Trajectories of Depressive Symptoms and Their Predictors among Jordanian Patients with Acute Coronary Syndrome

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Nedal Issa Mohammad Alfasfos

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Chapter 5: Results

This chapter presents the result of the study, the aim of which was to employ group-based modelling to identify trajectories of depressive symptoms after ACS. The chapter commences by providing an overview of the demographic and clinical characteristics of the study cohort. The chapter then presents the results of Growth Curve Modelling and Growth Mixture Modelling that have been used to identify trajectories of depressive symptoms after ACS. Factors related to distinct trajectories were identified using multinomial logistic regression. In addition, the chapter presents the prevalence and incidence of depressive symptoms at different time points.

5.1 Sample Characteristics

5.1.1 Demographics and Health-Related Behaviours

A total of 434 patients were included in the study. The mean age of patients was 56.46 (SD=11.3) and ranged from 28 to 85 years. About three quarters (72.6%, n=315) of the patients were male with 27.4% (n=119) were female. Most patients were married (89.2 %, n= 387), while 3% (n= 13) were single, 1.8% (n =8) were divorced and 6% (n=26) were widowed. Regarding living status, 95.9% (n= 416) of patients reported living with family, whereas 3.4% (n=15) reported living alone or with significant others (0.7%, n=3). None of the patients reported living in an institutional setting in Jordan. Almost two thirds of patients (n= 303) reported a monthly income of 500 Jordanian Dinar (JOD) or less, while 30.2% (n=131) reported a monthly income of more than 500 JOD.

Almost one third of patients (n=144) were educated to university level or above, 183 (42.2%) to secondary level, and 107 (24.7%) to primary level or were non-educated. With respect to employment status, about one third of the sample were employed (32.7%, n=142), while the remaining patients were unemployed (44%, n=191) or retired (23.3%, n=101). Of all patients, 64.7% (n=281) were insured, while 35.3% (n=153) were not insured. A small percentage (10.1%, n=44) reported a family history of depression (Table 7).

Table 7: Demographics and health-related behaviours of the sample (N = 434)

Variable	N	%	M(SD)
Age			56.46 (11.3)
Gender			
Male	315	72.6	
Female	119	27.4	
Monthly income			
≤ 500 JD	303	69.8	
> 500 JD	131	30.2	
Medical Insurance			
Yes	281	64.7	
No	153	35.3	
Family history of depression			
Yes	44	10.1	
No	390	89.9	
Marital Status			
Single	13	3.0	
Married	387	89.2	
Divorced	8	1.8	
Widow	26	6.0	
Educational level			
Primary or none	107	24.7	
Secondary	183	42.2	
University or above	144	33.2	
Employment status			
Employed	142	32.7	
Unemployed	191	44.0	
Retired	101	23.3	
Living status			
Alone	15	3.4	
With family	416	95.9	
With significant other	3	0.7	
Hospital Type			
Hospital A (Public)	80	18.4	
Hospital B (Public, university)	123	28.3	
Hospital C (Public)	161	37.1	
Hospital D (Private)	70	16.1	

M (SD) Mean (Standard Deviation)

5.1.2 Clinical Characteristics

With respect to ACS diagnosis, 138 (31.8%) patients were diagnosed with STEMI, 193 (44.5%) with non-STEMI and 103 (23.7%) with unstable angina. Regarding CVD risk factors, 25.6% (n=111) of patients were obese (BMI >=30), almost half were current smokers (48.6%, n= 211) or former smokers (15.4%, n=67), while only 156 (36%) never smoked. One third of patients had an Ejection Fraction (EF) of less than 40% (n= 154, 35.5%) while the remaining patients (n=280, 64.5%) had an EF above 40%. Most patients (73.7%, n=320) were treated with Percutaneous Coronary Interventions (PCI) with 26.3% (n=114) treated medically.

Regarding the 6-month GRACE risk index, scores ranged from 25 to 184.The scores were not normally distributed based on Shapiro-Wilk statistics ($p< 0.05$). The median GRACE score was 92 with an interquartile range (IQR) of 71.8 to 116.3. Scores for the Charlson Comorbidity Index (CCI) ranged from 1 to 7. The majority of patients (94.7%, n= 411) had CCI scores below 5 with only 5.8% (n=25) having a score of 5 or more. The scores were not normality distributed based on Shapiro-Wilk statistics ($p< 0.05$). The median CCI score was 2 with an IQR of 1 to 3. Patients' length of hospital stay ranged from 2 to 16 days, with a median of 3 days and an IQR of 3 to 5 days.

Some hospitals in Jordan used mg/dl as a standard unit for measuring cholesterol levels while others use mmol/l. In order to use the cholesterol variable in subsequent analysis, all values in mg/dl were converted into mmol/L by using 1 mg/dL= 0.0259 mmol/L (Nayor *et al*. 2016). The mean cholesterol level was 5.4 mmol/l (SD = 0.85), with a minimum of 3.62 mmol/l and a maximum of 8.0 mmol/l. According to the National Institutes of Health (2001), serum cholesterol values are classified into desirable (>5.2 mmol/l), borderline high (5.2-6.1 mmol/l) and high (>6.1mmol/l). Almost one third (31.9%, n=116) of patients had cholesterol levels between 5.2 and 6.2 mmol/l, while 25.5% (n=93) had cholesterol level greater than 6.1 mmol/l (Table 8).

Table 8: Clinical characteristics of the sample (N = 434)

Variable	N	%	*M* (IQR)
GRACE score			92 (71.8-116.3)
Charlson Comorbidity Index (CCI)			2 (1-3)
Length of Stay			3 (3-5)
Cholesterol level (mmol/l) (n= 364)			5.4 (.85)
Smoking status			
Current smoker	211	48.6	
Former smoker	67	15.4	
Non-smoker	156	36.0	
Body Mass Index (BMI)			
< 30	323	74.4	
≥ 30	111	25.6	
Ejection Fraction (EF)			
≥ 40	280	64.5	
< 40	154	35.5	
Medical Diagnosis			
ST elevation MI	138	31.8	
Non-ST elevation MI	193	44.5	
Unstable Angina	103	23.7	
In-hospital PCI			
Yes	320	73.7	
No	114	26.3	

Legend: M (IQR): Median and interquartile range; GRACE: Global Registry of Acute Coronary Event ; PCI: Percutaneous Coronary Intervention.

5.2 Descriptive Results of History of Depression

Most patients (62.2%, n= 270) reported no previous history of depression, based on the general question: 'Have you even been diagnosed or have history of depression for a period of two weeks or more'? Of the remaining patients, 15% (n= 65) reported a previous history of depression while 22.8% (n=99) were unsure if they had a history of depression. Accordingly, the latter two groups were further evaluated using the modified version of the PHQ-9 for lifetime history of depression, from which 15.9 % (n=69) were found to have a history of depression.

5.3 Descriptive Results of the Self-Reported Instruments

Depressive symptoms

The prevalence of in-hospital depressive symptoms was 23.5% (n=102) using the PHQ-9 ≥10. The mean score of depressive symptoms in patients with ACS was 6.37 (SD=4.40), with scores ranging from 0 to 20. Regarding the severity of depressive symptoms, 40.1% (n=174) of patients reported having minimal or no depressive symptoms, 36.4% (n=158) reported having mild depressive symptoms, 18.7% (n=81) reported having moderate depressive symptoms while 4.8% (n=21) reported having from moderately severe to severe depressive symptoms. Descriptive statistics of depressive symptoms based on their severity are presented in Table 9.

Table 9: Depressive symptoms and their severity at baseline

	Depressive symptoms
N	434
Mean (SD)	6.37 (4.40)
Skewness	.548
Kurtosis	-.327
Minimum	0
Maximum	20
Severity of depressive symptoms at baseline	N (%)
Minimal or no depressive symptoms	174 (40.1%)
Mild	158 (36.4%)
Moderate	81 (18.7%)
Moderately severe	19 (4.4%)
Severe	2 (0.5%)

Type D Personality

The mean score on the Negative affective (NA) scale was 7.58 (SD= 6.0) and 7.5 (SD= 5.3) on the social inhibition (SI) scale. Scores ranged from 0 to 23 for the NA scale and from 0 to 25 for the SI scale. Scores of 10 or more were recorded in 41% (178) and 36% of patients (N=434) for NA and SI respectively. Using the cut-off point of 10 or more in both NA and SI scales, 111 (25.6%) patients were classified as having Personality Type D.

Multidimensional scale of Perceived Social Support (MSPSS)

Patients' responses to the 12 items on the MSPSS were summed to calculate the total score. The mean score was 59.50 (SD=12. 71). The minimum score was 20 and the maximum was 84. More than half of the patients (53%, n= 230) had a total score above the mean while 47% (n=204) had total scores below the mean. The analysis indicated that the level of perceived social support in the sample was moderate. The mean scores of subscales indicated that patients perceived more social support from family (M=21.9, SD=4.36) and significant others (M= 21.6 SD=5.51) as opposed to friends (M=16, SD=7.26). The internal consistency reliability for MSPSS and its scales was good and ranged from 0.74 to 0.90 (Table 10).

Table 10: Multidimensional Scale of Perceived Social Support (MSPSS)

Scales	Mean (SD)	Min-Max	Skewness	Kurtosis	Cronbach's alpha
MSPSS	59.5 (12.7)	20-84	-0.52	- 0.12	.84
Family	21.9 (4.36)	4-28	-1.04	0.86	.74
Friends	16.0 (7.26)	4-28	-0.41	-1.10	.90
Significant others	21.58 (5.51)	4-28	-0.94	-0.041	.85

Brief COPE

The mean of dysfunctional coping strategies was 19.39 (SD= 6.78). Scores ranged from 12 to 40, with more than one-third (37.5%, n=161) of patients scoring 20 or higher. Following this, the mean score for using emotion-focused strategies was 17.83 (SD= 4.45). Scores ranged from 8 to 28, with almost half (47%, n=204) of the patients scoring 18 or higher. The mean score for using problem-focused coping was 8.8 (SD= 3.48), with 47.9% (n=208) of the patients scoring nine or above. Scores ranged from 4 to 16. The final subscale (social coping) showed a mean score of 7.79 (SD= 2.85), with 54.8% (n=283) of patients scoring higher than the mean. Scores ranged from 4 to 16. These findings indicated that patients tend to use dysfunctional coping strategies less frequently than the other strategies, such as emotion-focused, problem-focused, and social coping.

5.4 Predictors of in-hospital Depressive Symptoms

5.4.1 Assumptions of logistic regression

Lack of multicollinearity between the independent variables.

Due to the lack of collinearity diagnostic options for logistic regression in SPSS, the aforementioned collinearity statistics were obtained by running a linear regression using the same independent and dependent variables (Filed, 2013, P .297). All categorical variables were changed into dummy variables to be included in the test. The analysis showed that there was no evidence of multicollinearity between variables since all the predictor variables had

tolerance that ranged from 0.71 to 0.95 and VIF values that ranged from 1.05 to 1.40 (Table 11). This assumption was also tested by evaluating the presence of high standard errors (SE>2) of the B coefficient in the logistic regression model (Josephat and Ame, 2018). By exploring SE for the predictor variables in the multivariate models, all values in both nested models (Table 14) were below 0.4, indicating absence of multicollinearity between items. Collinearity statistics for all variables included in the multivariate nested models are presented in Table 11.

Linearity of the logit

The analysis showed that all the interactions between the variables and their logarithm were non-significant ($p>0.05$) except for the length of hospital stay (Table 12). This indicates that the length of stay variable violated the linearity of logit assumption. To deal with the non-linearity, the length of stay variable was analysed as dichotomous: “one” for scores in the upper quantile and “zero” for all other scores.

Table 11: Testing multicollinearity across all independent variables included in the multivariate analysis (N=434)

Variables [a]	Collinearity Statistics	
	Tolerance	**VIF**
Gender	.862	1.161
Smoking (current vs non-smoker)	.870	1.150
Monthly income	.969	1.032
Obesity	.879	1.138
Length of stay [b]	.707	1.415
Left ventricular Ejection fraction	.873	1.145
Charlson Comorbidity Index	.759	1.318
Lifetime history of depression	.952	1.051
Problem-focused coping	.791	1.265
Social coping	.845	1.184
Perceived social support	.839	1.191
Personality Type D	.802	1.247
Dysfunctional coping	.794	1.259
Emotion-focused coping	.887	1.127

a. The analysis was conducted using linear regression due to lack of collinearity diagnostics option in SPSS software for the logistic regression.
b. analysed as upper quartile= 1, and lower quartile equal to zero

Table 12: Testing the linearity of the logit assumption for the continuous variables included in the multivariate analysis

Model	B	SE	Wald	Sig	Exp(B)
LOS by Ln_LOS	-.693	.234	8.797	.003	.500
CCI by Ln_CCI	-.278	.324	.739	.390	.757
Ln_MPSS by MPSS	-.028	.066	.178	.673	.973
DysC by Ln_DysC	-.026	.134	.038	.845	.974
EFC by Ln_EFC	.011	.192	.003	.953	1.011
Ln_PFC by PFC	.110	.205	.291	.590	1.117
Ln_SociC by SociC	-.395	.271	2.121	.145	.674
LOS	2.263	.671	11.383	.001	9.608
CCI	.517	.656	.620	.431	1.677
MPSS	.110	.327	.113	.736	1.116
DysC	.163	.548	.088	.766	1.177
EFC	-.058	.743	.006	.938	.944
PFC	-.424	.645	.433	.510	.654
SociC	1.107	.824	1.805	.179	3.024

Legend: LOS: Length of hospital Stay; CCI: Charlson Comorbidity Index; PSS: Perceived Social Support; DysC: Dysfunctional Coping; EFC: Emotion-Focused Coping; PFC: Problem-Focused Coping; SociC: Social Coping

The Expected Cell Frequency

The cross-tabulation showed that all the variables had expected cell counts of more than five except for marital status and living status variables. Regarding marital status, analysis showed that two cells had expected counts of less than five, which constituted 25% of the cells. The minimum expected cell count was 1.9 and 3.8 for divorced and single categories, respectively. To solve this problem, the single, divorced and widowed categories were merged and labelled unmarried. This solution resulted in 0 (0%) cells with an expected count of less than five. The minimum expected count for the unmarried category was 11%.

Similarly, the crosstab of the living status variable showed that 50% of cells had counts of less than five. The minimum expected cell count was 0.7 and 4.0 in categories of significant others and living alone, respectively. The significant others category was merged with the 'living with family' category and labelled living with 'family and significant others'. However, the cell count for the living alone category remained at less than five which means that this variable should be evaluated for a large standard error when it included in a logistic regression model.

Independence of Residuals

The standardised residuals were computed in both nested logistic models. The analysis showed that eight observation (1.8%) exceeded the absolute value of 3.0 in the first nested model (Demographics-Health Related Behaviours-Psychosocial Variables model), and ten observations (2.3%) in the second nested model (Clinical- Psychosocial variables model). To check whether these outliers had significant impact regression coefficients, Cook's distance and DFBeta values were evaluated for all observations in the models. The results showed that there was no evidence of influence on the regression coefficients in both models as none of these observations had Cook's distance and or DFBeta value greater than 1. In addition, the classification accuracy was compared with the outliers in the model (baseline model) and after excluding outliers (revised model), the revised models showed an improvement in the

classification accuracy by less than 2% in both nested models. Since the improvement in the classification accuracy was small and the outliers did not influence the fitted models as suggested by Cook's distance and DFBeta values, the researcher decided to report the findings based on the baseline model.

5.4.2 Univariate Logistic Regression

Depressive symptoms were categorised, based on the cut-off point of 10, into elevated (≥ 10) and non-elevated (<10) depressive symptoms. All variables were initially evaluated using a univariate binary logistic regression and those that were significant at $p \leq .15$ in the univariate logistic regression were included in the multivariate logistic model. Unlike univariate analysis, multivariate logistic regression can identify the impact of each independent variable on the odds of being depressed when other independent variables are included in the same model. The independent variables that were included in the analysis involved four groups of variables: demographics, health behaviours, clinical variables, and psychosocial variables.

The results of the univariate analysis (Table 13) showed that two demographic and two health related behaviour variables were significant predictors of depressive symptoms as follows: gender (OR = 1.735; 95% CI, 1.080-2.789), income (OR = 2.408; 95% CI, 1.379 - 4.204), current smoking status (OR = 1.740; 95% CI, 1.053-2.875) and obesity (OR = 2.668; 95% CI, 1.659-4.291).

Three clinical variables: length of stay in-hospital (LOS) (OR = 1.490; 95% CI, 1.303-1.720), Left Ventricular Ejection Fraction (LVEF) (OR= 1.999; 95% CI, 1.272-3.141), and Charlson Comorbidity Index (CCI) (OR = 1.182; 95% CI, .998-1.402) were found to be significant predictors of depressive symptoms at $p \leq .15$. With respect to cholesterol level, univariate analysis was conducted with and without using the multiple imputation technique. Both strategies indicated that cholesterol level was not a significant univariate predictor of depressive symptoms.

Finally, all psychosocial variables were found to be significant predictors of depressive symptoms as follows: Type D personality (OR = 3.795; 95% CI, 2.358-

6.108), perceived social support (OR = .984; 95% CI, .931-.966), problem-focused coping (OR = .836; 95% CI, .777-.900), social coping (OR = .853; 95% CI, .782-.931), emotion-focused coping (OR = .908; 95% CI, .860-.959), dysfunctional coping (OR = 1.106; 95% CI, 1.070-1.142) and history of lifetime depression (OR = 2.900; 95% CI, 1.686-4.989).

Table 13: Univariate logistic regression for variables predicting depressive symptoms in patients with ACS (N=434)

Variables	no depressive symptoms n= 332	elevated depressive symptoms n= 102	OR	CI		Sig
				Lower	Upper	
1.Demographics						
Age (Median (IQR))	56.5 (49-65.8)	55 (45-65)	.987	.968	1.007	.209
Gender (female)	24.7%	36.3%	1.735	1.080	2.789	**.023**
Income (<500)	70%	82.4%	2.408	1.379	4.204	**.002**
Family history of depression (Yes)	9.0%	13.7%	1.602	.814	3.153	.173
Employment [a]						.319
Employed	34%	28.4%	.857	.505	1.455	.569
Retired	21.7%	28.4%	1.345	.779	2.325	.287
Education [b]						.693
Primary of non-educated	23.8%	27.5%	1.292	.719	2.322	.392
Secondary level	42.2%	42.2%	1.120	.663	1.891	.673
Living (alone)	3.6%	2.9%	.808	.224	2.921	.745
Marital status(unmarried)	10.8%	9.8%	.894	.427	1.871	.766
Medical insurance (No)	34.5%	36.3%	1.060	.668	1.683	.805
2. Health-related behaviours						
BMI (>=30)	20.8%	41.2%	2.668	1.659	4.291	**.000**
Smoking [c]						**.063**
- Current smokers	45.5%	58.8%	1.740	1.053	2.875	**.031**
- Former smokers	16.3%	12.7%	1.054	.509	2.182	.887
3. Clinical factors						
Medical diagnosis [d]						.757
STEMI	32.2%	30.4%	.816	.450	1.477	.501
NSTEMI	44.9%	43.1%	.831	.478	1.445	.512
LVEF (<40)	31.6%	48%	1.999	1.272	3.141	**.003**
CCI (median (IQR))	2 (1-2)	2 (1-3)	1.182	.998	1.402	**.053**
In hospital PCI (yes)	72.9%	76.5%	1.209	.720	2.028	.473
GRACE score (median (IQR))	93 (72-115)	90 (68.8-124)	1.003	.996	1.010	.395

Variables	no depressive symptoms n= 332	elevated depressive symptoms n= 102	OR	CI		Sig
				Lower	Upper	
Length of stay (median (IQR))	3 (3-4)	5 (3-6)	1.498	1.304	1.721	**.000**
Cholesterol level (Mean (SD))	5.4 (.84)	5.5 (.90)	1.131	.848	1.507	.402
Imputed Cholesterol level (pooled)	-	-	1.105	.833	1.466	.487
4. Psychosocial factors						
Type D (yes)	19.0%	47.1%	3.795	2.358	6.108	**.000**
Perceived Social Support (median (IQR))	64 (54-70)	52 (43.75-64)	.948	.931	.966	**.000**
Dysfunctional coping (median (IQR))	16 (14-20.75)	22 (15.75-30)	1.106	1.070	1.142	**.000**
Problem focused coping (median (IQR))	9 (7-12)	6 (5-9.25)	.836	.777	.900	**.000**
Social coping (median (IQR))	8 (6-10)	6 (5-8)	.853	.782	.931	**.000**
Emotion focused coping (median (IQR))	18 (15-22)	16 (13-18)	.908	.860	.959	**.001**
History of lifetime depression (yes)	12.1%	28.4%	2.900	1.686	4.989	**.000**

Legend: BMI: Body Mass Index; IQR: Interquartile Range; STEMI: ST-segment Elevation Myocardial Infarction; NSTEMI: Non-ST-segment Elevation Myocardial Infarction; LVEF: Left Ventricular Ejection Fraction; PCI: Percutaneous Coronary Intervention; GRACE: Global Registry of Acute Coronary Events.
Note: The unmentioned categories in a, b, c, and d variables were used as reference groups

5.4.3 Nested logistic regression

Nested logistic regression was conducted to identify the independent predictors of depressive symptoms when different variables present together. Nested logistic regression is a technique in which variables can be included into subsequent models based on their relative importance. The subsequent model includes new variables in addition to all variables from the preceding model (Doyle *et al*., 2011b). Given that the number of significant predictors in the univariate analysis exceeded 10, two nested logistic regression models were evaluated. The first nested model included the significant demographics and health related behaviours in block 1 and the significant psychological variables in block 2 (Table 14). The second nested model included the significant clinical factors in block 1 and the psychosocial variables in block 2 (Table 15).

