

Empowering Women under Social Constraints: Evidence from a Field Intervention in Rural Egypt

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Abstract

To what extent would relaxing the human capital constraints of women in developing countries help them be more empowered? To answer this question this paper evaluates the impact of a large-scale training intervention in rural Upper Egypt where marginalized women in treated villages were offered an intensive vocational, business, and life skills training. Relative to women in control villages, the intervention increased the likelihood for treated women to engage in income generating activities (driven by an increase in self-employment). They also became more likely to have future business aspirations. However, their social aspects of empowerment (namely, intra-household decision making and attitudes toward gender equality) were not affected. We find no evidence of positive spill over effect within treated villages. These findings suggest that while economic situation of women in conservative societies could be enhanced by training interventions, this does not necessarily translate into better social conditions for women.

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1 Introduction

Women in several developing countries, compared to their peers in advanced countries, suffer from lower levels of economic and social empowerment. This is manifested in their low levels of human capital investment, restricted access to labor markets and limited control over their future choices. The last decades witnesses a rapid increase in the number of different microfinance and employment intervention programs that typically targeted women in developing countries to help them become more economically and socially independent (Field et al. 2010; Bandiera et al. 2016; Groh et al. 2016a; 2016b). However, the literature shows mixed evidence on how successful these interventions are. While some studies found strong positive impact of these interventions on the labor market (as well as other social) outcomes of women (e.g., Jensen 2012; Bandiera et al. 2016), several other studies found no evidence of improvement (e.g., De Mel et al. 2008; Groh et al. 2016a; 2016b).

One reason for the inability of several women empowerment interventions to achieve the planned goals could be gender differences in human capital. For example, women, relative to men, are often untrained in basic cost-benefit analysis and uninformed about investment opportunities (Karlan and Valdivia 2011). Another reason could be that norms governing women's roles in society limit women's perceptions about what is achievable in the workplace (Field et al. 2010). A key question then is whether relaxing women's human capital constraints could help them set on a trajectory towards better outcomes, or whether such circumstances are maintained by binding social norms or low aspirations, which cannot easily be shifted or relaxed by public policy interventions.

This paper aims to answer this questions by evaluating the impact of a large scale women empowerment intervention in the conservative setting of rural Upper Egypt.¹ *Neqdar Nesharek* (NN) -We can participate- program provides an integrated approach

¹Upper Egypt refers to the South of the country while Lower Egypt is the north. The terminology "Upper" and "Lower" derives from the flow of the river Nile from the highlands of East Africa northwards to the Mediterranean Sea.

to female economic and social empowerment to enhance transition to work for young marginalized women in rural Upper Egypt. The program provides business skills training and actual support in starting business or getting employed. It emphasizes soft and life skills knowledge, legal rights, and the importance of involving the women’s gatekeepers (husbands and fathers) and community leaders (Ramadan et al. 2014).²

Using a quasi-experimental design, which includes a midline survey and an endline survey, this paper evaluates the impact of the program on young women’s employment outcomes and aspirations, intra-household decision making, and gender roles attitudes. The impact of the program is assessed using a strategy of difference in difference (DD) and propensity score matching (PSM) by comparing end-of-program responses to midline survey responses across participants in the intervention villages, and non-participants in both the intervention and control villages.

We find that, relative to women in control villages, the program increased the likelihood that treated women engage in income generating activities (driven by an increase in self-employment), and increased the share of women planning to set-up their own businesses. However, social aspects of empowerment (namely, intra-household decision making, and gender equality attitudes) were not affected. Comparing the change in outcomes for untreated women in the intervention villages and those in control villages shows no significant difference, suggesting the absence of spillover effects within treated villages. The findings of the paper suggest that while economic situation of women in conservative societies could be enhanced by training interventions, this does not necessarily translate into better social conditions for women.

The rest of the paper is organized as follows. Following this introduction, Section 2 provides a brief background on the situation of women in Upper Egypt, Section 3 provides institutional background about the NN program goals, training components and key implantation activities. Section 4 explains the empirical strategy. Section 5 explains the data analyses. Concluding remarks are provided in Section 6.

²To get a better feeling of the NN project watch this video: <https://www.youtube.com/watch?v=-7VBRZdZnI8>

2 Context of women in Upper Egypt

In Egypt, as many countries in the developing world, women face several forms of gender inequality. The recent 2016 Global Gender Gap Report ranked Egypt as the 132nd country out of 144 countries in terms of the relative disparities between women and men in four key areas: economic opportunity, educational attainment, political participation, and health and survival. The domain in which Egypt is performing relatively poorly is the economic opportunity, on which it is ranked 132nd as compared to 95th on the health and survival domain, 112th on education attainment and 115th on political participation (World Economic Forum 2016). Egypt's ranking has not changed much, since its inclusion in the Gender Gap Index in 2006, where it was ranked 109 out of 115. It has been quite below many of the lower middle-income countries in the Middle East and North Africa region (Sieverding and Hassan 2016).

