Enhancing the value of women’s reproductive rights through community based interventions in upper Egypt governorates: a randomized interventional study

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Abstract

Background: In 2012, the WHO described the quality of health care as the route to equity and dignity for women and children.

Aim of the work: To provide community based support and empowerment to women in childbearing period to seek optimal prenatal, natal and postnatal healthcare. Achieving this is anticipated to decrease maternal morbidity and mortality in Egypt.

Subjects and methods: An interventional study was conducted among women in childbearing period in the poorest two governorates of Upper Egypt. The study passed through three stages over three and a half years; pre-interventional assessment of awareness (n = 1000), educational interventions targeting the health providers and all women in childbearing period in their communities (n = 20,494), and post-intervention evaluation of change in awareness of their rights for prenatal, natal and postnatal care (no = 1150).

Results: The studied indicators relating to receiving care in pregnancy, labor, and puerperium have changed dramatically as a result of the study interventions. Results of the study showed that before interventions, the surveyed women had inaccurate knowledge regarding most of the items related to their rights. The percentages of women aware of their right to have pregnancy card increased and those who possessed a pregnancy card were doubled with a significant percent change of more than 25%. Some indicators showed more than 75% improvement, including; percent of surveyed women who knew that it’s their right to follow up their pregnancy and to deliver with a specialized doctor, a trained nurse or at an equipped health facility, and those who knew their right to have at least two home preparations necessary for safe delivery at home.

Conclusion and recommendations: More work is needed in order to achieve the targeted reduction of maternal mortality. This could be achieved by ensuring accessible and high quality care provided by the governmental health facilities together with increasing the awareness of women regarding their rights in receiving such care.

Keywords: women’s reproductive rights, Antenatal care, Natal care, Postnatal care

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Background

Reproductive rights have been recognized as one of the fundamental human rights [1]. According to the World Health Organization (WHO), reproductive rights rest on the recognition of the right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health. They also include the right of all to make decisions concerning reproduction, free of discrimination, coercion and violence [2]. Reproductive rights began to develop as a subset of human rights at the United Nation’s 1968 International Conference on Human Rights [3]. Reproductive rights were clarified and endorsed internationally in the Cairo Consensus that emerged from the 1994 International Conference on Population and Development [4]. Adequate reproductive health and women’s reproductive right help to reduce poverty, promote economic growth, raise female productivity, lower fertility, and improve child survival and maternal health. Utilizing the reproductive right can decrease pregnancy related morbidity and mortality and give women the autonomy to make decisions about their lives including their reproductive life [5]. This could be a step to achieve the millennium development goal number five which focuses on improving maternal health including eliminating inequity by ensuring universal access to maternal health services [6]. In Egypt, the status of reproductive health and the quality of life of females are not satisfactory. There is still a lot of challenges to be met; unequal access to information, care and basic health services, early marriage, deeply-rooted believes, and illiteracy leading to lack of awareness and underutilization of reproductive rights among women [7]. In addition, another barrier for utilizing antenatal care (ANC) natal care and postnatal care was found to be the poor quality of health care provided by their health providers which undermines the trust people have in those services [8]. In another study, Egyptian women who did not receive ANC were found to have up to 10 times higher risk of deaths compared to those who received ANC [9].

The current study provides a series of interventions aiming to enhance women’s rights and eventually decrease maternal morbidity and mortality in Egypt. The study uses a deductive approach to test the hypothesis that community based interventions targeting women in childbearing period to enhance reproductive rights could raise the awareness and increase the utilization of the governmental health services.

While the data for the current study was gathered in Egypt, its findings could be a useful resource and have implications for government and primary health care providers across many countries given similarities in their cultures and government responses.

Methods

Study setting

This study targeted pregnant and postpartum women in 21 villages and 119 satellites of two governorates of Upper Egypt; Al Fayoum and Benisuef; 11 villages and 76 satellites belonging to Al Fayoum governorate (in Senores and Youssef El Sedeek districts) and 10 villages and 43 satellites belonging to Benisuef governorate (in El Fashen and Somosta districts). These two governorates of Upper Egypt were ranked the poorest as declared in Egypt report of 2015 [6].