The first nested model: demographics, health-related behaviours and psychosocial variables.

In this first model, demographics and health related behaviours that were significant at p = 0.015 in the univariate analysis (gender, income, smoking status and BMI) were included in Block 1. These variables explained 13.5% of the total variance in depressive symptoms. Psychosocial variables included in block 2 were Type D personality, history of depression, perceived social support, social coping, problem-focused coping, and emotion-focused coping. The analysis indicated that there was a statistically significant difference between the log-likelihood of this model and the baseline (null) model based on the omnibus test of model coefficients (X^2 (12) =109.937, $p < .0001$). The significant *P value* of Chi-square in the omnibus test indicated that this model had a better fit than the baseline model. The model explained from 22.4% (Cox & Snell R^2) to 33.7% (Negelkerke R^2) of the variances in depressive symptoms. The Hosmer-Lemeshow statistic indicated an overall model fit based on the non-significant *P value* of the chi-square (X^2 (8) = 5.427, $p=. 711$). This model correctly predicted depressive symptoms for 81.6% of observations compared to the null model, which was 77%. This is an indication that this model had a higher predictive power than the null model. Additionally, the model with

psychosocial variables accounted for higher percentages of explained variance (Negelkerke R^2 =33.7%) than the model which included demographic and health-related behaviours only. This indicates that psychosocial variables explained most of the variances in depressive symptoms and therefore can predict depressive symptoms better than demographics and health related behaviours.

From the 11 variables included in the model, six were significant at 0.05 level (Table 14). Only four of the seven psychosocial variables remained significant in the model after controlling for demographics. They were Type D personality (OR = 2.169; 95% CI, 1.251-3.759), history of depression (OR = 2.150; 95% CI, 1.135-4.074), perceived social support (OR = .969; 95% CI, .949-.990) and dysfunctional coping (OR = 1.054; 95% CI, 1.014-1.095). However, emotion-focused coping (*P*= .211), problem-focused coping (*P*=.098) and social coping (*P*= .063) were no longer significant when included together with other psychosocial variables. Patients with Type D personality were 2.17 times more likely to be depressed than non-Type D patients. Regarding dysfunctional coping, each unit increase in its score was associated with a 1.05 increase in the odds of being depressed. Perceived social support had an odds ratio of less than one, indicating that each unit increase in perceived social support was associated with a 3% decrease in the odds of being depressed. Patients who reported a history of depression were 2.15 more likely to be depressed than those with no history of depression.

From all the demographics and health related behaviours that were included in the model, only low income (OR= 2.161, 95% CI= 1.139-4.100) and current smoking status (OR= 2.430, 95% CI= 1.254-4.708) were significant predictors of depressive symptoms. Gender (*p*= .056) and BMI (*p*=.120) were no longer significant. Current smokers were 2.43 times more likely to be depressed than non-smokers. However, there was no statistically significant difference between former smokers and non-smokers (*p*= .197). Regarding monthly income, patients who reported a monthly income of 500 JOD or less were 2.16 more likely to be depressed than patients with a monthly income higher than 500 JOD.

Table 14: Nested logistic regression model A

Model A	B	SE	Wald	Sig	OR	95% CI	
						Lower	Upper
Block 1: Demographics and Health Related Behaviours							
Gender (Female)	.611	.320	3.653	.056	1.842	.985	3.445
Monthly income (≤ 500JOD)	.770	.327	5.560	**.018**	2.161	1.139	4.100
Obesity (BMI ≥ 30)	.455	.296	2.370	.124	1.576	.883	2.813
Smoking status [a]			6.932	**.031**			
Currently Smokers	.888	.337	6.927	**.008**	2.430	1.254	4.708
Former smokers	.573	.444	1.664	.197	1.774	.742	4.239
Block 2 Psychosocial variables							
Type D personality	.774	.281	7.606	**.006**	2.169	1.251	3.759
Perceived social support	-.031	.011	8.292	**.004**	.969	.949	.990
Social coping	-.102	.055	3.459	.063	.903	.812	1.005
Dysfunctional coping	.053	.020	7.240	**.007**	1.054	1.014	1.095
Problem-focused coping	-.072	.043	2.739	.098	.931	.855	1.013
Emotion-focused coping	-.040	.032	1.564	.211	.961	.903	1.023
History of depression (Yes)	.766	.326	5.514	**.019**	2.150	1.135	4.074

The second nested model: clinical and psychosocial variables.

In the second model, significant clinical variables at $p \leq .15$ in the univariate analysis (LVEF, LOS and CCI) were included in block 1. These variables explained 13.5% of the total variance in depressive symptoms. Psychosocial variables that were included in block 2 included Type D personality, history of depression, perceived social support, social coping, problem-focused coping, and emotion-focused coping. The analysis indicated that there was a statistically significant difference between the log-likelihood of this model and the baseline (null) model based on the omnibus test of model coefficients ($\chi 2$ (10) =106.60, $P <$ .0001). The overall model fit was determined by Hosmer-lemeshow goodness-to-fit statistic. The test showed a non-significant *P* value, which indicated a model fit (X2(8) = 8.926, p=0.328). The model correctly predicted depressive symptoms for 81.3% of the patients compared to 76.5% in the null model. This nested model explained from 21.8% (Cox & Snell R2) to 32.8% (Negelkerke R2) of the variance in depressive symptoms. This indicates that this model has a higher predictive power than the null model. Furthermore, adding psychosocial variables into the clinical variables accounted for a higher percentage of the explained variance (Negelkerke R2 =32.5%) than the model that included clinical variables only (Negelkerke R2 =13.5%). This is an indication that psychosocial variables can predict depressive symptoms in patients with ACS better than clinical variables.

As shown in table 15, Type D personality (OR = 2.092; 95% CI, 1.179-3.711), history of depression (OR = 2.234; 95% CI, 1.178-4.234), perceived social support (OR = .971; 95% CI, .951-.992) and dysfunctional coping (OR = 1.058; 95% CI, 1.018-1.100) were significant predictors of depressive symptoms. However, emotion-focused coping (p= .280), problem-focused coping (p=.090) and social coping (p= .128) were no longer significant when included together with other variables. Type D personality was associated with increased odd of being depressed by 2.09. This indicates that patients with Type D personality were 2.09 times more likely than non-Type D patients to be depressed after controlling for clinical and other psychosocial variables. Likewise, patient who

reported a history of depression were 2.23 more likely to be depressed than patients with no history of depression after controlling for clinical and other psychosocial variables. Regarding the other psychosocial variables, the analysis showed that for each one unit increase in dysfunctional coping there was an increase in the odds of being depressed by 1.06. However, a one unit increase in perceived social support was associated with a decrease in the odds of being depressed by 3% after controlling for clinical and other psychosocial variables. Regarding the clinical variables, the analysis showed that the LVEF (OR=1.917; 95% CI, 1.097-3.349) and LOS (OR= 2.627; 95%CI, 1.221-5.6535) were significant predictors of depressive symptoms. However, CCI became non-significant when it was included with other clinical and psychosocial variables (*p*= .324). The odds of being depressed for patients with low LVEF (<40) was 1.92. This indicates that patients with low LVEF were 1.92 times more likely to be depressed than those with LVEF ≥40. The length of hospital stay was associated with increased odds of being depressed by 2.63. This indicates that patients who stayed in hospital for a longer time were 2.63 times more likely to be depressed than those who stayed in hospital for a shorter period.

Table 15: Nested logistic regression model B

Model B	B	SE	WALD	Sig	OR	95%CI	
						Lower	Upper
Block 1: Clinical variables							
Length of hospital stay	.966	.391	6.107	**.013**	2.627	1.221	5.653
Ejection Fraction (EF<40)	.651	.285	5.220	**.022**	1.917	1.097	3.349
Charlson comorbidity index (CCI)	-.121	.122	.972	.324	.886	.697	1.127
Block 2: Psychosocial variables							
Type D	.738	.292	6.370	**.012**	2.092	1.179	3.711
Perceived social support	-.030	.011	7.498	**.006**	.971	.951	.992
Social coping	-.082	.054	2.311	.128	.921	.829	1.024
Dysfunctional COPE	.057	.020	8.276	**.004**	1.058	1.018	1.100
Problem-focused coping	-.074	.044	2.875	.090	.928	.852	1.012
Emotion-focused COPE	-.035	.032	1.169	.280	.966	.906	1.029
History of depression (Yes)	.804	.326	6.067	**.014**	2.234	1.178	4.234

5.5 Prevalence of Depressive Symptoms over 6 Months of ACS

This study found that the prevalence of depressive symptoms decreased over time (Table 16). The prevalence of depressive symptoms at baseline, one, three and six months after ACS was 23.5%, 18%, 16.7% and 15.4%, respectively. On average, depressive symptoms scores showed improvement over time. The mean PHQ-9 score reduced from 6.37 (SD, 4.47) at baseline to 4.55 (SD, 4.19) at 6 months. Regarding the severity of depressive symptoms at baseline, most patients had minimal (40.1%) or mild (36.4%) depressive symptoms. A minority had moderate (18.7%), moderately severe (4.4%) or severe (0.5%) depressive symptoms. The results also show that the proportion of patients who had minimal or no depression increased from 40.1% at baseline to 60.6% at 6 months. Proportions of patients in other categories, including mild, moderate, moderately severe and severe depressive symptoms, reduced over time (Table 17).

Table 16 : Descriptive statistics and prevalence of depressive symptoms over 6 months of ACS

	Baseline	One month	Three months	Six months
Prevalence rate	0.235 (n=102)	0.18 (n=75)	0.167 (n=67)	0.154 (n=61)
95% CI	0.196-0.278	0.145-0.221	0.132-0.207	0.120-0.193
Mean (SD)	6.37 (4.47)	5.47 (4.25)	5.00 (4.28)	4.55 (4.19)
Skewness / Kurtosis	0.6/ -.33	0.8/ .057	0.9/.39	1.0/.63

Legend: CI: Confidence Interval; SD: Standard deviation

Table 17: Description of depressive symptoms over 6 months of ACS based on their severity

Severity of symptoms	Baseline	One month	Three months	Six months
- Minimal or none	174 (40.1%)	190 (45.7%)	203 (50.6%)	244 (61.6%)
- Mild	158 (36.4%)	151 (36.3%)	131 (32.7%)	91 (23%)
- Moderate	81 (18.7%)	62 (14.9%)	53 (13.2%)	50 (12.6%)
- Moderately severe	19 (4.4%)	13 (3.1%)	12 (3.0%)	11 (2.8%)
- Severe	2 (0.5%)	-	2 (0.5%)	-

5.6 Incidence of depression over 6 months of ACS

Incidence of depression was estimated by identifying the number of new cases with PHQ-9 scores ≥ 10 at 1, 3 and 6 months of ACS. The study enrolled 434 patients with ACS, of whom, 69 reported a history of depression. From the 102 (23.5%) patients who reported elevated depressive symptoms at baseline hospitalisation, 29 (28.4%) had a history of depression. Patients who reported a history of depression and those who had elevated depressive symptoms at baseline (n=142) were considered not at risk for incident depression at 1, 3 and 6 months.

From the 292 patients who were at risk for depression at one month follow-up, 18 patients were lost to follow-up. Five of them had baseline depression and two had a history of depression (therefore they were already excluded). Therefore, the total number at risk for incidence of depression at one month of ACS was 281 (292-11). The number of new cases of depression at baseline was 7. Thus, the incidence of depressive symptoms at one month of ACS was 2.5% (7/281).

Three months following ACS, an additional 15 patients were lost to follow-up, three of whom had a history of depression and three who had baseline depression (already excluded). Thus, the number of patients at risk for incidence of depression at three months was 272 (281-9). However, the seven patients who had incident depression at one month were also excluded in subsequent analysis. Therefore, the total number of patients at risk for incident depression at three months was 265 (272-7) patients. The number of new cases of depression at 3 months was 8. Thus, the incidence of depression at three month of ACS was 3.0 % (8/265).

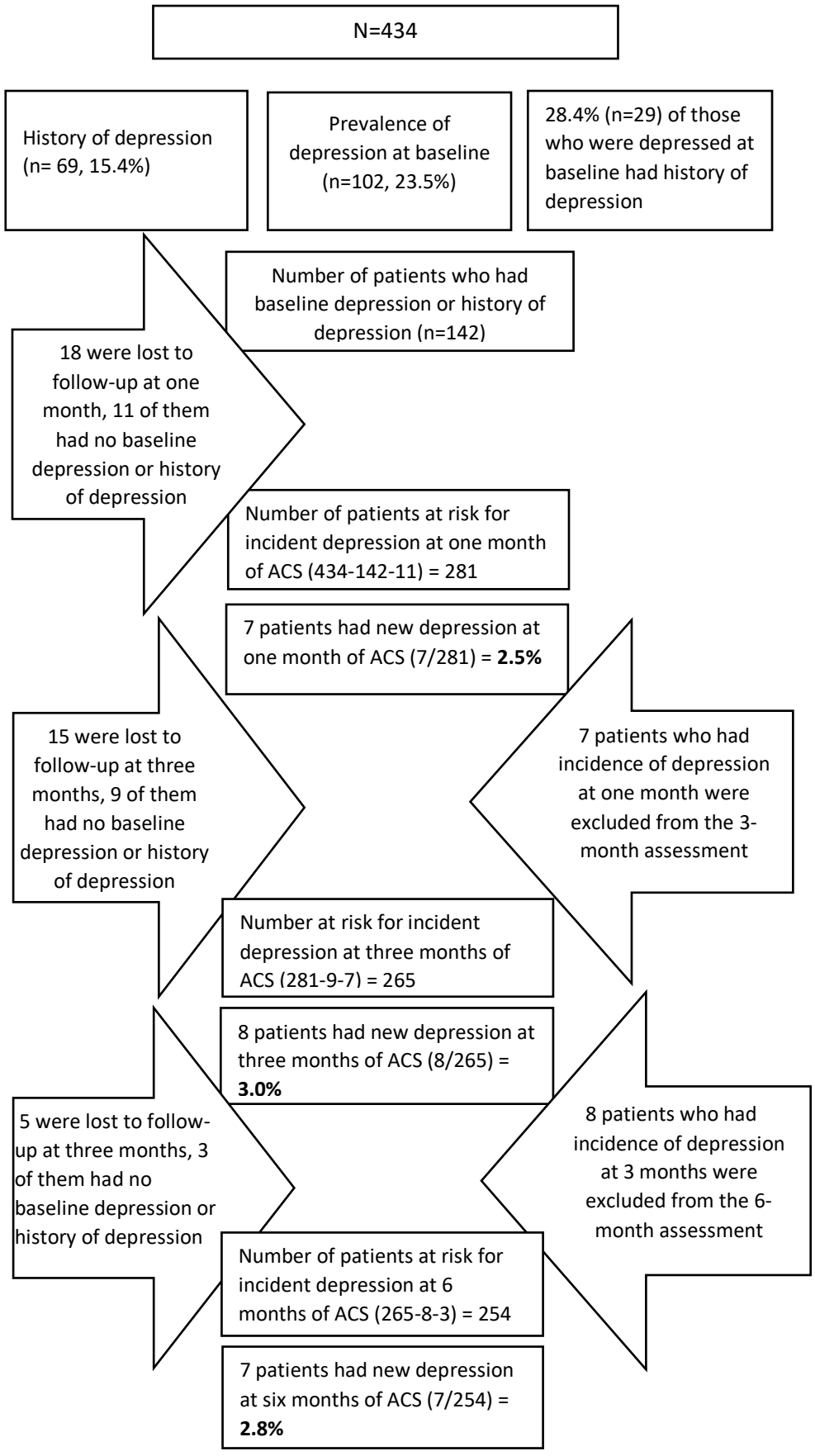
Six months following ACS, five patients were lost to follow-up, of whom 2 had a history of depression (already excluded). Thus, the number of patients at risk for incidence of depression was 262 (265-3). In addition, eight patients who had incidence of depression at three months were excluded from assessment at 6 months. Thus, the total number of patients at risk of incidence of depression at 6 months was 254 (262-8). The number of new

cases of depression at 6 months were 7. Thus, the incidence of depression at 6 months was 2.8% (7/254). Accordingly, the 6 months cumulative incidence of depression was 8.3% (Table 18). (See Figure 7 for flow chart).

Table 18: Incidence of depression over 6 months of ACS (n=434)

Time of assessment	Number at risk	Incident depression (N)	Incident depression (%)	Cumulative incidence
1 monAppendic VI th	281	7	2.5%	2.5%
3 months	265	8	3.0%	5.5%
6 months	254	7	2.8%	**8.3%**

Figure 7: Flow Chart for Incidence Depression Over 6 Months of ACS



5.7 Trajectories of Depressive Symptoms Over 6 Months of ACS

5.7.1 Single-class Latent Growth Curve Model

The first step before conducting GMM was running three univariate growth curve models to determine which growth factor works best for the data. The models included intercept-only linear and quadratic growth factors. The intercept-only model included a significant intercept but not a significant slope (no change). The linear growth factor indicates either a decrease or an increase in depressive symptoms over time while the quadratic growth refers to nonlinear growth trajectories that reflect an upturn downturn (Muthén *et al*., 2002). According to Muthen and Muthen (2004), a minimum of four repeated measures are required to model a nonlinear quadratic growth curve. In this study, depressive symptoms were measured at four time points (baseline, 1 month, 3 months and 6 months). Several model fit statistics were used to decide which growth factor fit the data better such as BIC, Chi-square test, CFI, TLI, RMSEA, and RSMR.

The model fit statistics indicated that an intercept-only model was a poor fit to the data as it had the largest BIC, RMSEA, SRMR and Chi-square values and the lowest CFI and TLI values. The fit indices indicated that the linear growth model fit the data better than intercept-only model. By comparing the linear model to the quadratic model, the former was better in term of smaller BIC, smaller RMSEA and greater TLI values. However, the latter was better in term of smaller Chi-square value, and smaller RSMR value in addition to a lower ratio of chi-square to its degree of freedom and greater CFI value (Table 19).

After the researcher added the quadratic growth factor to the model in Mplus, the following warning notification was noted: "*WARNING: THE LATENT VARIABLE COVARIANCE MATRIX (PSI) IS NOT POSITIVE DEFINITE. THIS COULD INDICATE A NEGATIVE VARIANCE/RESIDUAL VARIANCE FOR A LATENT VARIABLE, A CORRELATION GREATER OR EQUAL TO ONE BETWEEN TWO LATENT VARIABLES, OR A LINEAR DEPENDENCY AMONG MORE THAN TWO LATENT VARIABLES. CHECK THE TECH4 OUTPUT FOR MORE INFORMATION. PROBLEM INVOLVING VARIABLE Q*" (Muthén and Muthén, 1998). This warning

indicated that there was a problem with the quadratic factor being added to the model. The researcher reviewed the problem and there was a high negative correlation (>1) between the slope and the quadratic growth factors. The standardised model result estimated a correlation of -1.172 between the slope and the quadratic growth factors, which is an unacceptable value for a correlation. A correlation coefficient value greater than 1 between linear and quadratic growth factors in standardised model results, indicates that the quadratic growth factor may not be suitable for the data (Geiser, 2012). Therefore, the linear growth factor was used in testing the subsequent GMM.

Table 19: Model fit statistics for three different single-class latent growth curve models

Growth factor	X^2	df	X^2/df	CFI	TLI	RMSEA	SRMR	BIC
Intercept-only	134.293	8	16.8	0.874	0.905	0.189	0.125	8625.239
Linear	25.214	5	5.04	0.980	0.976	0.090	0.054	**8534.379**
Quadratic	6.606	3	2.20	0.994	0.966	0.114	0.017	8540.063

Legend: X^2 Chi-Square; df: Degree of Freedom**,** CFI: Comparative Fit Index; Tucker–Lewis index: TLI; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardised Root Mean Square Residual; BIC: Bayesian Information Criterion.