Egypt is a young country, where over 40% of its population are aged 10-29. Despite improvements in literacy and school enrolment rates over the recent decades, the gender disparity in terms of economic opportunity is not much narrower among the younger cohort of the population. Young women have been persistently facing a disadvantage position on the Egyptian labor market. Based on the 2014 Survey of Young People in Egypt, only 13.3% of young women (aged 15-29) participate in the labor force is only 13.3%, compared to 57.8% among their male peers. Unemployment rate among female youth (32.3%) is more than triple that of young males (9.3%). Young women's employment expectations continue to be based on the flexible working conditions of the public sector, and the private sector has failed to offer conditions attractive enough to encourage long-term labor force participation among female youth. Entrepreneurship rate among youth is still very low, particularly among females. Only 5.7% of employed female youth reported establishing their own business in 2014, compared to 13.1% of their employed male peers. Furthermore, young people throughout the country, and particularly females, face difficulties in starting and running their own business because of lack of access to credit, lack of business information, and lack of marketing outlets and financial services (Roushdy and Selwaness 2015; Sieverding 2012; Assaad and El-Hamidi 2009).

The situation is the worst for young women in the rural settings of Upper Egypt, which is the most culturally conservative and traditional region of the country. It is one of those pockets of population in the MENA region where the vicious cycles of low education, early marriage, high fertility, and severe poverty still persist (Assaad and Roudi-Fahimi 2007). Upper Egypt is culturally distinguished relative to other parts of Egypt with regards to values and gender roles. This region is characterized by distinct patriarchal values which underscore the power of men over women, the influence of elders over youth and the prevalence of tribal feud (Hopkins and Saad, 2004). This cultural restrictions greatly limits young women's mobility, education attainment, economic opportunity, and participation in the public sphere, as the arrival of puberty decreases girls' access to friends and freedom to move around the community (Baldwin 2011; Sieverding and Elbadawy 2016). Only 13.5% of young women (aged 15-29) participate in the labor force in these conservative communities.³ They face the most challenging transition to work, when job opportunities are not readily available in the villages. Young women in rural Upper Egypt also stand out as the largest group of those who are left behind in education. Almost 22.6% of young women in rural Upper Egypt never attended school, as compared to only 7% among young men (Krafft 2015).⁴ In these rural communities, where employment in the non-agricultural private sector is very limited, both small enterprise development and the expansion of female-friendly employment in existing enterprises are essential for job creation and generating employment opportunities.

3 The intervention

3.1 Background

NN program was launched by the Population Council-Egypt office in September 2011 with funds from USAID with the goal of enhancing young women's transition to work in the rural communities of Upper Egypt. The training activities of the program started

³See Figure A1 for the trend of women labor force participation over the last two decades by region (to be included).

⁴While in other regions of the countries, the rates of youth (13-34) who never been to school ranges between 3% and 8% among young men and 4-13% among young women.

in Jan. 2013 and continued till mid-2014.⁵ Neqdar targeted women in 30 villages in the Upper Egyptian governorates of Fayoum, Suhag, and Qena, and was implemented in partnership with three governorate-level NGOs and 30 village-level community development associations (CDAs). Each of the three NGOs oversee 10 CDAs. Unlike most of the existing women empowerment programs, which often focus on microfinance, the program aimed to empower young rural Upper Egyptian women economically through providing them with business and vocational skills and socially through providing them with life skills, and legal and civic rights education, while emphasizing the importance of involving the whole community members.

The NN project was designed to be implemented in 30 villages chosen *a priori* in Upper Egypt. Since the villages were not randomized, propensity score matching was used to select a group of 15 control villages that are comparable to the 30 villages. The control and intervention villages were matched in terms of village size, poverty level, education prevalence, and labor market-related variables. Using matching in control village selection is expected to make the selection as close to being random as possible, thereby alleviating the potential selection bias at the village-level.⁶ Table A# in the Appendix shows a comparison between the characteristics of treated and control villages drawn from the 2006 census of Egypt (TO BE INCLUDED). Figure A# in the Appendix shows common trends in the characteristics of treated and control villages using data from the 1986, 1996, and 2006 of the census (TO BE INCLUDED).

Following the preparatory phase, registration was open in the intervention villages at the local CDAs premises. The main eligibility criterion is to be a woman in the age range 16-29, who could read and write. Despite the large community outreach and advertising efforts conducted by the program staff before the project registration period, the number of women who registered and were eligible for the program was about the targeted number of women in each village. Hence, the women were not randomly selected for participation in the Neqdar program. Data was collected for all treated and a random

⁵For more details on the program description, see Ramadan et al. (2014). Figure 1 shows an overview of the timeline of the project activities. The preparatory activities included getting governmental approvals for implementing the program, village selection, CDAs selection, curriculum development, recruitment and TOT training of promoters and other project staff.

⁶See Bifulco (2012), Arceneaux et al. (2006) and Aiken (1998) for a discussion on how the experimental and matching methods may lead similar results.

sample of the untreated women in intervention villages.

3.2 Trainings

240 promoters (8 in each treated village), who are young educated women (with at least a secondary education), were recruited from the same local community to mentor, teach, coach, guide, as well as provide moral support to the program participants during the training period. Promoters also served as role model of women's achievements in areas where girls face many social and economic restrictions.

The training program consisted of three main training components: (I) Business skills training, (II) Vocational training, and (III) Life skills, legal rights and civic education. The business skills curriculum was delivered in 12 weeks, meeting three times a week for a two-hour session (i.e., a total of 72 hours). During the business training, beneficiaries started either directly searching for employment opportunities (while attending the program classes) or started preparing a market study, with guidance from promoters. The aim of the market study was to map existing local businesses and assess the potential for small businesses in which they are interested in setting up. Based on the market study, beneficiaries who are interested in starting their own business submitted their business plans and market assessments for their proposed projects, and accordingly their vocational training needs.

