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YOUTH MENTAL HEALTH, WELLBEING, AND  
MARRIAGE? EVIDENCE FROM EGYPT  
USING LONGITUDINAL DATA**

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**Working Paper No. 1200**

# **DOES PRECARIOUS EMPLOYMENT DAMAGE YOUTH MENTAL HEALTH, WELLBEING, AND MARRIAGE? EVIDENCE FROM EGYPT USING LONGITUDINAL DATA**

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**Working Paper 1200**

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## Abstract

The work environment has witnessed dramatic changes over the past three decades as a result of globalization, competition, and economic uncertainty, which led to a sharp rise in precarious employment across the world. Although the number of precarious jobs has increased considerably in the Arab countries over the recent decades, little is known about such jobs' social and health consequences. Using Egypt as a case study, this paper aims to fill this gap in the literature by adding new evidence on the social consequences of precarious employment from an understudied region. This paper particularly looks at the impact of precarious employment on mental health, self-rated health and happiness in marriage. We use longitudinal data from the Survey of Young People in Egypt (SYPE) conducted in 2009 and 2014. To estimate the causal impact of precarious employment, we employ several identification strategies, namely fixed and random effect regressions and instrumental variable two stage least squares. Our findings suggest that precarious employment is associated with poor mental health and worse well-being among youth. Our main findings remained across different identification strategies with different assumptions. The adverse impact of precarious work is likely to be mediated, though in some models it is a partial mediation, through poor working conditions such as low salary, maltreatment at work, job insecurity, and harassment from colleagues.

**JEL Classifications:** I10, I31, J12, J28

**Keywords:** Precarious Employment, Mental Health, Wellbeing, Marriage, Egypt.

## ملخص

شهدت بيئة العمل تغيرات هائلة على مدى العقود الثلاثة الماضية نتيجة للعولمة والمنافسة وعدم الاستقرار الاقتصادي، مما أدى إلى ارتفاع حاد في العمالة غير المستقرة في جميع أنحاء العالم. على الرغم من أن عدد الوظائف غير المستقرة قد ازداد بشكل كبير في الدول العربية خلال العقود الأخيرة، إلا أنه لا يُعرف الكثير عن العواقب الاجتماعية والصحية لهذه الوظائف. تستخدم هذه الورقة مصر كدراسة حالة، بهدف سد الثغرة في الأدبيات من خلال إضافة أدلة جديدة على العواقب الاجتماعية للعمالة غير المستقرة من منطقة لم تدرس دراسة كافية بعد. تبحث هذه الورقة بشكل خاص في تأثير العمل غير المستقر على الصحة النفسية والحالة الصحية حسب تقييمها ذاتياً والسعادة في الزواج. نحن نستخدم البيانات الطولية من مسح الشباب في مصر والذي جري عامي 2009 و2014. ولتقدير الأثر السلبي للعمالة غير المستقرة، فإننا نستخدم العديد من استراتيجيات تحديد الهوية، وهي انحدارات التأثيرات الثابتة والعشوائية والمتغيرات ذات المراحل الأقل من مرحلتين. وتشير النتائج التي توصلنا إليها إلى أن التشغيل غير المستقر مرتبط بضعف الصحة النفسية وسوء حالة الرفاه بين الشباب. تظل النتائج الرئيسية لدينا على أساس استراتيجيات تحديد مختلفة مع افتراضات متنوعة. ومن المرجح أن يحدث التأثير السلبي للعمل غير المستقر بطرق غير مباشرة، وإن كان جزئياً في بعض النماذج، من خلال ظروف العمل السيئة مثل الراتب المنخفض، وسوء المعاملة في العمل، وانعدام الأمن الوظيفي، ومضايقة زملاء.

## 1. Introduction

The work environment has gone through major changes over the last two decades as a consequence of globalization, fierce competition, and economic uncertainty. Under the pressure of fierce global competition, companies are cutting their costs and shirking their legal obligation by replacing permanent jobs with fixed short-term contracts, temporary and part-time positions. While this non-standard work arrangement has helped firms in rationing their costs, there is a growing concern that it has adverse consequences on the well-being of workers and their families. This is because precarious employment is characterized by employment that is insecure, uncertain and unstable. Precarious workers have limited access to social benefits and health insurance. They receive low pay, and encounter dangerous working conditions, and a higher risk of work injuries (Vosko 2010; Benach et al. 2014). There is no precise definition of precarious employment in the literature. We here define precarious employment through a combination of forms of the employment relationship and characteristics. Workers are precarious if they are in involuntary part-time work, in seasonal or casual work or in temporary jobs without a legal work contract or formal appointment.

A growing number of studies have examined these changes in the working conditions on workers' welfare and health. When voluntarily chosen, flexible work arrangements have been found to have a positive impact on workers particularly for highly skilled workers and mothers with young children (Nätti 1993; Kalleberg et al. 2000; Guest & Clinton 2006; Benach & Muntaner 2007). The flexibility that is associated with precarious employment may have positive externalities on individuals that allow them to combine work with family life and to control their schedule, and perhaps some workers would prefer this kind of flexibility.

On the contrary, a substantial number of studies have linked precarious employment to a wide range of adverse psychological health outcomes as well as low life and job satisfaction (Benach et al. 2000; Benavides et al. 2000; Ferrie et al. 2001; Quinlan et al. 2001; Ferrie et al. 2002; Rodriguez 2002; Ludermir & Lewis 2003; Benach et al. 2004; Lee et al. 2004; Kim et al. 2006; Kim et al. 2008; Reine et al. 2008; Scherer 2009; Benach et al. 2014; Pirani & Salvini 2015). However, the effect of precarious employment on physical health and chronic diseases is not well established in the literature.

The consequences of precarious employment on individuals' well-being rest on the social, economic, and political processes driving labor market regulations and welfare state policies (Kim et al. 2008; Ehlert & Schaffner 2011). Thus, the impact of precarious employment on individuals' well-being might be ameliorated by the strength of the social safety net. Consequently, the investigated relationship is likely to be a country-specific, as the welfare system could mitigate the effect of precarious employment (Virtanen et al. 2002; Virtanen et al. 2005). For instance, precarious workers in Scandinavian countries seem to be protected from the negative consequences of precarious work (Westergaard-Nielsen 2008). On the contrary, the adverse health consequences of precarious employment are evident for the South and Central European countries where the welfare system is less generous (Rodriguez 2002; László et al. 2010; Cottini & Lucifora 2013). Furthermore, precarious work is associated with political instability, as it can produce instability in society and increase inequalities (Witte 1999; Standing 2016).

Egypt has witnessed a sharp increase in the prevalence of precarious employment, particularly among youth, in the recent decades and the situation has worsened since 2011 (Assaad & Krafft 2013a, b). Krafft and Assaad (2014) suggested that the economic downturn that accompanied the political instability in Egypt has doubled the share of precarious employment among male workers in the labor force between 2006 and 2012 from 9% to 20%. Likewise, the Survey of Young People

in Egypt (SYPE) has shown that the share of irregular workers has increased from 21% to 26% among young workers between 2009-2014 (Roushdy et al. 2015).

Research on the consequences of the rise of precarious employment in Egypt is rare and this study aims to fill this gap. The paper explores two research questions: compared to wage employee in a regular job, *does precarious employment damage youth mental health?* Likewise, compared to wage employee in a regular job, *does precarious work harm workers' marriages?*