The selection of districts and villages for the study conduction was done through participatory approach with local governmental authorities. The selection was aiming to decrease the documented disparity between rural and urban communities. There is a significant disparity between urban and rural communities for both maternal mortality ratio (MMR) as well as the awareness and perception about maternal mortality in Egypt [6, 7, 9]. In 2013, the national MMR in Egypt was found to be 43.5 deaths per 100 thousand births with the highest rate for the rural communities of upper and lower Egypt governorates ranging between 60 and 65 deaths per 100,000 live births; while lowest rates were observed in city governorates ranging between 24 and 37 deaths per thousand births [6, 7]. Furthermore, awareness and care seeking behaviors about maternal mortality issues were found to be poor in rural communities compared to urban ones [9].

Study design and participants’ characteristics

The study was a randomized intervention evaluation study for which the interventions were conducted along three and a half years starting from August 2012 till March 2016. The study passed through three stages; pre-interventional assessment of women awareness of their rights, community based interventions targeting primary health care providers, community health workers and women in their communities, and post-intervention evaluation of the change in the women’s awareness of their reproductive rights.

The second target group was the host community which refers to the individuals living in the area of the study, their leaders, and community-based organizations that serve or represent them directly who are the para-medical and medical health providers.

Study phases

This study was done over three phases:

The first phase included: assessing the level of beneficiaries’ awareness, attitude and behavior towards their
rights in standard of care and treatment which was conducted along six months starting from February 2012 till August 2012.

The second phase of the study included community based interventions where three types of interventions were conducted along three years starting August 2012 till March 2016.

The third phase included: evaluation of the impact of the interventions on change of the level of beneficiaries’ awareness, attitude and behavior towards their rights in standard of care and treatment and on the utilization of the governmental health services. The evaluation was conducted along six months starting from April 2016 till October 2016.

Both the assessment and the evaluation phases were done by the community health workers after their training in order to avoid any information bias for the respondents (beneficiaries) in the community. All householders were asked questions.

Sample size and sampling technique
The sampling technique was used during both the pre- and post-intervention. The sample included women in their reproductive age who are either currently pregnant women or women in post-partum period or newly married women as these women will be the direct beneficiaries of the governmental reproductive health services. These groups were selected as they were expected to benefit most from the study interventions.

Both the pre- and post-intervention phases were done to measure the level of awareness of as well as the utilization of the health facilities before and after the interventions to measure their impact.

- Two-stage random sampling was used; households were randomly selected, and then one woman of reproductive age was randomly selected from each household. Sample size was calculated to meet the Division of Reproductive Health (DRH) standards at the center for disease control and prevention of point estimates within +/- 5% of the true population prevalence, with 95% confidence and estimated response rate of 80% [10]. Accordingly, in order to complete interviews for at least 480 women of reproductive age, at least 550 households were contacted from each governorate. This estimate was based on household lists where only households with women of reproductive age were identified. Household lists, having current pregnant women, newly married women and women in the postpartum period were obtained from community health workers (CHWs) zones within the targeted villages that were used in sampling.

- The samples were chosen from the targeted villages with a range of 2–8 interviewers per village according to beneficiaries’ size within each village. For each interviewer a range of 14 to 17 households were surveyed. The households were randomly selected. The first household was selected from the random table by the supervisor. The second household was selected by adding the sampling interval to the original random number and so on till interviewer target was met.

- During the pre-intervention phase, out of 550 targeted women for survey from each governorate, 480 and 520 women in El Fayoum and Benisuef governorates respectively completed the survey and were included in the study with response rate of 87 and 94.5%. During the post-intervention phase, out of 550 targeted women for survey from each governorate, 480 and 520 women in El Fayoum and Benisuef governorates respectively completed the survey and were included in the study with response rate of 87 and 94.5%.