The linear growth curve model showed a modest fit to the data. The intercept refers to the level of depression at baseline hospitalisation and the slope reflects changes in depressive symptoms over six months of ACS. The mean intercept was significant ($M_{INTERCEPT}$=5.923, Z = 30.379, *p*<.001) and the mean of slope was negative and significant (M_{LINEAR} = -.282, Z=-.216, *p*<.001). This indicates that depressive symptoms tend to decrease over time. The variance of intercept ($VAR_{INTERCEPT}$=13.056, Z=11.609, p<.001) and slope (VAR_{LINEAR}=.207, Z=5.213, p<.001) were significantly different from zero indicating significant individual differences on initial levels and on rate of change in depressive symptoms over time. The significant variability around the mean of intercept indicates that while some patients had higher initial level of depressive symptoms, others had lower initial level of depressive symptoms. The significant variability around the mean of slope indicating that some patients had higher rate of decline in depressive symptoms while some others had lower

rate of decline over time. There was a significant negative intercept- slope covariance (r=.172, Z=-2.503, *p*<.005). These findings indicate that, on average, patients who had higher initial level of depressive symptoms tended to have more rapid decrease in depressive symptoms over time compared to those with lower initial levels (Murphy *et al*., 2014b). The R-squares of the repeated measures indicated that 63.1% to 96.6% of the individual differences were explained by the latent growth factors. However, the remaining variance could be attributed to measurement errors (Geiser, 2012). The estimated mean growth curves in a single-class linear model are shown in Figure 8

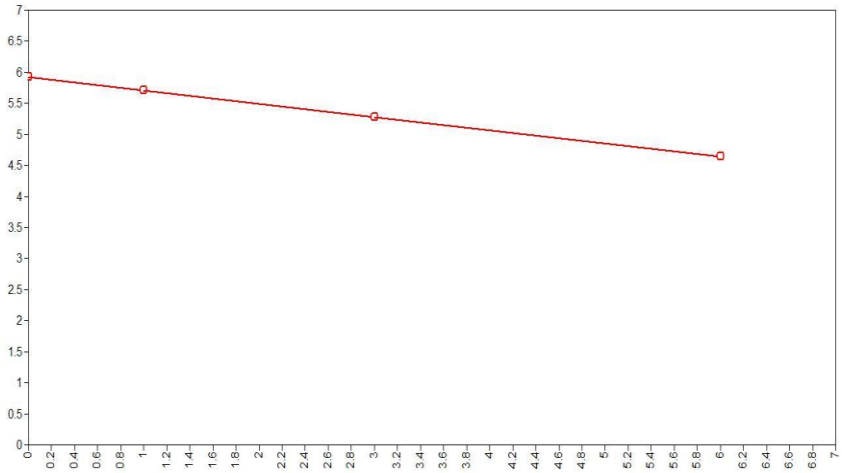


Figure 8: The estimated mean growth curves in a single-class linear model. The y-axis refers to the mean of initial level of depressive symptoms and the x-axis represents the time in months

5.7.2 Growth Mixture Model

Identification of the optimal number of depressive symptom trajectory groups (classes)

As shown in Table 20, several Growth Mixture models were fitted starting from 1 class to 5-classes. The 5-class model was examined as a last model because (a) most of the studies in ACS identify three to four trajectory classes and therefore, one additional class was explored to identify all possible solutions; (b) the *p* value of the BLRT test became non-significant in the 5-class model. The non-significant *p* value of the BLRT test indicated that the 5-class model (K)

had no significant improvement in the model fit compared to the 4-class model (K-1). For every solution examined, the best log likelihood for the model was replicated at least twice. In case that the best loglikelihood value was not replicated, the number of random start values were increased until the best loglikelihood was replicated. After successful replication, two seed values from the best loglikelihood were evaluated using the OPTSEED option in Mplus to ensure that the resulted solution was not a local solution (Asparouhov & Muthén, 2012).

The 1-class model was specified as a baseline model for comparison. The model showed the highest AIC, BIC and the ABIC values compared to other models. This indicated that a 1-class model had poorer fit indices than the other models. The *p* values of BLRT, LMR-LRT, and LMR-ALRT for the 2-class model were significant ($p<.001$). This indicates that the 2-class model provided a better fit to the data compared to the 1-class model. By comparing the 2-class model to the 3- class model, the *p* values of LMR-LRT and LMR-LRT were not significant. This indicated that 3-class model did not show a significant improvement in the model fit over the 2-class model. However, the *p* value of BLRT for the 3-class model was significant *(*$p<.001$). This suggests that the 3-class model showed a significant improvement in the model fit compared with the 2-class model.

Taking into consideration other fit indices, the 3-class model had smaller AIC, BIC, and ABIC than the 2- class model, indicating that the 3-class model fit the data better than the 2-class model. By comparing the 4-class model to the 3-class model, the 4-class model had smaller AIC, BIC, and ABIC values and higher entropy. In addition, the *p* value of the BLRT in the 4-class model was significant. This indicate that the 4-class model added significant improvement in the model fit compared to the 3-class model. In comparison with the 5-class model, the 4-class model had smaller (better) BIC and ABIC than the 5-class model. The *p* value of the BLRT in the 5-class model was not significant. This indicates that the 5-class model did not show an improvement in the model fit compared to the 4-class model.

In conclusion, the 4-class model showed the lowest BIC (8369.073) and ABIC (8311.951) values. The 5-class model did not show an improvement in the model fit compared to the 4-class model which was evident by non-significant *p* value of BLRT in the 5-class model (*p*, <001). Although the 5-class model had the lowest AIC value (8294.732), the 4-class model had an AIC value that was very close to the 5-class model (8295.758). The entropy which refers to the accuracy of the classification was very good for the 4-class model (0.867) and was slightly higher (better) than the 5-class model (0.859). Thus, the 4-class model provided the best fit for the data.

Table 20: The Fit statistics for 1 to 5-class Growth Mixture Models (n=434)

Fit indices	1 class	2 classes	3 classes	4 classes	5 classes
Loglikelihood	-4239.861	-4165.015	-4151.744	-4129.879	-4126.366
Entropy	-	0.888	0.849	0.867	0.859
AIC	8497.772	8354.030	8333.489	8295.758	**8294.732**
BIC	8534.379	8402.907	8394.585	**8369.073**	8380.266
SS-ABIC	8505.818	8364.825	834.983	**8311.951**	8313.623
LMR-LRT *p value*	-	.000	**.2470**	.0001	.155
ALRT *p value*	-	.000	**.2621**	.0002	.162
BLRT *p value*	-	.000	.0000	.0000	**.333**
Final class counts based on most likely latent class membership	C1 (n=434, 100%)	C1 (n=366, 84.3%)	C1 (n=331, 76.3%)	C1 (n=327, 75.4%)	C1 (n=329, 7.6%)
		C2 (n=68, 15.7%)	C2 (n=57, 13.1%)	C2 (n=37, 8.5%)	C2 (n= 30, 6.9%)
			C3 (n=46, 10.6%)	C3 (n=31, 7.1%)	C3 (n=29, 6.7%)
				C1 (n= 39, 9.0%)	C5 (n=28, 6.5%)
					C4 (n=18, 4.2%)

Legend: AIC: Akaike's Information Criteria; BIC: Bayesian Information Criteria; LMR-LRT: LO-Mendell-Rubin Likelihood Ratio Test; LMR-ALRT: LO-Mendell-Rubin Adjusted Likelihood Ratio

Patterns of Depressive Symptom Trajectory Groups

The four-class model provided the best fit for the data and showed good interpretability. As shown in Table 21, the majority of the sample (n=327, 75.35%) were in a class characterised by minimal depressive initial symptoms ($M_{INTERCEPT}$ = 4.165, SE= 0.164) that improved over time. This class was called "no depression". A second class comprised 9.0% (n=39) of the sample and had high initial depression scores ($M_{INTERCEPT}$ = 11.458, SE= 0.545) that decreased over time. This class was called "decreasing" The third class comprised 7.1 %% (n=31) of the sample, had low initial depression scores ($M_{INTERCEPT}$ = 4.165, SE= 0.164) but increased over time. This class was called "increasing". The last class comprised 8.5% (n=37) of the sample had high initial depression scores ($M_{INTERCEPT}$ = 13.061, SE= 0.545) that remained high over 6 months. This class was called "stable high". A graph of depressive symptom trajectories groups for the best-fitting model is shown in Figure 9.

Table 21: Mean scores of growth factors of the 4-class growth mixture model

Growth factors	Class 1 (minimal and decreased)		Class 2 (decreasing)		Class 3 (increasing)		Class 4 (stable high)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Intercept	4.165**	0.164	11.458**	0.545	6.660**	0.562	13.061**	0.580
Linear	-0.225**	0.024	-1.120**	0.088	0.916**	0.084	-0.072	0.115

SE: Standard Error
**$p<0.001$*

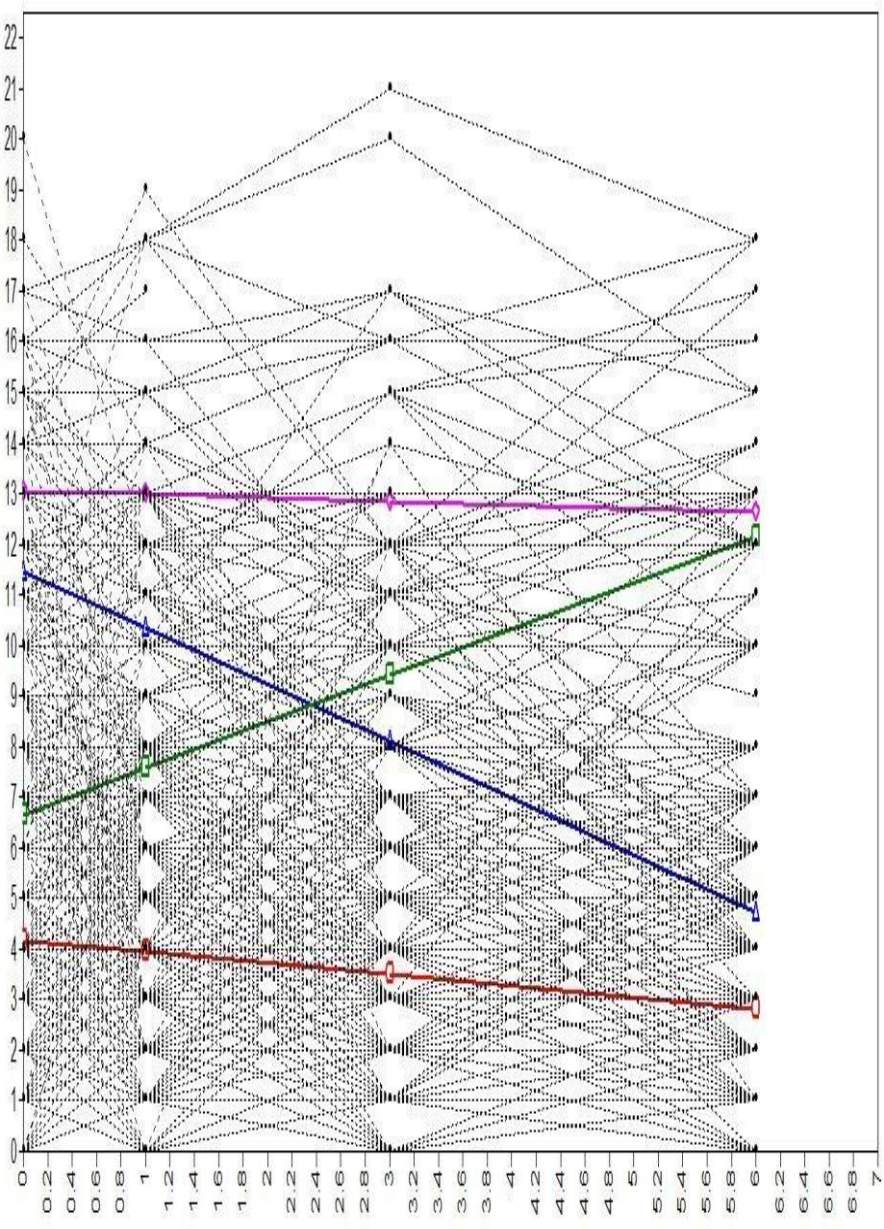


Figure 9: Depressive symptom trajectory groups for the best fitting four-class model

5.8 Predictors of trajectories of depressive symptoms after an ACS event

5.8.1 Univariate multinomial logistic regression

As shown previously, GMM identified four depressive symptom trajectory groups including none, increased, decreased and stable high (persistent) depressive symptom trajectory groups. In order to identify predictors of these groups, posterior probabilities and class assignments of GMM were exported from Mplus 8.3 into SPSS version 25. After that, a univariate multinomial logistic regression was examined to identify predictors of these distinct trajectories. The independent variables that were included in the analysis involved (a) socio-demographics and health-related behaviours; (b) clinical and cardiac disease severity factors and (c) psychosocial factors. Socio-demographics included age, gender, marital status, education level, living status, medical insurance, monthly income, employment status, and family history of depression. Health-related behaviours include obesity (BMI≥ 30) and smoking. Clinical factors included medical diagnosis, Left Ventricular Ejection Fraction (LVEF), Charlson Comorbidity Index (CCI), Global Registry of Acute Coronary Events (GRACE), In-hospital PCI, length of in-hospital stay and total cholesterol level. Psychosocial factors included Type D personality, perceived social support, history of lifetime depression, and the four coping domains (problem-focused coping, emotion-focused coping, social coping and dysfunctional coping). Univariate predictors of depressive symptom trajectory groups are presented in Table 22**.**

5.8.1.1 Socio-demographics and health-related behaviours

From the nine examined socio-demographic variables, seven had a non-significant *p* value of Likelihood Ratio Test. The non-significant *p* value of Likelihood Ratio test indicates that the model with predictor variables did not fit the data better than the model with no predictor variables (intercept-only model). Variables with a non-significant Likelihood Ratio Test included age ($X^2(3) = 1.962$, $p=.588$) employment status ($X^2(3) = .7.164$, $p=.306$), living status ($X^2(3) = 1.293$, $p=.731$), marital status ($X^2(3) = 1.43$, $p=.700$), medical insurance ($X^2(3) = 2.262$, $p=.513$), education level ($X^2(6) = 8.800$, $p=.193$), family history of depression ($X^2(3) = 259$, $p=.459$) and hospital type ($X^2(9)= 5.816$, $p= .758$).

Table 22: Univariate Predictors of Trajectories of Depressive Symptoms after an ACS event [a]

		Increased				Decreased				Persistent (stable high)			
		95% CI				95% CI				95% CI			
Variables	**LRT *p***	**OR**	**lower**	**upper**	***p***	**OR**	**Lower**	**upper**	***p***	**OR**	**lower**	**upper**	***p***
1. Socio-demographics													
Age	.588	.981	.981	.950	.266	1.004	.975	1.034	.809	.988	.958	1.018	.419
Female gender	.049	.886	.368	2.133	.787	2.113	1.064	4.194	**.033**	2.071	1.026	4.181	**.042**
Income (<500 JOD)	.003	1.477	.640	3.410	.360	1.713	.786	3.734	.176	5.824	.640	3.410	**.004**
Family history of depression (yes)	.459	0.955	.275	3.311	.942	.482	.111	2.090	.329	1.724	.670	4.438	.259
Employment status [b]	.306												
- Employed		1.229	.504	2.994	.651	.929	.415	2.080	.858	0.965	.413	2.253	.935
- Retired		2.066	.837	5.102	.116	1.705	.764	3.803	.193	2.110	.940	4.737	.070
Education level [c]	.193												
- Primary or non-educated		1.125	.376	3.368	.833	1.269	.541	2.977	.584	3.000	1.081	8.328	.035
- Secondary level		1.884	.784	4.525	.157	1.023	.467	2.238	.955	2.807	1.084	7.265	.033

		Increased				Decreased				Persistent (stable high)			
			95% CI				95% CI				95% CI		
Variables	**LRT *p***	**OR**	**lower**	**upper**	***p***	**OR**	**Lower**	**upper**	***p***	**OR**	**lower**	**upper**	***p***
Living status (alone)	.731	2.186	.457	10.457	.327	.865	.104	6.697	.865	1.811	.381	8.601	.455
Marital status (unmarried)	.700	1.773	.637	4.937	.237	1.054	.352	3.155	.926	1.440	.524	3.957	.469
Medical Insurance (uninsured)	.513	1.539	.732	3.235	.256	.734	.352	1.529	.409	1.137	.564	2.295	0.72
Hospital Type [d]	.758												
- Hospital A		1.443	.532	3.917	.471	2.041	.786	5.298	.143	1.396	.548	3.917	.485
- Hospital B		.860	.321	2.301	.764	1.891	.805	4.444	.144	.831	.331	2.301	.331
- Hospital C		1.385	.486	3.948	.542	1.524	.526	4.415	.438	1.563	.611	3.948	.611
2. Health-related behaviours													
BMI (≥ 30)	.000	2.803	1.308	6.006	**.008**	2.173	1.071	4.408	**.031**	3.299	1.638	6.643	**.001**

		Increased				Decreased				Persistent (stable high)			
			95% CI				95% CI				95% CI		
Variables	**LRT *p***	**OR**	**lower**	**upper**	***p***	**OR**	**Lower**	**upper**	***p***	**OR**	**lower**	**upper**	***p***
Being a current smoker	.006	4.147	1.738	9.894	**.001**	1.273	.655	2.475	.476	1.277	.646	2.521	.482
Clinical factors													
Medical diagnosis	.790												
STEMI		1.434	.515	3.990	.490	.782	.328	1.866	.580	.574	.216	1.521	.264
NSTEM		1.136	.415	3.107	.804	.762	.337	1.725	.515	.996	.441	2.249	.992
LVEF (<40)	.031	2.255	1.074	4.735	**.032**	1.184	.591	2.371	.633	2.232	1.125	4.428	**.022**
CCI	.021	1.308	1.007	1.700	**.045**	1.117	.855	1.460	.416	1.396	1.105	1.764	**.005**
In-hospital PCI (Yes)	.511	1.975	.736	5.300	.177	1.266	.578	2.771	.555	1.025	.477	2.204	.949
GRACE score	.383	1.004	.993	1.015	.492	.995	.985	1.006	.407	1.007	.997	1.017	.192

		Increased				Decreased				Persistent (stable high)			
			95% CI				95% CI				95% CI		
Variables	**LRT *p***	**OR**	**lower**	**upper**	***p***	**OR**	**Lower**	**upper**	***p***	**OR**	**lower**	**upper**	***p***
Length of in-hospital stay	.000	1.304	1.088	1563	**.004**	1.269	1.067	1.510	**.007**	1.469	1.259	1.714	**<.001**
Cholesterol level	.965	.914	.552	1.513	.726	.922	.605	1.406	.707	1.025	.663	1.582	.913
Imputed Cholesterol (pooled)	.350-.965	0.990	.595	1.647	.968	.930	.598	1.448	.747	1.060	.644	1.745	.812
3. Psychosocial factors													
Type D personality (Yes)	.000	2.406	1.113	5.198	**.026**	1.313	.610	2.827	.486	4.999	2.475	10.098	**<.001**
Perceived social support	.000	.983	.953	1.013	.261	.975	.948	1.002	.067	.901	.873	.929	**<.001**
Dysfunctional coping	.000	1.087	1.033	1.144	.000	1.055	1.006	1.107	.028	1.157	1.103	1.214	**<.001**
Problem-focused coping	.000	.830	.734	.938	**.003**	.915	.828	1.012	.084	.801	.711	.902	**<.001**

		Increased			Decreased				Persistent (stable high)			
		95% CI			95% CI				95% CI			
Variables	**LRT *p***	**OR**	**lower**	**upper**	***p***	**OR**	**Lower**	**upper**	***p***	**OR**	**lower**	**upper**	***p***
Social coping	.102	.991	.871	1.127	.891	.895	.788	1.015	.084	.885	.776	1.008	.066
Emotion-focused coping	.097	.968	.890	1.053	.449	.942	.871	1.018	.131	.919	.847	.997	.430
History of lifetime depression	.002	1.341	.488	3.689	.569	2.093	.928	4.721	.075	4.246	2.025	8.905	**<.001**

Legend: LRT, Likelihood ratio test; CI, Confidence interval; PCI, percutaneous coronary intervention; OR, odd ratio; STEMI, ST-Segment Elevation Myocardial Infarction; NSTEMI, Non-ST Segment Elevation Myocardial Infarction; CCI, Charlson Comorbidity Index; GRACE, Global Registry of Acute Coronary Event; LVEF, Left Ventricular Ejection Fraction.

a. The reference category: No depression
b. The reference category: Unemployed
c. The reference category: Higher education
d. The reference category: Hospital D
e. The reference category: Unstable angina

Two of the socio-demographic variables had a significant *p* value of the Likelihood Ratio Test. These variables included gender ($X^2(3) = 7.86$, $p=.049$) and income ($X^2(3) = 14.21$, $p=.003$). Regarding health-related behaviours, smoking ($X^2(3) = 12.50$, $p=.006$) and obesity ($X^2(3) = 14.21$, $p=.003$) also showed significant *p* values of the Likelihood Ratio Test indicating significant improvement in the fit of the model with predictor variables relative to the intercept-only model. By examining parameter estimates, the univariate multinomial logistic regression analysis showed that four of the socio-demographic and health behaviours were significant predictors of the depressive symptom trajectory groups namely: gender, income, smoking and obesity. One variable 'education level' did not fit the data better than the model with no predictors, based on a non-significant likelihood ratio test ($p=.193$). However, examining parameter estimates indicated that primary level of education (or no-education) (OR = 3.00, 95%CI, 1.081-8.328) and secondary level of education (OR=2.807, 95%CI, 1.084-7.265) were significant univariate predictors of persistent depression relative to no depression. No differences were found related to other portions of the model.