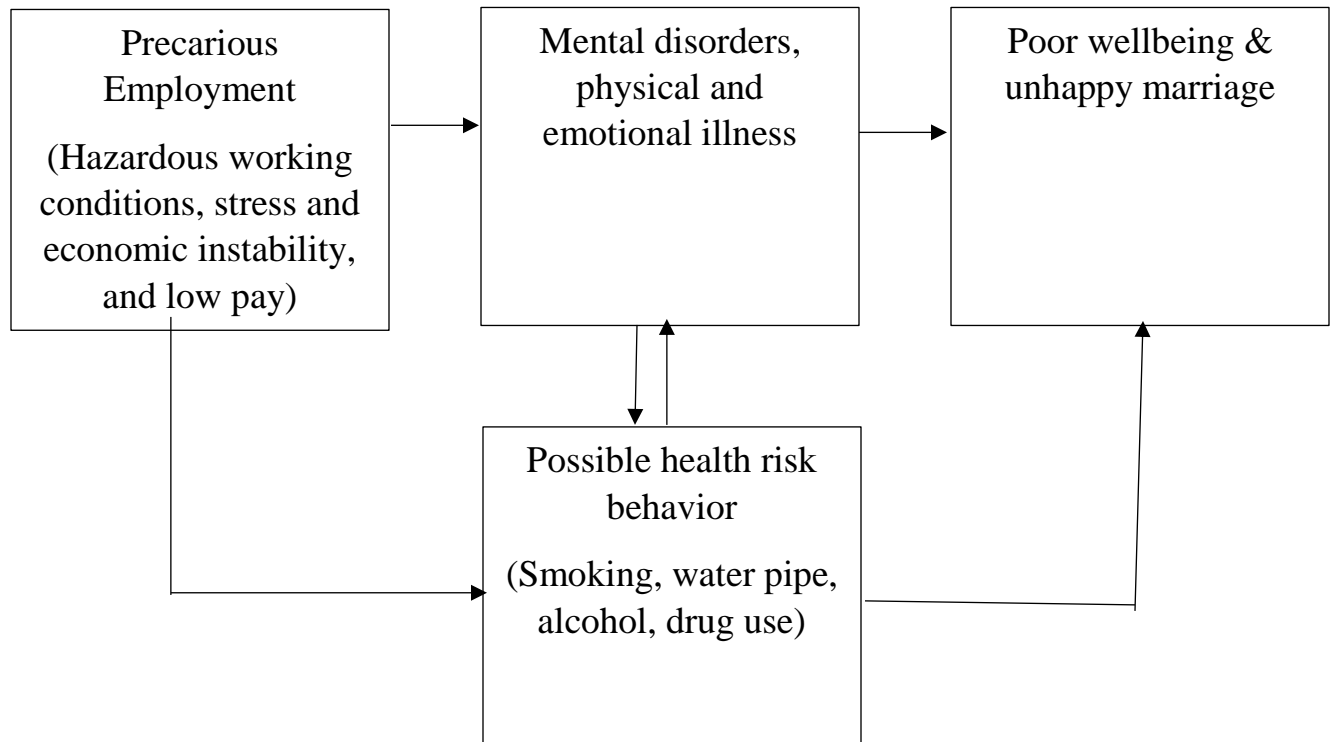
The rest of this paper is structured as follows: Section 2 presents the conceptual framework; Section 3 discusses the diffusion of precarious employment; Section 4 describes the data and the empirical methods; results are discussed in Section 5 while the conclusions are summarized in Section 6.

## **2. Precarious employment and health linkages: A conceptual framework**

Precarious work damages individuals' health through several pathways. Figure 1 provides a conceptual framework linking precarious work and individuals' well-being within a broad institutional context (Benach et al. 2007; Kim et al. 2008). The figure postulates two pathways through which precarious employment conditions can damage health. Firstly, in comparison to regular employment, precarious workers encounter poorer working conditions with detrimental health consequences such as physically demanding workloads, toxic exposures, repetitive work and hazardous working conditions (Rodgers & Rodgers 1989; Benach et al. 2004). Furthermore, precarious workers are more at risk of occupational injuries. For example, Benavides et al. (2006) suggested that precarious workers are three times more likely than permanent workers to experience a non-fatal injury in Spain. Fabiano et al. (2008) found similar results in Italy. In India, Saha et al. (2004) studied the effect of the type of contract on injuries at the factory level and suggested that fixed-term workers were exposed to occupational injuries 1.2 to 3.5 times more often than permanent workers. This could be attributed to the high exposure to hazardous working conditions, lack of training about occupational risks, and less job experience than permanent workers (Letourneux 1998; Benavides et al. 2006). In addition, precarious workers and their families are living without stability and they bear all the risks of the work that would increase the stress and impair mental health. They lack support at work in their relations with both supervisors and permanent coworkers (Clarke et al. 2007; Elcioglu 2010). The lack of support at work is known to increase psychosocial stress (Mirowsky & Ross 1986). Furthermore, precarious workers have no or limited rights in the workplace and lack the prospect of promotion, which creates the sense of marginalization and social disadvantage causing depression and a low sense of self-worth.

Secondly, precarious workers are usually poorly paid and not insured. This may lead to material deprivation, which in turn may affect various social determinants of health such as the ability to access health care, and healthy housing conditions (Lewchuk et al. 2008; Vives et al. 2013). Also, precarious workers live under the constant threat of a sudden drop in income, which can cause stress, anxiety, depression and sleep disorders. Job insecurity imposes uncertainty on workers' personal lives and their future plans (Clarke et al. 2007; Ferrie et al. 2008). The uncertainty even hampers their ability to take key decisions relative to personal life and family formation (Bhagwati 1995; Green 2011). These factors can be influential social stressors that damage health (Muntaner et al. 2010). Alcohol and cigarettes could also be used as anti-anxiety or anti-depressant agents to cope with precarious work and the associated stress (Mensch & Kandel 1988; Azagba & Sharaf 2011).

**Figure 1: Theoretical Framework Connecting Employment Conditions and Health**



Precarious employment can also undermine partners' relationships. This stems from the premise that unstable work increases the economic and social stress among couples. For example, Marcus (2013) found that the job instability effect is not limited to the worker but also can be transmitted to their spouse's mental health. A woman from El Gawaber, Egypt once said "Problems have affected our relationship. The day my husband brings in money, we are all right together. The day he stays at home [out of work], we are fighting constantly" (Narayan et al. 2000). On another front, Modena and Sabatini (2012), Modena et al. (2014) and Hanappi et al. (2017) explore the impact of having occasional, precarious and low paid jobs on childbearing decisions made by parents. In contrast to the theoretical predictions of the Becker's (1960) model, low opportunity cost did not increase the number of children demanded. On the contrary, precarious employment was a discouraging factor in childbearing decisions. Piotrowski et al. (2015) investigated the consequences of precarious employment on the timing of marriage in Japan, where the male breadwinner remains a tradition. The results suggested that males employed in precarious jobs are likely to postpone their marriage, which can cause low fertility as well. Carrieri et al. (2014) explored the influence of precarious jobs on individuals' happiness, a factor that can influence happiness in marriage, in Italy. They found that precarious employment had a well-being reducing effect and damages young males' happiness. However, it had no influence on women's mental health. On the other hand, Maume and Sebastian (2012) have looked at the effect of nonstandard work schedules, one characteristic of precarious work, on marital quality. Their results indicated that marriage suffers when the work schedule shrinks the time that men can spend with their spouses.

### **3. Diffusion of Precarious Employment in Egypt**

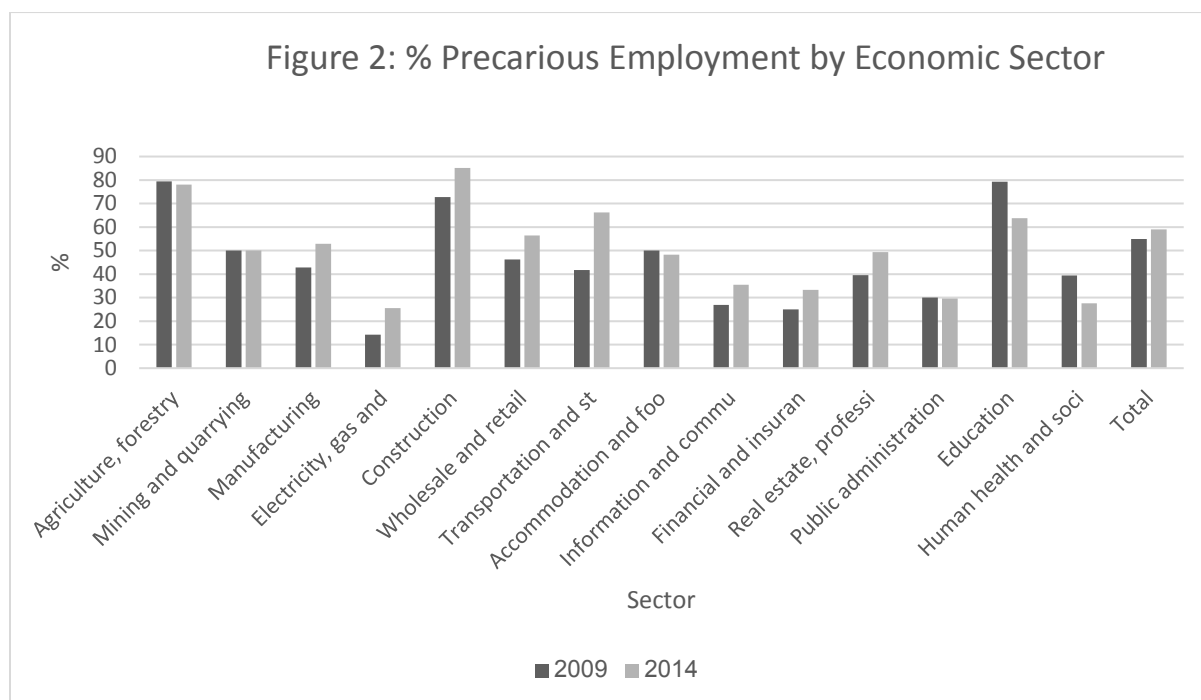
Since 1956, Egypt has been a socialist country, where the government was the main creator of employment opportunities. In this period, the Government of Egypt has adopted the policy of guaranteed employment, where the government was responsible for decades for hiring all the university graduates in the public sector. Dissatisfied with the economic results, the country started to move back toward a free market economy. Under the supervision of the International Monetary Fund (IMF), Egypt implemented a structural adjustment program in 1991 that aims to liberalize the economy. The policy of guaranteed employment in the public sector to all university graduates could not be long sustained under the new economic direction and the privatization of public enterprises. The government role started to shrink in the labor market. At the same time, the private sector did not replace the government as a creator of formal employment opportunities, which led to the rise of precarious employment. Strict labor codes and protection policies discourage formal hiring, as it increases the cost for the private employers. With imperfect enforcement of the law, private employers simply avoided the legal obligations by offering precarious employment (which encompasses involuntary part-time jobs, temporary jobs without a contract or social insurance, seasonal or casual jobs) that denies employees their rights. Even though that the Government of Egypt has introduced a new labor law in 2003 that increased the flexibility in job protection regulations, it did not encourage private sector employers to curb precarious employment (Wahba & Assaad 2017).

