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The benefits of paid employment among persons with common mental health problems: evidence for the selection and causation mechanism <sup>1</sup>

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- 1 *Appendix: Two alternative models: fixed effects model and random effects model*
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Fixed effects model

A fixed effects model was used to analyse within –individual changes in health among persons who entered paid employment. The following regression model was used:

$$y_{it} - \bar{y}_i = \alpha_t + \beta_w(x_{it} - \bar{x}_i) + \varepsilon_{ij}$$

where  $y_{it}$  is the dependent variable for individual  $i$  at time  $t$ ,  $\bar{y}_i$  is the mean value of dependent variable for individual  $i$ ,  $\alpha_t$  is the time effect that is constant across individuals,  $x_{it}$  is the exposure variable (employment status) for the  $i$ th participant at measurement  $t$ ,  $\bar{x}_i$  is the mean value of the exposure variable averaged across all measurement times for individual  $i$  and  $\varepsilon_{it}$  is the error term. The regression coefficient  $\beta_w$  gives the within-individual estimate of the change in scores of the outcome measures among individuals who enter or exit paid employment. Mental and physical health, self-esteem and mastery were modelled with linear regression analysis, happiness with logistic regression analysis. All models were adjusted for education, sex, and age.

Random effects model

A random effects model was used to analyse the differences in health between being employed and being unemployed. The following regression model was used:

$$y_{it} = \alpha_t + \beta_{0i} + \beta_{1i}x_{it} + \gamma z_i + \varepsilon_{ij}$$

where  $y_{it}$  is the dependent variable for individual  $i$  at time  $t$ ,  $\alpha_t$  is the time effect that is constant across individuals,  $\beta_{0i}$  is the individual-specific random intercept,  $\beta_{1i}$  is the individual-specific random slope,  $x_{it}$  is the exposure variable (employment status) for the  $i$ th participant at measurement  $t$ ,  $z_i$  are the independent variables that do not vary over time and  $\varepsilon_{it}$  is the error term. The regression coefficient  $\beta_1$  gives the estimate for the health differences between unemployment ( $x=0$ ) and employment ( $x=1$ ) (for at least 12 hours per week). Mental and physical health, self-esteem and mastery were modelled with linear regression analysis, happiness with logistic regression analysis. All models were adjusted for education, sex and age.

Results of two alternative models

Table A1 Within individual change after entering paid employment (fixed effects model) and difference between unemployment and employment status (random effects model) in health- and psychological measures among persons with common mental health problems (n=749), adjusted for age, sex, and education. [b=regression coefficient, SE=standard error, OR=odds ratio, CI=confidence interval]

	Fixed effects model within-individual change		Random effects model difference between employment and unemployment status	
	b	SE	b	SE
Mental health (0-100, higher is better)	16.47	2.78	18.41	2.53
Physical health (0-100, higher is better)	9.86	2.69	10.67	2.42
Self esteem (10-40, higher is better)	3.31	0.59	3.82	0.55
Mastery (6-18, higher is better)	1.69	0.39	1.96	0.33
	OR	95%CI	OR	95% CI
Happiness (happy/very happy)	2.78	1.25-6.17	4.06	2.03-8.17