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A study of 0-14-year-old children's access to health centers in rural areas using a buffer model (a case study of villages based in Kermanshah province, Iran)

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Abstract:

INTRODUCTION: Children are among the most vulnerable groups in society, whose health is of prominent significance. Moreover, as a group of clients with special needs in the health care system, they require special attention. Therefore, the present study aimed to investigate the 0–14-year-old children's access to health centers in rural areas of Kermanshah Province, Iran.

MATERIALS AND METHODS: In the present cross-sectional study, both the latest published demographic statistics related to the Population and Housing Census, announced by the Statistical Center of Iran in 2011, and the information about the public and private hospitals in the province, collected by Kermanshah University of Medical Sciences, were used as the basis for the analyses. In addition, given the importance of the spatial nature of the research, geographic information system was used for data analysis, and a buffer model was also applied.

RESULTS: The results revealed that out of the total population of 0–14-year-old children residing in rural areas within 15,000 and 30,000-km radii of Kermanshah Province, 87.94% and 75.11% of girls versus 88.15% and 75.38% of boys lacked access to health centers, respectively.

CONCLUSION: It was found out that the 0–14-year-old children's access to health centers was in poor condition in rural areas of Kermanshah Province, which would endanger the health of this age group.

Keywords:

Child, geographic information system, health-care disparities, hospitals, rural health services

Introduction

Providing health for everyone in societies is among the fundamental rights of humans, which is known by the World Health Organization as the main social goal of societies, and its enjoyment is seen as the basis for sustainable development and one of the main pillars of social justice.[1-5] Hence, one of the goals of policymakers in the health sector in any country is facilitating access to health services, and hence that all walks of life can use these services properly.[6-8]

Not to mention, injustice is the presence of deliberate differences between the various social, geographical, and economic groups in societies that can be eliminated by proper interventions.[9-11] In this regard, research has it that inequality in the spatial distribution of health-care resources has posed serious problems to people's equal access to health-care services.[12,13] The results of studies have shown that what matters in

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the field of equity in health is the ability of the system to deliver suitable services, and the number of people who want to benefit from these services is the second priority.[14-16] Geographic information system (GIS) has not been used in the developing world countries to ensure that vulnerable populations have accessibility to health-care services. GIS led to the effective analysis of assessing hospitals, access to this type of service, geographical diversity, exploration of inequalities among people, and planning and provision of support and decision-making toward the equal provision of health services. Furthermore, GIS employed for better management and thus better access to health-care services. In this regard, children have always been regarded as a group of clients with special needs in the health care system who require special attention.[17,18] The results of other studies have also revealed that this age group is among the vulnerable groups who need appropriate services.[19-21] Similarly, the need for developing appropriate systems to support vulnerable children has been stressed in many other studies.[22,23]

As the results of other studies have shown, children are the most vulnerable age groups in societies, whose health is of the essence. Therefore, their timely access to health centers will maintain and improve the health of societies.[24,25] On the other hand, the results of other studies indicate that the residents of Kermanshah have not been adequately provided with treatment facilities, and the burden of disease and fertility have also been high in this province 13,24. Not to mention, out of a population of 1,941,715 in Kermanshah, 586,621 reside in rural areas, with 211,498 making up the children's age group.

Materials and Methods

Study design

In the present cross-sectional study, the 0–14-year-old children's access to health centers in rural areas of Kermanshah Province was investigated. Furthermore, both the latest published demographic statistics related to the Population and Housing Census, announced by the Statistical Center of Iran in 2011, and the information about the public and private hospitals in the province, collected by Kermanshah University of Medical Sciences, were used as the basis for the analyses.

Geographic information system

Given the importance of the spatial nature of the research, GIS was used for data analysis, and a buffer model was also applied. As for modeling, the base map of the province was used, whereby digitization was performed in the GIS environment. Then, boundaries were created for the areas under the coverage of health centers in terms of access to services using Buffer. The buffer routine traverses each of the input feature's vertices and creates buffer offsets. Output buffer features are created from those offsets. Creates buffer polygons around input features to a specified distance. Besides, the number of populations aged 0–14 years old with and without access was calculated through both Intersect and Symmetrical Difference Instruments (18 and 25). Further, the 0–14-year-old children's access to hospital centers residing in rural areas within 15,000 and 30,000-km radii of Kermanshah Province was considered in the present study.[26,27]

Results

The results revealed that out of the total population of 0–14-year-old children residing in rural areas within 15,000 and 30,000-km radii of Kermanshah Province, 87.94% and 75.11% of girls versus 88.15% and 75.38% of boys lacked access to health centers, respectively [Figure 1 and Table 1].