Vocational training started right after the business skills training. With the help of local training institutes and businesses, beneficiaries received a variety of training options including: accessory making, sewing, hair dressing, livestock raising, dairy-product making, perfume making, cleaning-supplies making, mobile repair and computer hard/software training, first aid/paramedic, and dessert/food catering services. Simultaneously, beneficiaries who were seeking employment were helped to apply for employment opportunities in various factories, shops, schools, and pharmacies, etc.

Concurrent with the vocational training and business startup or employment phase, beneficiaries attended life skills trainings (eight two-hour sessions), Health-awareness classes (four two-hour sessions), legal rights and civic engagement (two two-hour sessions). Parallel to the trainings, NGOs and CDAs staff made sure that all beneficiaries

had proper identification, since having proper identification is vital to apply for loans, formalize businesses, find employment, vote, etc.⁷ CDAs staff also helped beneficiaries open their own saving accounts at local post offices and banks.

3.3 Data collection and outcome variables

The NN implementation started before securing sufficient funds for a baseline impact evaluation survey. Accordingly, when funds got available, the Population Council contracted an external independent entity (the Egyptian Demographic Association (EDA)) to conduct a late-baseline or a midline survey as well as an endline survey to assess the impact of the program (Ramadan et al. 2014). The midline survey was conducted in December 2013/January 2014 and an end-line survey in November/December 2014. Before the mid-line survey, the business skills classes were almost completed, and the vocational training was just starting. The life skills, legal rights, and civic engagement trainings and community awareness events were still to be implemented following the mid-line evaluation. Hence, following the midline data collection, many changes were expected to occur to the program participants' outcomes.⁸

The midline and endline surveys collected detailed information on women's household economic conditions, access to public services, ownership of durables and agricultural land, as well as individual information on age, marital status, education, work information and parents' education. More importantly, the surveys included questions on work and financial independence, business and marketing knowledge, participation in decision-making, and gender roles (including views on women's work, women's rights and gender equality).

We investigate the effect of the program on labor market outcomes, women's economic aspirations, and social empowerment. *Labor market outcomes* are estimated by (1) Income generating activity: which is measured by a dummy variable on whether a woman was involved in any economic activity with the goal of generating income over

⁷A total of 402 beneficiaries were helped to get their national ID cards

⁸Although an interim survey results, compared to that of a baseline, could underestimate the effects of the program, we yet believe that by comparing the results of the mid-line and the end-line surveys, we should still be able to capture a significant share of the effect of the program on women's economic and social outcomes.

the three months prior to the survey. (2) Waged employment: which is measured by a dummy variable that takes the value 1 if the woman currently works for wage, and zero otherwise, (3) Self-employment: which is a dummy variable that takes the value 1 if the woman is currently self employed, and 0 otherwise. (4) Business knowledge index: is a scale from 0 to 1 based on an unweighted index of 6 items that capture women’s business knowledge. Table ?? in the Appendix displays the individual components of the scale.

Economic aspirations are estimated by women’s economic goals for the future. Women are asked about whether they have plans (1) to set up/continue a project, and/or (2) to get wage employment. Each of the two items is a dummy variable that takes the value 1 if the woman has the plan in mind, and zero otherwise. The two items are not mutually exclusive (i.e., individuals can choose more than one item), so each item is considered a separate question on its own.

Social empowerment is estimated using two indexes⁹: (1) Gender equality index (GEI): Women were given different statements about the role of women and asked if they agree to each statement. Table ?? shows the statements. a scale that ranges from 0 to 1 based on the unweighted average of these statements is calculated where 0 is the lowest in terms of perception toward gender equality, and 1 is the highest. (2) Decision making index (DMI): Women are asked whether within the family they usually have the final say in making different decisions (See Table ??). Unweighted average of these items is calculated and then an index that ranges from 0 to 1 is calculated where 0 is the lowest in terms of intra-household decision making, and 1 is the highest.

3.4 Sample size, attrition, and descriptives

Among the 7,028 women who were interviewed in the first round of the survey and for whom we have complete information about background characteristics, labor market outcomes, and social outcomes [4,273 treated, 1,523 untreated, and 1,232 in control villages], 5,704 women (3,483 treated, 1,225 untreated, and 996 in control villages), were tracked in the endline survey, corresponding to a tracking rate of 81%. Table ?? shows a comparison in observable characteristics between the group that remained across the two waves and

⁹For more information on women’s social empowerment measures, see: Tuccio and Wahba (2015).

the group that dropped in the second wave. Although some differences exist in observable (and outcome) characteristics between the two groups, attrition does not seem to be driven by the treatment status.¹⁰

The analysis in this paper is limited to the balanced sample of 5,704 women whom completely filled both midline and endline surveys and have complete information on all relevant variables.¹¹ Table ?? shows descriptive statistics of the three groups from the midline survey. The table shows clear significant differences between the treated group and both untreated and control groups. Treated women are less likely to be married and have children, more likely to be working, and have on average lower level of mental health, and less conservative attitudes towards gender roles. However, normalized differences are below the rule of thumb of 0.25 (Imbens and Wooldridge 2009).¹²(Detailed comments on this table will be included).