Female gender was a significant predictor of both persistent and decreasing depression groups. However, it was not significant for the increasing depression group. Compared to males, females were more likely to have persistent (OR= 2.071, 95%CI, 1.026-4.181) and decreasing (OR=2.113, 95%CI, 1.064-4.194) depression over no depression. There were no statistically significant differences between males and females regarding increasing depression relative to no-depression. Monthly income significantly predicted persistent depression after ACS. Further, patients with a low monthly income (<500 JOD) were more likely than those with higher monthly income (≥500 JOD) to have persistent depression relative to no depression (OR= 5.824, 95%CI, .640-3.410). However, there were no significant differences between patients with income <500 JOD and those with income ≥500 JOD regarding increasing or decreasing depression relative to no-depression.

Regarding health-related behaviours, obesity (BMI ≥30) was found to be a significant predictor for decreasing (OR= 2.173, 95%CI, 1.071-4.408), increasing

(OR= 2.803, 95%CI, 1.308-6.006), and persistent (OR= 3.299, 95%CI, 1.638-6.643) depression groups relative to the no depression group. When examining smoking status (current smokers, former smokers, non-smokers), a warning message was received regarding unexpected singularities in Hessian matrix. This indicated that some categories in the smoking status variable needed to be merged or excluded. By combining the current smoker and former smoker categories together relative to the non-smokers category, no warning message was received. However, the *p* value of the likelihood ratio test for the model was non-significant ($X^2(3) = 3.024$, $p=.338$). On the other hand, when former smoker and non-smoker categories were combined into one category, the *p* value of the Likelihood Ratio Test became significant ($X^2(3) = 12.521$, $p=.006$). The parameter estimates table showed that being a current smoker was a significant predictor of increased depression (OR= 4147, 95%CI, 1,738 -9.894) with reference to no depression. However, there were no significant differences with respect to persistent or decreasing depression relative to no depression.

5.8.1.2 Clinical and cardiac severity factors

Four factors were non-significant univariate predictors of depressive symptom trajectory groups including GRACE Score ($X^2(3) = 3.054$, $p=.383$), cholesterol level, ($X^2(3) = .740$, $p=.965$), and in-hospital PCI ($X^2(3) = 2.308$, $p=.511$). On the other hand, three variables were found to be significant univariate predictors of depressive symptom trajectory groups: LVEF, CCI and length of in-hospital stay. Compared with LVEF≥ 40, LVEF <40 was a significant predictor for both increasing (OR=2.255, 95%CI 1.07-4.735) and persistent (OR=2.232, 95%CI 11.25-4.428) depression after ACS, relative to no depression. However, there was no statistically significant difference between those with LVEF≥ 40, and LVEF <40 with regard to decreasing depression relative to no depression. Similarly, CCI was a significant predictor of increasing and persistent depression relative to no-depression. For each one unit increase in CCI, the likelihood of having increasing and persistent depression increased by 1.308 and 1.396, respectively. However, CCI scores did not significantly predict decreased depression, relative to no depression. The length of hospital stay was a

significant predictor of decreasing (OR= 1.269, 95%CI, 1.067-1.510), increasing (OR= 1.304, 95%CI, 1.088-1.563), and persistent (OR= 1.469, 95%CI, 1.259-1.714) depression groups, relative to no depression group.

5.8.1.3 Psychosocial factors

As previously mentioned, psychosocial factors in this study included Type D personality, perceived social support, history of depression, and coping factors. From all included psychosocial variables, emotion-focused coping ($X^2(3)$ = 6.312, p=.097) and social coping ($X^2(3)$ = 6.2.9, p=.102) had a non-significant *p* value of the Likelihood Ratio Test. However, other psychosocial variables including Type D personality, perceived social support, history of depression, dysfunctional coping, and problem-focused coping were found to be significant univariate predictors for depressive symptom trajectory groups. Type D personality significantly predicted increasing (OR=2.406, 95%CI 1.113-5.198) and persistent (OR=4.999, 95%CI 2.475-10.098) depression after ACS. However, no statistically significant differences were found between Type D versus non-Type D personality with regard to decreasing depression, relative to no depression. Type D personality was associated with increased the odds of being in the increasing and persistent depression groups, relative to no depression group, by 2.406 and 4.999, respectively.

Likewise, history of lifetime depression significantly predicted persistent depression after ACS (OR=4.246, 95%CI 2.025-8.905). Compared to those with no history of depression, history of lifetime depression was significantly associated with increased odds of being in the persistent depression group, relative to no depression by 4.246. However, there were no statistically significant differences in history of lifetime depression with regard to decreasing or increasing depression, relative no depression. Regarding coping factors, dysfunctional coping was a significant positive predictor of decreasing (OR=1.055, 95%CI, 1.055-1.006), increasing (OR=1.087, 95%CI, 1.033-1.144) and persistent depression (OR=1.157, 1.103-1.214), relative to no depression. The odds ratio, which was greater than one, indicates that patients who

identified as being higher on dysfunctional coping, tended to have greater likelihood of being the in decreasing, increasing and persistent depression group, compared to no depression.

Problem-focused coping was a predictor of increasing (OR=.830, 95%CI, .734-.938) and persistent (OR=.801, 95%CI, .711-.902) depression, compared to no depression. For every one unit increase in problem-focused coping, the odds of being in the increasing and persistent depression group decreased by a factor of .830 and .938, respectively. This indicates that patients who identified as being higher on problem-focused coping, tended to have lower likelihood of being in the increasing and persistent depression group, compared to no depression. Perceived social support significantly predicted persistent depression, relative to no depression (OR= .901, 95% CI .873-.929). The odds ratio of .901 indicates that for every one unit increase in perceived social support, the odds of being in the persistent depression group decreased by a factor of .901. In other words, those who scored higher on perceived social support were less likely to have persistent depression, relative to no depression.

5.8.2 Univariate predictors of increased and persistent depression, relative to decreased depression

Increased and persistent depression, relative to decreased depression are presented in Table 23. There were no statistically significant differences in all study variables regarding increased versus decreased depression, except for smoking status. Being a current smoker significantly predicted increased depression relative to decreased depression (OR=3.257, 95%CI, 1.139-9.310). Regarding persistent versus decreased depression, only Type D personality (OR=3.806, 95%CI, 1.444-10.034), dysfunctional coping (OR = 1.096, 95%CI, 1.03-1.166) and perceived social support (OR= .924, 95%CI, .890-.960) were found to be significant univariate predictors. Being with Type D personality significantly predicted persistent depression, relative to decreased depression. Patients who were identified as being higher on perceived social support,

tended to have lower likelihood of having persistent depression compared to decreased depression. Further, those who scored higher on dysfunctional coping were more likely to have persistent depression relative to decreased depression.

Table 23: Univariate Predictors of Trajectories of Depressive Symptoms after an ACS event

Variables		Increased versus decrease 95% CI				Persistent versus decrease 95% CI			
	LRT *p*	**OR**	**lower**	**Upper**	***P***	**OR**	**lower**	**upper**	***p***
1. Socio-demographics									
Age	.588	.978	.938	1.020	.298	.984	.945	1.024	.430
Being female	.49	.419	.146	1.206	.966	.980	.392	2.448	.966
Income (<500 JOD)	.003	.863	.288	2.582	.791	3.400	.842	13.730	.086
Family history of depression (yes)	.459	1.982	.310	12.673	.470	3.581	.674	19.020	.134
Employment status [a]	.306								
- Employed		1.322	.419	4.176	.634	1.039	.340	3.175	.947
- Retired		1.212	.389	3.780	.740	1.238	.428	3.585	.694
Education level [b]	.185								
- Primary or non-educated		.886	.235	3.347	.859	2.364	.666	8.391	.183
- Secondary		1.842	.600	5.653	.286	2.744	.843	8.938	.094
Living status (alone)	.496	.208	.020	2.210	.193	.246	.024	2.555	.240
Marital status (unmarried)	.329	1.497	.705	3.179	.294	.839	.349	2.012	.693
Medical Insurance (uninsured)	0.513	2.096	.776	5.661	.144	1.549	.591	4.060	.373

Variables		Increased versus decrease				Persistent versus decrease			
			95% CI				95% CI		
	LRT *p*	OR	lower	Upper	*P*	OR	lower	upper	*p*
2. Health-related behaviours									
BMI (≥ 30)	.000	1.290	.490	3.395	.606	1.518	.605	3.808	.347
Hospital Type	.758								
- Hospital A		.707	.191	2.613	.603	.684	.194	2.410	.554
- Hospital B		.455	.131	1.583	.215	.440	.133	1.456	.179
- Hospital C		.999	.220	3.758	.895	1.026	.268	3.923	.970
3. Clinical factors									
Medical diagnosis [d]	.790								
STEMI		1.833	.511	6.571	.352	.733	.213	2.530	.624
NSTEM		1.490	.433	5.121	.527	1.306	.442	3.863	.629
LVEF (<40)	.031	1.905	.728	4.981	.189	1.885	.752	4.523	.176
CCI	.021	1.171	.827	1.657	.374	1249	.902	1.731	.181
In-hospital PCI (Yes)	.511	1.560	.464	5.246	.472	.810	.286	2.291	.691
GRACE score	.383	1.009	.994	1.024	.262	1.011	.997	1.026	.113
Length of in-hospital stay	.000	1.027	.832	1.268	.805	1.157	.965	1.388	.116
Cholesterol level	0.965	.991	.529	1.855	.977	1.111	.626	1.970	.719

Variables		Increased versus decrease				Persistent versus decrease			
			95% CI				95% CI		
	LRT *p*	OR	lower	Upper	*P*	OR	lower	upper	*p*
4. **Psychosocial factors**									
Type D personality (Yes)	**.000**	1.832	.661	5.076	.245	3.806	1.444	10.034	**.007**
Perceived social support	**.000**	1.008	.970	1.048	.685	.924	.890	.960	**.000**
Dysfunctional coping	**.000**	1.030	.966	1.099	.366	1.096	1.031	1.166	**.003**
Problem-focused coping		.906	.779	1.055	.204	.875	.754	1.014	.076
Social coping	.102	1.118	.932	1.316	.244	.989	.832	1.175	.900
Emotion-focused coping	.097	1.028	.921	1.147	.653	0.976	.877	1.086	.653
History of lifetime depression (yes)		0.64	.191	2.156	.472	2.029	.748	5.505	.165

Legend: LRT, Likelihood ratio test; CI, Confidence interval; PCI, percutaneous coronary intervention; OR, odd ratio; STEMI, ST-Segment Elevation Myocardial Infarction; NSTEMI, Non-ST Segment Elevation Myocardial Infarction; CCI, Charlson Comorbidity Index; GRACE, Global Registry of Acute Coronary Event; LVEF, Left Ventricular Ejection Fraction.

a. The reference category is unemployed.
b. The reference category is higher education
c. The reference category is hospital D
d. The reference category is unstable angina

5.8.3 Multivariate Multinomial Logistic Regression

Univariate analysis identified several predictors of depressive symptom trajectory groups. For socio-demographics and health behaviours, gender, income, BMI and smoking significantly predicted depressive symptom trajectory groups. Regarding clinical variables, LVEF, CCI and length of in-hospital stay were significantly associated with trajectory groups. Lastly, Type D personality, history of lifetime depression, perceived social support, dysfunctional coping and problem-focused coping were found to be significant psychosocial predictors of trajectory groups. Using a similar methodology as to that used by Martens and colleagues (2008), variables that were significantly associated with at least one depressive symptom trajectory group were included in the multivariate models. The results compared each depressive symptom trajectory group (i.e., increasing, decreasing, and persistent depression) against no depression as a reference category.

5.8.3.1 Socio-demographics and health-related behaviours model

As shown in Table 24, four variables were included in this multivariate multinomial logistic regression model namely: gender, income, smoking status and BMI. The *p* value of the likelihood ratio test (x^2 (12) = 52.164, *p*<. 001) was significant. This indicates that the final model is significantly better than models with no predictors. The model was a good fit to the data based on the non-significant *p* values of Pearson (*p*=.556) and Deviance (*p*=.499) statistics. The model explained from 11.3 % (Cox-Snell's R Squared) to 14% (Negelkerke R squared) of the total variance in symptoms trajectory groups.

Table 24: Multinomial logistic regression including socio-demographics and health behaviours.

Depression Trajectory Groups [a]	Variables						95% CI for OR	
		B	SE	Wald	Sig.	OR	Lower Bound	Upper Bound
Persistent	Intercept	-4.476	.672	44.325	.000			
	Female gender	.694	.397	3.051	.081	2.001	.919	4.358
	Current smoker	.546	.384	2.025	.155	1.726	.814	3.660
	Monthly income (<500 JOD)	1.762	.619	8.110	**.004**	5.824	1.732	19.584
	BMI≥30	1.162	.369	9.913	**.002**	3.195	1.550	6.584
Increased	Intercept	-4.025	.573	49.358	.000			
	Female gender	.245	.489	.251	.616	1.278	.490	3.330
	Current smoker	1.565	.473	10.958	**.001**	4.781	1.893	12.075
	Monthly income (<500 JOD)	.426	.438	.945	.331	1.530	.649	3.610
	BMI≥30	1.107	.401	7.619	**.006**	3.025	1.378	6.640
Decreased	Intercept	-3.224	.460	49.183	.000			

Female gender	.812	.381	4.536	**.033**	2.252	1.067	4.754
Current smoker	.543	.368	2.174	.140	1.722	.836	3.544
Monthly income (<500 JOD)	.520	.403	1.665	.197	1.681	.764	3.701
BMI≥30	.710	.369	3.715	.054	2.035	.988	4.190

Legend: OR: Odd Ratio; SE: Standard Error; CI: Confidence Interval; BMI: Body Mass Index.

No depression as reference category

The model indicates that obesity (BMI ≥ 30**)** was a significant predictor of increasing (OR=3.025, 95%CI, 1.378-6.640) and persistent (OR=3.195, 95%, 1.550-6.584) depression after ACS, relative to no depression. However, no statistically significant differences were found in BMI between the decreased depression and no depression groups. In other words, patients with BMI≥ 30 were 3.025 times more likely to be in the increased depression group relative to the no depression group and 3.195 times more likely to be in the persistent depression group relative to the no depression group.

Current smoking was a significant predictor of increased depression relative to no depression (OR= 4.781, 95%CI, 1.893-12.075). Compared to non-smokers and former smokers, current smokers were 4.781 times more likely to have increased depression relative to no depression. However, there were no statistically significant differences in smoking status between persistent depression and no depression, and between decreased depression and no depression.

Monthly income (<500 JOD) was a significant predictor of persistent depression relative to no depression. Patients with low monthly income (<500 JOD) were 5.824 times more likely to be in the persistent group relative to no depression group. Female gender was a significant predictor of decreased depression relative to no depression. Compared to males, females were 2.252 times more likely to have decreased depression relative to no depression. No statistically significant differences were found between males and females with regards to persistent and increased depression, relative to no depression.

Given that parameter estimates for the education level variable in the univariate analysis indicated some categories with significant *p* values, level of education was examined in another multivariate model to check if it significantly predicted depressive symptom trajectory groups. No statistically significant differences were found in the level of education across different depressive symptom trajectory groups.

5.8.3.2 Clinical and cardiac disease severity factors model

As shown in Table 25, three variables included in this multivariate multinomial logistic regression model were: CCI, LVEF, and length of in-hospital stay. The *p* value of the likelihood ratio test (x^2 (9) = 34.009, p<. 001) was significant. This indicates that the final model was significantly better than the model with no predictors. The model had a good fit to the data based on the non-significant *p* value of Deviance (*p*=.391) statistics but not based on Pearson statistics (*p*=.008). This conflict between Deviance and Pearson statistics can be related to overdispersion (Field, 2013). Thus, overdispersion parameters were calculated for both statistics by dividing chi-square value by its degree of freedom. For Pearson statistics (x2/df= 242.319/192= 1.26) and for Deviance (x2/df= 196.812/192= 1.03), both statistics were around the ideal value of 1 and less than 2. The deviation in Pearson statistics was not large enough to raise concern about overdispersion (Field, 2013, p.309). The model explained from 7.5 % (Cox-Snell's R Squared) to 9.3% (Negelkerke R squared) of the total variance in symptom trajectory groups. Only length of in-hospital stay was a significant predictor of the depressive symptoms' trajectory groups, however, CCI and LVEF were no longer statistically significant. Length of in-hospital stay was a significant predictor of increased (OR=1.234, 95%CI, 1.017-1.500), decreased (OR=1.051, 95%CI, 1.051-1.525) and persistent depression (OR=1.405, 95%CI, 1.191-1.658) compared to no depression. Patients who stayed longer in-hospital were more likely to be in the increased, decreased, and persistent depression groups, compared no depression group.

5.8.3.3 Psychosocial factors model

As shown in table 26, five variables included in this multivariate multinomial logistic regression model were: Type D personality, perceived social support, history of lifetime depression, dysfunctional coping and problem-focused coping. The *p* value of the likelihood ratio test (x^2 (15) = 107.011, p<. 001) was significant. This indicates that the final model is significantly better than the model with no predictors. The model had a good fit to the data based on the non-significant *p* value of Pearson (*p*=.556) and Deviance (*p*=1.00) statistics. The

model explained from 21.9 % (Cox-Snell's R Squared) to 27% (Negelkerke R squared) of the total variance in depressive symptom trajectory groups.

The model showed that Type D personality (OR=3.376, 95%CI, 1.486-7.673), history of lifetime depression (OR= 3.122, 95%CI, 1.268-7.689) perceived social support (OR=.912, 95%CI, .880-.946) and dysfunctional coping (OR=1.095, 95%CI, 1.036-1.157) were significant predictors of persistent depression, relative to no depression. However, problem-focused coping did not significantly predict persistent depression relative to no depression when it was included with other psychosocial factors. Patients with Type D personality were 3.376 times more likely to be in the persistent depression group compared to no depression. Likewise, patients with a history of lifetime depression were 3.122 times more likely than those with no history of depression to be in the persistent depression group compared to the no depression group. The odd ratio of .912 in perceived social support indicates that for each unit increase in perceived social support, the odds of having persistent depression decreased by 0.912. In other words, patients who scored higher in perceived social support were less likely to have persistent depression, relative to no depression.

Regarding dysfunctional coping, each one unit increase in dysfunctional coping was associated with increased odds of being in the persistent depression group by a factor of 1.095. In other words, patients who scored higher in dysfunctional coping were more likely to have persistent depression, relative to no depression. Only dysfunctional coping and problem-focused coping were significant predictors of increased depression, relative to no depression. One unit increase in dysfunctional coping was associated with increased odds of being in the increasing depression group by a factor of 1.061. However, one unit increase in problem-focused coping was associated with decreased odds of being in the increased depression group by a factor of .870. The model showed that none of the psychosocial factors were significant predictors of decreased depression, compared to no depression.

Table 25: Multinomial logistic regression including clinical and cardiac disease severity factors

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
Persistent	Intercept	-4.079	.457	79.577	.000			
	Length of in-hospital stay	.340	.084	16.233	**.000**	1.405	1.191	1.658
	Left ventricular ejection fraction	.430	.386	1.235	.266	1.537	.720	3.277
	Charlson Comorbidity Index	.097	.144	.453	.501	1.102	.831	1.462
Increased	Intercept	-3.693	.496	55.515	.000			
	Length of in-hospital stay	.211	.099	4.530	**.033**	1.235	1.017	1.500
	Left ventricular ejection fraction	.600	.405	2.192	.139	1.822	.823	4.029
	Charlson Comorbidity Index	.097	.151	.409	.523	1.101	.819	1.481
Decreased	Intercept	-3.083	.446	47.776	.000			
	Length of in-hospital stay	.236	.095	6.149	**.013**	1.266	1.051	1.525
	Left ventricular ejection fraction	.029	.378	.006	.939	1.029	.491	2.159
	Charlson Comorbidity Index	-.011	.156	.005	.944	.989	.728	1.344

a. No depression as reference category

Table 26: Multinomial logistic regression including psychosocial factors

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
Persistent	Intercept	.418	1.311	.101	.750			
	Type D Personality	1.217	.419	8.442	**.004**	3.376	1.486	7.673
	History of lifetime depression	1.139	.460	6.130	**.013**	3.122	1.268	7.689
	Perceived social support	-.092	.018	25.095	**.000**	.912	.880	.946
	Dysfunctional coping	.091	.028	10.423	**.001**	1.095	1.036	1.157
	Problem-focused coping	-.056	.072	.605	.437	.945	.821	1.089
Increased	Intercept	-2.708	1.368	3.918	.048			
	Type D Personality	.644	.408	2.487	.115	1.904	.855	4.237
	History of lifetime depression	.146	.532	.075	.784	1.157	.408	3.279
	Perceived social support	.002	.017	.009	.923	1.002	.969	1.035
	Dysfunctional coping	.060	.028	4.538	**.033**	1.061	1.005	1.121
	Problem-focused coping	-.140	.066	4.482	**.034**	.870	.764	.990

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
Decreased	Intercept	-1.563	1.178	1.759	.185			
	Type D Personality	.046	.402	.013	.909	1.047	.476	2.305
	History of lifetime Depression	.680	.423	2.583	.108	1.974	.861	4.523
	Perceived social support	-.016	.015	1.262	.261	.984	.956	1.012
	Dysfunctional coping	.038	.026	2.164	.141	1.039	.987	1.094
	Problem-focused coping	-.052	.054	.931	.335	.949	.854	1.055

a. No depression as reference category

5.8.4 Final model of multivariate multinomial logistic regression including socio-demographics, health-related behaviours, clinical and psychosocial factors.

