzae* type B vaccines. "Incomplete vaccination" entails having missed some of these vaccinations and "no vaccination" is having not received any of these vaccinations.

Independent variables were child's age, sex, health insurance, vaccination card, disability status, household size, mother's education, and father's education.

2.6. Data collection

This project was carried out according to the Helsinki Declaration principles, and ethics committee approval was received. Data were collected with a structured questionnaire focused on infant vaccination, reasons for vaccination failure, and sociodemographic data about the children and their families. The questionnaire was conducted via face-to-face interviews by researchers. Mothers or caregivers provided information on the children's vaccination status and the reasons for immunization failure.

The vaccination status of each child was determined by inspection of the vaccination cards. If the child did not have a vaccination card, the vaccination status was determined by interviewing the mother or another caretaker who was knowledgeable about the child.

2.7. Data analysis

The chi-square test and the Mann–Whitney U test were used for statistical analyses. The Kolmogorov–Smirnov test was used in testing for normality. If the data did not meet the normal distribution, then the Mann–Whitney U test was used.

Predictive factors were included in subsequent models if they were significantly associated at the $P < 0.05$ level with any outcome variable in the bivariate analysis.

In the bivariate analysis, both the "never vaccinated" variable and the "incomplete vaccination" variable were included in the analyses as one variable, the "incomplete vaccination" variable.

All data were analyzed using SPSS 11.5.

3. Results

3.1. Characteristics of the MSF children

In this study, the mean age was 16.9 ± 3.6 months and 46.4% of children were female. The mean household size was 8.2 ± 2.6 people. Most of the children had health insurance (85.7%) and 29.2% of the children had vaccination cards. It was found that 6.5% of the children had mental and/or orthopedic disabilities. While 95.2% of mothers were illiterate, 39.9% of the fathers were illiterate.

3.2. Vaccination status

In this study, 49.4% of children (n = 83) were fully vaccinated, while 39.3% (n = 66) had incomplete vaccine coverage and 11.3% (n = 19) had never been vaccinated. Vaccination coverage statuses for MSF children are shown in the Figure.

Factors related to vaccination coverage

Variables affecting vaccination coverage are shown in Tables 1 and 2.

We found no relationship between vaccination coverage and child's age, mother's age, household size, sex, disabilities, health insurance, mother's education, or father's education in the bivariate analysis. We only found a significant relationship between having a vaccination card and vaccination coverage.

Mothers and caregivers reported the reasons for not having a vaccination card as follows: 24% (n =12), reported that they did not keep the vaccination cards because they thought that the vaccines were completed; 36.7% (n = 18) reported that they lost the card; and 38.8% (n = 19) reported that they were never given a vaccination card because they never received vaccinations.

No significant relationship was found between having a vaccination card and the number of family members (Mann–Whitney U = 2670, P = 0.38), mothers' age (Mann–Whitney U = 2201.5, P = 0.28), child's age (Mann–Whitney U = 2359.5, P = 0.051), child's sex (χ^2 = 2.61, P = 0.10), child's disability (Fisher's exact test, P = 0.30), health insurance (χ^2 = 1.47, P = 0.22), mothers' education level (Fisher's exact test, P = 0.69), and fathers' education level (χ^2 = 0.00, P = 0.98).

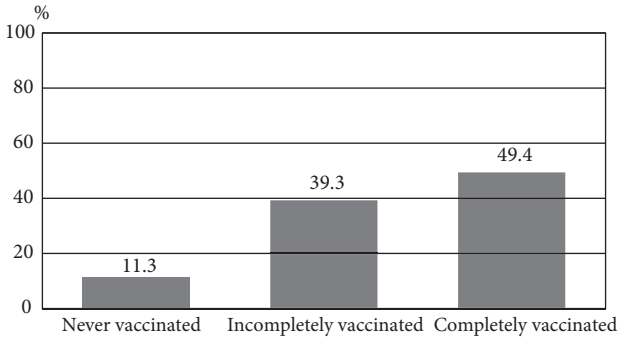

Figure. Vaccination coverage of migrant and seasonal farmworkers' children.

Reasons for vaccination failure in children as reported by their caregivers were as follows: unawareness of the need for vaccination (20.8%, n = 36), fear of side effects (11.9%, n = 20), working in the agricultural field (10.7%, n = 18), neglect (9.5%, n = 16), and not knowing the place and time of vaccinations (6.5%, n = 11).

4. Discussion

Vaccination is among the most important forms of medical care in the context of pediatric health. In this study, the complete vaccination percentage was found to be 49.4%, which is below the DHS-2008 vaccination percentage (66.7%) among children in the southeastern region (4). The overall vaccination status among children of MSF families is thus quite deplorable. According to the research results, this is mainly attributable to not having a vaccination card. When the results are considered, it is possible to claim that migrant and seasonal agricultural farm laboring leads to a decrease in the vaccination levels, or, in other words, the vaccination failure, of children

Table 1. The effects of child's age, mother's age, and household size as independent variables for vaccination coverage.

		Mean ± SD	M–W U*	P
Age	Incomplete vaccination	17.2–3.7	3075.0	0.14
	Complete vaccination	18.1–3.5		
Household size	Incomplete vaccination	8.5 ± 2.9	3165.5	0.24
	Complete vaccination	7.9 ± 2.3		
Mother's age	Incomplete vaccination	36.1 ± 10.0	2993.0	0.98
	Complete vaccination	36.4 ± 11.0		

*Mann–Whitney U test.