4 Empirical Strategy

To evaluate the impact of the intervention while accounting for unobserved heterogeneity of individuals, we use difference-in-difference approach (DD) in evaluating the impact. The design of the intervention enables to estimate the impact of the program and the spillover effect in one single equation. We evaluate the impacts of the NN program on several outcomes for treated and untreated groups compared to the control group. For this purpose, we estimate the following DD specification:

$$Y_{it} = \alpha + \beta_1 T_{it} + \beta_2 U_{it} + \beta_3 W_t + \beta_4 [T_{it} * W_t] + \beta_5 [U_{it} * W_t] + \beta_6 X_{it} + \varepsilon_{it} \quad (1)$$

where Y_{it} is the outcome of woman i at time t , T_{it} is a dummy variable that takes the value one if the respondent is treated and zero otherwise, U_{it} is a dummy variable that takes the value one if the respondent is untreated and zero otherwise, W_t is a dummy

¹⁰We repeated all the analyses after accounting for non-random attrition using inverse probability weights (see Wooldridge 2002). This gives similar results (Tables TO BE SHOWN IN THE APPENDIX). Probit estimates of the attrition will be also shown

¹¹A different sample size with different subsets of variables was investigated for robustness checks and yielded similar results. More analysis will be added regarding this in later versions of the paper.

¹²Table ?? shows the descriptive statistics for the whole sample of 7,028 women.

variable that takes the value one if the observation is from the second wave of the study (at the follow-up) and zero otherwise, the parameter β_4 for the interaction between T_{it} and W_t is our measure of change in treated women’s outcomes compared to that of women in control group, β_5 captures the change in the outcome for untreated women compared to control group and therefore provides an estimate of the spillover effect within NN villages, X_{it} is a set of controls which include age, a dummy for being married, a dummy for having children, education, father’s education, household size, household wealth, and region fixed effects, and ε_{it} is a time-varying error term.

To account for the selective nature of the intervention, we also combine DD with propensity score matching (PSM). A combination of DD and PSM allows us to circumvent the self-selection problem by drawing on the assumption that, conditional on observable characteristics of women, unobservable characteristics that might affect self-selection into the program and subsequent changes in outcomes are similar between treated and control groups.

To illustrate the approach, which combines DD and PSM, let $T = 1$ if a woman is treated and $T = 0$ if he is in the control group. The outcome of being treated by the NN program and the counterfactual outcome at time t can be denoted by (Y_t^T, Y_t^C) . The gain from treatment is $(Y_t^T - Y_t^C)$, and we are interested in estimating the average effect of treatment on the treated (ATT), $(Y_t^T - Y_t^C|T = 1)$. The inability to observe the counterfactual outcome for treated women prevents us from directly estimating the ATT. Using data from midline and endline, we control for the individual fixed effects. With $(t = 0)$ denoting the midline and $(t = 1)$ denoting the endline, we can re-write the standard DD estimator as:

$$DD = E(Y_1^T - Y_0^T|T = 1) - E(Y_1^C - Y_0^C|T = 0) = E(Y_1^T - Y_1^C|T = 1) + B_1 - B_0 \quad (2)$$

where B_t is the selection bias in period t and $B_t = E(Y_t^C|T = 1) - E(Y_t^C|T = 0)$. If the initial individual characteristics that affect subsequent changes to the outcome variables are distributed differently between the treatment and the control groups, the condition $B_1 = B_0$ will not hold. To allow for this situation, we use PSM to balance these variables. The assumption underlying PSM is that, conditional on observable character-

istics, changes in outcome variables, if untreated, are independent of actual treatment, $[(Y_1^C - Y_0^C) \perp T|X]$. This assumption implies $[(Y_1^C - Y_0^C) \perp T|P(X)]$ where $P(X)$ is the propensity score defined as $P(X) = Prob(T = 1|X)$. This justifies balancing on $P(X)$ to remove selection bias based on X . Note that this only addresses time-varying selection bias based on observables; a bias will remain if there are any time-varying factors correlated with the changes in counterfactual outcomes (see Rosaenbaum and Rubin 1983; Chen et al. 2009). In the empirical estimations we use a PS-weighted regression method proposed by Hirano et al. (2003) which produces an estimate of the ATT as the parameter in a weighted least square regression of the form: $Y_{it} - Y_{i,t-1} = \alpha + \beta T_i + u_i$ where $E(u_i|T_i) = 0$, and the weights equal one for treated observations and $\hat{P}(X)/[(1 - [\hat{P}(X)]]$ for control observations. We use various methods for assuring balance on $P(X)$. One method is to limit comparisons to a trimmed sub-sample with sufficient overlap in propensity scores (Crump et al. 2007). This trimming method minimizes the variance of the estimated ATT under homoscedasticity.