As shown in Table 27, the ten variables that were included in this multivariate multinomial logistic regression model were: gender, income, BMI, smoking status, length of in-hospital stay, Type D personality, perceived social support, history of lifetime depression, dysfunctional coping and problem-focused coping. The *p* value of the likelihood ratio test (x^2 (30) = 144.087, p<. 001) was significant. This indicates that the final model is significantly better than the model with no predictors. This model showed a good fit to the data based on the non-significant *p* value of Pearson (*p*=.133) and Deviance (*p*=1.00) statistics. The model explained from 28.3 % (Cox-Snell's R Squared) to 34.9% (Negelkerke R squared) of the total variance in depressive symptom trajectory groups.

The model showed that low (<500 JOD) monthly income (OR= 6.618, 95%CI, 1.630-26.876), history of depression (OR = 3.547, 95% CI, 1.379-9.123), Type D personality (OR= 2.544, 95%CI, 1.016-6.370), dysfunctional coping (OR =1.073, 95% CI, 1.011-1.138), and perceived social support (OR =.910, 95% CI, .875-.946) were significant predictors of persistent depression compared to no depression. However, other variables including BMI, smoking status, and length of in-hospital stay did not significantly predict persistent depression relative to no depression when included together with other variables. The model indicates that only current smoking status (OR= 4.635, 95%CI, 1.765-12.174) and problem-focused coping (OR =.874, 95%CI, .767-.996) were significant predictors of increased depression compared to no depression. Other variables included in the model were not significant. Further, the model showed there were no statistically significant predictors of decreasing depression, compared to no depression.

Table 27: Final model of multivariate multinomial logistic regression of depressive symptom trajectory groups

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
Persistent	Intercept	-1.778	1.555	1.308	.253			
	Gender	.575	.482	1.427	.232	1.778	.692	4.569
	Monthly income (<500)	1.890	.715	6.985	**.008**	6.618	1.630	26.876
	Body Mass Index (≥30)	.066	.470	.020	.889	1.068	.425	2.686
	Smoking (current)	.425	.467	.829	.363	1.530	.613	3.821
	Length of in-hospital stay	.179	.100	3.249	.071	1.197	.984	1.455
	Perceived social support	-.093	.020	22.365	**.000**	.911	.876	.947
	Dysfunctional coping	.070	.030	5.446	**.020**	1.073	1.011	1.138
	Problem-focused coping	-.057	.074	.586	.444	.945	.816	1.093

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
	History of lifetime Depression (Yes)	1.266	.482	6.899	**.009**	3.547	1.379	9.123
	Type D personality (Yes)	.934	.468	3.978	**.046**	2.544	1.016	6.370
Increased	Intercept	-4.628	1.634	8.027	.005			
	Gender	.124	.507	.060	.807	1.132	.419	3.057
	Monthly income (<500)	.324	.455	.508	.476	1.383	.567	3.373
	Body Mass Index (≥30)	.737	.428	2.972	.085	2.090	.904	4.831
	Smoking (current)	1.534	.493	9.691	**.002**	4.635	1.765	12.174
	Length of in-hospital stay	.158	.101	2.442	.118	1.171	.961	1.429

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
	Perceived social support	.005	.018	.087	.768	1.005	.971	1.040
	Dysfunctional coping	.047	.030	2.526	.112	1.048	.989	1.111
	Problem-focused coping	-.135	.066	4.110	**.043**	.874	.767	.996
	History of lifetime Depression (Yes)	-.099	.557	.032	.858	.905	.304	2.697
	Type D personality (Yes)	.131	.466	.079	.779	1.140	.457	2.839
Decreased	Intercept	-2.971	1.350	4.844	.028			
	Gender	.740	.395	3.519	.061	2.096	.967	4.542
	Monthly income (<500)	.470	.409	1.318	.251	1.600	.717	3.569
	Body Mass Index (≥30)	.501	.390	1.652	.199	1.651	.769	3.546
	Smoking (current)	.509	.384	1.757	.185	1.664	.784	3.531

Depression Trajectory Groups [a]	Variables	B	SE	Wald	Sig.	OR	95% Confidence Interval for OR	
							Lower Bound	Upper Bound
	Length of in-hospital stay	.173	.097	3.181	.075	1.188	.983	1.436
	Perceived social support	-.015	.015	.938	.333	.986	.957	1.015
	Dysfunctional coping	.021	.027	.587	.444	1.021	.968	1.076
	Problem-focused coping	-.044	.055	.642	.423	.957	.860	1.066
	History of lifetime Depression (Yes)	.617	.432	2.040	.153	1.853	.795	4.322
	Type D personality (Yes)	-.374	.445	.708	.400	.688	.288	1.644

Legend: B: Unstandardised regression coefficient; OR: odd ratio; SE: Standard Error

a. No depression as reference category

5.9 Chapter Summary

The chapter presented the results of a prospective cohort study to identify the heterogenous trajectories of depressive symptoms and their predictors in Jordanian patients with ACS. The findings showed that almost one quarter of patients (n=102, 23.5%) reported increased depressive symptoms during hospitalisation with ACS. The cumulative incidence of depressive symptoms was 8.3% over 6 months of ACS. The prevalence of depressive symptoms showed an improvement over 6 months based on estimating the statistical average for the entire sample at each time point (1, 3 and 6 months after an ACS event). In contrast, the findings based on GMM indicated that the changes in depressive symptoms cannot be simply represented by a single trajectory of depressive symptoms. Instead, four distinct trajectories of depressive symptoms were identified: minimal and decreasing (n=327, 75.4%), decreasing (n=39, 9.0%), increasing (n=31, 7.1%) and stable-high (n=37, 8.5%). Several baseline characteristics have been explored to predict trajectories of depressive symptoms and this can be useful in understanding the characteristics of patients who follow distinct trajectories of depressive symptoms over time.

The univariate analysis found that longer in-hospital stay, being obese (BMI>=30), and using more dysfunctional coping significantly predicted increased, decreased, and persistent depression, relative to no depression. Some variables predicted increased and persistent depression relative to no depression including Type D personality, using less problem-focused coping, having higher CCI scores and having lower LVEF (<40). Only three variables significantly predicted persistent depression relative to no depression. These included having lower monthly income (<500 JOD), lower perceived social support and a previous history of lifetime depression. One variable 'current smoking status' significantly predicted only increasing depression compared to no depression. Finally, female gender significantly predicted decreasing and persistent depression relative to no depression.

Following this, a multivariate multinomial logistic regression was examined for each group of variables including (a) socio-demographics and health behaviours, (b) clinical and cardiac disease severity, and (c) psychosocial factors. The findings indicate that psychosocial factors explained higher variance in depressive symptom trajectory groups compared to health-related behaviours, socio-demographics, and clinical factors. In general, most variables that were significant in the univariate analysis remained significantly associated with at least one depressive symptom trajectory groups in multivariate analysis. However, both CCI and LVEF became non-significant predictors of depressive symptom trajectory groups in the clinical and cardiac disease severity model. The final model indicated that having low monthly income (<500 JOD), having a history of depression, being with Type D personality, using more dysfunctional coping and having less perceived social support were significant predictors of persistent depression compared to no depression. The model also indicated that current smoking status and using less problem-focused coping were significant predictors of increased depression, compared to no depression. The final model showed that none of the included variables significantly predicted decreased depression relative to no depression.

The next chapter discusses the results of the study in the context of the international literature. It discusses and conceptualises the study's results in relation to the prevalence and incidence of depressive symptoms in patients with ACS, as well as trajectories of depressive symptoms and their predictors in this cohort. The strengths and limitations of the study are also considered.

Chapter 6: Discussion

Introduction

This study is the first in Jordan, or neighbouring countries, to address trajectories of depressive symptoms and their predictors after ACS. This is also the first study in Jordan to examine the incidence of depressive symptoms following ACS. The systematic search of the literature carried out for this study found that most studies that addressed trajectories of depressive symptoms in this cohort were carried out in western countries and few employed Growth Mixture Modelling (GMM). GMM was used in this study to identify distinct depressive symptom trajectory groups and multinomial logistic regression was then used to examine predictors of these groups.

In this chapter, the baseline and follow-up results of the study are discussed in the context of relevant literature. The discussion is presented in line with the study objectives. The implications and recommendations for research, education and clinical practice are outlined. Further, the limitations of the study are discussed, and conclusions are drawn.

6.1 Prevalence of in-hospital depression among patients who have experienced an ACS event in Jordan

This study found that, using the PHQ-9 with a cut-off score of ≥ 10, depressive symptoms were prevalent in almost a quarter (23.5%) of patients hospitalised with ACS in Jordan. This result is at variance with most of the international literature which reports prevalence of depressive symptoms ranging from 10.5% to 78.7% (Allabadi *et al*., 2019; Mujtaba *et al*., 2020; Murphy *et al*., 2020). Specifically, the prevalence rate of depressive symptoms was lower than that reported in the United States (31%) (Sanner *et al*., 2013), Malaysia (46.3%) (George *et al*., 2021) and Pakistan (69%) (Hadi *et al*., 2020) and higher than reported in another study in Pakistan (10.5%) (Mujtaba *et al*., 2020), and Italy (21.4%) (Ossola *et al*., 2020).

From the 22 studies included in the literature review four studies also examined prevalence of depressive symptoms using the PHQ (Table 28); three used the PHQ-9 while one used the PHQ-8. All studies used a similar cut-off score (≥ 10) to indicate elevation in depressive symptoms. In the current study, prevalence of depressive symptoms was significantly higher than the 14.4% reported by the Irish study (Trick *et al*., 2019), but lower than the 46.3% reported by the Malaysian study (Lenog *et al*., 2021). The variations among these studies could be attributed to difference in samples and sample characteristics. Further, both the Malaysian (n=95) and Irish (n=113) studies had smaller sample sizes than the current study (n=434). Another study, carried out on 188 patients with ACS in Pakistan reported a prevalence rate of 19.4%, which is close to but slightly lower than the current study findings (Alvi and Ahmad, 2016b). Finally, a large multicentre study (n=3572) conducted in the United States, Spain and Australia, which examined gender-based prevalence of depressive symptoms reported prevalence of 22% for males and 39% for females (Smolderen *et al*., 2015). Although the current study did not compare the prevalence of depressive symptoms based on gender, almost two thirds of the sample were males (n= 335, 72.6%), thus, the findings seem comparable.

Table 28: Summary of studies which used the patient health questionnaire (PHQ) to estimate the prevalence of depressive symptoms in patients with ACS

Authors (Year)	**Instrument and cut-off score**	**Prevalence rate**
Lenog *et al*. (2021)	PHQ-9≥ 10	46.3%
Trick *et al*. (2019)	PHQ-8≥ 10	14.4%
Alvi and Ahmad (2016b)	PHQ-9≥ 10	19.4%
Smolderen *et al*. (2015)	PHQ-9≥ 10	Based on gender - Female (39%) - Male (22%)

With respect to studies that used other instruments to measure prevalence of depression following ACS but that reported comparable prevalence of depressive symptoms (~23%) to the current study, instruments ranged from Structured Clinical Interview for DSM-IV Axis I Disorder (patient edition) (SCID-I//P) (Figueiredo *et al*. (2017) to a combination of the International Classification of Diseases, Tenth Revision (ICD-10) and BDI-II (Makkar and Jiloha, 2019) to HADS>8 (Murphy *et al*., 2020). Studies were carried out in Brazil (Figueiredo *et al*., 2017), India (Makkar and Jiloha, 2019) and Australia (Murphy *et al*., 2020).

Allabadi *et al*. (2019) was one of the studies that reported very high prevalence of depressive symptoms (78.7%) in 1,053 Palestinian ACS patients using the Cardiac Depression Scale (CDS). These researchers also reported prevalence based on level of severity which allows comparisons to be drawn with other studies who reported prevalence similar. In their study, Allabadi *et al*. (2019) prevalence of mild-to-moderate levels of depressive symptoms was 25.2% while severe-to-very severe was 53.5%. Similar findings were reported by Goudarzian *et al*. (2016) who also used the CDS to examine depressive symptoms in 407 patients with ACS in Iran. Goudarzian *et al*. (2016) found that 9.1% of patients had mild depressive symptoms, 17.7% had moderate depressive symptoms while 73.2% had severe depressive symptoms. Using the Hamilton depression rating scale, Hadi *et al*. (2020) found that 15.5% and 35.5% of their ACS patients (N=110) had severe and very severe depressive symptoms respectively.

Unlike the aforementioned studies which reported high prevalence of severe depressive symptoms in patients with ACS (Goudarzian *et al*., 2016; Allabadi *et al*., 2019; Hadi *et al*., 2020), the current study found that most patients reported minimal/no depressive symptoms (40.1%) or symptoms that were mild (36.4%). Around one fifth of patients reported moderate (18.7%) or moderately severe (4.4%) depressive symptoms. Moreover, only 0.5% reported severe depressive symptoms, which is congruent with other studies that also

found only a minority (<1%) of patients had severe depressive symptoms (Mujtaba *et al*., 2020; Rawashdeh *et al*., 2021).

The variations in prevalence of depressive symptoms across these studies could be attributed to differences related to the: (a) instruments used for identifying elevated depressive symptoms; (b) cut-off scores used to diagnose depression; (3) timing of assessing depressive symptoms; (d) composition of the sample (for example, younger age, female…); and (e) presence of specific coexisting environmental, social, and medical factors which may increase the risk of depression.

When examining comparative literature specific to Jordan, the prevalence of depressive symptoms in the current study was lower than the reported estimates in previous studies of ACS cohorts (AbuRuz *et al*., 2018; Hayajneh *et al*., 2021). AbuRuz *et al*. (2018) used the BDI II scale to assess 175 patients with MI for depressive symptoms. They reported that 69.7% (n=122) of patients had elevated depressive symptoms (BDI-II>10) while 30.3% (n=53) had minimal depressive symptoms. The variation in the instruments employed along with the variation in the cut-off scores used to assess prevalence of depression may be to blame for the disparity in depressive symptom prevalence across these Jordanian studies. For example, the current study used a cutoff score of $\geq$ 10 on the PHQ-9 for moderate to severe levels of depressive symptoms, which meant that the 36.4% of patients who had mild depressive symptoms were not considered clinically depressed based on this cut-off score. On the other hand, AbuRuz *et al*. (2018) used the BDI-II scale, but their cut-off score of ≥10 included all patients who reported mild, moderate, and severe levels of depression.

Hayajneh *et al*. (2021), administered the Geriatric Depression Scale (GDS) to 300 older adults with ACS who were enrolled from the Emergency Department (ED). The researchers reported that 65.7% of the participants had elevated depressive symptoms. The timing of the assessment may have been one of the reasons for the variation in prevalence of depressive symptoms across these studies. Hayajneh *et al*. (2021) enrolled patients from the ED at a time when they may have been experiencing more symptoms because of their acute

illness, while participants in the current study were enrolled from coronary units and cardiology wards when their condition was stable and prior to their discharge.

Furthermore, in their study, Hayajneh *et al*. (2021) only included older adults, who by the nature of their age may experience higher somatic symptoms at the time of attending the ED. As such the prevalence of depressive symptoms reported in their study may have been an overestimate. Another possible rationale for the differences in prevalence across studies could be related to the sample characteristics. Evidence suggests that living alone increases the risk of depression by 40% (Wu *et al*., 2022). Hayajneh *et al*. (2021) reported that about 30% of their participants were living alone, while in contrast only 3.5% of patients in the current study were living alone.

Other comparative literature specific to Jordan, reported higher rates of depressive symptoms in patients with CHD (Al-Zaru *et al*., 2020; Rawashdeh *et al*., 2021) than those identified in the current study. Rawashdeh *et al*. (2021) enrolled 335 patients with CHD ten days following PCI and found high symptoms of depression (PHQ-9 score ≥ 10) were present in 34% of patients. The differences in findings could be attributed to the different methods and samples used. Al-Zaru *et al*. (2020) examined 174 non-hospitalised patients with CHD using the CDS and found that 53.4% of patients had elevated depressive symptoms (CDS score ≥ 90). The differences in the prevalence rates between their study and the current one could be attributed to the variation in instruments used. Al-Zaru *et al*. (2020) used the CDS to assess depressive symptoms while the current study used the PHQ-9. Interestingly, two of the studies that reported very high prevalence of severe depressive symptoms in Iran and Palestine also used the CDS to assess prevalence (Goudarzian *et al*., 2016; Allabadi *et al*., 2019). Furthermore, Al-Zaru *et al*. (2020), identified the prevalence of depressive symptoms based on having mild to severe depressive symptoms (CDS score ≥ 90) while the findings of the current study were based on having moderate to severe symptoms (PHQ-9 ≥ 10). Finally, the differences could be related to the sample characteristics whereby Al-Zaru *et al*. (2020)

included more females than in the current study and most of their patients (90%) reported having comorbid chronic conditions.

In summary, a clinically significant number of patients who experience ACS in Jordan report depressive symptoms. Although broadly like other comparative literature, the prevalence of depressive symptoms reported here is lower than that reported in other Jordanian studies. Reasons for the variation across studies may be attributed to the use of different instruments and/or cut-off scores along with differences in sample characteristics.

It is well accepted that screening for depressive symptoms in hospitalised patients with ACS is recommended for the diagnosis and treatment of depression (Colquhoun *et al*., 2013, Jha *et al*., 2019). Including a brief instrument to screen depressive symptoms in patients with ACS during routine assessment at hospitals is warranted. The AHA recommends using the PHQ-2 for detecting depression in patients with CHD and if patients respond 'yes' to either of the PHQ-2 questions, then further evaluation using the PHQ-9 is necessary (Lichtman *et al*., 2008). While guidelines are available elsewhere, there is a need to develop guidelines in Jordan for screening and evaluating depressive symptoms in patients with ACS. Cardiac rehabilitation programmers are useful in addressing mental health problems including depression and should be comprehensive to include educational and psychosocial interventions (Caccamo *et al*., 2018). As a follow on to focused assessment of depression, there is also a need for collaboration among healthcare professionals to provide appropriate management for depression (Colquhoun *et al*., 2013).

6.2 Incidence of depression in the six-months post ACS

The second objective of this study was to estimate the incidence of depressive symptoms over 6-months of ACS. This was estimated by calculating the number of patients who had no previous history of depression but developed clinically significant depressive symptoms (PHQ>=10) at 1, 3, and 6 months of ACS. The 6-month cumulative incidence of depressive symptoms was 8.3%. Other

studies examining incidence of depression in this cohort have reported incidence rates ranging from 13.1% to 31% over 12 months of ACS (Strik *et al*., 2004; Dickens *et al*., 2008; Kang *et al*., 2015; Ossola *et al*., 2015), which is higher than that reported here. The reason for differences in reported findings may be due the fact that the current study was conducted over 6 months following ACS while other studies were conducted over 12 months. Furthermore, studies conducted by Strik *et al*. (2004) and Ossola *et al*. (2015) reported cumulative incidence of minor and major depression, which could overestimate incidence of depression. However, the current study used PHQ-9≥ 10 which has high sensitivity to detect major depression. There is also variation among studies in the incidence of depression after ACS. This could be attributed to difference in the method of assessing depression and history of depression. While some studies used estimated incidence rate using self-reported instruments (Strik *et al*., 2004; Dickens *et al*., 2008), others used structured clinical interview (Kang *et al*., 2015).

