The Comparison of Maternal and Child Health Indicators before and after the Family Physician Program in Shiraz, from 2001 to 2012

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Abstract

Background: One of the aims of the family physician program (FPP) is to improve the maternal and child health indicators. This study aimed to compare maternal and child health indicators in Shiraz rural areas before and after implementation of FPP during 2001 to 2012.

Methods: This applicable study was conducted in Shiraz in the south west of Iran in 2014. The child and maternal health indicators before (2001 to 2005) and after FPP (from 2006 to 2012) were gathered from the Health Center (Enghelab and Shohadaye Vali Fajr). The instrument for data collection was a questionnaire consisted of 20 maternal and child health indicators. Descriptive statistics were used and for analyzing the data, Excel and Stata software and comparisons of rates and joint point regression tests were employed.

Results: The results showed that the FPP lead to decrease in stillbirth, infant mortality and child under-one-year mortality in the rural area. Also all the vital horoscope indicator (mortality under one month, mortality under one year, the frequency of the infants under one year, the percentage of stillbirths, crude death percentage, crude birth percentage, general fertility percentage, total fertility percentage) have improved after FPP in Health Center rather than Enghelab Health Center.

Conclusion: The maternal and child health indicators had improvement after FPP implementation. Therefore, it is recommended to continue the program.

Introduction

Health system is one of the most important parts of each society. Despite the establishment of the health systems all around the worlds, most of them are not managed efficiently. Health is the most important need of people in each society and governments play very important role in it. The availability of health services is an important factor in Primary Health Care (PHC) for establishing efficient and fair health services. In countries with primary health care system, the treatment costs are lower and the society is usually healthier. For receiving these services, people should be able to access and use them. It may decrease the unfair of the health services. In most countries of the world, the health system is organized for the easy access of people to the level one, two and three of health services. This is not only prevent people from unnecessary referrals to more specialized levels, but also controls the hospital care costs. To improve the quality of medical services, the government of Iran introduced a new policy named family physician for making some reform in health department that is very helpful for the
are creating and developing the health document for each person, more appropriate and effective care for pregnant
get the health service insurance. Positive points of the FPP
family physician for at least one time, and 96.8% of them
of the population was aware of FPP, 97.6% were referred to
Considering the importance of the FPP increasing the
costs and wasting resources through the continuous
the same token, it is possible to stop increasing the
improve administrating it and increasing the health level
areas before and after administration of FPP during 2001
the maternal and child health indicators in Shiraz rural
Accordingly, the present research was done to investigate
effectiveness of this program from different points of view.
From the WHO's point of view, it is possible to
society. From the WHO's point of view, it is possible
to improve the quality, costs, efficiency and justice in
healthcare systems. Because of the existence of referral
culture in rural areas of Iran, family physician program
(FPP) was designed and administered in rural areas and
towns with population under 20000, from 2005, to
control additional costs, boost the health level and prevent
unnecessary referrals to the higher levels of medical
services. During this period, primary health care was
offered by the family physician team. A family physician
should have at least a medical doctor degree and his
duty is to help all the age and sex groups with any type
of disease. Family physicians are responsible for giving
health services to people and their families. They prevent
disabilities and health problems by on time and effective
treatments. Family physician, as a link between people
and health care system, has a very important effect on
the effectiveness of the health services. Therefore, it
is supposed to have an improvement in the quality of
the health services by increasing their quantity. By
the same token, it is possible to stop increasing the
costs and wasting resources through the continuous
participation of the family physicians, and accurate and
on time referrals to more specialized levels of health
services. It is obvious that for better administration of
each program in any country, the corporaion of people
and the supervision of the government are essential to
correct any possible defects.

According to the studies in Maragheh, Iran, about 97%
of the population was aware of FPP. 97.6% were referred to
family physician for at least one time, and 96.8% of them
got the health service insurance. Positive points of the FPP
are creating and developing the health document for each
person, more appropriate and effective care for pregnant
women and babies under 6 years old, easy access of the
villagers to physician and drugs and decreasing treatment
costs. Negative points of this program on the other side are
high referrals of patients to the health houses, lack of enough
job positions for the personnel, delay in paying salary
to the personnel, and limited time of accessing physical
physicians in rural areas. Rayisi's 2011 study showed that
administrating FPP had positive effects on all the
maternal and child health indicators except maternal death
from 2001 to 2007. Based on Barati's 2012 study in Iran,
administrating family physician was effective on decreasing
infants' death under one year, infants' death under five
years, newborn death, and maternal death indicators.
Considering the importance of the FPP increasing the
health level, controlling the costs and improving the quality
of the medical services, it is important to investigate
effectiveness of this program from different points of view.