As a robustness check we also estimate the coefficients applying regular propensity score matching techniques (Heckman 1997; 1998) using the nonparametric kernel matching in which all the non-participants are used as controls and weights are assigned according to a kernel function of the predicted propensity score so that we assure valid bootstrapped standard errors (Chen et al. 2009)

5 Data analyses

Table ?? shows the simple DD estimates from Equation (1). The table shows a significant increase in the labor market outcomes of the treated group relative to the control group. To benchmark the magnitude of the effects we report the effects in percentage of the treated group mean in the midline period. The probability to be involved in an income generating activity witnessed an increase of 33% between the midline and endline periods for the treated women relative to women in the control group. Most of the change comes from self-employment which witnessed an increase of 87% for the treated women relative to control, while waged employment was not affected by the treatment. Although the midline survey started after most women finished the business skills component,

business knowledge showed a significant increase of 15% for the treated women. The table further shows that the share of women who plan to set up their own businesses increased significantly by 36%. Social empowerment aspects of GEI and DMI witnessed no change. Comparing the change in outcomes between the untreated and control groups, the table shows no evidence of spillover effects.

to better understand the pattern of the change for the business knowledge index, GEI, and DMI, Table A# in the Appendix runs the analyses for each individual components of the indexes.

Table ?? shows the coefficients of the propensity score estimates using PS-weighted approach and Kernel PSM for both untrimmed and trimmed samples. Panel A shows the main effect of comparing treated group to the control group and Panel B shows the spill-over effect comparing the untreated to control group. Table ?? in the Appendix shows the probit estimates used for calculating the propensity score.

Table ?? examines the extent of heterogeneity of the program impact with respect to the midline characteristics of education, marriage, and wealth. The table also reports the heterogeneity with respect to midline levels of social empowerment measures of GEI and DMI. Highly educated and married women are more likely to be involved in income generating activities and be self-employed. Low educated are more likely to gain business knowledge. Women from poorer families are more likely to benefit from the intervention. The table further shows that if a woman has a higher level of social empowerment in the midline period, she is more likely to benefit from the program.

6 Conclusion

Women in several developing countries face enormous challenges due to lack of economic and social empowerment. This paper investigated to what extent relaxing the human capital constraint for women could enhance their empowerment perspectives. Evaluating a large-scale female empowerment intervention in Upper Egypt where women were offered an extensive vocational, business, and life skills training shows that labor market outcomes of women improved. However, no significant impact on their social empower-

ment measured by their decision making and gender equality attitudes was found. The findings of the paper show that while these interventions could help women achieve economic empowerment, binding constraints arising from social norms could still hinder social empowerment.

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Table 1: Descriptive Statistics on Estimation Sample

	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	NN villages Treated	NN villages Untreated	Control villages	P value (1)=(2)	Normalized diff. (1) and (2)	P value (1)=(3)	Normalized diff. (1) and (3)	P value (2)=(3)	Normalized diff. (2) and (3)	
Women empowerment										
Income generating activity	0.134	0.060	0.062	0.000	0.059	0.000	0.062	0.928	-0.001	
Waged work	0.079	0.030	0.039	0.000	0.052	0.000	0.046	0.256	-0.008	
Self-employment	0.034	0.012	0.007	0.001	0.030	0.000	0.040	0.079	0.005	
Business knowledge index	0.476	0.256	0.338	0.000	0.165	0.000	0.120	0.000	-0.053	
Wishes to set up/continue a project	0.270	0.078	0.078	0.000	0.109	0.000	0.118	0.978	-0.000	
Wishes to get employed	0.295	0.214	0.261	0.000	0.046	0.016	0.021	0.004	-0.023	
Gender equality index	0.601	0.573	0.576	0.005	0.040	0.000	0.038	0.508	-0.004	
Decision making power index	0.467	0.445	0.425	0.037	0.021	0.000	0.045	0.061	0.017	
Background characteristics										
Less than secondary education	0.566	0.521	0.496	0.010	0.023	0.000	0.040	0.223	0.011	
Secondary education	0.382	0.415	0.418	0.060	-0.017	0.033	-0.020	0.869	-0.001	
Above secondary education	0.052	0.064	0.087	0.106	-0.013	0.000	-0.040	0.045	-0.020	
Age	22.375	22.000	21.863	0.293	0.014	0.037	0.020	0.244	0.004	
Married	0.348	0.602	0.544	0.000	-0.128	0.000	-0.109	0.039	0.025	
Number of children	0.707	1.022	0.867	0.000	-0.064	0.000	-0.035	0.007	0.027	
Household size	5.256	4.452	4.469	0.000	0.104	0.000	0.110	0.559	-0.002	
Father can read and write	0.160	0.236	0.246	0.000	-0.050	0.000	-0.061	0.489	-0.005	
1st wealth quantile	0.220	0.172	0.184	0.000	0.032	0.002	0.025	0.266	-0.007	
2nd wealth quantile	0.216	0.173	0.200	0.001	0.029	0.153	0.012	0.096	-0.015	
3rd wealth quantile	0.179	0.201	0.226	0.085	-0.014	0.000	-0.033	0.141	-0.014	
4th wealth quantile	0.195	0.222	0.190	0.013	-0.018	0.977	0.003	0.039	0.017	
5th wealth quantile	0.190	0.233	0.199	0.000	-0.027	0.280	-0.006	0.043	0.018	
Sample size	3,483	996	1,225							

Note: The table provides descriptive statistics from the mid-line survey on the balanced estimation sample. The normalized difference is computed following Imbens and Wooldridge (2009).