The structure of employment in terms of the firms' size is another factor that increases the precariousness of jobs in Egypt. This is because the employment in the private sector is mainly dominated by the informal small and micro-enterprises (Assaad & Krafft 2013b). Therefore, precarious employment in Egypt is a problem of labor demand rather than labor supply, although the rapid expansion in the population and labor supply did not help.

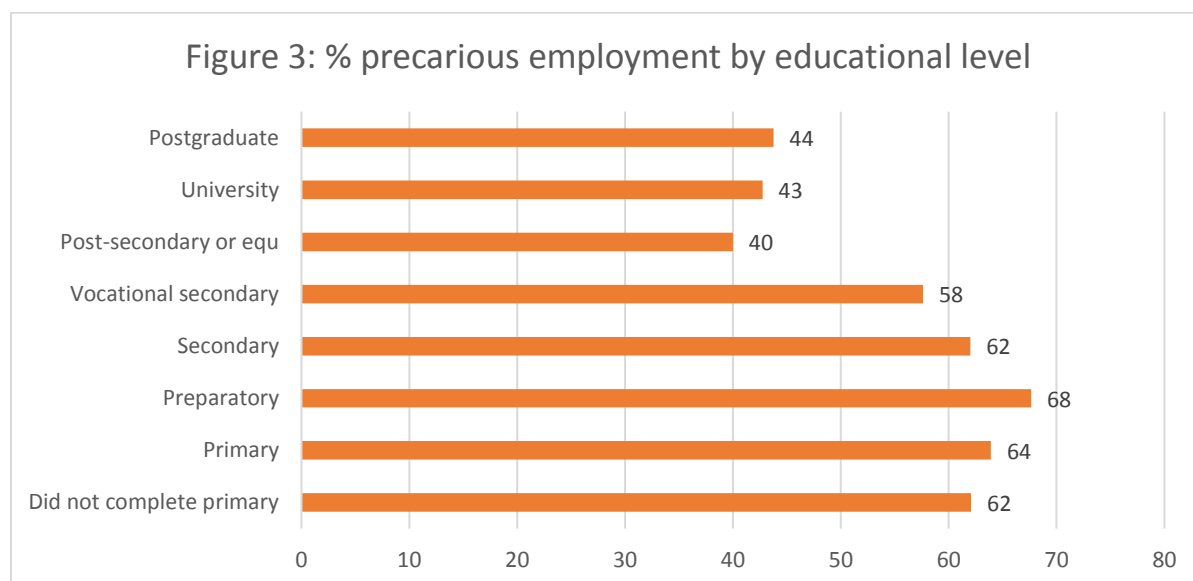
Furthermore, the deterioration of economic conditions in Egypt between 2009 and 2014 has driven private sector employment to become increasingly precarious. This is because precarious employment in Egypt is very sensitive to economic changes, it increases in recessions and declines in booms (Krafft and Assaad 2014). When the economy is in recession, those who cannot afford to stay unemployed will have to search for precarious work such as day-to-day jobs. For example, workers on construction sites will move from one site to another to make living. On the other hand, when the Egyptian economy is growing fast, it is easier for the poor and vulnerable groups to find stable jobs.

Precarious jobs are prevalent in all economic sectors but particularly high in the construction, transport, agricultural and education sectors (Figure 2). Additionally, the burden of precarious employment falls on the less educated. Precarious employment falls as education increases (Figure 3).





Source: Authors' compilations- SYPE 2009 and 2014



Source: Authors' compilations- SYPE 2009 and 2014

## 4. Data and Methodology

### 4.1 Data

This study uses longitudinal data from the SYPE, which is conducted by the Population Council together with the Central Agency for Public Mobilization and Statistics (CAPMAS). The SYPE provides panel data on a nationally representative sample of youth. The survey covers a broad set of areas crucial to the transition to adulthood, including education, employment, migration, health, family formation, social issues, and civic and political participation. The SYPE consists of two waves. The first SYPE wave collected a sample of youth aged between 10-29 in 2009, while the second wave re-interviewed the respondents in 2014. The 2009 SYPE sample contains 15,029

individuals from 11,372 households across all governorates in Egypt. The 2014 SYPE sample re-interviewed 10,916 from the 2009 SYPE sample (Roushdy et al. 2015).

The SYPE collected detailed information on working conditions, employment type and health issues such as self-rated health, chronic illness, and occupational injuries. It also has information on working hours, the stability of work, sector of employment, the legal status of the firm they work in, and access to legal work contract or formal appointment. We use this information to identify precarious workers. In the present study, precarious work includes involuntary part-time workers (those who work less than 36 hours per week involuntarily). The SYPE survey asked for the reason for working part-time, which allows us to distinguish between the voluntary part-time workers and the involuntary ones. Those who choose part-time work on a voluntary basis are viewed as non-precarious workers and dropped from the analysis. The intuition behind this is that individuals who limit their labor supply and chose part-time on discretionary basis are not likely to endure mental stress from the nature of their employment. In fact, few individuals in the sample have chosen part-time jobs voluntarily, about 1% of the sample that is working aged. In addition, precarious jobs comprise irregular jobs, i.e. seasonal or casual work. We consider workers with temporary jobs and without a legal work contract or formal appointment as precarious too since these jobs are likely to be involuntary chosen and workers are poorly paid and deprived of any rights.

The risk factor that we are analyzing is the exposure to precarious work. Therefore, we mainly focus on waged workers who are working aged (17 years or older). Our control group includes waged workers who are not exposed to precarious working conditions. Therefore, we restrict our analytic sample to a sub sample of only waged workers who have remained working between 2009 and 2014.

#### **4.2 Endogeneity Issues**

Several studies have attempted to evaluate the causal effect of precarious employment on individuals' well-being using the naïve standard regression method (Ludermir & Lewis 2003; Kim et al. 2006; Reine et al. 2008; Van Aerden et al. 2016). Evaluating the causal effect of precarious employment on health has remained challenging because of the obvious selectivity of the distinct types of workers into different types of jobs. For instance, precarious workers are more likely to be from lower income groups with a lower level of education, and more likely to have poor health before joining the labor market. If workers with poor health are commonly hired at precarious jobs then causality would run in both directions, leading to a biased coefficient on precarious employment. These selection factors complicate the comparison of the health outcomes of precarious and standard workers and would cause bias unless they are carefully controlled for. Apart from the self-selection effect, other sources of endogeneity such as omitted variables could bias the standard regression parameters in unpredictable directions.

Several researchers have employed Propensity Score Matching (PSM) to overcome the endogeneity problem (Kim et al. 2008; Quesnel-Vallée et al. 2010; Carrieri et al. 2012; Gebel 2013). However, PSM requires an extensive dataset with a large number of observations and it is conducted only based on observable factors. Hence, it assumes no selection bias is stemming from the unobserved characteristics. This assumption implies that there are no systematic differences in the unobserved characteristics between the precarious workers and the regular workers. This is a strong assumption and unfortunately, it cannot be tested.

Lately, scholars have relied on instrumental variables (IVs) to estimate the effect of precarious employment (Modena & Sabatini 2012; Moscone et al. 2016). For example, Moscone et al. (2016)

instrumented precarious employment using firm-level probabilities of temporary workers in addition to other firm-level variables that do not depend on the mental health status of the workers. This included the percentage of workers having the same contract and average working days. The IV approach can address the reverse causality problem as well as the unobserved heterogeneity driving both mental health and precarious employment. However, the instrument's exogeneity assumption is difficult to satisfy.