Shiraz is located in the south west of Iran and as the
sixth Metropolis was implemented FPP in rural area.
Accordingly, the present research was done to investigate
the maternal and child health indicators in Shiraz rural
areas before and after administration of FPP during 2001
to 2012. The results of this study present useful information
to the administrators and policy makers of this program to
improve administrating it and increasing the health level
of the society.

Methods

This retrospective study was conducted as cross-sectional
in 2014. The research population was rural population
under the administration of FPP around Shiraz from
2001 to 2005 as before FPP implementation and 2006 to
2012 as after FPP implementation. Data were specifically
maternal and child indicators of the target population;
therefore, all data related to the maternal and child
indicators were collected from two Rural Health Centers,
Shohadaye Enghelab and Shohadaye Vali afar, from 2001 to
2012, via the enumeration method. These Health Centers
had done supportive functions for Health Hoses in rural
area. For data collection researchers referred to the Health
Centers and the data were gathered from documentation.
A Checklist was designed by the researchers. This
checklist was consist of twenty maternal and child
indicators including the percentage of breast-feeding, the
percentage of cesarean deliveries among all deliveries, the
percentage of receiving at least one care a year between
two- to five-year old children, birth rate per 1000 people,
the percentage of receiving at least six cares in pregnancy
period, the percentage of receiving at least two cares after
delivery, the percentage of prenatal care, the percentage
of infants’ mortality under 1 month, the percentage of
continuing breastfeeding for 12 to 15 month-old infants,
the percentage of exclusive breastfeeding till 6 months,
the percentage of children under one year, the percentage
of 6 to 9 month-old infants which eat additional food, the
percentage of mortality under one year, the percentage
of total fertility, the percentage of general fertility, the
percentage of crude birth, and the percentage of crude
death. The data were classified from 2001 to 2012. The
validity of the checklist was approved by about eight
specialists in health services management and faculty
members of the related field. Descriptive statistics was
used and for analyzing the data, Excel and Stata software
and comparisons of rates and joint point regression tests
were employed.

The study was approved by Ethics Committee of Shiraz
University of Medical Sciences.

Results

The results of the study showed that the percentage of
mortality under 1 month and the percentage of stillbirths
were decreased after administrating the FPP (Figure 1).

Another investigation showed that the overall trend
of the frequency of the children under one year and the
percentage of the mortality under 1 year were decrease after
administrating the program (Figure 2).

Figure 3 shows that the percentage of before prenatal
cares and pregnancy period cares were decreased after
administrating the FPP, while the percentage of the cesarean
among all deliveries and post-partum cares were increased.

Table 1 shows that there are statistically significant
relationships between four health indicators before and after
administrating FPP in rural areas around Shiraz, Iran, from 2001 to 2012.

Also, Table 2 indicates the means difference of health indicators in rural health centers before and after the family physician program.

As shown in Table 3, the mean of stillbirth, neonatal mortality rate and infant mortality rate had differences before and after the FPP implementation.

Also, Table 4 shows the differences of health indicators based on the Joint point regression in each period.

**Discussion**

The results showed that among the eight maternal and health indicators in the study in Shiraz, four indicators (mortality under 1 month, stillbirth, Mortality of children under one year and crude birth rate) before and after administrating FPP had differences. In other words, these four indicators were improved after administrating FPP that shows the positive effect of this program. This finding shows that FPP could promote health
indicators in the rural area. The results are similar to Rayisi’s study. Based his study, there was a significant relationship between the mortality of the children under one year, before and after administrating the FPP that is identical to the present research.

Based on the review study of Sans-Corrales in Cuba that studied 365 articles about family physician, there were significant relationships between health level, costs, and FPP. In other words, the FPP improved the health level and decreased the treatment costs.