Description of the community based intervention

1) Educational and promotional materials were developed keeping in view the users and the respondents (beneficiaries) in the community. All the developed and produced materials were distributed to cover all the targeted health units within the targeted districts. The developed materials included; two educational pockets modules; one targeting nurses and the other targeting CHWs. The module targeting CHWs included mainly drawings, illustrations and role plays. Four types of promotional materials were developed to disseminate information to the targeted women. The developed promotional materials included the following: calendar, three wall posters, “Who will win with us” game (derived
from “Who will win a million” / “Who wants to be a millionaire”) and drama production on CDs. The theme of the developed messages for the drama’s scenario is what women and their families need to know regarding their rights in receiving care during antenatal, natal, and postnatal period. It also included all the services that are provided within the primary health facilities according to the period of continuum of care and how to recognize danger signs, where to go for delivery care and emergency care and how to arrange in advance for transport.

2) A 103 nurses and 63 CHWs were trained after being assessed for their knowledge, attitude and behaviors related to maternal and obstetric care. They were chosen because this group (CHWs) is proved to play an important role in the life of women in the rural and urban low-income communities in Egypt [11, 12]. Their training was followed by conduction of refresher courses for the promotion of good antenatal, natal and post-natal care for the nurses and CHWs. During the training courses much emphasis was put on identifying women’s rights for having quality care, recognition of danger signs during pregnancy, labor and puerperium. During the refresher courses the developed promotion materials were used as aiding materials to deepen and sustain the gained knowledge.

3) Outreach and in facility education sessions by both the trained nurses and CHWs were conducted with at least one month home visit for every woman. Four campaigns were conducted yearly with 3 months interval, with a total of 14 campaigns. The promotional materials were regularly distributed during campaigns and home visits along the three and a half years of intervention.

Data collection types and tools during the first and the third phase
The data-collection instrument used was a structured questionnaire that was derived from that of the Center for Disease Control (CDC), 2010 [13], as well as from the information given to the pregnant women having the pregnancy card during their ANC visits which is designed and authorized by the Maternity and Childhood sector in the Ministry of Health in Egypt. A structured interview was done to collect the necessary data by the CHWs under the supervision of the team. The questionnaire focused on eight indicators to detect women’s awareness about ANC and pregnancy complications, six indicators to detect women’s awareness about delivery care and complication and three indicators to assess women’s awareness about postpartum care and complications.

Statistical analysis
All completed questionnaires were statistically analyzed with SPSS, version 16. Data were presented by percentages. The change in the knowledge and practices were the basic instruments for comparison. Z test between proportions was used for comparison. The analysis was done using Z test between two proportions [14]. P value < 0.05 was considered significant. The impact of the intervention was calculated by the percent change between the assessment and evaluation indicators. The percent change for each indicator was calculated by deduction of the indicator percentage value during the assessment from that during the evaluation.

Indicators used during the assessment and evaluation
Five health care access indicators (4 awareness and 1 practice) including the percentage of surveyed women who knew:

1. their right to issue a health card once they know they are pregnant
2. that the health card is obtained from the health unit.
3. their right to obtain a health card for free
4. who actually possess a health card (practice)
5. their right to obtain at least two services out of the contents of the health card

Six prenatal care indicators including: The percentage of women who knew:

1. their right to follow up their pregnancy with a specialized doctor, a trained nurse or at the health unit
2. their right to follow up their pregnancy not less than four times at the health unit
3. at least two of their rights in health care during follow up at the health unit
4. at least two of their rights for having the laboratory investigations they should do at the health unit at the beginning of pregnancy
5. their right to attend health education sessions at the health unit
6. at least two pregnancy complications which give them the right to go to the hospital immediately

Seven postpartum indicators including: the percentage of women who knew:

1. their right to deliver in a hospital (or any equipped medical center)
2. their right to have their delivery attended by a specialized doctor or a trained nurse
3. their right to have their delivery attended by a specialized doctor and in a hospital when experienced prolonged delivery
4. their right to have at least two home preparations necessary for safe delivery when delivery is attended at home
5. at least two delivery complications which give them the right to go to the hospital immediately
6. their right to be visited during the puerperium by the nurse after reporting the delivery
7. at least two complications during the puerperium which give them the right to go to the hospital immediately

Ethical considerations
The study complied with the International Ethical Guidelines for Biomedical Research Involving Human Subjects [15]. The Research and Ethical Committee of the National Research Centre have cleared the study protocol with the ethical approval registration number 10140. Informed consent was obtained from all participants involved in the study and the information obtained at the individual level was kept strictly confidential.