Other researchers went for panel data techniques such as fixed effect models to control for the unobserved characteristics (Bardasi & Francesconi 2004; Böckerman & Ilmakunnas 2009; Minelli et al. 2014). The merit of the fixed effect model over PSM is that it can control for time-invariant unobserved individual characteristics, which could be an important source of bias. However, reverse causality remains a concern in panel data. Thus, when finding credible instruments is difficult, relying on panel data methods would be the best alternative to eliminate or at least reduce the bias.

### 4.3 Fixed Effect Regressions

In attempting to identify the effect of precarious employment, we use fixed effect regressions that eliminate the effect of all time-invariant individual factors (equation 1). They rely mainly on workers present in both rounds with some change in their status over time. The identifying assumption of fixed effects is that the unobserved heterogeneity that affects mental health and precarious employment is time invariant. We have an unbalanced panel because we have a number of individuals that are observed once in either 2009 or 2014. On the other hand, we have 1187 individuals who have exactly two years of data and are employed as wage workers in the two waves.

$$y_{it} = \beta_1 x_{it} + \beta_2 z_{it} + a_i + u_{it} \quad (1)$$

$y_{it}$ , the outcome variable, is a measure of the health or wellbeing of individual  $i$  in period  $t$ .  $x$ , the main control variable, is an indicator of job precariousness. In our basic specification,  $x$  is represented by a binary variable. It takes the value of zero for full time waged employee in a regular jobs (the benchmark group) and one for all different types of precarious work. The next specification looks at more disaggregated measures of precarious employment. Instead of a binary variable, we use a categorical variable with multiple categories (full time formal wage workers, part-time permanent wage workers, temporary and informal full time wage workers, casual and informal full time wage workers, casual and informal part time wage workers, part time and temporary informal wage workers). This specification investigates in detail where the precarious employment effect is coming from. The base group in this specification remains full time formal wage workers. Additionally, we explore the drivers of the precarious employment effect by controlling for possible mediators. These include whether the interviewed workers experience any of the following situations at their current job: maltreatment from their supervisor, little pay, long commute times, harassment from colleagues/supervisors, the workplace is hazardous, no payment of wage after finishing work, and no wage determination at the beginning of the job.  $z$  is a vector of control variables, mainly time variant variables.  $a_i$  is the time invariant unobserved individual heterogeneity (genetic factors, innate ability, motivation and etc), and  $u_{it}$  is the standard time variant error term. All models are estimated separately by sex.

### 4.4 Instrumental Variable Approach

As well as using fixed effect regressions, we use IV two-stage-least squares (2SLS) to correct for other sources of endogeneity, reverse causality and omitted bias. The instrument for job precariousness is the prevalence of construction, agricultural, and transport jobs in total

employment in the individual's region of residence, 804 regions (Kism/ Markaz). We exclude the individual's own employment type in the construction of our IV, so as not to be correlated with the outcome variable and avoid built-in correlation.

The first stage regression has precarious employment as a dependent variable and the instrument as well as the control variables as regressors. At the second stage, mental health and happiness in marriage are regressed on the predicted precarious employment and the control variables.

#### **4.5. Outcome Variables**

SYPE has a rich list of validated questions that assess individuals' mental health status known as the Self-Reporting Questionnaire-20 (SRQ-20) (Liu et al. 2017). The World Health Organization developed the SRQ-20 as a screening instrument to capture the physical symptoms of psychiatric disturbance and neurotic disorder, in addition to feelings of stress, worry, uncertainty, and happiness (Beusenberg et al. 1994). The list of SRQ-20 is presented in Table 1. The interviewed individuals respond with a yes or no to the SRQ-20. A score of one suggests that the symptom was present in the past month and zero otherwise. Using the SRQ-20 variables, we construct an additive mental health index based on the summation of the 20 questions. The mental health index is a count of the number of symptoms of mental disorder with nonnegative counts. The index ranges between 0 (the symptoms of mental disorders were absent) and 20.

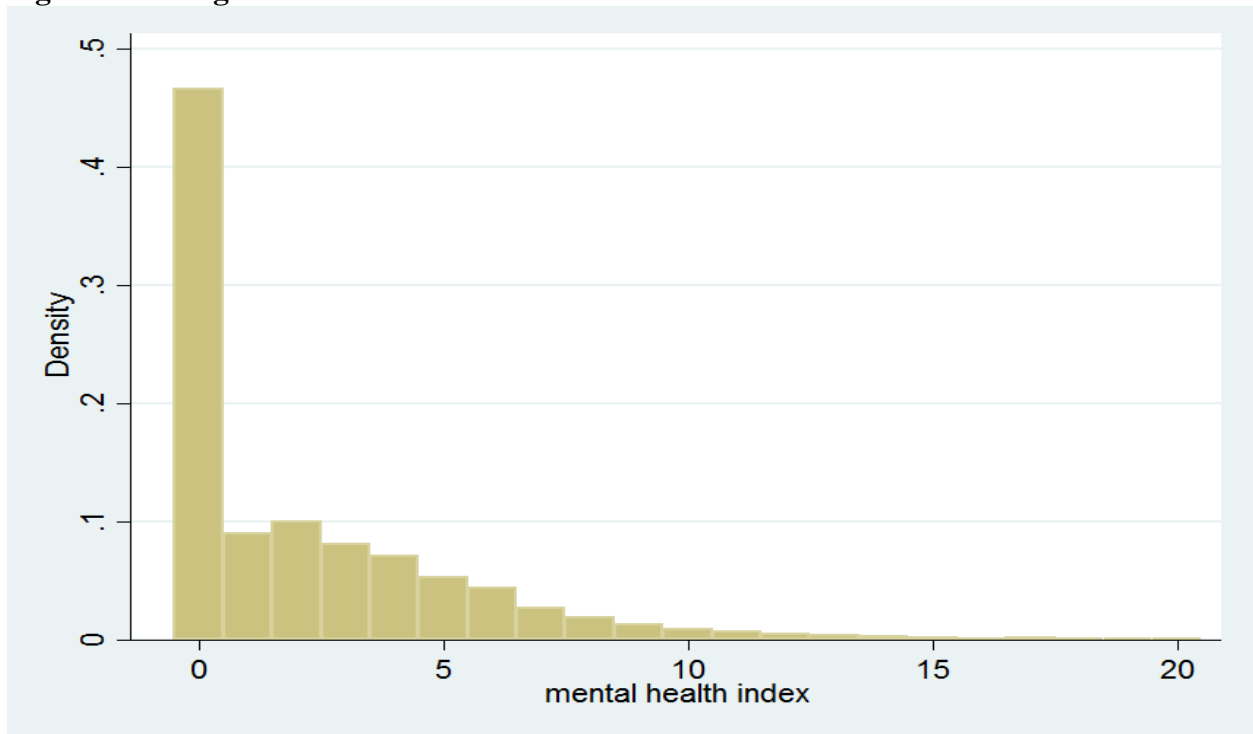
Figure 4 provides the distribution of mental health index. As shown in the figure, there are a large proportion of zeros and a long right tail. The benchmark for count data models is a Poisson regression model. However, the count data is always overdispersed, the conditional mean is smaller than the conditional variance. Therefore, it is critical to use panel-robust standard errors to correct for overdispersion. We use the individual fixed effect Poisson model with bootstrapped standard errors to obtain the cluster-robust standard errors (Cameron & Trivedi 2010).

**Table 1: A list of SRQ-20**

Question	Answer
Do you often have headaches?	=1, if yes, 0 otherwise
Is your appetite poor?	=1, if yes, 0 otherwise
Do you sleep badly?	=1, if yes, 0 otherwise
Are you easily frightened?	=1, if yes, 0 otherwise
Do your hands shake?	=1, if yes, 0 otherwise
Do you feel nervous, tense/worried?	=1, if yes, 0 otherwise
Is your digestion poor?	=1, if yes, 0 otherwise
Do you have trouble thinking clearly?	=1, if yes, 0 otherwise
Do you feel unhappy?	=1, if yes, 0 otherwise
Do you cry more than usual?	=1, if yes, 0 otherwise
Do you find it difficult to enjoy your daily activities?	=1, if yes, 0 otherwise
Do you find it difficult to make decisions?	=1, if yes, 0 otherwise
Is your daily work suffering?	=1, if yes, 0 otherwise
Are you unable to play a useful part in life?	=1, if yes, 0 otherwise
Have you lost interest in things?	=1, if yes, 0 otherwise
Do you feel that you are a worthless person?	=1, if yes, 0 otherwise
Has the thought of ending your life been on your mind?	=1, if yes, 0 otherwise
Do you feel tired all the time?	=1, if yes, 0 otherwise
Do you have uncomfortable feelings in your stomach?	=1, if yes, 0 otherwise
Are you easily tired?	=1, if yes, 0 otherwise

Source: SYPE

**Figure 4: Histogram of the Mental Health Index**



In addition to the mental health index, we look at additional welfare indicators. Specifically, we investigate the impact of precarious employment on self-rated health status and happiness in marriage as reflected by the following two questions:

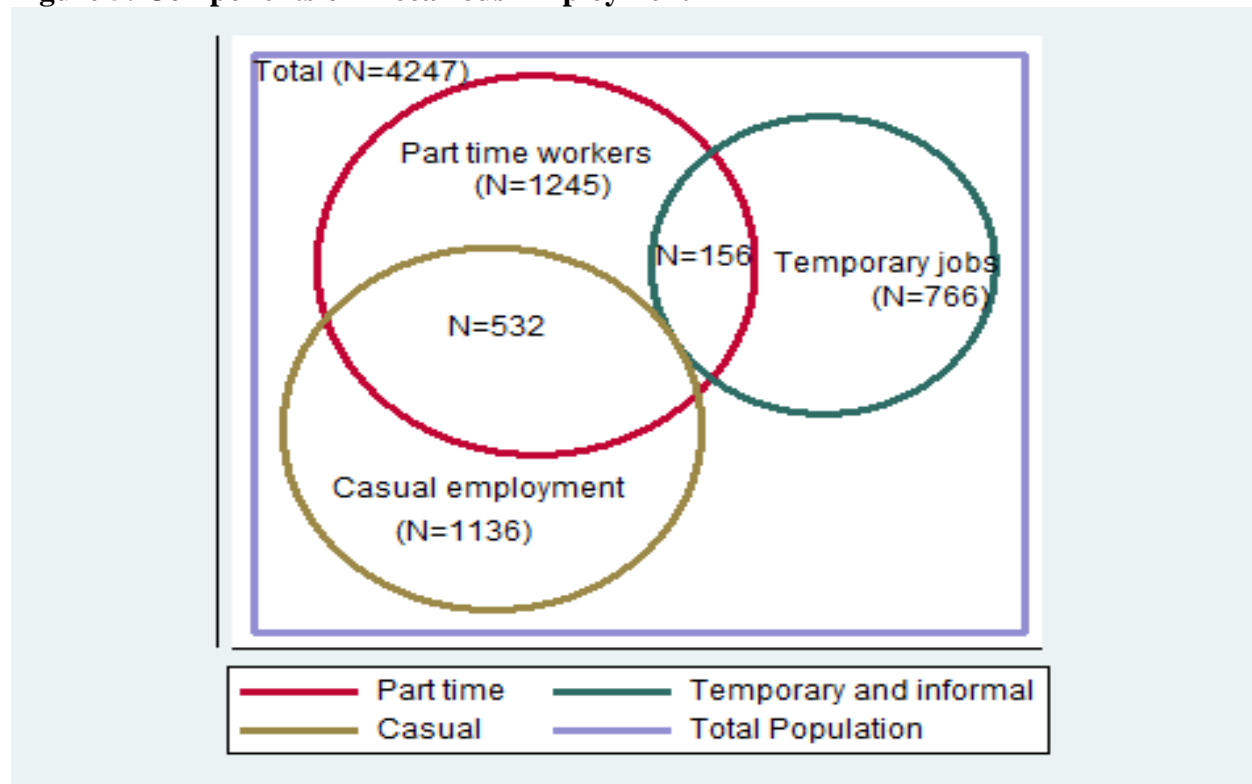
*“How is your health in general- Very good/ excellent, Good, Fair, Bad, Very bad”.*

*“How would you describe your marriage? Very happy, happy, does not matter as long as we have children to look after, Unhappy, Very Unhappy”.* The percentage of married workers within our subsample is about one third of the sample.

#### 4.6 The Key Regressor

We identify precarious work based on a number of standard criteria that are commonly used in the literature. These include stability at work, the number of working hours per week, duration of employment, and whether having a work contract. There is variation in measuring precarious employment in the literature. For example, Kim et al. (2008) and Moscone et al. (2016) used a binary measure of precarious employment, while García-Pérez et al. (2016) attempted to develop an index of precarious employment using Alkire and Foster (2011)’s methodology of measuring multidimensional poverty. Like Kim et al. (2008) and Moscone et al. (2016), we identify precarious workers here as involuntary part-time workers, defined as less than 40 hours per week (Roushdy et al. 2010), in addition to informal temporary workers, as well as casual workers. These criteria are not mutually exclusive, and they can intersect, as some of the casual and temporary informal workers work few hours per week (Figure 5). Therefore, precarious employment is made up of five components, part-time permanent wage workers, temporary and informal full time wage workers, casual full time informal wage workers, casual part time informal wage workers, part time and temporary informal wage workers.

**Figure 5: Components of Precarious Employment**



#### **4.7 Control Variables**

We control for several time-variant covariates, as we mainly rely on fixed effect models. The fixed effect models cancel out the individual time-invariant unobserved effect. We control for the square of the individual's age to avoid correlation with the time trend dummy. It is critical to include the time trend by the inclusion of the time dummy for the year 2014 in the regression analysis, as Egypt witnessed a dramatic political shock in 2011. The time trend is a confounding factor because the political and economic instability that followed the 2011 revolution can lower the probability of having a permanent job and increase the probability of having worse mental health and lower well-being. Therefore, if we omitted the year dummy, the secular decay in mental health would be attributed to the precarious work. The analyses also control for whether the individual is experiencing disease or disability, as they both closely linked to individual wellbeing. SYPE respondents provided whether they have been experiencing disease or disability. This is a time-variant factor variable with multiple categories; as the gap between the two surveys is five years and health shock could hit within this interval. We control for marital status in the mental health models. Religiosity might act as a protective factor against poor mental health. Religiosity is measured by the response to the following SYPE question on whether the respondents think they are very religious persons, religious persons, or not religious persons. Being overweight or underweight is known to have adverse psychological consequences. SYPE asked the respondents to assess her/his weight from her/his point of view. The respondents chose between very underweight, slightly underweight, about the right weight, slightly overweight, and very overweight. We use this categorical variable in our model. We benefit from the information on the risk that SYPE respondents faced on the street and transportation such as stealing, crowdedness, sexual harassment, and no crossing area, as facing high risk in the street and on transportation are potential stressors that might be associated with poor mental health. We also control for the tenure of the dwelling.

#### **5. Results**

Table 2 provides summary statistics for the overall variation of the key characteristics of our sample. The mean age of individuals in our sample is 25 years. The minimum age is 17 years and the maximum age is 35. The average number of effective years of schooling is 11 years. The majority, 57%, of the young workers are hired on precarious arrangements. The average mean of mental health index is 2.24. However, this average is sensitive to extreme values. The average mean of happiness in marriage is about 4, where 1 is very unhappy and 5 is very happy. The average value of self-rated health is 2.55, where 1 is excellent and 5 indicates poor health.

**Table 2: Descriptive statistics**

<i>Variables</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>Age</i>	25.17	4.30	17	35
<i>Years of schooling</i>	11.39	3.81	0	19
<i>Precarious employment</i>	0.57	0.49	0	1
<i>Mental health index</i>	2.24	3.09	0	20
<i>Happiness in marriage</i>	4.04	0.62	1	5
<i>Self-rated health</i>	2.55	0.85	1	5

Table 3 shows the status of subjective health by employment conditions. Individuals with precarious employment conditions are more likely to report worse self-rated health compared to non-precarious workers. For example, 30% of the non-precarious workers rated their health as very good, while 26% of precarious workers rated their health as very good. The data show that compared to non-precarious jobs, precarious jobholders are more likely to report maltreatment from supervisors, little pay, lack of annual paid leave or sick leave, and no wage upon finishing work (Table 4). Furthermore, they are more likely to experience hazardous working conditions.

**Table 3: Self-rated health of wage workers by their employment conditions (%)**

<i>Self-rated health %</i>	<i>Non-precarious</i>	<i>Precarious</i>	<i>Total</i>
<i>Excellent</i>	13	13	13
<i>Very good</i>	30	26	28
<i>Good</i>	49	50	49
<i>Fair</i>	7	10	9
<i>Poor</i>	1	1	1
<i>N</i>	100	100	100
	1785	2456	4241

**Table 4: Work characteristics by employment conditions**

<i>Experience any of the following %</i>	<i>Non-precarious</i>	<i>Precarious</i>
<i>The workplace is hazardous</i>	5	10
<i>No wage upon finishing work</i>	2	6
<i>Cannot have sick leave</i>	12	17
<i>Cannot have annual paid leave</i>	12	17
<i>Little pay</i>	39	52
<i>Maltreatment from supervisors</i>	12	17
<i>N</i>	1788	2459

Source: Authors' calculation based on data from the SYPE

Table 5 summarizes the results of the different estimation methods. Separate regressions are estimated for both males and females. For brevity, the control variables have been omitted from



Table 5. Results of the full models are presented in the paper appendix. In 7 out of the 12 fixed effect models there was a statistically significant negative association between precarious employment and the different well-being indicators.