According to Barati’s study FPP had decreased mortality indicators (mortality under one month, mortality under five years and maternal death). It means that these indicators were improved in all rural areas of Iran from 2005 to 2006. Thus, by appropriate administration and continuous supervision of this program, it is possible to boost the health level of the society.

Table 1: The relationship between health indicators in rural health centers of Shiraz, Iran from 2001 to 2012

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Before Family Physician Program</th>
<th>After Family Physician Program</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>SE</td>
<td>Rate</td>
<td>SE</td>
</tr>
<tr>
<td>Stillbirths(per1000 deliveries)</td>
<td>9.69</td>
<td>6.54</td>
<td>0.31</td>
</tr>
<tr>
<td>Neonatal mortality rate(per1000 live births)</td>
<td>14.31</td>
<td>9.31</td>
<td>0.98</td>
</tr>
<tr>
<td>Infant mortality rate(per1000 live births)</td>
<td>21.55</td>
<td>16.96</td>
<td>1.25</td>
</tr>
<tr>
<td>Total Fertility Rate(TFR)</td>
<td>1.96</td>
<td>1.85</td>
<td>2.03</td>
</tr>
<tr>
<td>General fertility Rate(GFR)</td>
<td>61.25</td>
<td>63.55</td>
<td>4.95</td>
</tr>
<tr>
<td>Crude Birth Rate (CBR)</td>
<td>17.25</td>
<td>18.49</td>
<td>1.34</td>
</tr>
<tr>
<td>Crude Death Rate(CDR)</td>
<td>5.96</td>
<td>5.18</td>
<td>1.070</td>
</tr>
</tbody>
</table>

Table 2: The mean difference of health indicators before and after implementation of the family physician program

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Before Family Physician Program</th>
<th>After Family Physician Program</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillbirths</td>
<td>1.26</td>
<td>0.57</td>
<td>0.331</td>
</tr>
<tr>
<td>Neonatal mortality rate</td>
<td>1.40</td>
<td>0.921</td>
<td>0.272</td>
</tr>
<tr>
<td>Mortality under 1 year</td>
<td>1.59</td>
<td>1.44</td>
<td>0.826</td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>1.89</td>
<td>1.28</td>
<td>0.375</td>
</tr>
<tr>
<td>Total Fertility</td>
<td>0.166</td>
<td>0.175</td>
<td>0.023</td>
</tr>
<tr>
<td>General fertility</td>
<td>5.63</td>
<td>5.98</td>
<td>0.46</td>
</tr>
<tr>
<td>Crude Birth Rate</td>
<td>1.57</td>
<td>1.81</td>
<td>0.059</td>
</tr>
<tr>
<td>Crude Death Rate</td>
<td>0.383</td>
<td>0.342</td>
<td>0.060</td>
</tr>
</tbody>
</table>

Table 3: Joint point regression of health indicator in rural health centers of Shiraz, Iran from 2001 to 2012

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Intercept</th>
<th>Parameter Estimate(B)</th>
<th>SE</th>
<th>t</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillbirths(per1000 deliveries)</td>
<td>112.21</td>
<td>-0.18</td>
<td>0.2</td>
<td>-7.34</td>
<td>0.01</td>
</tr>
<tr>
<td>Neonatal mortality rate(per1000 live births)</td>
<td>86.25</td>
<td>-0.09</td>
<td>0.01</td>
<td>-5.36</td>
<td>0.01</td>
</tr>
<tr>
<td>Infant mortality rate(per1000 live births)</td>
<td>226.12</td>
<td>-0.25</td>
<td>0.03</td>
<td>-4.55</td>
<td>0.02</td>
</tr>
<tr>
<td>Total Fertility Rate(TFR)</td>
<td>85.26</td>
<td>-0.02</td>
<td>0.85</td>
<td>-1.25</td>
<td>0.13</td>
</tr>
<tr>
<td>General fertility Rate(GFR)</td>
<td>225</td>
<td>0.06</td>
<td>0.33</td>
<td>-0.93</td>
<td>0.36</td>
</tr>
<tr>
<td>Crude Birth Rate (CBR)</td>
<td>301.41</td>
<td>0.15</td>
<td>0.04</td>
<td>3.38</td>
<td>0.03</td>
</tr>
<tr>
<td>Crude Death Rate(CDR)</td>
<td>199.21</td>
<td>-0.11</td>
<td>0.01</td>
<td>-6.38</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table 4: Joint point regression of health indicators before and after implementation of the family physician program