Two studies were found to examine incidence of depression over a shorter period of time and also reported different findings to the current study. The first study was conducted by Parker *et al*. (2008) which enrolled 489 patients with ACS and found that about 5.4% of patients had incident depression over one month of ACS. The second study (Halima *et al* 2020) involving 110 patients with ACS found that the cumulative incidence of depression over an average of 42 days following ACS was 25.3%. The variations between these studies could be attributed to the fact that the latter study estimated the incidence of depression at both in-hospital (19.1%) and at 42 days (6.2%) time-points, while the former study estimated the incidence of depression only in at one month follow-up.

In summary, very few studies have examined incidence of depression over time in patients following ACS. Of these, findings suggest a higher rate of incident depression than that reported here. The differences in findings may be attributed to data collection procedures and the length of time allowed for

follow-up. The current study highlighted the about 8.3% of patients develop incident depression over 6 months of ACS.

6.3 Trajectories of depressive symptoms in patients with ACS

6.3.1 Prevalence of depressive symptoms over six months of ACS

The third objective in this study was to examine trajectories of depressive symptoms over 6 months, in patients with ACS. Prior to this, the prevalence of depressive symptoms following ACS was reported, at baseline, 1, 3 and 6 months (23.5%, 18%, 16.7% and 15.4%) respectively. The mean PHQ-9 scores were 6.37 (SD = 4.47), 5.47 (SD =4.25), 5.00 (SD= 4.28), and 4.55 (SD= 4.19) for baseline, 1, 3 and 6 months, respectively. On average, the results indicate that depressive symptoms showed improvement over 6 months of ACS.

These findings are consistent with previous research (Parashar *et al*., 2006; Murphy *et al*., 2008b; Murphy *et al*., 2020; Pérez *et al*., 2020) where depressive symptoms improved over time. For instance, an Australian study (Murphy *et al*., 2020) of 911 patients following a cardiac event reported prevalence of depressive symptoms using HADS as 22%, 17% and 15% at baseline, early (2-4 months) and late phases (6-12 months), respectively. Another study (Pérez *et al*., 2020), assessed depressive symptoms using PHQ-9 at both baseline and 3 months after ACS and found a prevalence of depressive symptoms (PHQ-9 ≥10) were 20% and 11% at baseline and 3 months, respectively. Similarly, a large study conducted on 1873 patients with MI in the United States found the prevalence of depressive symptoms using PHQ-9 was 20.6% (n=387) at baseline and 13.1% (n=246) at one month follow-up (Parashar *et al*., 2006).

A study by Murphy (2008b) assessed depressive symptoms for 226 women with MI and CABGs. The study reported an improvement in mean score of depressive symptoms over 12 months. The mean scores of depressive symptoms were 4.93 (SD= 3.77), 4.27 (SD= 3.47), 3.73 (SD= 3.33) and 3.48 (SD= 3.22) for baseline, 2, 4, 12 months, respectively. Another study (Murphy *et al*.,

2008a) involving 184 patients with CABG found improvement in the mean scores of HADS over 6 months of the surgery. The mean scores of depressive symptoms were 5.35 (SD= 4.01), 4.16 (SD= 3.71), and 3.87 (SD= 3.51) for baseline, 2 and 6 months, respectively (Murphy *et al*., 2008a).

On the other hand, some studies were inconsistent with the current study findings and reported stable prevalence rate across time. For instance, a Dutch study found consistent prevalence rates at four time points over 12 months (Kaptein *et al*., 2006). The prevalence of depressive symptoms using BDI was 22.7%, 23.8%, 25.5% and 24.8% at baseline, 2, 6 and 12 months of ACS. Likewise, a German study (Mittag *et al*., 2016) involving 252 cardiac patients assessed their depressive symptoms using Checklit-90-Revised at 3 time points: 1-3 weeks, 3 months and 12 months (Mittag *et al*., 2016). The overall prevalence of depressive symptoms at baseline was 55% (n=139). The study also reported that the prevalence of mild to moderate symptoms at 1-3 weeks of cardiac event was 32% (n=81) and 23% (n=58) for severe depressive symptoms. The study indicated that the prevalence of "mild to moderate" symptoms and "severe" symptoms categories remained similar at all-time points (Mittag *et al*., 2016).

Stable prevalence rate of depressive symptoms across time was also reported by an Australian study, (Schrader *et al*., 2006), which enrolled 739 patients with cardiac illnesses and assessed depressive symptoms using CES-D at 3 time points over 12 months. The study found that 60.9% (n=451), 60.6% (n=448) and 60.5% (n=447) of patients reported no depression at baseline, 3 months and 12 months after discharge, respectively. The study also found that the prevalence of mild depressive symptoms was 22.5% (n=168), 23.4% (n=173), and 22.7% (n=168) at hospitalisation, 3 months and 12 months, respectively. Regarding the prevalence of moderate to severe depressive symptoms, the study found prevalence rates of 16.4% (n=120), 15.8% (n=117), and 16.8% (n=124) at hospitalisation, 3 months and 12 months, respectively.

Similarly, Lane *et al*. (2002) examined depressive symptoms over 12 months using BDI for 288 patients with MI in England and reported stable prevalence rate at all time points. The prevalence of depressive symptoms at 2-15 days, 4 months and 12 months after MI were 30.8% (n=89), 37.7% (n=75) and 37.2% (n=67), respectively. Another study by Schrader *et al*. (2004) enrolled 833 patients hospitalised with cardiac illnesses including ACS and assessed depressive symptoms at 2-3 days of hospitalisation and then at 3 months later. The study found that 58.5% (n=487) and 57.7% (n=481) of patients had no depressive symptoms at baseline and 3 months after discharge, respectively. The prevalence of mild depressive symptoms was 23.9% (n=199) at baseline and 24.7% (n= 206) at 3 months following discharge. The prevalence of moderate to severe depressive symptoms was 17.5% (n=146) at baseline and 17.4% (n=145) at 3 months after discharge.

In contrast, one study found that the prevalence of depressive symptoms tended to increase over time (Kala *et al*., 2016). The study investigated depressive symptoms in 79 patients with acute MI at five different time points: within 24 hours of PCI, prior to discharge, and 3 months, 6 months and 12 months following discharge (Kala *et al*., 2016). The study found that the highest prevalence of depression was within 24 hours of PCI (21.5%). However, the prevalence of depression had significantly decreased prior to discharge (9.1%). Regarding prevalence of depressive symptoms after discharge, the study found that the prevalence of depressive symptoms tended to increase gradually over 12 months of MI. The prevalence of depressive symptoms at 3, 6 and 12 months were 10.4%, 15.4% and 13.8% respectively (Kala *et al*., 2016).

In summary, studies that reported the mean scores or examined the prevalence of depressive symptoms across time found inconclusive results. While some studies showed improvement in depressive symptoms over time, others found no change in the prevalence rates of depressive symptoms across different time points. This could be explained by the fact that relying on the mean scores or reporting the prevalence rate across time might oversimplify the process of

change in depressive symptoms. Mittag and colleagues (2016) reported stable prevalence rates of depressive symptoms at 3 different time points over 12 months after a cardiac event. However, the study also found substantial fluctuations in depressive symptoms when they analysed the changes that occurred between classes of depression. The study found that 13% of patients had depressive symptoms characterised by sustained remission while 11.5% of patients had worsening depressive symptoms over 12 months. These findings were consistent with an earlier study (Schrader *et al*., 2004) who reported stable prevalence rate at baseline hospitalisation and at 3 months after discharge. However, when they analysed changes between classes of depressive symptoms, the study identified that 30.1% (n=44) and 10.3% (n=15) of those with moderate depression at baseline (n=156) become with mild and no depressive symptoms, respectively (Schrader *et al*., 2004).

Likewise, Martens and colleagues (2008), reported a decline in the mean scores of depressive symptoms over 6 months of CABG. However, when analysing change based on GMM, the study found that 14% of the sample followed a trajectory of worsening depressive symptoms over time while the majority of the sample (72%) followed a trajectory of remitted minor depression. The authors attributed the remission in minor depression to be related to normal bereavement processes (Murphy *et al*., 2008a). In order to provide better insight into this phenomenon, the next section will discuss the results based on GMM.

6.3.2 Growth curve and growth mixture modelling.

In the current study, the GCM indicated that the linear growth model provided a reasonable fit to the data, and it was better than intercept-only and quadratic models. Accordingly, the linear form of change was used for specifying subsequent GMMs. These findings were consistent with an Australian study (Murphy *et al*., 2014a), which found that the linear growth model had better fit than intercept-only, quadratic and fourth square growth models. The study

enrolled 160 patients following cardiac event and assessed depressive symptoms at three time points over 6 months (Murphy *et al*., 2014a). Linear changes over time were also reported by another study (Romppel *et al*., 2012) which used a similar methodological approach to the current study and assessed depressive symptoms in 679 patients with cardiac illnesses at two time points: baseline and 6 years.

However, there were some studies which evaluated different forms of change in GMM without examining GCM as an initial step and identified some trajectory groups with significant quadratic changes. The first study utilised data from a health and retirement study (1994-2008) in the United States and assessed depressive symptoms for 2147 older adults at five different time points in 6 years before MI and then for four years after MI (Galatzer-Levy and Bonanno, 2014). The study identified two stable trajectories (resilient and chronic depression groups) and two unstable trajectories with significant linear and quadratic changes (emerging and improving depression groups). The second study was conducted on 200 polish patients with MI and evaluated depressive symptoms at four time points over 6 years (Kroemeke, 2016). The study identified three trajectory groups including low, rising and chronic depression. Both rising and chronic depression groups had significant linear and quadratic changes while low depression group had only significant linear change (Kroemeke, 2016).

To ensure that the identified solution was the optimal one, the current study also included quadratic growth factor when specifying different GMM. It was found that the fit indices of BIC, AIC and ABIC became larger when the quadratic growth factor included the GMM compared to the linear model, indicating that the linear GMM model had better fit indices that the quadratic model. These variations among studies regarding which form of change suited data better might be explained by the difference among studies in the duration of follow-ups, sample size or number of repeated measure assessments. This study enrolled 434 patients with ACS and assessed depressive symptoms at four time

points over 6 months. However, increasing the sample size, number of assessments and the duration of follow-up might identify different patterns of change in depressive symptoms in patients with ACS.

The results of GCM analysis in this study suggests that, on average, there is a significant decrease in depressive symptoms over time. However, GMM indicated that the change in depressive symptoms over time is not simply characterised as a single trajectory of depressive symptoms. The results of GMM indicated that the one-class model had a very poor fit to the data while the four-class model provided the best fit to the data. These findings are consistent with previous studies where depressive symptoms in patients with ACS are considered to be heterogeneous and that a single trajectory of depressive symptoms does not represent the entire sample (Kaptein *et al*., 2006; Martens *et al*., 2008; Murphy *et al*., 2008a; Murphy *et al*., 2008b; Doyle *et al*., 2011a; Romppel *et al*., 2012; Galatzer-Levy and Bonanno, 2014; Murphy *et al*., 2014a; Kroemeke, 2016; Peter *et al*., 2020).

The Number and Patterns of trajectories of depressive symptoms over time

Using GMM, the current study identified four depressive symptom trajectory groups characterised as (a) minimal-decreasing, (b) increasing, (c) decreasing and (d) high-stable symptoms. This number is consistent with international comparative literature which report findings ranging from two to five groups. Most of these previous studies (n=11) identified three or four trajectory groups. Only one study identified two trajectory groups (Murphy *et al*., 2008b) and one study identified five trajectory groups (Kaptein *et al*., 2006). The current findings pertaining to the number of the identified trajectory groups were consistent with four studies (Martens *et al*., 2008; Romppel *et al*., 2012; Galatzer-Levy and Bonanno, 2014; Peter *et al*., 2020).

In the current study, the findings suggests that one of the identified trajectory groups contained the majority the sample (n= 327, 75.35%). This group was characterised by minimal depressive symptoms that improved over 6 months.

The second trajectory group comprised nearly 9% (n=39) of sample and characterised by high initial symptoms that decreased over 6 months. About 7.1% (n=31) of patients followed a third trajectory group characterised by low initial symptoms that increased over 6 months. The last group comprised about 8.5% (n=37) of the sample and characterised by high stable symptoms over 6 months. The findings of the current study indicate that trajectories of depressive symptoms in patients with ACS tend to vary in both stability and level of severity.

These findings are consistent with some comparative studies, in that trajectories of depressive symptoms vary their stability and the level of severity. For example, Murphy *et al*. (2014a) identified three trajectory groups including (a) no depression, (b) worsening and (c) resolving depression. Romppel *et al*. (2012) identified four trajectory groups including low, decrease, low increase, and high increase. Peter and colleagues (2020) identified four trajectory groups including (a) low-stable, (b) moderate stable, (c) increasing, and (d) high-stable. Kaptein *et al*. (2006) identified five trajectory groups including (a) no depression, (b) mild, (c) moderate and increasing, (d) significant but decreasing and (e) significant and increasing.

On the other hand, the findings of the current study were inconsistent with other comparative studies who found that trajectories of depressive symptoms stable over time but differed only in the level of severity. For example, a study by Martens *et al*. (2008) found four stable groups including (a) non-depressed, (b) mildly, (c) moderately and (d) severely depressed. Likewise, Doyle *et al*. (2011a) found three stable trajectories including (a) no depression, (b) subthreshold and (c) high persistent depression. However, there was one study which evaluated gender-based trajectories of depressive symptoms and found that females had three stable trajectories including (a) persistent minimal, (b) moderate “subclinical” depression, and (c) chronic depression while males had two stable trajectories (persistent minimal, and moderate “subclinical”

depression) and one unstable trajectory with linear change (emerging depression) (Kong *et al*., 2022).

As previously mentioned, in the first trajectory group, the current study found that about 75.35% (n=327) of the sample followed a trajectory characterised by minimal depressive symptoms that improved over 6 months. These findings were consistent with all reviewed studies in that every study reported that the majority of their sample were in a group characterised by low severity (i.e., minimal or no depression). The percentage of patients who followed this trajectory group in prior research ranged from 40% (Martens *et al*., 2008) to 89% (Murphy *et al*., 2008b). Although most of the reviewed studies found that this group tended to be stable over time, the current study found this group tended to have a decrease in depressive symptoms over time. These findings were consistent with two previous studies where the identified group of low level depressive symptoms tended to be further decreased over time (Murphy *et al*., 2008a; Murphy *et al*., 2008b).

In the second trajectory group, the current study found that nearly 9% (n=39) of the sample followed unstable trajectory characterised by high initial depressive symptoms that decreased over 6 months. These findings are consistent with some studies which identified a trajectory group characterised by decreasing symptoms over time. For example, Kaptein *et al*. (2006) enrolled 475 MI patients and identified five latent groups with both stable and unstable trajectories. One of these groups included patients who had high initial symptoms but decreased over time and this group represented 4.5% of the sample (n=475). Another study identified four trajectory groups including low, low increase, high increase, and decrease (Romppel *et al*., 2012). In the third trajectory group, the study found that 7.3% of the sample followed a trajectory of decrease depressive symptoms over time. Murphy *et al*. (2014a) identified three trajectory groups including no depression, worsening and resolving depression, and found that 17% of patients followed a trajectory of resolving depression over 6 months of CABG.

In the third trajectory group, the current study found that about 7.1% (n=31) of patients followed a group characterised by low initial symptoms that increased over 6 months. Several studies identified one of the trajectory groups characterised by increasing or worsening in depressive symptoms over time (Kaptein *et al*., 2006; Murphy *et al*., 2008a; Romppel *et al*., 2012; Murphy *et al*., 2014a; Peter *et al*., 2020). The proportion of patients in this class varied among studies as following: 3.3% (Peter *et al*., 2020), 9.3% (Kaptein *et al*., 2006), 14% (Murphy *et al*., 2008a), 25.8% (Romppel *et al*., 2012) and 29% (Murphy *et al*., 2014a) of patients followed an unstable trajectory characterised by increasing symptoms over time.

In the fourth trajectory group, the current study found that 8.5% (n=37) of patients followed a stable trajectory characterised by high initial depressive symptoms that remained consistently high over 6 months. These findings were congruent with some studies that found a trajectory group characterised by persistently high depressive symptoms over time (Doyle *et al*., 2011a; Galatzer-Levy and Bonanno, 2014; Peter *et al*., 2020). The proportion of patients in this group varied among previous studies from 3.3% to 15%. For instance, Peter *et al*. (2020) found that 3.3% of the sample had a class of stable high trajectories over 15 years. Galatzer-Levy and Bonanno (2014) found that 14% of the sample followed a chronic depression trajectory group which was characterised by stable high symptoms over 10 years (6 years before MI to 4 four years after MI). Similarly, Doyle *et al*. (2011a) found that 15% of the sample followed a persistent depressive symptom trajectory group which was characterised by high stable depressive symptoms over 12 months.

However, Martens *et al*. (2008) identified two trajectory groups characterised by moderate-stable and severe-stable depressive symptoms over 12 months of CABG. The percentage of patients who followed the moderate-stable group was 14% while only 4% of patients had severe-stable symptoms. The wide variation among studies regarding the proportion of patients in this trajectory

group could be explained by the difference among studies on the identified level of persistence in depressive symptoms (i.e., moderate versus severe). In the current study, the mean PHQ-9 score for high-stable trajectory group was 13.06 (SE=.505), indicating, on average, a moderate level of severity. This consistent with other studies that found that the level of severity for persistent depression group tended to be moderate (Doyle *et al*., 2011a; Galatzer-Levy and Bonanno, 2014).

Similarly, the four identified trajectory groups in the current study were found to be consistent with earlier studies that used clinical cut-off score as a method for classifying trajectories of depressive symptoms. For example, Lane *et al*. (2002) examined depressive symptoms at three time points over 12 months in 165 patients with MI and found that 66% had no depressive symptoms over time (no depression). However, about 12.7% of patients had no depression at baseline but developed depression at 4 and 12 months after MI (worsening depression). Of all patients, 6.7% had depressive symptoms at baseline but became no longer depressed at 4 and 12 months later (remitted depression). Lastly, about 14.6% of patients who were depressed at baseline became depressed at both 4 and 12 months of MI (persistent depression). Another study by Mittag *et al*. (2016) assessed depressive symptoms at 3 time points over 12 months (n=199) and classified patients into four groups including no depression, worsening, sustained remission and persistent depression. The study reported that about 33.2% of patients had no depressive symptoms at baseline and remained non-depressed over 12 months (No depression). Further, about 43.7% of patients had high depressive symptoms at baseline that remained high over time (persistent depression). Of all patients, nearly 11.6% had no depressive symptoms at baseline but become depressed at 3 months and 12 months (worsening depression). Lastly, about 11.6% of patients had high depressive symptoms at baseline but became non-depressed at 3 and 12 months (sustained remission).

Additionally, there were three studies which used a clinical cut-off score method of classifying trajectories and classified patients into four groups that were consistent with the current study findings. However, the assessment of depressive symptoms in these studies was limited to two time points only (Rieckmann *et al*., 2006a; Parashar *et al*., 2006 ; Thombs *et al*., 2008). The four groups included no depression, new, transient and persistent symptoms. Rieckmann *et al*. (2006a) included 172 patients with ACS and found that approximately 50% of the sample had no depression at both baseline and 3 months while 4.1%, 23.3%, and 22.1% of patients had new, remitted and persistent symptoms, respectively. Thombs *et al*. (2008) enrolled 425 patients with ACS and found that 66.1% of patients had no depressive symptoms at baseline and 12 months while 4.9%, 8.9 and 20% had new, remitted and persistent symptoms, respectively. With a larger sample size (n=1873), Parashar *et al*. (2006) found that 73.5% of patients had no depressive symptoms at baseline and 1 month of MI while 6%, 13.5% and 7.1% of patients had new, remitted and persistent symptoms, respectively. Using similar approaches to data analysis, two studies classified patients into three groups based on course of depressive symptoms. The first study evaluated depressive symptoms over 3 months of ACS (n=492) and reported the following three groups: no depressive symptoms (52%), remitted (22.8%) and persistent symptoms (22%). The second study evaluated changes in depressive symptoms over 12 months of ACS (n=1152) and reported the following groups: no depressive symptoms (63.6%), remitted (25.8%) and worsening symptoms (10.5%).

Although several studies used the clinical cut-off score for analysing the change in depressive symptoms over time, most of these studies examined depressive symptoms at only two-points and the remaining studies were at three time points. Analysing trajectories of depressive symptoms based on clinical cut-off score could be a straightforward method of analysis when depressive symptoms are assessed at two time points. However, it becomes more difficult to assign patients into groups when the number of assessments increase.

Furthermore, using this method for analysing repeated measures of data, may exclude some patients from the analysis because they have missing values or follow an unclassified “fluctuating” pattern. In addition, this method of analysis would fail to address issues related to unequal spacing in timing of assessment as evident in this study.

A study by Mittag and colleagues (2016) enrolled 252 patients following cardiac events and used clinical cut-off score for analysing trajectories at three time points over 12 months. However, the study was able to classify 199 patients who had stable trajectories over time. Using GMM was sought to overcome these limitations as follows: (a) instead of assigning patients into observed groups, GMM uses repeated measures data to make inferences about unobserved groups; (b) GMM uses continuous score of depressive symptoms Instead of cut-off score which capture real change over time; (c) GMM uses FIML to estimate parameters in the presence of missing values; (d) GMM is able to handle unequal spacing in time series data.