**Table 5: Summary of the Regression Results**

Model	Design	Outcome	Key Regressor	Gender	Controls <sup>a</sup>	Measure of Association <sup>b</sup>	Appendix Table Number
1	Poisson Fixed Effect	Mental health index	Binary variable	Males	Time-variant variables	IRR=1.292*	Table 6
2	Poisson Fixed Effect	Mental health index	Categorical variable	Males	Time-variant variables	IRR (part time permanent) =1.566*** IRR (temporary & informal)=1.188 IRR (casual) =1.025 IRR (part time, temporary & informal)= 1.841 IRR (part time & casual)= 1.692***	Table 8
3	Poisson Fixed Effect	Mental health index	Binary variable	Males	Time-variant variables + Mediators <sup>c</sup>	IRR=1.190	Table 6
4	Linear Fixed effect	Self-rated health	Binary variable	Males	Time-variant variables	$\beta = -0.021$	Table 9
5	Linear Fixed effect	Happiness in marriage	Binary variable	Males	Time-variant variables	$\beta = -0.176^*$	Table 9
6	Linear Fixed effect	Happiness in marriage	Categorical variable	Males	Time-variant variables	$\beta = -0.536^{**}$ (part time & casual)	Table 10
7	Linear Fixed effect	Happiness in marriage	Binary variable	Males	Time-variant variables	$\beta = -0.174$	Table 11
8	Poisson Fixed Effect	Mental health index	Binary variable	Females	Time-variant variables	IRR=1.029	Table 7
9	Linear Fixed effect	Self-rated health	Binary variable	Females	Time-variant variables	$\beta = 0.376^*$	Table 9
10	Linear Fixed effect	Self-rated health	Binary variable	Females	Time-variant variables+ Mediators	$\beta = 0.324^*$	Table 11
11	Linear Fixed effect	Self-rated health	Categorical variable	Females	Time-variant variables	$\beta = 0.393^*$ (part time permanent)	Table 10
12	Linear Fixed effect	Happiness in marriage	Binary variable	Females	Time-variant variables	$\beta = -0.134$	Table 9
13	Poisson Random Effect	Mental health index	Binary variable	Males	Time-variant variables	IRR=1.217***	Table 12

Model	Design	Outcome	Key Regressor	Gender	Controls <sup>a</sup>	Measure of Association <sup>b</sup>	Appendix Table Number
14	Poisson Random Effect	Mental health index	Binary variable	Females	Time-variant variables	IRR=1.039	Table 12
15	IV 2SLS	Mental health index	Binary variable	Males	Time-variant and invariant variables	$\beta=1.926^*$	Table 13
16	IV 2SLS	Mental health index	Binary variable	Females	Time-variant and invariant variables	$\beta=2.386$	Table 14
17	IV 2SLS	Self-rated health	Binary variable	Males	Time-variant and invariant variables	$\beta=0.411$	Table 13
18	IV 2SLS	Self-rated health	Binary variable	Females	Time-variant and invariant variables	$\beta=1.570$	Table 14
19	IV 2SLS	Happiness in marriage	Binary variable	Males	Time-variant and invariant variables	$\beta=-0.641^*$	Table 13
20	IV 2SLS	Happiness in marriage	Binary variable	Females	Time-variant and invariant variables	$\beta=-1.836$	Table 14

<sup>a</sup> Time-variant variables= age<sup>2</sup>, religiosity, marital status, health status (have disease/ disability), year dummy, sex, current work characteristics, individual's body weight, the tenure of dwelling and risk at street and transportation.

<sup>b</sup> Beta ( $\beta$ ) or incidence rate ratio (IRR). \*  $p<0.05$ , \*\*  $p<0.01$ , \*\*\*  $p<0.001$

<sup>c</sup> Mediators= maltreatment at work, low salary, difficult transportation to work, harassment in work (only females), hazardous workplace, no wage determination

The incidence rate ratios (IRR) are presented for the Poisson models. Using the non-precarious workers as the benchmark group, we found that the number of symptoms of mental disorder is 30% more for male individuals with precarious employment (Model 1). When the precarious employment measure is disaggregated (see model 2), male individuals in part-time permanent jobs on average have 56% more number of symptoms of mental disorder than the reference group. Likewise, having a temporary and informal full time job increases the number of symptoms of mental disorder by an (insignificant) 18%. Also, being part-time and temporary informal worker increases the number of symptoms of mental disorder by 84%. Male individuals with casual and informal part-time employment have 69% (IRR=1.69) more symptoms of mental distress. When mediators are included in model 1, the IRR value of precarious employment falls to 1.19 and only significant at the 10% level. On the other hand, two mediators, maltreatment at work and receiving a low salary, have large and statistically significant effects. This suggests that our mediators do explain where the precarious employment effect is coming from. On the contrary, estimates for the association between precarious employment and mental disorder are weak in the case of females (IRR=1.03). The mediation analysis is not performed in the case of women, as the overall impact of precarious employment was not significant. In fact, we had expected that the impact of precarious employment would be stronger among males in traditional societies, as males are usually the breadwinners in Egypt.

Regarding happiness in marriage and self-rated health, there was statistical support for a negative association between precariousness and happiness in marriage among men. The precarious employment coefficient indicates that precarious workers are less satisfied in their marriage compared to workers with stable employment. Model 6 suggests the impact of precariousness is mainly driven by individuals that work on a part-time and casual basis. However, the impact of precarious work on happiness in marriage was insignificant in the case of women. Although the regression coefficient has the expected sign (precarious employment increases poor rated health), the impact of precarious employment on self-rated health was very small ( $\beta = -0.028$ ) and insignificant in the case of men. In contrast, there is a significant positive association between precarious employment and poor self-rated health across women. This effect is mainly resulting from part-time permanent employment. When mediation analysis was performed, the coefficient of precarious employment gets slightly smaller but retains its significance; thus, it suggests our mediators partially explain the impact of precarious employment. As a robustness check, we utilize random effect regression. The models 13 and 14 are based on random effects models and equivalent to the models 1 and 2 but with a larger sample size. The impact of precarious employment is similar to the fixed effects results. However, it slightly falls for males but is still statistically significant.

We further check the robustness of our results by re-estimating the effect of precarious employment with IV 2SLS. We use the prevalence of construction, agricultural, and transport jobs in total employment in the individual's region of residence (Kism/ Markaz) as an IV for job precariousness. In the case of males, the first stage regression suggested that our IV is strongly correlated with precarious employment variable, where  $\beta = 0.18$  with  $t\text{-stat} = 5.83$  and  $F\text{-stat}$  for the first stage regression equals 67.96. In the case females, the IV remains correlated with precarious employment in the expected direction but it is marginally significant with  $p\text{-value} = 0.11$  (see Table 15 in the appendix). The second stage results showed that precarious employment is significantly associated with poor mental health and low satisfaction in marriage only for males. Even though the results are in the expected direction, no statistically significant association is found between precarious employment and poor mental health among females.

## **Discussion and Conclusion**

The current study benefits from the availability of new data to draw evidence from Egypt on the social and health impact of precarious employment. We provide empirical evidence on the relationship between mental health and well-being and employment conditions in Egypt. We compare the health status of precarious workers with regular workers. Given the high prevalence of precarious employment in Egypt, this research question is critical from a policy point of view.

The methodological strength of the paper rests on the use of longitudinal data coupled with several identification strategies to answer the study's research question. However, due to the non-experimental nature of the data, the longitudinal data might not resolve the bias problems completely. Our findings provide robust evidence that precarious employment is associated with poor health and worse well-being among youth. The main findings remained after we used different estimation methods and controlled for several factors. The adverse impact of precarious work is likely to be mediated, though in some models it is a partial mediation, by inferior working conditions such as low salary, maltreatment at work, job insecurity, and harassment from colleagues.

It has been suggested that the precarious work in Egypt is a countercyclical phenomenon, it tends to increase in the economic expansion and tends to fall into recession. Likewise, in Spain, García-Pérez et al. (2016) suggested that precarious employment is also countercyclical. Thus, relying on the economic growth alone will not resolve the problem. Because when the economy falls back into recession, the problem will always re-emerge. Therefore, increasing the awareness of policymakers about the adverse social consequences of precarious work is critical. Institutional settings and labor market regulations play a key role in sheltering workers against the adverse consequences of precarious jobs. They account for a large bulk of the heterogeneous impact of precarious employment across countries (László et al. 2010; Cottini & Lucifora 2013).