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Before Family Physician Program</th>
<th>After Family Physician Program</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillbirths(per1000 deliveries)</td>
<td>0.01-</td>
<td>0.32</td>
<td>-0.23</td>
</tr>
<tr>
<td>Neonatal mortality rate(per1000 live births)</td>
<td>-0.04</td>
<td>0.02</td>
<td>-0.08</td>
</tr>
<tr>
<td>Infant mortality rate(per1000 live births)</td>
<td>-0.05</td>
<td>0.08</td>
<td>-0.22</td>
</tr>
<tr>
<td>Total Fertility Rate(TFR)</td>
<td>-0.03</td>
<td>0.33</td>
<td>-0.05</td>
</tr>
<tr>
<td>General fertility Rate(GFR)</td>
<td>0.02</td>
<td>0.36</td>
<td>-0.60</td>
</tr>
<tr>
<td>Crude Birth Rate (CBR)</td>
<td>0.05</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Crude Death Rate(CDR)</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.16</td>
</tr>
</tbody>
</table>
one year old can be a proof of the appropriate performance of the health centers, hospitals and doctors. Boskabadi mentioned that acute insufficiencies, infections, breathing problems, prenatals asphyxia and background diseases are the main reasons of the infants’ death. Also in Jurecz’s study, the infection in male infants is one of the reasons of their death. Being an underweight infant, delivery type, pregnancy age and gender are other reasons of the infants’ death. Considering the appropriate performance of FPP in decreasing the infant’s death, it is possible to lessen infant’s death to the minimum amount.

The percentage of the stillbirths was increased in 2005, the starting time of the program, but it was decreased by the time and after administrating the FPP in a way that in 2007, it reached the minimum level. These findings showed the efficiency of the program in increasing the percentage of the stillbirths. The results were similar to Rayisi’s study. Hemmatyar claimed that some factors such as poor maternal nutritional status, inappropriate socio-economic status and insufficient care in prenatal period may lead to stillbirth. To prevent these sorts of problems, it is necessary to use health education, suitable nutrition, prenatal care, social support, and midwifery care.

According to the results of the study the percentage of the mortality under one year old was decreased. This may be related to people increasing awareness Safari mentioned that being underweight, feeding with milk powder, and being crude at birth may lead to infants’ death. Other studies showed that there is a relationship between the job and education level of the parents and death rate of the children.

The percentage of the total fertility and crude death rate indicators showed similar trend before and after administration of the FPP. In other words, administrating this program had no effect on these indicators. Bradshaw stated that in most developing countries the number of births was decreased by improving the education level of the people, women’s role in the society, increasing incomes, and migration from rural to urban areas. But in most developed countries such as Denmark and Sweden, the governments’ policies prevent any brunt in the upbringing of children. Considering the governments’ policies for increasing fertility and births, it is possible to grow the population by offering some facilities to families in order to improving fertility, offering facilities for employed women, improving the awareness of people and stop offering free pregnancy prevention tools. The maximum means for the years before and after administrating the FPP related to general fertility rate indicator were 1.57 and 1.81 which shows an improvement in this indicator after administrating the program.

Takian’s study showed that the Primary Health Care (PHC) is a very important property in facilitating the administration of FPP in rural areas. Also, the World Organization of Family Doctors (WONCA) states that the primary health services will be improved by using family physician in rural areas. These physicians are important links for improving the cooperation between primary health centers, hospitals and more special cares.

Limitations of the study: In this study, among the 20 maternal and child health indicators, only 13 indicators were available for investigation in Shohadaye Enghelab and Shohadaye ValiFaraj Health Centers of Shiraz. While among them, the information about 8 health indicators was completely available before and after administrating the FPP. Therefore, the lack of enough information and the lack of appropriate recording system were the limitations of this study. Also, there were few studies on this topic around the world, so there was an attempt to use the closest studies to the topic under the study.

Conclusion

The maternal and child health indicators had improvement after FPP implementation. Therefore, it is recommended to continue the program. For future studies it is recommended that the FPP impact in urban area will be investigated in Iran.

Acknowledgement

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Conflict of Interest: None declared.

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