Table 2. Variables affecting vaccination coverage.

Independent variables		Incomplete vaccination		Complete vaccination		Significance	
		n	%*	n	%*	χ^2	P
Sex	Female	42	53.8	36	46.2	0.39	0.52
	Male	43	47.8	47	52.2		
Disabilities	Present	4	36.4	7	63.6	0.44	0.50
	Absent	81	51.6	76	48.4		
Health insurance	Absent	74	51.4	70	48.6	0.08	0.77
	Present	11	45.8	13	54.2		
Vaccination card	Absent	37	75.5	12	24.5	**15.8**	**<0.001**
	Present	48	40.3	71	59.7		
Mother's education	Illiterate	83	51.9	77	48.1	**	0.16
	Literate	2	25	6	75.0		
Father's education	Illiterate	38	56.7	29	43.3	1.28	0.25
	Literate	47	46.5	54	53.5		

*Row percentage, **Fisher's exact test.

through 2 mechanisms. The first is the families' scarce resources and the challenging living conditions in the agricultural field. Likewise, Rahman and Obaida-Nasrin reported that distance from a health facility was found to be a significant predicator of full immunization (9).

Nevertheless, 9.5% of agricultural laborer parents openly admitted that they neglected their children's vaccination, while 10.7% attributed their neglect to laboring in the field. In another study conducted in Şanlıurfa, 27.3% of agricultural laborer parents openly admitted that they neglected their children's vaccination (19). Research indicates that only 44.3% of female agricultural farmworkers received 2 doses of tetanus toxoid vaccination, while only 52.9% receive prenatal care and 42.5% have given birth at home without the assistance of a healthcare professional (20). As is evident, parents not only neglect their children's needs, but also neglect their own. In a study carried out in Diyarbakır, some parents (30.0%) declared that they had no time because of their own work to go to healthcare centers for their children's vaccinations (21). In another study conducted in Kahramanmaraş, the results demonstrated that BCG vaccination is insufficient in rural areas (22).

In fact, the existence of serious health problems in this disadvantaged group cannot be explained exclusively by poverty and low education rates. Additional factors contributing to the region's deteriorating health include limited access to health and education services and the use of child labor. It seems very difficult to attempt to prevent vaccination failure within the first mechanism.

Secondly, there is a lack of organized effort on behalf of the healthcare systems. Consider the following: as is known, children in rural areas may be at high risk for both under-immunization and poorly documented immunization (23). The fact that the governmental units, especially the healthcare system, are not prepared for the agricultural residency and the migrant lifestyle of an estimated 2 million people further aggravates the vaccination failure rate (24).

This study joins previous studies in finding a positive relationship between immunization status and the possession of an immunization card. The practice of keeping an immunization card was also found to be associated with increased complete vaccination (25–27). Similarly, in a study from Diyarbakır, it was reported that failure to receive a vaccination card or the loss of the vaccination card had a negative effect on the level of immunization (21).

Vaccination cards serve many functions: they inform both the parents and healthcare personnel of the vaccination status of the child, as well as the timeliness and the periodicity of vaccinations. In addition, they alert one to any interruption in services, and remind the parents of the date of the next vaccination (28).

It is possible that the relationship between having a vaccination card and vaccination coverage simply reflects the results of forgetfulness on the part of caregivers whose children do not have an immunization card. In a prior study (29), vaccination coverage was found to be significantly higher amongst those who had a vaccination card (69.7%) than in those records assessed by a mother's memory (52.3%). Vaccination cards also prevent unnecessarily repeated doses (25,26,29).

Vaccination cards serve as a valuable cue for the caregiver or mother to take the child for immunization (25). Thus, an easy to understand and easy to read vaccination card was redesigned in a region in Pakistan for the local population. The new card was much larger than the existing card (15.5 × 11.5 cm when folded). On its outer sides, the card showed nothing but the next immunization date and day of the week for vaccine visits, written in a large font (Times New Roman 42, Microsoft Word) using preprinted stickers. It was stated that the new card is more effective than the older one in increasing vaccination coverage (30).

It is known that "owning a vaccination card" is one of the indispensable criteria in ensuring the "quality" of vaccination services and showing the continuity of the relationship between service providers and users (28). To increase vaccination coverage, there is a need for strengthening the quality of immunization services to ensure that children who come for services are provided with appropriate immunization cards and a for educating caregivers on the need to keep the immunization card in a safe place (25).

In a study conducted in Aydın, a city in the western part of Turkey, a quality of life indicator called "missing opportunity" was found to be higher in children who did not have a vaccination card (31).

Immunization records and the provision of a vaccination card are significantly related to each other. However, problems regarding the scattering of records may be especially important in rural areas in which children have providers in multiple counties or where distances between providers are large. For this reason, it is suggested that the establishment of a central electronic tracking and reminder system can significantly increase immunization rates (23).

Due to poverty, lack of education, and the drawbacks of migrant living conditions, MSF families require more basic healthcare services than the general population. Therefore, a system of mobile clinics was designed to provide primary healthcare for MSF families in agricultural areas (32). In turn, providers should check the vaccination records of all children who come into contact with the healthcare system.

The present study was constructed with limited information since there are few studies related to this vulnerable group in Turkey. As a further limitation, in this survey, vaccination information was reported by the mothers or caregivers in the population without vaccination cards, and this may cause a recall bias because of the low education status of the caregivers.

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