Although evaluating policy response to precarious work in Egypt is out of the scope of this study, implementing policies or regulations that lower the risk of instability among precarious workers might be necessary to curb the adverse impact of precarious jobs. Although the Egyptian government has expanded social insurance to cover irregular and casual workers by law 112/1980, the participation of precarious workers in the social insurance system remains modest (Roushdy & Selwaness 2014). In 2012, the participation of irregular private waged workers in the social security system was only 4%. Roushdy and Selwaness (2017) suggested that the high cost of participation in the social security has expanded the informalization of the employment, as waged workers may negotiate for a higher wage in return for not participating in social insurance.

In 2018, the Government of Egypt has launched a new life insurance plan named "Amman" for precarious labor. The life insurance plan aims to protect the insurance's beneficiaries in the case of death. Workers can purchase these plans themselves or employers can deduct percentages from wages and purchase them for the workers. Even though these attempts are likely to mitigate the burden of precarious employment, they are not going to eliminate it completely.

Labor demand policies that can increase job creation in stable sectors are essential for Egypt. Providing incentives for firms to formalize employment for precarious workers such as preferential tax treatment might be a viable policy option.

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## Appendix

**Table 6: Fixed effect- Dependent Variable: Mental Health Index (Males)**

	(1)	(2)
Precarious Employment?		
Yes	1.292* (2.04)	1.190 (1.83)
Age square	0.999 (-0.9)	0.999 (-1.00)
Tenure of dwelling?		
Rented	1.064 (0.42)	1.011 (0.06)
Provided for work	0.387 (-0.87)	0.438 (-1.03)
Survey year=2014	0.797 (-0.98)	0.958 (-0.19)
Disease	2.430*** (7.01)	2.213*** (4.89)
Disability	3.302 (1.26)	2.842* (0.31)
Disease and Disability	0.001*** (-12.49)	0.001*** (-13.05)
Married	0.759 (-1.63)	0.780 (-1.45)
Divorced/Separated	0.331 (-1.72)	0.238** (-2.85)
Widowed	0.571 (-1.51)	0.437 (-1.35)
Religious person	1.150	1.295

	(0.53)	(1.30)
Not a religious person	1.240	1.401
	(0.68)	(1.86)
Facing risk at the street?		
Yes	0.783*	0.807*
	(-1.96)	(-1.96)
Individual's weight		
Very underweight	0.884	0.699
	(-0.03)	(-0.11)
Slightly underweight	1.933***	1.840***
	(3.77)	(4.78)
Slightly overweight	1.063	1.045
	(0.26)	(0.17)
Very overweight	1.297	1.212
	(0.03)	(0.03)
Facing risk at the transportation		
Yes	1.299	1.236
	(1.7)	(1.48)
Maltreatment at work?		
Yes		1.370*
		(2.41)
Receiving Low Salary?		
Yes		1.330***
		(3.57)
Difficult transportation to workplace?		
Yes		1.170
		(1.49)
Hazardous workplace?		
Yes		1.074

	(0.30)
No wage determination?	
Yes	1.216 (0.65)
Observations	1250      1250

IRR coefficients; t statistics in parentheses  
 \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 7: Fixed effect (FE)-Dependent Variable:  
Mental Health Index (Women)**

	(3)
Precarious employment?	
Yes	1.029 (0.16)
Age square	1.000 (0.31)
tenure of dwelling	
Rented	1.443 (1.59)
Survey year=2014	0.343*** (-3.44)
Disease	1.967*** (2.48)
Married	1.153 (0.73)
Divorced/Separated	9.571** (2.92)
Widowed	0.001*** (-15.06)
Religious person	1.459 (0.933)
Not a religious person	0.688 (-0.961)
Facing risk at the street?	
Yes	0.707 (-1.01)
Individual's weight	
Slightly underweight	2.742***

	(3.66)
Slightly overweight	1.313 (0.92)
Very overweight	0.578 (-0.83)
Facing risk at transportation?	
Yes	1.305 (0.72)
Observations	204

IRR coefficients; t statistics in parentheses  
 \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 8: FE- Disaggregating Precarious employment  
Dependent Variable: Mental Health Index**

	(1)	(2)
	Males	Females
Part time permanent worker	1.566*** (2.95)	0.963 (-0.13)
Temporary and informal full time worker	1.188 (1.33)	1.952 (0.60)
Casual and informal full time worker	1.025 (0.18)	2.249 (1.03)
Part time and temporary informal worker	1.841 (1.92)	0.611 (-0.92)
Casual and informal part time worker	1.692*** (3.78)	4.482 (1.22)
Age squared	0.999 (-0.95)	1.000 (0.01)
Tenure of Dwelling		
Rented	1.053 (0.36)	1.121 (0.24)
Provided for work	0.334 (-1.37)	
Survey year=2014	0.799 (-1.05)	0.348*** (-3.22)
Disease	2.475*** (7.25)	2.176 (1.75)
Disability	2.789 (0.22)	
Disease and Disability	0.001*** (-3.77)	
Married	0.753 (-1.93)	1.270 (0.76)



Divorced/Separated	0.332 (-1.90)	10.760 (0.26)
Widowed	0.713 (-1.14)	0.001*** (-13.03)
Religious person	1.150 (0.56)	1.136 (0.02)
Not a religious person	1.274 (1.13)	0.539 (-0.07)
Facing risk at the street?		
Yes	0.773* (-2.05)	0.652* (-0.71)
Very underweight	0.930 (-0.11)	
Slightly underweight	1.924*** (4.52)	2.339 (1.14)
Slightly overweight	1.107 (0.43)	1.143 (0.30)
Very overweight	1.541 (0.45)	0.711 (-0.30)
Facing risk at the transportation?		
Yes	1.361*** (2.61)	1.505 (1.18)
Observations	1250	204

IRR coefficients; t statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 9: FE-Effect of Precarious Employment on self-rated health and happiness in marriage**

	Males		Females	
	Happiness in Marriage	Self-rated health	Happiness in Marriage	Self-rated health
Precarious Employment?				
Yes	-0.176* (-1.97)	-0.021 (-0.36)	-0.134 (-0.72)	0.376* (2.48)
Age square	0.001 (0.18)	0.001 (0.08)	-0.001 (-1.09)	-0.001 (-0.06)
Survey year=2014	-0.017 (-0.09)	-0.336** (-2.74)	0.400 (1.11)	-0.507 (-1.82)
Disease	0.001 (0.00)	0.276** (2.98)	-0.078 (-0.32)	0.714*** (3.39)
Disability	-0.288 (-0.76)	0.390 (1.07)		
Disease and Disability	-0.071 (-0.11)	0.712 (1.02)		
Religious person	0.250 (1.26)	0.195 (1.27)	-0.118 (-0.26)	0.062 (0.16)
Not a religious person	0.067 (0.27)	0.150 (0.87)	1.783 (1.79)	1.261 (1.77)
Facing Risk at the street?				
Yes	-0.110 (-0.95)	-0.200* (-2.37)	0.288 (1.25)	-0.261 (-1.28)
Very underweight		0.299 (0.69)		
Slightly underweight	-0.064 (-0.42)	0.153 (1.67)	-0.270 (-0.66)	-0.107 (-0.41)

Slightly overweight	0.033 (0.20)	-0.053 (-0.44)	-0.078 (-0.31)	0.123 (0.59)
Very overweight	0.415 (0.81)	-0.050 (-0.12)		-0.502 (-0.46)
Facing risk at the transportation?				
Yes	0.168 (1.37)	0.069 (0.78)	0.236 (0.89)	0.122 (0.49)
Tenure of Dwelling				
Rented		0.093 (0.95)		0.402 (1.54)
Provided for work		-0.099 (-0.32)		
Married		-0.014 (-0.17)		0.203 (0.85)
Divorced/Separated		-0.627 (-1.08)		-0.894 (-1.26)
Widowed		-0.430 (-0.53)		0.645 (0.63)
Observations	1201	3119	279	585

t statistics in parentheses  
\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 10: FE-Disaggregating Precarious employment**

	Males	Females
	Happiness in Marriage	Health status in general
Part time permanent worker	-0.186 (-1.44)	0.393* (2.34)
Temporary and informal full time worker	-0.215 (-1.50)	0.372 (0.96)
Casual and informal full time worker	0.076 (0.57)	1.114 (1.48)
Part time and temporary informal worker	-0.193 (-0.61)	0.194 (0.46)
Casual and informal part time worker	-0.536** (-3.33)	1.067 (0.96)
Age squared	0.001 (0.10)	-0.001 (-0.48)
Survey year=2014	-0.016 (-0.08)	-0.374 (-1.39)
Disease	0.071 (0.56)	0.664** (3.05)
Disability	-0.215 (-0.55)	
Disease and Disability	0.120 (0.18)	
Religious person	0.306 (1.57)	0.053 (0.14)
Not a religious person	0.126 (0.51)	1.451* (2.02)
Facing risk at the street?		
Yes	-0.112 (-0.98)	-0.237 (-1.14)
Slightly underweight	-0.0718 (-0.48)	-0.107 (-0.38)