Results
Awareness of the right of women to receive care at the health units is presented in Table 1. It was generally unsatisfactory but was substantially improved after health education. The percent change in awareness was more or less the same for both governorates. The percent change in awareness was more than 40% for four out of five indicators; awareness of their right to issue a health card once they know they are pregnant, knowing that the health card is obtained from the health unit, awareness of their right to obtain a health card for free, awareness of their right to obtain at least two of the contents of the health card. The least percent change in awareness was noticed in the percentage of surveyed women who actually possess a health card (26.9%). Awareness of the right of women to issue a health card once they

Table 1 Evaluation of women’s right indicators for receiving care at the health units in the targeted villages of the selected governorates

| Indicator | El Fayoum Governorate | Benisuef Governorate | Total |
|-----------|-----------------------|----------------------|-------|
|           | Before | After | % Change | Before | After | % Change | Before | After | % Change |
|           | n = 520 | n = 543 | N (%) | n = 480 | n = 607 | N (%) | n = 1000 | n = 1150 | N (%) |
| 1. % of surveyed women who know their right to issue a health card once they know they are pregnant | 37.7% | 505 93.0% | 85.6% | 82.16% | 565 93.1% | 76.7% | 119 11.9% | 1070 93.0% | 81.1% |
| 2. % of surveyed women who know that the health card is obtained from the health unit | 171 35.6% | 440 81.0% | 45.4% | 127 24.4% | 498 82.0% | 57.6% | 298 29.8% | 938 81.6% | 51.8% |
| 3. % of surveyed women who know their right to have their delivery attended by a specialized doctor and in a hospital when experienced prolonged delivery | 126 26.3% | 410 75.5% | 49.2% | 139 26.7% | 483 79.6% | 52.9% | 265 26.5% | 893 77.7% | 51.2% |
| 4. % of surveyed women who actually possess a health card (from a total of 827 women exposed to pregnancy; 363 before and 464 after) | 143 39.4% | 308 66.1% | 26.7% | 229 49.4% | 442 76.6% | 27.2% | 372 45.0% | 750 71.9% | 26.9% |
| 5. % of surveyed women who know their right to obtain at least two services out of the contents of the health card | 64 13.3% | 295 54.3% | 41.0% | 72 13.8% | 354 58.3% | 44.5% | 136 13.6% | 649 56.4% | 42.8% |

*z test between two proportion, P < 0.05 is significant

*aThe most frequent two were: Health Card Contents: 1-Personal data (name, age, address) 2- Health status (e.g. weight, height, blood pressure, blood sugar) 3- History and circumstances of previous deliveries 4- Visits made to health unit and their results
know they are pregnant was the least known item by the interviewed women in the two governorates especially in El Fayoum (7.4% in El Fayoum versus 16.4% in Benisuef), while it showed the highest percentage change after the intervention (81.1%).

Participants were found to have limited knowledge regarding most of the items relating to their right to receive pregnancy care and follow up in the health units as shown in Table 2. Awareness of the right of women to follow up their pregnancy with a specialized doctor, a trained nurse or at the health unit was the most known item in the two governorates especially in El Fayoum (86.5% in El Fayoum versus 66.5% in Benisuef). On the other hand, awareness of the right of women to attend health education sessions at the health unit was the least known item by the interviewed women in both governorates especially in El Fayoum (20% in El Fayoum versus 31.2% in Benisuef). The surveyed women in Benisuef had better knowledge compared to those in El Fayoum regarding knowing at least two of their rights in health care during follow up at the health unit and their right to attend health education sessions at the health unit. On the contrary, women in El Fayoum had better knowledge compared to those in Benisuef regarding their right to follow up their pregnancy with a specialized doctor, a trained nurse or at the health unit. General