Table 2: The impact of the intervention on empowerment of women

VARIABLES	(1) Income generating activity	(2) Waged work	(3) Self-employment	(4) Business knowledge index	(5) Plans to set up a project	(6) Plans to work	(7) Gender equality index	(8) Decision making power index
Treated group x Follow-up round	0.045** (0.020)	0.002 (0.013)	0.030** (0.011)	0.061** (0.025)	0.094*** (0.032)	0.023 (0.043)	0.005 (0.020)	-0.000 (0.035)
Untreated group x Follow-up round	0.005 (0.017)	0.002 (0.010)	-0.004 (0.008)	0.024 (0.026)	0.044 (0.030)	0.031 (0.046)	0.002 (0.024)	0.017 (0.037)
Treated group	0.074*** (0.015)	0.036*** (0.009)	0.032*** (0.008)	0.130*** (0.023)	0.190*** (0.022)	0.023 (0.032)	0.012 (0.013)	0.029 (0.023)
Untreated group	-0.000 (0.016)	-0.011 (0.009)	0.006 (0.008)	-0.050** (0.023)	-0.007 (0.021)	-0.029 (0.034)	-0.004 (0.016)	0.022 (0.024)
Follow up round	-0.003 (0.014)	0.000 (0.009)	0.005 (0.007)	0.120*** (0.021)	0.040 (0.024)	0.021 (0.039)	0.002 (0.016)	-0.043 (0.031)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.076	0.067	0.049	0.272	0.102	0.051	0.076	0.086
Mean of outcome	.134	.079	.034	.432	.27	.295	.601	.467
Effect size %	33	3	88	14	35	8	1	0
Sample size	11408	11408	11408	11408	11408	11408	11408	11408

Note: *** denotes significance at 1%, ** at 5%, and * at 10%. Standard errors are clustered by village. Control variables include a dummy variable for having secondary education or higher, age, age square, marital status, number of children household size, a dummy variable that takes the value 1 if the girl's father is educated, household wealth index, and region (markaz) FE.

Table 3: PSM estimates of the impact of the intervention on empowerment of women

	PS weighted DD		Kernel matched DD	
	Untrimmed sample	Trimmed sample	Untrimmed sample	Trimmed sample
A) Main effect				
Income generating activity	0.047*** (0.011)	0.047*** (0.013)	0.043*** (0.011)	0.043*** (0.012)
Waged work	0.000 (0.007)	0.001 (0.009)	0.002 (0.008)	-0.001 (0.008)
Self-employment	0.032*** (0.007)	0.031*** (0.008)	0.031*** (0.007)	0.029*** (0.007)
Business knowledge	0.105*** (0.022)	0.108*** (0.023)	0.088*** (0.012)	0.088*** (0.012)
Wishes to set up a project	0.088*** (0.017)	0.080*** (0.018)	0.092*** (0.017)	0.096*** (0.018)
Wishes to get employed	0.145 (0.164)	-0.156 (0.166)	0.007 (0.021)	0.003 (0.023)
Gender equality index	-0.005 (0.01)	-0.006 (0.01)	0.003 (0.01)	0.001 (0.01)
Decision making power index	0.029 (0.025)	0.022 (0.028)	0.006 (0.014)	-0.001 (0.014)
B) Spill-over effect				
Income generating activity	0.003 (0.011)	-0.001 (0.012)	0.000 (0.010)	0.000 (0.010)
Waged work	0.000 (0.008)	-0.002 (0.007)	0.001 (0.008)	0.001 (0.009)
Self-employment	0.006 (0.007)	-0.006 (0.007)	0.007 (0.005)	-0.005 (0.006)
Business knowledge	0.025 (0.015)	0.020 (0.015)	0.017 (0.016)	0.018 (0.017)
Wishes to set up a project	0.031 (0.019)	0.028 (0.018)	0.026 (0.016)	0.025 (0.016)
Wishes to get employed	0.045 (0.034)	0.038 (0.026)	0.040 (0.029)	0.048 (0.037)
Gender equality index	0.001 (0.010)	0.006 (0.012)	-0.002 (0.010)	0.000 (0.009)
Decision making power index	0.024 (0.015)	0.028* (0.017)	0.020 (0.022)	0.018 (0.023)

Note: *** denotes significance at 1%, ** at 5%, and * at 10%. Standard errors are clustered by village. Control variables include a dummy variable for having secondary education or higher, age, age square, marital status, number of children household size, a dummy variable that takes the value 1 if the girl's father is educated, household wealth index, and region FE. Similar to Crump et al. 2007; Chen et al. 2009), trimmed sample is calculated based on a common support interval between 0.1 and 0.9.