Slightly overweight	0.039 (0.24)	0.058 (0.27)
Very overweight	0.022 (0.04)	-0.330 (-0.32)
Facing risk at the transportation?		
Yes	0.168 (1.40)	0.0688 (0.28)
Observations	1201	585

t statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 11: FE-Mediation analyses for self-rated health and happiness in marriage**

	Males	Females
	Happiness in marriage	Self-rated health
Precarious employment	-0.174 (-1.95)	0.324* (2.14)
Age squared	0.001 (0.80)	-0.001 (-0.15)
Year dummy=2014	-0.187 (-1.12)	-0.361 (-1.36)
Disease	-0.019 (-0.16)	0.659** (3.07)
Disability	-0.305 (-1.29)	
Disease and Disability	-0.0820 (-0.43)	
Religious person	0.226 (1.30)	0.018 (0.05)
Not a religious person	0.034 (0.15)	1.300* (2.45)
Facing risk at the street?		
Yes	-0.098 (-0.76)	-0.215 (-1.20)
Individual's weight		
Very underweight	-0.089 (-0.53)	-0.256 (-0.91)
Slightly overweight	0.0561 (0.31)	0.0559 (0.33)
Very overweight	0.105 (0.32)	-1.047* (-2.53)
Facing risk at the transportation		
Yes	0.123 (0.98)	-0.119 (-0.52)

Maltreatment at work?		
Yes	-0.209 (-1.44)	0.314 (1.43)
Receiving Low Salary?		
Yes	-0.175 (-1.95)	0.169 (0.99)
Difficult transportation to workplace?		
Yes	-0.021 (-0.20)	0.076 (0.40)
Hazardous workplace?		
Yes	0.207 (1.25)	-0.739 (-1.88)
No wage determination?		
Yes	0.447* (2.32)	-0.256 (-0.90)
<hr/>		
N	1201	585

t statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 12: Dependent variable Mental Health Index (random effect models)**

	(1)	(2)
	Males	Females
<i>Precarious employment?</i>		
<i>Yes</i>	1.217***	1.039
	(3.42)	(0.34)
<i>Age square</i>	1.000	1.000
	(1.16)	(-0.67)
<i>tenure of dwelling</i>		
<i>Rented</i>	1.090	1.501**
	(1.01)	(2.95)
<i>Provided for work</i>	0.416	0.786
	(-1.52)	(-0.03)
<i>Survey year=2014</i>	0.633***	0.420***
	(-8.05)	(-6.37)
<i>Disease</i>	2.120***	2.251***
	(8.22)	(5.40)
<i>Disability</i>	2.358***	1.826
	(3.45)	(0.82)
<i>Disease and Disability</i>	0.710	1.746***
	(-0.12)	(3.68)
<i>Married</i>	0.921	0.964
	(-0.87)	(-0.25)
<i>Divorced/Separated</i>	0.910	3.427**
	(-0.03)	(2.89)
<i>Widowed</i>	0.746	1.289
	(-0.78)	(0.47)
<i>Religious person</i>	1.015	1.023
	(0.10)	(0.09)
<i>Not a religious person</i>	1.258	0.785
	(1.21)	(-0.84)
<i>Facing risk at the street?</i>		
<i>Yes</i>	0.824**	0.921



		(-2.72)	(-0.62)
<i>Individual's body weight</i>			
	<i>Very underweight</i>	1.530	2.061*
		(1.11)	(2.45)
	<i>Slightly underweight</i>	1.659***	2.091***
		(5.25)	(3.79)
	<i>Slightly overweight</i>	0.979	1.160
		(-0.14)	(0.98)
	<i>Very overweight</i>	1.335	1.200
		(0.34)	(0.56)
<i>Facing risk at transportation?</i>			
	<i>Yes</i>	1.188	1.367
		(1.80)	(1.59)
	<i>Observations</i>	3120	585

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

IRR coefficients; t statistics in parentheses

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 13: IV 2SLS regressions for Males (second stage regression)**

	<b>Mental Health Index</b>	<b>Health status in general</b>	<b>Marriage status</b>
Precarious	1.926* (2.05)	0.411 (1.43)	-0.641* (-2.29)
age <sup>2</sup>	0.001 (0.63)	0.001 (0.96)	-0.001*** (-4.93)
Rented	0.103 (0.74)	0.068 (1.77)	-0.008 (-0.18)
Provided for work	-1.252* (-2.32)	-0.123 (-0.73)	0.678*** (3.79)
Survey year=2014	-0.988*** (-7.22)	-0.469*** (-11.75)	0.302*** (6.77)
Disease	1.530*** (9.26)	0.332*** (7.05)	-0.061 (-1.17)
Disability	2.537** (2.81)	0.530** (2.68)	-0.002 (-0.02)
Disease and Disability	0.546 (0.54)	0.730** (2.88)	0.034 (0.18)
Married	0.074 (0.62)	-0.020 (-0.59)	
Divorced/Separated	0.576 (0.47)	-0.049 (-0.21)	
Widowed	-0.838 (-1.72)	-0.765*** (-5.89)	
Religious person	-0.424 (-1.82)	0.174** (2.67)	0.091 (0.96)

Not a religious person	0.223 (0.79)	0.194* (2.56)	-0.058 (-0.51)
Facing risk at the street?			
Yes	0.019 (0.19)	-0.061* (-2.02)	-0.028 (-0.68)
Governorates dummies	Yes	Yes	Yes
Observations	3496	3493	1363

t statistics in parentheses  
="\* p<0.05

\*\* p<0.01

\*\*\* p<0.001"

The base category for precarious workers is non-precarious workers, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 14: IV 2SLS regressions for Females (second stage regression)**

	<b>Mental Health Index</b>	<b>Health status in general</b>	<b>Marriage status</b>
precarious	2.386 (0.42)	1.570 (1.15)	-1.836 (-1.29)
age <sup>2</sup>	-0.001 (-0.32)	-0.001 (-0.50)	-0.001 (-0.88)
Rented	0.946* (2.14)	0.075 (0.72)	0.006 (0.04)
Provided for work	1.149 (0.54)	1.282* (2.07)	-1.328 (-1.03)
Survey year=2014	-2.727*** (-4.41)	-0.336* (-2.20)	0.128 (0.59)
Disease	2.269** (2.90)	0.261 (1.37)	-0.100 (-0.59)
Disability	2.812 (0.94)	1.097 (1.91)	
Disease and Disability	2.801 (1.02)	2.308*** (3.40)	
Married	-0.044 (-0.11)	0.099 (0.96)	
Divorced/Separated	3.886** (3.08)	0.278 (0.98)	
Widowed	3.549 (0.99)	0.035 (0.05)	
Religious person	-1.103 (-1.43)	-0.035 (-0.19)	-0.421 (-0.83)

Not a religious person	-0.546 (-0.35)	0.430 (0.96)	-0.355 (-0.51)
Facing risk at the street?			
Yes	0.140 (0.22)	0.105 (0.63)	-0.310 (-1.14)
Governorate dummies	Yes	Yes	Yes
Constant	5.436 (1.46)	1.675 (1.76)	5.555*** (3.92)
Observations	665	665	318
t statistics in parentheses			
="* p<0.05                      ** p<0.01                      *** p<0.001"			

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.

**Table 15: IV 2SLS- First Stage regression**

	Precarious- Males	Precarious-Females
IV	0.181*** (5.8)	0.112 (1.57)
age <sup>2</sup>	0.001*** (-4.80)	0.001 (-0.57)
Rented	-0.015 (-0.67)	0.013 (0.27)
Provided for work	0.099* (0.89)	-0.323 (-1.24)
Survey year=2014	0.102*** (5.59)	-0.095*** (-2.01)
Disease	0.021 (0.91)	0.110*** (2.02)
Disability	0.046 (0.5)	-0.464 (1.61)
Disease and Disability	0.200 (1.37)	-0.435** (-3.47)
Married	-0.026 (-1.28)	-0.013 (-0.27)
Divorced/Separated	0.065 (0.711)	-0.030 (-0.25)
Widowed	0.381 (7.94)	-0.441*** (-5.49)
Religious person	0.001 (0.992)	0.003 (0.04)

Not a religious person	-0.008 (0.857)	-0.186 (-1.23)
Facing risk at the street?		
Yes	-0.012 (0.495)	-0.088** (-1.99)
Governorates dummies	Yes	Yes
Observations	3496	3493
t statistics in parentheses		
=** p<0.05	** p<0.01	*** p<0.001"

The base category for precarious jobs is non-precarious employment, while the benchmark group for the tenure of dwelling is tenure, no disease/disability is the reference category for disease, never married is the base category for marital status; very religious person is the reference category for religiosity and about the right weight is the reference group for individual weight.