In summary, in relation to the number and pattern of depressive symptom trajectories, the current study findings were consistent with comparative international literature. As with others, this study considers that depressive symptoms in patients with ACS are heterogenous and that a single trajectory is not representative of the change that occurs in depressive symptoms over time. The findings also indicate the baseline depressive symptoms are not transient, but tend to be persistent for some patients after ACS. Similar to other studies, the current study identified four distinct trajectories of depressive symptoms in the Jordanian population with ACS that vary in both stability and level of severity. The majority of the sample belong to a trajectory group that is characterised by minimal severity of depressive symptoms that resolve over time.

The study identified three other trajectory groups including decreasing, increasing and high-stable symptoms, each of which had a percentage less than

10% of the sample. The high-stable trajectory represents a moderate level of depressive symptoms that remained stable over 6 months of ACS. Unlike GCM which indicated that the average depressive symptoms tend to decrease over time, GMM indicated that while some patients tend to have high initial depressive symptoms that decease over time, others might have high initial depressive symptoms that remain consistently high over time.

6.4 Predictors of trajectories of depressive symptoms after an ACS event

Psychosocial factors

In this longitudinal study, psychosocial factors including coping, Type D personality and perceived social support were examined to identify independent predictors of trajectories of depressive symptoms over 6 months of ACS while controlling for a history of depression. The current findings indicated that psychosocial factors explained a higher amount of variance in trajectories of depressive symptoms than socio-demographics, health-related behaviours and clinical factors. The findings indicated that psychosocial factors not only predicted baseline depressive symptoms but also the heterogeneous trajectories of depressive symptoms over six months of ACS.

In this study psychosocial factors were found to predict worsening and persistence in depressive symptoms over 6 months of ACS. These trajectories have been consistently reported in prior research as toxic trajectories that are associated with poor outcomes following ACS (Kaptein *et al*., 2006; Murphy *et al*., 2008b). These findings were consistent with a study by Doyle *et al*., (2011b) who reported that psychosocial factors including stressful life event, cognitive distortion, reinforcing events and Type D personality predicted depressive symptoms better than clinical and sociodemographic factors. A longitudinal study also found that these psychosocial factors were able to differentiate subthreshold and persistent trajectories of depression over 12 months of ACS from no depression (Doyle *et al*., 2011a).

Coping strategies

The results of the current study indicate that on average patients used social coping and problem-focused coping more frequently than other coping strategies to deal with stressful events. The least frequently used coping strategies in this cohort were dysfunctional coping strategies. These findings were consistent with a study (Chung *et al*., 2013) conducted on 120 patients with ACS which found that patients used problem-focused strategies more frequently than emotion-focused strategies to deal with stressful events. However, these findings were not supported by other studies that found that patients with MI tended to use dysfunctional coping strategies more frequently than problem-focused coping to cope with illness (Rahman, 2013; Bafghi *et al*., 2018).

The results of multivariate models indicate that patients who used less problem-focused coping and more dysfunctional coping were more likely to follow a trajectory of increasing depressive symptoms over 6 months of ACS. Additionally, those who use more dysfunctional coping strategies were found to follow a trajectory group characterised by persistence in depressive symptoms. Unsurprisingly, these findings can be explained in line of transactional theory of stress and coping. Accordingly, ACS patients who use fewer problem-focused coping strategies after ACS may be less able to alter the problem caused by the stress and thus more likely to develop increased depressive symptoms over 6 months. Furthermore, those who use more dysfunctional coping strategies would be less able to manage emotional responses caused by the stressful situation (i.e., an ACS event) and thus more likely to develop depressive symptoms and remain depressed over 6 months following ACS. The results of the current study also support and confirm previous findings from cross-sectional studies which found that greater use of problem-focused coping strategies were negatively associated with depressive symptoms while greater use of dysfunctional emotion-coping strategies were positively associated with depressive symptoms (Bennett *et al*., 1999; Trivedi *et al*., 2009; De Fazio *et al*., 2012; Monirpour, 2016).

In fact, a review of literature identified only two studies that addressed coping strategies as predictors for trajectories of depressive symptoms after ACS. However, these studies used different conceptualisations of coping and different instruments. The first study examined 12 months trajectories of depressive symptoms in 199 patients following a cardiac event and identified four trajectories of depressive symptoms including no depression, worsening, sustained remission and persistent (Mittag *et al*., 2016). The study used a German questionnaire for assessing coping strategies (Der Fragebogen zur Krankheitsverarbeitung) which involves three main domains: cognitive, emotional and behavioural coping. The study found that using a low depressive coping strategy was significantly associated with sustained remission trajectories of depressive symptoms over 12 months following an acute cardiac event. However, no statistically significant differences were found in coping strategies between worsening symptoms and no depression, or between persistent symptoms and no depression.

The second study (Kroemeke, 2016) was conducted in 200 patients with MI and identified three trajectories of depressive symptoms over 6 years including chronic, rising and no depression. The study used the Coping Inventory for Stressful Situation (CISS) to assess coping strategies as proposed by Endler and Parker (1990a) which includes three coping domains: problem-oriented, emotion-oriented, avoidance-oriented coping. The study found that greater use of emotion-focused coping was a significant predictor of chronic trajectory group compared to rising and no depression group. Furthermore, a greater use of emotion-focused coping was a significant predictor of rising group compared to no depression group. However, there were no statistically significant differences among the three depressive symptom trajectory groups regarding avoidance or problem-focused coping domains.

These variations among studies may be attributed to the fact that these studies used different instruments and different conceptualisations of coping. For

instance, Parker and Endler (1992), conceptualised coping as a task-oriented, person-oriented and avoidance oriented. The first two dimensions of coping were similar to those conceptualised by Lazarus and Folkman (1984). The third dimension "avoidance-oriented" was conceptualised separately as a "distraction" dimension which involves self-distraction and social diversion. According to Endler and Parker (1990b) avoidance oriented-coping may include problem-focused (distracting yourself with other tasks) or emotion-focused (seeking social support from others) strategies. Endler and Parker (1990b) found that anxiety and depressive symptoms were positively associated with emotion-oriented coping and negatively associated with problem-focused coping. However, avoidance-oriented coping were found to be associated with increased anxiety but not depression (Endler and Parker, 1990b).

The current findings are in line with Carver *et al*. (1989), who argued that not all emotion-focused strategies are maladaptive. While some emotion-focused strategies can be useful strategies, others may be less so. This study found that dysfunctional coping strategies were associated with an increased risk of worsening and persistent depressive symptoms. These findings are consistent with two studies carried out on patients with heart failure (Klein *et al*. 2007; Trivedi *et al*., 2009). Trivedi *et al*. (2009) found dysfunctional coping strategies such as self-distraction, venting, denial and behavioural disengagement were associated with higher depressive symptoms. Similarly, Klein *et al*. (2007) reported denial, self-blame, and self-distraction to be associated with higher depressive symptoms. The current findings are also congruent with studies in other non-cardiac populations, which found that dysfunctional coping strategies were associated with increased depressive symptoms (Carver *et al*., 1999; Gourounti *et al*., 2013; Nipp *et al*., 2016; Almeida *et al*., 2021; Dev *et al*., 2021; Nipp *et al*., 2017). In addition, the current study's findings were also congruent with studies that found problem-focused strategies such as active coping and planning to be negatively associated with depressive symptoms (Allman *et al*., 2009; Obembe *et al*., 2019).

To conclude, the current study suggests that greater use of dysfunctional coping strategies such as substance use, behavioural disengagement, venting of emotion, self-blame, denial and self-distraction were found to be associated with higher risk of increasing and persistent depressive symptoms. However, using less planning and active coping strategies (problem-focused) tend to be associated with increased depressive symptoms over 6 months. Thus, these findings are consistent with Carver *et al*. (1989).

Type D personality

The current study findings suggests that Type D personality is prevalent in this cohort and found in 25.6% of the sample. This is consistent with a cross-cultural study which evaluated Type D personality in 6222 patients with CHD across 22 countries and found that the prevalence of Type D ranged from 24% to 37% (Kupper *et al*., 2013). The international literature reports a considerable variation in percentage of type D personality in patients with ACS. For instance, a study in The Netherlands enrolled 1205 patients with MI and found 18.7% of patients had Type D personality (de Jonge *et al*., 2007). A study in India found 24% of patients with MI had Type D personality (Pillai *et al*., 2019), however, another Indian study found 50.7% of MI patients had Type D personality (n=150) (Manoj *et al*., 2020).

A Turkish study enrolled 100 patients with ACS and found that 45% of patients were found to have Type D personality (Arslan *et al*., 2016). However, some other studies found a higher percentage of Type D personality in their sample. For instance, a study in Pakistan enrolled 80 patients with ACS and found that 70% of patients had Type D personality compared to 33% from the general population (n=70) (Saeed *et al*., 2011). Another study in Italy enrolled 81 patients with ACS and found that 76% of patients were found to have type D personality (De Fazio *et al*., 2012). These variations could be attributed to the cultural differences in emotional expression (Hareli *et al*., 2015). It may also be related to the difference in sample characteristics. Most of the sample in the current study, for instance are males. However, evidence suggest that females

tend to express their emotion more than males (Kring and Gordon, 1998). There is also the possibility that the DS14 cut-off score of 10 for both negative affectively and social inhibition needs to be validated before use for studies with very high percentage.

The results of the current study identified that Type D personality is associated with persistent depressive symptoms after ACS. These findings were consistent with a study by Martens *et al*. (2008) which found that Type D personality is associated with persistence of depressive symptoms in 287 Dutch patients with ACS. Likewise, Romppel *et al*. (2012) enrolled 679 cardiac patients and found that Type D personality is a significant predictor of significant and increasing trajectory of depressive symptoms. In another study in Ireland, Type D personality was associated with subthreshold and persist depression after MI (Doyle *et al*., 2011a). These findings also support previous cross-sectional studies which found that having Type D personality is associated with increased depressive symptoms after ACS (De Fazio *et al*., 2012; Su and He, 2019). The findings indicate the type D personality is prevalent in Jordan patients with ACS and thus should be screened routinely as a significant factor related to depression. Early identification of this stable trait can be helpful in identifying ACS patients who are at risk for persistent depression and thus include them in specific psychosocial interventions.

History of depression

The current study found that 15.9% of patients had a history of lifetime depression. This is similar to a Danish study which enrolled 78,188 patients with first time ACS and reported that 11.1% of patients had a history of lifetime based on medical records (Joergensen *et al*., 2016). However, other studies reported much higher rates of history of depression in patients with ACS. For instance, the Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients (VIRGO) study evaluated history of lifetime depression for 3572 patients with AMI and reported that 24% and 48% of men and women reported history of lifetime depression using a general yes or no question (Smolderen *et*

al., 2015). Another study in Australia by Parker *et al*. (2008) enrolled 489 patients with ACS and assessed history of depression using CIDI and found that 38.2% of patients experienced history of lifetime depression. Another Australian study enrolled 160 patients following cardiac events (including ACS) and found that 37% of the sample reported a history of lifetime depression based on a general yes or no question (Murphy *et al*., 2014a). The percentage of lifetime history of depression in the current study is higher than the Danish study (Joergensen *et al*., 2016) but lower than other studies in this cohort (Parker *et al*., 2008; Murphy *et al*., 2014a; Smolderen *et al*., 2015). These differences may be attributed to the difference in the methods of assessing history of life-time depression among studies in this cohort. There is also a possibility that the percentage of lifetime history of depression in this current study is low due to the stigma of mental illness in Jordan. Stigma with regards to mental illness varies across cultures, but is strongly evident in the Jordanian culture (Dardas, 2017; Hasan and Musleh, 2017; Zolezzi *et al*., 2018). This may have dissuaded patients in the current study from divulging if they had a history of depression.

The results of the current study found that a history of lifetime depression significantly predicted a trajectory of persistent depression during the first six months of ACS, relative to no depression. These findings were consistent with a longitudinal study involving 287 patients with MI in the Netherlands which found that a history of lifetime depression was a significant risk factor for persistent depressive symptoms over 12 months following MI (Martens *et al*., 2008). This also congruent with another Dutch study conducted by Kaptein *et al*. (2006) which found that a history of lifetime depression was associated with persistent depressive symptoms in 475 patients over 12 months following MI. Furthermore, a history of lifetime depression has been found to predict persistent depressive symptoms in patients with cardiac illnesses including ACS at 3 months (Schrader *et al*., 2004) and 12 months of hospitalisation (Schrader *et al*., 2006). Therefore, it is important to screen patients who experience an ACS event for history of depression in order to identify those at risk for

persistence in depressive symptoms. Identifying those with a history of depression might assist in the early management of depression and thus improve patient outcomes.

Perceived social support

The results of the current study indicate that the level of perceived social support in the sample was moderate. Furthermore, patients perceived their social support coming from family members more than other friends or significant others. This is congruent with the nature of Arab culture which is socially bonded and where the family is of great importance (Hamed, 2012). The family is considered the main source of support in typical Jordanian culture and thus individuals would expect higher support from family during stressful situations (Hamdan-Mansour and Dawani, 2008).

This study indicated that low perceived social support significantly predicted persistence in depressive symptoms during the first 6 months of ACS. These findings are compatible with a study by Mittag *et al*. (2016) reporting that low perceived social support is associated with persistent depressive symptoms in 252 patients with acute cardiac event. This is also congruent with a study by Hammond *et al*. (2008) which enrolled 191 patients after a cardiac event and evaluated depressive symptoms at both baseline and one month after cardiac event. They found that low perceived social support, as measured by a subjective social support scale, was associated with an increased risk of persistent depressive symptoms after 1 months. The current findings are also consistent with cross-sectional studies which found a significant negative association between low perceived social support and depressive symptoms in patients with ACS (Ghannam *et al*., 2014; Allabadi *et al*., 2019; Trick *et al*., 2019).

Findings indicate that low perceived social support predict persistence in depressive symptoms. These findings highlight the importance of assessing perceived social support for those who experience ACS in order to reduce the risk of persistence in depressive symptoms. Perception of social support goes

beyond having a family and friend. It reflects both availability of the support as well as satisfaction with support (Sarason *et al*., 1990). Accordingly, health care professionals should provide patients with support during hospitalisation and encourage their families to be involved in the process of caring in order to improve patients' perception of the support received. They should also deliver a psychoeducational training that focuses on cognitive reframing in order to boost patients perception of social support.

In summary, this study found that coping strategies, Type D personality, perceived social support and history of depression are important psychosocial factors for predicting persistent depressive symptoms relative to no depressive symptoms. One important finding in this study is that only three factors (Type D personality, perceived social support and dysfunctional coping) were able to predict persistence of depression relative to decreased depression. These findings indicate that depressed patients who have Type D personality, low perceived social support or use more dysfunctional coping strategies are less likely to have transient depressive symptoms over 6 months of ACS.

Demographics and health-related behaviours

In the current study, the univariate analysis for socio-demographics and health-related behaviours showed that gender and monthly income, obesity and smoking status were found to be significantly associated with different trajectory groups. When gender, monthly income, obesity (BMI ≥ 30) and smoking status were included together in a multivariate model, all remained significant predictors of different depressive symptoms trajectory groups. These are discussed below.

Smoking status

The study findings showed that current smokers were more likely to follow trajectory of increasing depressive symptoms relative to no depressive symptoms trajectory and relative to decreased depressive symptoms trajectories. These findings were consistent with two Australian studies that

employed GMM to identify trajectories of depressive symptoms and found that current smoking status was a significant predictor of worsening depressive symptoms over time (Murphy *et al*., 2008a; Murphy *et al*., 2014a). The current findings are also consistent with two studies examining trajectories of depressive symptoms in cardiac patients including those with ACS and found that being a current smoker was significantly associated with development of depressive symptoms at 3 months and 12 months respectively (Schrader *et al*., 2004; Schrader *et al*., 2006). Similarly, Murphy *et al*. (2020) found that being a current smoker significantly predicted development of depression in early (2-4 months) and late (6-12 months) period of acute cardiac event.

The association between smoking and depression has been consistently reported in cross-sectional studies (Doyle *et al*., 2011b; Smolderen *et al*., 2015; Allabadi *et al*., 2019; Trick *et al*., 2019). However, it is still unclear whether smoking leads to depression or depression encourages individuals to start smoking (Fluharty *et al*., 2016). The relationship between smoking and depression seems to be bidirectional (Fluharty *et al*., 2016). However, a possible explanatory mechanism is that nicotine stimulates the release of dopamine neurotransmitter which is often low in depressed patients and this produces a temporary positive affect (Mendelsohn, 2012). Because of this effect, it is possible that patients who experience stressful events may start to use smoking as a coping mechanism or as self-medication to boost their mood. Healthcare professionals should encourage patients to quit smoking and to provide them with individualised treatment plan that includes both medical and behavioural treatment. There is a need for a national health campaign to encourage smoking cessation in Jordan given that the country is among the highest in the world in rates of smoking. A national survey from the Jordanian Ministry of health in collaboration with World Health Organisation Regional Office for the Eastern Mediterranean (WHO EMRO) reported that every 8 in every 10 men in Jordan are smokers or addicted to nicotine (WHO EMRO, 2021).

Monthly income

Growing evidence suggests that individuals with low income are more vulnerable to mental health illnesses such as depression (Ridley *et al*., 2020; Shields-Zeeman *et al*., 2021). A study by Ridley *et al*. (2020) reported that individuals with low income were 1.5 to 3 times more likely to become depressed than those with high income. Similar findings of positive association between low income and depression were reported by studies in patients with ACS (Trick *et al*., 2019; Murphy *et al*., 2020; Pogosova *et al*., 2021). The mechanisms by which income may be associated with depression include (a) those with low income may have higher worries about costs of illness treatment, follow-up visits and counselling services and this may worsen their mental health (Ridley *et al*., 2020). Furthermore, (b) patients with low income may have high level of stress and this may trigger depression (Fell and Hewstone, 2015), (c) There is a possibility that those with low incomes may have low social interactions and this could lead to social isolation and increased risk of depression (Ridley *et al*., 2020). Lastly, (d) a systematic review and meta-analysis recently published in the Lancet Public Health suggests a unidirectional causal impact of income on mental health and wellbeing. The study reported that the "decrease" in the income was associated with worsen mental health and wellbeing while the increase the income was associated with an improvement in mental health and wellbeing (Shields-Zeeman *et al*., 2021)

The current study found that low monthly income was a significant predictor of persistent depressive symptoms in patients with ACS. These findings are consistent with a study by Gilmer *et al*. (2005) which enrolled 1380 persons with depression from 41 clinics in the United States and evaluated risk factors for persistence of depression over 2 years. The study found that low income was significantly associated with persistence of depressive symptoms (Gilmer *et al*., 2005). These findings were consistent with a systematic review of literature on 25 studies related to trajectories of depressive symptoms and their predictors in the general population (Musliner *et al*., 2016).The study identified that low income was a predictor of persistent depressive symptoms.

In the context of cardiac illness, Kong *et al*. (2022) examined 10-year trajectories of depressive symptoms for 1787 male and female patients with heart disease. They identified three trajectories of depressive symptoms in female patients including persistent minimal depression, moderate and chronic depression. However, the study found that low income significantly predicted trajectory of moderate depression relative to minimal depression. Another study by Murphy *et al*. (2014a) identified three trajectories of depressive symptoms including worsening, resolving and no depression and found that financial stress (being not home owner) predicted trajectories of worsening depressive over 6 months of acute cardiac event.

In summary, low income is associated with an increased risk of persistent depressive symptoms over 6 months of ACS. The explanatory mechanisms could be attributed to causal, stress or social isolation.

Obesity and gender

The multivariate model, which included both demographics and health-related behaviours, suggests that female gender was a significant predictor of decreased depression while obesity was a significant predictor of increased and persistence in depressive symptoms over 6 months of ACS. However, these associations became non-significant when clinical and psychosocial factors were included in the model. These findings should therefore be interpreted with caution due to the small number of patients within increasing and persistent depression groups.

Several studies have found a positive association between obesity and depressive symptoms in patients with ACS (Sanner *et al*., 2013; Sin *et al*., 2016; Murphy *et al*., 2020). For instance, Murphy *et al*. (2020) enrolled 911 patients diagnosed with ACS and elective CABG and found that obesity significantly predicted development of depression in early (2-4 months) and late (6-12 months) period of cardiac event. Furthermore, analysis from the Heart and Soul study provided support for a bidirectional relationship between health-related

behaviours and depression in patients with CHD and found that having higher BMI predicted worsening in depressive symptoms over 5 years (Sin *et al*., 2016). These findings are consistent with a systematic review and meta-analysis (Luppino *et al*., 2010) of 8 longitudinal studies which supported a bidirectional relationship between obesity and depressive symptoms. The study found that obesity is associated with 55% increased the risk of depression over time while depression was associated with 58% increased the risk of obesity (Luppino *et al*., 2010).