Table 2 Evaluation of women’s right indicators for receiving pregnancy care and follow-up at the health units in the targeted governorates

| Indicator                                                                 | El Fayoum Governorate Before Total | El Fayoum Governorate After Total | Benisuef Governorate Before Total | Benisuef Governorate After Total | Total Before Total | Total After Total | Rate of Change Before Total | Rate of Change After Total |
|---------------------------------------------------------------------------|-------------------------------------|-----------------------------------|----------------------------------|----------------------------------|--------------------|--------------------|--------------------------|--------------------------|
| 2. % of surveyed women who know their right to follow up their pregnancy not less than four times at the health unit a | 256 (48.5%) | 520 | 421 (90.3%) | 543 | 231 (44.4%) | 480 | 346 (57.0%) | 607 | 12.6% |
| 3. % of surveyed women who know at least two of their rights in health care during follow up at the health unit a | 210 (43.8%) | 480 | 413 (76.1%) | 543 | 231 (44.4%) | 480 | 346 (57.0%) | 607 | 12.6% |
| 4. % of surveyed women who know at least two of their rights for having the laboratory investigations they should do at the health unit at the beginning of pregnancy a | 174 (36.2%) | 357 | 366 (67.4%) | 543 | 185 (35.6%) | 480 | 336 (55.4%) | 607 | 19.8% |
| 5. % of surveyed women who know their right to attend health education sessions at the health unit a | 96 (20.0%) | 480 | 260 (47.9%) | 543 | 162 (31.2%) | 480 | 411 (67.7%) | 607 | 36.5% |
| 6. % of surveyed women who know at least two pregnancy complications which give them the right to go to the hospital immediately a | 185 (38.5%) | 480 | 406 (74.8%) | 543 | 195 (37.5%) | 480 | 395 (65.1%) | 607 | 27.6% |

* test between two proportion, P < 0.05 is significant
a The most frequent mentioned two: Women’s rights in health care during follow-up:
1-weight and height measurement 2-laboratory investigations 3- tetanus vaccination 4- sugar analysis 5- X-ray
bThe most frequent mentioned two: Women’s rights in the laboratory investigations they should do at the beginning of pregnancy: complete urine analysis – blood analysis – determination of blood group and Rh factor – thyroid gland tests
cThe most frequent mentioned two: Pregnancy complications which give woman the right to go to the hospital immediately: severe headache and blurring of vision – rise of body temperature – convulsions – foul smelling vaginal discharge – vaginal bleeding even in small amounts or without pain
improvement in awareness of the surveyed women was noticed especially the awareness of their right to attend health education sessions at the health unit and knowing at least two pregnancy complications which give them the right to go to the hospital immediately.

Table 3 presents knowledge about different issues relating to the right of women to receive care during delivery and puerperium at the health units. It was found to be generally unsatisfactory but was improved after health education. Awareness of the right of women to have their delivery attended by a specialized doctor or a trained nurse and to have their delivery attended by a specialized doctor and in a hospital in case of prolonged delivery were the most known items by the interviewed women in the two governorates. On the other hand, awareness of the right of women to have at least two

| Indicator                                                                 | El Fayoum Governorate | Benisuef Governorate | Total             |
|--------------------------------------------------------------------------|-----------------------|----------------------|-------------------|
|                                                                          | Before: n = 520       | After: n = 543       | % Change          |
|                                                                          | N (%)                 | N (%)                |                   |
|                                                                          | %                     | %                    |                   |
|                                                                          | Before: n = 480       | After: n = 607       | % Change          |
|                                                                          | N (%)                 | N (%)                |                   |
|                                                                          | %                     | %                    |                   |
|                                                                          | Before: n = 1000      | After: n = 1150      | % Change          |
|                                                                          | N (%)                 | N (%)                |                   |
|                                                                          | %                     | %                    |                   |

**Table 3** Evaluation of women’s right indicators for receiving care during delivery and puerperium at the health units in the targeted governorates

1. % of surveyed women who know that it’s their right to deliver in a hospital (or any equipped medical center)
   - Before: 221 (46.0%) 439 (80.8%) 34.8%*
   - After: 192 (36.9%) 364 (60.0%) 23.1%*
   - Total: 413 (41.3%) 803 (69.8%) 28.5%*

2. % of surveyed women who know their right to have their delivery attended by a specialized doctor or a trained nurse
   - Before: 326 (67.9%) 488 (93.5%) 25.6%*
   - After: 340 (65.4%) 442 (82.9%) 17.5%*
   - Total: 666 (66.6%) 930 (88.2%) 21.6%*