Discussion

Health is the most important social goal of societies and its enjoyment is seen as the basis of sustainable development and one of the main pillars of social justice. Moreover, proper policymaking in the health

Table 1: The population of 0-14-year-old children with and without access to health centers in rural areas of Kermanshah province

Gender	Population	15 km	30 km
Female	With access	7823 (12.06)	16,135 (24.89)
	Without access	57,005 (87.94)	48,693 (75.11)
	Total	64,828	64,828
Male	With access	8139 (11.85)	16,914 (24.62)
	Without access	60,557 (88.15)	51,782 (75.38)
	Total	68,696	68,696
The total sample population		133,524	

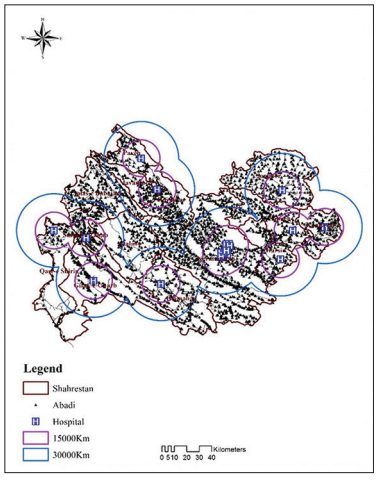

Figure 1: The areas under the coverage of hospital centers across the rural areas of Kermanshah province using a buffer model

sector in societies will facilitate access to health services. Therefore, the present study is aimed to investigate the 0–14-year-old children's access to health centers in rural areas of Kermanshah Province.

The results of the present study indicated that the 0–14-year-old children's access to health centers was in poor condition in rural areas of Kermanshah Province, which was consistent with the results of a study done by Eshrati *et al*.[28] Rechel *et al*.[29] and Rechel.[30] As stated in other studies, the inappropriate distribution of healthcare in developing countries has led to inequities in terms of access to health centers.[31] Moreover, lack of proper access to health centers in children's age groups has resulted in various diseases.[32,33] Therefore, proper access to health care in this age group allows for the prevention of many diseases, an indication of the need for strengthening the system of health-care providers toward adequate care at any time and place.[34,35] On the other hand, the results of other studies have shown that households suffer not only from the burden of diseases but also from the direct financial burdens from treatments.[36,37] Households, especially the vulnerable strata, face a lot of suffering due to the costs of medical care, which sometimes make them ignore their other needs, thereby reducing their social welfare. Furthermore, a group of households is reluctant to receive or seek treatment due to financial issues, which also reduces the health of households and societies.[38] Although, in the last few decades, rural health clinics have played an important role in improving the health of rural areas in Iran, including a decline in population, screening, fight against contagious diseases, care for children and mothers, and so on, to name a few.[39-41] However, paying attention to villagers' proper access to health centers (hospitals) has always been one of the issues that policymakers and health-care planners should consider.

Access has a variety of dimensions, of which only the physical access was addressed. Hence, it is suggested that other dimensions of access be considered in future studies. As pointed out in other studies, Kermanshah is known as one of the deprived provinces in Iran[31,42-44] and apart from this, the present study failed to assess the urban residents' access to health centers (hospitals). Therefore, it is recommended that the inequality among other age groups and sex groups in rural and urban areas of Kermanshah Province be assessed as an index of inequity in access to health services.

This study investigates health justice in rural areas using GIS software. Considering inequality in rural areas in Kermanshah province is one of the issues that has been neglected so far, which was investigated with GIS techniques in this study. For future studies, it is suggested that by using the network analysis method, inequalities in access in rural areas be investigated more accurately.

Conclusion

The results of the present study demonstrated that the 0–14-year-old children's access to health centers was in poor condition in rural areas of Kermanshah Province, which would endanger the health of this age group. Accordingly, it is necessary to take the necessary measures regarding the access of this age group to health centers since children need special attention, and their timely access to health centers protects and improves their health.

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Conflicts of interest

There are no conflicts of interest.

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