Table 4: Heterogeneity of the impact of the intervention on empowerment of women

VARIABLES	(1) Income generating activity	(2) Waged work Waged work	(3) Self-employment Self-employment	(4) Business knowledge index	(5) Wishes to set up/ continue a project	(6) Wishes to get employed	(7) Gender equality index	(8) Decision making power index
Education								
Low education (below sec.)	0.028 (0.019)	-0.007 (0.011)	0.021** (0.010)	0.082** (0.041)	0.095*** (0.026)	0.016 (0.048)	0.003 (0.022)	0.008 (0.042)
High education (secondary or above)	0.060** (0.029)	0.011 (0.022)	0.039** (0.016)	0.049 (0.039)	0.094** (0.045)	0.024 (0.049)	0.006 (0.025)	-0.006 (0.034)
Marriage								
Unmarried	0.032 (0.026)	-0.005 (0.017)	0.028*** (0.010)	0.097*** (0.035)	0.101*** (0.035)	-0.001 (0.037)	0.009 (0.022)	0.004 (0.036)
Married	0.073** (0.030)	0.007 (0.015)	0.045** (0.020)	0.042 (0.049)	0.092** (0.043)	0.024 (0.054)	-0.006 (0.023)	-0.019 (0.040)
Wealth								
Below median wealth	0.051* (0.026)	-0.002 (0.016)	0.037*** (0.014)	0.065 (0.042)	0.101*** (0.037)	0.045 (0.053)	0.004 (0.025)	-0.020 (0.040)
Above median wealth	0.036* (0.020)	0.004 (0.014)	0.021 (0.013)	0.072* (0.036)	0.089** (0.037)	-0.004 (0.044)	0.004 (0.021)	0.024 (0.037)
Gender equality index								
Below median att	0.042** (0.019)	0.003 (0.015)	0.027* (0.013)	0.082* (0.041)	0.109*** (0.033)	0.023 (0.046)	- (0.039)	-0.003 (0.039)
Above median att	0.055* (0.030)	0.001 (0.014)	0.037*** (0.013)	0.051 (0.040)	0.080 (0.049)	0.035 (0.057)	- (0.042)	0.009 (0.042)
Decision making								
Below median empower	0.029 (0.024)	0.004 (0.015)	0.027** (0.011)	0.107** (0.040)	0.064 (0.050)	0.131* (0.075)	-0.005 (0.020)	- (0.028)
Above median empower	0.054** (0.022)	0.001 (0.015)	0.030* (0.015)	0.048 (0.044)	0.113*** (0.031)	-0.054 (0.032)	0.012 (0.028)	- (0.028)

Note: Simple DD estimates from Equation (1). *** denotes significance at 1%, ** at 5%, and * at 10%. Standard errors are clustered by village. Control variables include a dummy variable for having secondary education or higher, age, age square, marital status, number of children household size, a dummy variable that takes the value 1 if the girl's father is educated, household wealth index, and region (markaz) FE.

Appendix A

Table A1: Items of Business knoweldge

-
- What are the procedures required for registering a small business?
 - What are the procedures required for getting a loan for a small enterprise?
 - Are buildings, equipment, and machinery considered among the fixed or variable assets of the project?
 - What is the primary goal of the market analysis?
 - What are the main three components of feasibility study?
 - What is the goal of the financial study?
-

Note: Women were asked to give a correct answer to each of these statement. Complete correct answer on each question takes the value 1. If the answer is wrong, incomplete, or the respondent does not know, the statement takes 0. Unweighted average is calculated and rescaled from 0 to 1.

Table A2: Items of the gender equality index

-
- A woman's place is not only at home, she should be allowed to work
 - When job opportunities are scare, priority must go to men over women, regardless of capabilities
 - If the wife is working outside her home, the husband should help her with domestic work
 - A woman can have her own business project
 - Education is important for a girl to help her find a good job
 - Girls in the family should have same level of education as boys
 - If the family is financially constrained, boys should have priority in getting education over girls
 - Women can be an effective member of the parliament
-

Note: Women were asked if they agree or disagree to each of the statements. Unweighted average is calculated and rescaled from 0 to 1.

Table A3: Items of the decision making index

-
- I will tell you some life decisions you may experience and tell me who makes them:
- You getting employed or starting a business project
 - Choosing your household chores
 - How to spend your leisure time
 - Spending your income from work
 - You going to a doctor/ health unit
 - Buying clothes for yourself
 - Spending your saved money
-

Note: Choices given are: me alone, me with my partner (or family if unmarried), my partner (or family if unmarried alone), or other. Women are given 1 if they make the decision on their own, and zero, otherwise. Unweighted average of the seven statement is calculated and rescaled from 0 to 1.

Table A4: Descriptive Statistics for those attrited and those remained in the follow-up wave

	Mean remained	SD remained	Mean dropped	SD dropped	P value
Treatment groups					
Treated	0.611	0.488	0.597	0.491	0.370
Untreated	0.175	0.380	0.178	0.383	0.772
Control	0.215	0.411	0.225	0.418	0.427
Women empowerment					
Income generating activity	0.106	0.308	0.135	0.342	0.002
Waged work	0.062	0.241	0.085	0.279	0.002
Self-employment	0.024	0.154	0.020	0.141	0.387
Business knowledge index	0.408	0.319	0.427	0.318	0.046
Wishes to set up/continue a project	0.195	0.396	0.176	0.381	0.103
Wishes to get employed	0.273	0.446	0.284	0.451	0.452
Gender equality index	0.591	0.186	0.601	0.185	0.078
Decision making power index	0.454	0.276	0.452	0.276	0.804
Background characteristics					
Less than secondary education	0.543	0.498	0.558	0.497	0.319
Secondary education	0.396	0.489	0.370	0.483	0.088
Above secondary education	0.061	0.240	0.072	0.258	0.166
Age	22.200	7.139	22.727	10.643	0.029
Married	0.434	0.496	0.373	0.484	0.000
Number of children	0.797	1.236	0.661	1.173	0.000
Household size	4.947	1.945	5.011	2.003	0.280
Father can read and write	0.192	0.394	0.161	0.368	0.011
1st wealth quantile	0.204	0.403	0.219	0.414	0.230
2nd wealth quantile	0.205	0.404	0.222	0.416	0.185
3rd wealth quantile	0.193	0.394	0.181	0.385	0.329
4th wealth quantile	0.198	0.399	0.193	0.395	0.657
5th wealth quantile	0.200	0.400	0.186	0.389	0.243
Sample size	5,704		1,324		

Source: The table provides descriptive statistics for the attrition.