3. % of surveyed women who know that in case of prolonged delivery it’s their right to have their delivery attended by a specialized doctor and in a hospital
   - Before: 296 (61.7%) 509 (93.7%) 31.8%*
   - After: 360 (69.2%) 523 (86.2%) 17.0%*
   - Total: 656 (65.6%) 1032 (89.7%) 24.1%*

4. % of surveyed women who know their right to have at least two home preparations necessary for safe delivery when delivery is attended at home
   - Before: 34 (7.1%) 512 (94.3%) 87.2%*
   - After: 95 (18.3%) 530 (87.3%) 69.0%*
   - Total: 129 (12.9%) 1042 (90.6%) 77.7%*

5. % of surveyed women who know at least two delivery complications which give them the right to go to the hospital immediately
   - Before: 185 (38.5%) 406 (74.8%) 36.3%*
   - After: 195 (37.5%) 395 (65.1%) 27.6%*
   - Total: 380 (38.0%) 801 (69.7%) 31.7%*

6. % of surveyed women who know their right to be visited during the puerperium by the nurse after reporting the delivery
   - Before: 210 (43.8%) 413 (76.1%) 32.3%*
   - After: 231 (44.4%) 346 (57.0%) 12.6%*
   - Total: 441 (44.1%) 759 (66.0%) 21.9%*

7. % of surveyed women who know at least two complications during the puerperium which give them the right to go to the hospital immediately
   - Before: 154 (32.1%) 366 (67.4%) 35.3%*
   - After: 94 (18.1%) 420 (69.2%) 51.1%*
   - Total: 248 (24.8%) 786 (68.3%) 43.5%*

*Z test between two proportion, P < 0.05 is significant

*The most frequent mentioned two: Home preparations for safe delivery: choose the delivery room such that it is clean and well-ventilated – proving clean clothes and clean bed covers for the mother’s bed

*The most frequent mentioned two: Danger signs during delivery which give the woman the right to go to the hospital immediately: breach or hand or cord presentation – bleeding before the descent of the baby’s head – uterine contractions for more than ten hours – fainting – convulsions

*The most frequent mentioned two: Danger signs during the puerperium: rise of body temperature (puerperal fever) – increasing hemorrhage – attacks of convulsions or fainting
home preparations necessary for safe delivery in case of
delivery at home was the least known item by the inter-
viewed women in both governorates especially in El Fayoum (7.1% in El Fayoum versus 18.3% in Benisuef). General improvement in awareness of the surveyed women was noticed especially the awareness of the right of women to have at least two home preparations neces-

dary for safe delivery in case of delivery at home. The surveyed women in El Fayoum showed more improve-
ment in awareness of all items compared to women in Benisuef except their knowledge of at least two complica-
tions during the puerperium which give them the right
to go to the hospital immediately.

Discussion
The topic of women’s reproductive rights is a debated
issue in politics and social sciences. However, while
many scholars focus on women’s issues relating to hu-
man rights globally, little research has been done on re-
productive rights in Egypt especially the right of
Egyptian women to have quality antenatal, natal, and
postnatal care and to know about those rights.

Over the past 25 years, Egypt has recorded important
achievements in improving maternal survival and health.
Progress in coverage of prenatal care in Egypt has also
been noteworthy in the last decade. In 2014, around
90% of mothers underwent antenatal care checks dur-
ing pregnancy, 83% of them having had antenatal care
don a regular basis. Among all births, 92% were
attended by a skilled birth attendant and 87% took
place in a health facility [16].

Despite these significant improvements, regional dis-
parities remain substantial in the most disadvantaged
areas of the country, especially in rural areas. Sub-
stantial inequalities persist also across socio-economic
groups. Maternal mortality followed a similar declining
trend, from 174 maternal deaths per 100,000 live
births in 1992 to 52 maternal deaths per 100,000 live
births in 2013 [17].

Findings of the present study revealed poor knowledge
regarding important reproductive health rights which
should be an area of concern for policy makers. In the
current study, surveyed women had defective knowledge
regarding most of the items relating to their right in re-
ceiving care in the health units especially their right to
issue a health card once they knew they were pregnant
(11.9%). Also, less than half of them knew their right to
follow up their pregnancy not less than four times at the
health unit (44.1%). This could be attributed to limited
access to health services, poor educational level, low so-
 Socioeconomic status and repeated pregnancies; all of
which could undermine the ability of these women to be
aware of and make use of their reproductive rights. The
denial of these rights not only harms these women but
also affects the whole community and eventually the
country development. This emphasizes the need for
community interventions in order to enhance women’s
reproductive rights and empower women to be fully
aware of them and be able to exercise these rights.

Concerning the right of women to receive pregnancy
care and follow up at the health units, women in the
present study showed more knowledge especially regard-
ing their right to follow up their pregnancy with a spe-
cialized doctor, a trained nurse or at the health unit
(75.7%). These findings agreed with the results of a Nep-
alese study [18].

Knowledge of women about their right to receive care
during delivery and puerperium in our study was gener-
ally unsatisfactory as only 40% of them knew their right
in institutional delivery and about half of the women
knew their right in receiving postnatal care. When com-
pared to similar studies these percentages would be con-
sidered low as in a Nepalese study where 80% of women
were aware of their rights in institutional delivery and
about three quarters knew their need for post-natal care
visits and their right to have such visits [19]. Similar re-
results were observed in other studies [20, 21].

Other factors contributing to poor knowledge of the
women about their rights during antenatal, natal, and
post-natal care include early age of marriage, less ex-
posure to the media, having conservative traditions isolating
them from the outside world leading to lack of access to
information and eventually lower level of awareness.

This may imply the need for legislations to define and
protect women’s reproductive rights given that the Egyp-
tian Constitution comprises articles that ensure the pro-
tection of women against violence, torture, mutilation,
organ trade, violence, sexual exploitation and assault,
and human trafficking with no clear entity for the pro-
tection of reproductive rights [22]. It is equally import-
ant to enforce these laws and make them well known to
the public.

After the intervention, results of the study showed that
the majority of indicators have improved. Some indica-
tors showed improvement of more than 75%, other indi-
cators showed improvement from 50 to 75% which
necessitate more work in order to reach the required
achievement. Only one indicator showed improvement
less than 50% which is the percent of surveyed women
who know that it is their right to attend health educa-
tion sessions at the health unit only in El Fayoum gover-
norate and this indeed needs to be changed.

Conclusion and recommendations
Despite the great progress achieved in many areas relat-
ing to maternal mortality, reproductive rights of women
need to be addressed more closely in terms of accessibil-
ity to all women especially the poor rural women. Also
awareness of these rights and how to use them must be conveyed and taught to these women to enable them to exercise these rights. This will promote women’s health which will be reflected on her family and on the country development as a whole.

The study showed that before the project intervention the surveyed women had defective knowledge regarding most of the items relating to their rights in receiving care in pregnancy, labor and puerperium. The studied indicators have changed dramatically as a result of the applied interventions. This reflects the necessity of the continuity of educational interventions to the poor underprivileged communities.

More work is needed in order to reach the required achievement for maternal mortality reduction through ensuring accessible and high quality care provided by the governmental health facilities to increase access to skilled routine and emergency obstetric care and also implementing a prenatal surveillance program, which will help to monitor the quality and frequency of prenatal care visits together with increasing the awareness of women regarding their rights in receiving such care and subsequently decreasing the disparity for awareness as well as the mortality rates between governorates.

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Authors’ contributions
AM, LE, and AA wrote and submitted the research study and reviewed overall data analysis and manuscript. SS, GA and AA collected, entered and analysed data from study setting 1 and 2 for phase 1: SS, DM, AF, RY and SE collected, entered and analysed data from study setting 1 and 2 for phase 3. NI, OA, HI, MA, TT and DE supervise conduction of the intervention in study setting 1 and 2 for phase 2. RG interpreted the data, wrote the results of the manuscript. SH and HA assisted in manuscript writing and submission. All authors read and approved the final manuscript.

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Availability of data and materials
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate
The Research and Ethical Committee of the National Research Centre have cleared the study protocol with the ethical approval registration number 10140. Informed written consent was obtained from all participants involved in the study and the information obtained at the individual level was kept strictly confidential.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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