Table A5: Descriptive Statistics on the whole Sample

	(1) NN villages		(3) Control villages	(4) P value		(5) Normalized diff.		(6) P value		(7) Normalized diff.		(8) P value		(9) Normalized diff.	
	Treated	Untreated		(1)=(2)	(1) and (2)	(1)=(3)	(1) and (3)	(2)=(3)	(2) and (3)						
Women empowerment															
Income generating activity	0.134	0.060	0.062	0.000	0.055	0.000	0.058	0.928	-0.001						
Waged work	0.079	0.030	0.039	0.000	0.048	0.000	0.043	0.256	-0.008						
Self-employment	0.034	0.012	0.007	0.001	0.029	0.000	0.038	0.079	0.005						
Business knowledge index	0.476	0.256	0.338	0.000	0.156	0.000	0.114	0.000	-0.050						
Wishes to set up/continue a project	0.270	0.078	0.078	0.000	0.104	0.000	0.113	0.978	-0.000						
Wishes to get employed	0.295	0.214	0.261	0.000	0.043	0.016	0.020	0.004	-0.021						
Gender equality index	0.601	0.573	0.576	0.005	0.037	0.000	0.036	0.508	-0.004						
Decision making power index	0.467	0.445	0.425	0.037	0.020	0.000	0.042	0.061	0.016						
Background characteristics															
Less than secondary education	0.566	0.521	0.496	0.010	0.022	0.000	0.038	0.223	0.011						
Secondary education	0.382	0.415	0.418	0.060	-0.016	0.033	-0.019	0.869	-0.001						
Above secondary education	0.052	0.064	0.087	0.106	-0.013	0.000	-0.038	0.045	-0.019						
Age	22.375	22.000	21.863	0.293	0.012	0.037	0.018	0.244	0.004						
Married	0.348	0.602	0.544	0.000	-0.121	0.000	-0.104	0.039	0.023						
Number of children	0.707	1.022	0.867	0.000	-0.061	0.000	-0.034	0.007	0.025						
Household size	5.256	4.452	4.469	0.000	0.098	0.000	0.104	0.559	-0.002						
Father can read and write	0.160	0.236	0.246	0.000	-0.047	0.000	-0.058	0.489	-0.005						
1st wealth quantile	0.220	0.172	0.184	0.000	0.030	0.002	0.024	0.266	-0.007						
2nd wealth quantile	0.216	0.173	0.200	0.001	0.027	0.153	0.011	0.096	-0.014						
3rd wealth quantile	0.179	0.201	0.226	0.085	-0.014	0.000	-0.032	0.141	-0.013						
4th wealth quantile	0.195	0.222	0.190	0.013	-0.017	0.977	0.003	0.039	0.016						
5th wealth quantile	0.190	0.233	0.199	0.000	-0.026	0.280	-0.006	0.043	0.017						
Sample size	4,273	1,232	1,523												

Note: The table provides descriptive statistics from the mid-line survey on the balanced estimation sample. The normalized difference is computed following Imbens and Wooldridge (2009).

Table A6: Probit regression of girl participation in the NN program using baseline covariates

VARIABLES	(1)	(2)
	Treated	Untreated
Age	0.029*** (0.003)	-0.000 (0.004)
Married	-0.576*** (0.053)	0.102 (0.072)
Number of children	0.031 (0.020)	0.032 (0.025)
Household size	0.067*** (0.009)	0.010 (0.014)
Father can read and write	-0.173*** (0.035)	-0.061 (0.044)
Education		
Less than secondary education	Reference	Reference
Secondary education	-0.073** (0.031)	-0.056 (0.040)
Above secondary education	0.336*** (0.058)	-0.208*** (0.075)
Region		
Region 1: Qena	Reference	Reference
Region 2: Fayoum	0.183*** (0.035)	-0.055 (0.043)
Region 3: Suhag	0.016 (0.034)	-0.252*** (0.046)
Wealth quantiles		
Wealth quantile 1	Reference	Reference
Wealth quantile 2	-0.006 (0.043)	0.016 (0.060)
Wealth quantile 3	-0.178*** (0.043)	0.005 (0.058)
Wealth quantile 4	0.008 (0.044)	0.177*** (0.058)
Wealth quantile 5	-0.024 (0.044)	0.206*** (0.059)

Note: *** denotes significance at 1%, ** at 5%, and * at 10%. Standard errors are clustered by village..

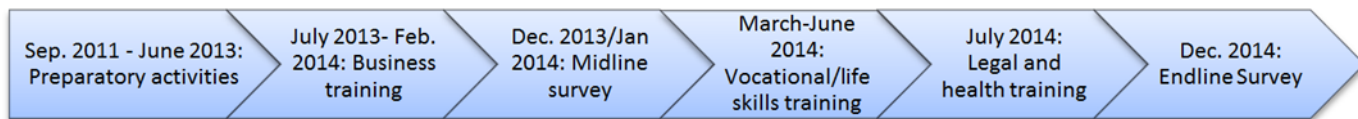


Figure 1: Timeline of the Neqdae Nesharek project