Indeed, no single mechanism can explain the association between obesity and depressive symptoms (Frank *et al*., 2022) yet seems to be complex and multifactorial (Plackett, 2022). The mechanism by which obesity is associated with the development of depression might be attributed to the following: Firstly, obesity is associated with multiple comorbidities such as diabetes and sleep apnoea which may increase the risk of depression (Sarwer and Polonsky, 2016). Secondly, obese persons are more likely than non-obese to have a chronic state of inflammation (Plackett, 2022). The state of Inflammation triggers a release of cytokines which suppress serotonin and increase the risk of depression (Lichtblau *et al*., 2013; Plackett, 2022). Thirdly, obesity is associated with dysregulation of the hypothalamic-pituitary-adrenal axis which is associated with increased risk of depression. Fourthly, obesity is associated with social stigma (Mooney and El-Sayed, 2016) and a feeling of low self-esteem which may lead to depression (Patten *et al*., 2008). A recent meta-analysis examined the association between obesity and depressive symptoms in 15 population-based cohorts and found systemic inflammation and obesity-related multimorbidity were important linking mechanisms (Frank *et al*., 2022). In summary, obesity was a significant predictor of increased and persistent depression in a multivariate model which included demographics and health-related behaviours. However, it become non-significant when it was included with other clinical and psychological variables.

With respect to gender, this study found that females were more likely to follow trajectories of a decrease in depressive symptoms over 6 months following ACS. These findings are consistent with Mittag *et al*. (2016) who assessed depressive symptoms on three occasions over 12 months of an acute cardiac event. They found that female gender was a significant predictor of transient depressive symptoms. Similarly, Romppel *et al*. (2012) found female gender significantly predicted decreased depressive symptoms over a 6 year period. However, depressive symptoms were only assessed at two time points. The current study's findings are in line with a recent systematic review of 20 longitudinal studies on depressive symptoms in women with CHD which found that most women experience improvement in depressive symptoms and this mainly occurs in the first 6 months of cardiac event (Buckland *et al*., 2019). Future longitudinal studies are needed to investigate gender differences and their trajectories of depressive symptoms.

Clinical and cardiac-disease severity factors

The univariate analysis found that CCI and LVEF predicted increased and persistent depressive symptoms. Furthermore, the length of hospital stay was found to be a significant univariate predictor of increased, decreased and persistence of depressive symptom groups. The multivariate analysis indicated that only the length of hospital stay variable remained significant in the model when included with CCI and LVEF. The findings indicate that patients who stay longer in hospital were more likely to follow trajectories of increase, decrease and persistent depressive symptoms over 6 months. In other words, longer hospital stay predicted post ACS depression in all times. A limited number of studies were found to evaluate length of hospital stay as a predictor of depressive symptoms and their trajectories after ACS. One of these studies was conducted in patients with ACS in Ireland and found that the length of hospital stay was not a significant predictor of trajectories of depressive symptoms over 12 months (Doyle *et al*., 2011a).

Another study was conducted in Australia and found that length of stay was a significant univariate predictor of moderate to severe depression at 12 months of cardiac event (Schrader *et al*., 2006). However, it became non-significant predictor in the multivariate analysis. A body of evidence suggests that a longer stay in hospital may increase the risk of depression. For instance, a study included 100 patients who were more likely to stay in hospital for 3 weeks or more and assessed depressive symptoms at time of hospitalisation and then after at least 3 weeks on discharge (Saboo and Khapri, 2019). The study found that 55.7% of patients had depression at discharge compared to 12% at time of hospitalisation. Another study was conducted in patients with hip fractures and found that a longer stay in hospital was a significant predictor of depressive symptoms at one year later (van de Ree, 2021). The current findings support the need to reduce unnecessary stay at hospital for ACS patients in order to reduce the risk of increased or persistent depressive symptoms over time.

The researcher's contribution to the body of knowledge surrounding instrument validation

The researcher made a significant contribution to the body of knowledge surrounding the Brief COPE by evaluating its factor structure (Appendix VI). Although the Brief COPE has previously been used in Jordan, no study has evaluated its factor structure, which is an essential component of measuring coping in a valid way. Furthermore, the literature reports considerable variation in the factor structure of the brief COPE and the current validation may help to resolve these inconsistencies. The researcher also contributed to the body of knowledge by reducing the number of subscales from 14 to 4. Using 14 subscales requires a large sample size, thus combining them into a fewer number of scales was of great benefit for the researcher in the current study. It is anticipated that future researchers who are interested in coping as a predictor of outcomes, will find using these four coping subscales to be more convenient than the original 14.

The researcher made another important contribution by translating the Type D personality scale (DS14) into Arabic through a rigorous process of translation and back-translation (Appendix V). The content validity of the translated version was evaluated by six experts, following which piloting was conducted in 25 patients with ACS. In addition, the validity and reliability of the translated version was evaluated. As this scale had not previously been translated and validated in the ACS cohort in Jordan this work is important for future researchers who wish to use the Arabic version of the DS14 scale.

Strengths and Limitations of this study

This study has several strengths.

- This is the first study in Jordan to identify trajectories of depressive symptoms and their predictors in patients with ACS. It is also the first study in Jordan to estimate the incidence of depressive symptoms in this population. Therefore, this study adds to the body of knowledge about depressive symptoms in patients with ACS.
- The low attrition rate adds to the generalisability of the study's results.
- Growth Mixture Modelling was used to capture heterogeneity in depressive symptoms. This is a person-centred approach to analysis that is congruent with a person-centred conceptualisation of coping as proposed by Lazarus and Folkman. GMM also provides greater flexibility over other traditional methods for analysing changes in unequally spaced time-series data and can handle missing values.
- Depressive symptoms were assessed at four-time points. This allowed an examination of different forms of change over time including linear and quadratic growth parameters.
- In consideration of the limitations of previous research and their recommendations, this study used the PHQ-9 as a continuous score as opposed to the dichotomous classification of depressive symptoms.
- This is the first study that translated and validated the Type D Personality Scale in patients with ACS in Jordan. The rigorous process of

translation involved professional translators and academic nurse researchers.

- The Brief COPE scale was validated for its use in this study. In its validation it addressed the inconsistencies in the literature with respect to its factor structure.

On the other hand, the study has some limitations which should be acknowledged and considered.

- Most of the sample were male, therefore the results may not be generalisable to females.
- Depression in this study was not assessed using a clinically structured interview, which is the gold standard. However, depressive symptoms were self-reported using the PHQ-9. The PHQ-9 is a valid instrument recommended by the American and Australian Heart Associations for assessing depression in patients with cardiac illness using a cut-off score of 10 or more (Lichtman *et al*., 2008, Colquhoun *et al*., 2013).
- There may be additional important factors that affect depression, such as anxiety, which were not examined in this study. Evidence suggests that anxiety might comorbid with depression and may exert worsening outcomes than either alone (Doering *et al*., 2010).
- The sample size was relatively small for assessing complex patterns of trajectories of depressive symptoms and their predictors. A small proportion of patients followed trajectories of increasing (7.1%) or persistent depression (8.5%), and this might indicate the need to replicate the study using a larger sample size. However, the methodological approach used in this study for identifying trajectories of depressive symptoms and their predictors were consistent with previous research in this cohort (Martens *et al*., 2008, Murphy *et al*., 2008a, Murphy *et al*., 2008b, Murphy *et al*., 2014a, Mittag *et al*., 2016).

- The study had a relatively short follow-up period of six-months. Longer follow-up duration might identify different pattern of trajectories and capture different forms of change such as quadratic or cubic changes.
- Although this study included the four largest hospitals in Jordan, the results might not be representative of patients in remote areas in Jordan.
- This study only included patients residing in Jordan for the study duration. Therefore, those who were temporarily residing in Jordan or expected to leave during the study timeframe were not included. As Jordan faces an influx of refugees and one in every three individuals in Jordan are non-Jordanians (Ghazal, 2016), the results of the current study are generalisable only to those residing in Jordan.

Conclusion

This chapter provided a discussion of the major results of this study in the context of international literature. The contribution of the study to the advancement of knowledge regarding trajectories of depressive symptoms and their predictors among patients with acute coronary syndrome have also been discussed. Finally, the overall strengths and limitations of the study have been discussed.

Chapter 7: Conclusion and Recommendations

Introduction

This final chapter provides a conclusion to the thesis along with several recommendations and implications for future clinical practice, research, and education. These recommendations are presented in the context of the study's results. The chapter concludes with a plan for dissemination.

7.1 Conclusion to the thesis

In this study, depressive symptoms were found to be prevalent in 23.5% of patients hospitalised with ACS in Jordan, while cumulative incidence of depressive symptoms was estimated to be 8.3% over six months of ACS. Previous studies have reported that incident depression is associated with worse outcomes following ACS. As this is the first study in Jordan to examine the incidence of depressive symptoms following ACS it provides useful and important information about this phenomenon.

Psychosocial factors, such as coping strategies, type D personality, perceived social support, and history of depression, were found to be significant predictors of in-hospital depressive symptoms. In addition, longitudinal analysis identified that trajectories of depressive symptoms were heterogenous over six months with four trajectory groups being identified. These groups included: minimal and decreased, increased, decreased and stable high.

In the final model, psychosocial factors were able to differentiate these trajectories in which type D personality, history of depression, low perceived social support and dysfunctional coping predicted persistence of depressive symptoms. Conversely, less use of problem-focused coping predicted an increase in depressive symptoms. Other important factors for predicting the course of depressive symptoms over six months were smoking, low income and length of hospital stay. This study is the first longitudinal Jordanian cohort study which examined the heterogeneous trajectories of depressive symptoms and their predictors following an acute coronary syndrome. Consequently, these

results greatly inform the body of knowledge in this area of depression and ACS care.

7.2 Recommendations and implications for clinical practice, research and education.

7.2.1 Recommendations and implications for clinical practice

- The results of this study which identified trajectories of depressive symptoms using GMM has the potential to inform policymakers in Jordan. Screening of depressive symptoms is not part of standard in-hospital patient assessment in Jordan. This study found depressive symptoms were prevalent in patients with ACS and for some patients, these symptoms persisted for six months. Therefore, screening of depressive symptoms should be a part of routine assessment. In addition, screening should not be limited to the time of hospitalisation but should be re-assessed in follow-up visits.
- Screening should be comprehensive to include psychosocial factors such as history of lifetime depression, Type D personality, coping and perceived social support. These psychosocial factors were found to predict worsening and persistence in depressive symptoms during the first 6 months of ACS.
- The results of this study found that most patients had minimal symptoms of depression that resolved over time. Depressive symptoms in most patients with ACS could be an adjustment reaction to stress that resolves spontaneously. Thus, screening of depressive symptoms is recommended, but with caution, and initiating treatment such as antidepressants should not be based on one-time assessment.
- Cardiac rehabilitation programmes which include health education and psychological counselling have been found to be effective in improving depression. As there is a limited number of these programmes in

Jordan, more are required to help improve psychological outcomes including depression.

- Following an ACS event, patients should be educated about the symptoms of depression and encouraged to contact their physician if they experience symptoms for 2 weeks or more following discharge from hospital.
- Following an ACS event, healthcare professionals should advise patients about the importance of practicing effective coping strategies, such as problem-focused coping, when they encounter stressful situations.
- Patients who adopt unhealthy behaviours such as smoking, and obesity should be encouraged to stop smoking and reduce weight as they are at higher risk for having increasing or persistent depressive symptoms. Referring current smokers into smoking cessation clinics are warranted.
- There is a need to optimise the available resources for diagnosing and treating patients who experience worsening or persistence in depressive symptoms after ACS in Jordan. A combination of pharmacological treatment and psychotherapy is recommended.

7.2.2 Recommendations and implications for future research

- Although some evidence has reported that Growth Mixture Modelling can be employed in small samples of approximately 100 individuals, larger sample sizes of more than 500 is recommended to evaluate the stability of the current classification. This study included 434 patients and a small proportion of them were found to follow significant trajectories of worsening (n=31, 7.1%) or persistent symptoms (n=39, 8.5%). It is therefore recommended that future studies use a large sample size (n>500) for conducting trajectory analysis.
- Three and four time points are the minimum required to estimate linear and quadratic GMM, respectively. However, additional time points are needed to estimate cubic changes. This study identified four classes with stable and unstable trajectories of depressive symptoms over 6 months. It is therefore recommended that future studies use a longer

follow-up period which may identify a different number of classes, another pattern of trajectories or different form of change (i.e., quadratic or cubic).

- This study addressed trajectories of depressive symptoms and their predictors but did not examine a distal outcome associated with different trajectory groups. Examining Health Related Quality of life (HRQoL) as a distal outcome in patients with ACS is recommended as no previous study has evaluated trajectories of depressive symptoms and their association with HRQoL in this cohort.
- Consistent evidence suggests a negative association between depressive symptoms and HRQoL, therefore it is recommended that future studies examine HRQoL as a distal outcome and determine the causal association between predictors, trajectories of depressive symptoms and HRQoL. Only one study evaluated the longitudinal association between predictors, trajectories of depressive symptoms and outcomes in patients with ACS (Keegan *et al*., 2016). However, the study (a) included psychological vulnerabilities as predictor variables but did not include coping or perceived social support variables and had no information about lifetime history of depression; (b) included outcome variables in the study which were related to mortality and morbidity but did not evaluate HRQoL. The researcher proposes to carry out this work on HRQoL as a post-doc researcher.
- The AHA recommends the identification of subtypes of depressive symptoms most associated with poorer outcome after ACS (Lichtman *et al*., 2014). Two main subtypes of depressive symptoms have been reported to be associated with worse patient outcomes after ACS. The first is the somatic and cognitive subtypes of depressive symptoms. Using confirmatory factor analysis, depressive symptoms can be classified into somatic (i.e., fatigue, sleeping problems) and cognitive symptoms (i.e., loss of interest, negative self-image) (De Jonge *et al*., 2007b). These classes were reported to be differentially associated with poor outcomes in ACS patients, in which somatic rather than cognitive

symptoms were associated with an increased risk of mortality, cardiac events and poor quality of life (Roest *et al*., 2011a, Bekke-Hansen *et al*., 2012, Martens *et al*., 2010, Doyle *et al*., 2010, de Miranda Azevedo *et al*., 2014). It is therefore recommended that future studies examine trajectories of depressive symptoms based on the subtypes of depression, such as somatic/ cognitive, incident/ non incident.

The second subtype of depressive symptoms is categorised according to the time of onset of depression. Some patients experience first-time depression following an ACS event 'incident depression', while others who have a history of depression, develop a new episode 'non-incident depression' (de Jonge *et al*., 2006). Studies that evaluated the impact of incident depression on health outcomes after ACS, have shown this subtype to be an independent risk factor for mortality (Larsen *et al*., 2013, Dickens *et al*., 2008, Grace *et al*., 2005) and cardiovascular complications, both in-hospital (Grewal *et al*., 2010) and during the follow-up period (Ossola *et al*., 2016, de Jonge *et al*., 2006).

- Only one study evaluated trajectories of depressive symptoms based on the somatic /cognitive subtype of depressive symptoms and they found that somatic persistent trajectories were associated with increased 12-month morality after ACS compared to low severity. However, the overall persistent symptom trajectory did not (Roest *et al*., 2016). In addition, none of the 22 studies reviewed by the researcher provided a distinction between trajectories of depressive symptoms for those with first onset of depression and those with previous history of depression. It would be also of importance for future studies to examine trajectories of depressive symptoms based on incident and non-incident subtypes of depression.
- Finally, depressive symptoms might coexist with symptoms of anxiety and impose negative outcomes after ACS (Alhurani *et al*., 2022). The current study had limited information about symptoms of anxiety. Future longitudinal studies could include measures of anxiety and

examine Joint trajectories of depressive symptoms and anxiety after ACS.

7.2.3 Recommendations and implications for education

- Nurses and healthcare professionals need to have the requisite knowledge regarding trajectories of depressive symptoms in ACS and their predictors in order that they can assess, educate, and support these patients appropriately. This will include knowledge about the symptoms of depression and encouraging patients to contact their physician if they experience symptoms beyond discharge. Nurses and healthcare professionals will also need knowledge about the effective coping strategies, such as problem-focused coping, in order that they can impart this information to the patient.

  It is therefore recommended that hospitals provide continuous education to health care providers in cardiac units. This could take the form of orientation programmes for newly appointed staff, in addition to seminars and workshops for all healthcare professionals.
- Healthcare professionals should be educated about the results of this study with respect to the association between length of stay in hospital and worsening and persistent depressive symptoms. Consequently, these patients may require re-assessment and evaluation of depressive symptoms post discharge.
- There is a need to incorporate the concept of coping when addressing depressive symptoms in the nursing curriculum. As a component of this, nursing students should be advised that patients/clients who use dysfunctional coping strategies as opposed to problem-focused coping can be predisposed to worsening or persistence in depressive symptoms after an ACS event.

7.3 Dissemination

The following oral and poster presentations have been disseminated to date.

Oral Presentations

- Nedal Alfasfos, Sharon O'Donnell, Frances O'Brien. (2021) Psychometric properties of Type D Personality Scale (DS14) among Jordanian patients with acute coronary syndrome, Trinity Health and Education International Research Conference 2021 (THEconf2021): 'Transforming healthcare in a changing world: new ways of thinking and working' March 10th-11th 2021,
- Alfasfos N, O'Donnell S., O'Brien F. (2020) Prevalence and Predictors of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome, Trinity Health and Education International Research Conference 2020 (THEconf2020): 'Integrated healthcare: developing person-centred health systems' Trinity College Dublin, 3rd - 5th March 2020

Poster presentation

- Alfasfos N, O'Donnell S, O'Brien F. (2020) Reliability and Validity of the Arabic Version of Brief COPE in Jordanian Patients with Acute Coronary Syndrome, Trinity Health and Education International Research Conference 2020 (THEconf2020): 'Integrated healthcare: developing person-centred health systems' Trinity College Dublin, 03-05 March, 2020

Plan for future dissemination will include:

Papers:

- Prevalence and Predictors of depressive symptoms among patients with ACS
- Reliability and validity of the Arabic version of Brief COPE scale in patients with ACS

- Translation and validation of Type D personality scale among patients with ACS
- Predictors of incident depression among patients with ACS
- Trajectories of depressive symptoms and their predictors among patients with ACS
- Longitudinal modelling of psychosocial factors, trajectories of depressive symptoms and Health-related Quality of life over 6 months of ACS
- Trajectories of incident and recurrent depressive symptoms among patients with ACS

Book: "Growth Mixture Modelling: a step-by-step approach"

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Appendix I: Search strategy for prevalence and predictors of depressive symptoms

CONCEPT 1: Prevalence OR Predictors

PubMed: Prevalence [MeSH Terms]

Note: there was no MeSH Terms for Predictor(s)

CINAHL: MH "Prevalence"

Note: There was no Mesh Heading for predictor(s) in CINAHL

Embase: 'predictors'/exp OR 'prevalence'/exp

PsycINFO: MA Prevalence

Note: There was no thesaurus index term for Prevalence OR predictor(s)

MEDLINE: MH "Prevalence"

Note: There was no Mesh Heading for predictor(s) in MEDLINE

Keywords: “Prevalence” OR “Correlates” OR “Predictors” OR “Predictor”

CONCEPT 2: Depression

PubMed: "Depression"[Mesh] OR "Depressive Disorder"[Mesh] OR "Depressive Disorder, Major"[Mesh]

CINAHL: (MH "Depression")

EMBASE: “depression”/exp OR “major depression”/exp

PsycINFO: (MA Depression)

MEDLINE: (MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")

Keywords : “incident depression” OR “incident depressive” OR “incident depressive disorder” OR “incident depressive illness” OR depression OR depressed OR depressing OR “low mood” OR “low moods” OR Depressions OR “Depressive Symptoms” OR “Depressive Symptom” OR “Emotional Depression” OR “Emotional Depressions” OR “Depressive Disorders” OR “Depressive Disorder” OR “Depressive Syndrome” OR “Depressive Syndromes” OR “feeling blue” OR “major; depression” OR “major; depressive disorder” OR “major depressive episode”

CONCEPT 3: Acute coronary syndrome OR Myocardial infarction OR Unstable angina

PubMed: Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]

CINAHL: (MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")

EMBASE: “acute coronary syndrome”/exp OR “heart infarction”/exp OR “acute heart infarction”/exp OR “unstable angina pectoris”/exp

PsycINFO: (MA Acute Coronary Syndrome OR MA Myocardial Infarction OR MA Angina, Unstable

MEDLINE: MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")

Keywords: “Acute Coronary Syndrome” OR “Acute Coronary Syndromes” OR “Coronary Syndrome, Acute” OR “Coronary Syndromes, Acute” OR “Syndrome, Acute Coronary” OR “Syndromes, Acute Coronary” OR “Acute myocardial infarction” OR “Acute myocardial infarctions” OR unstable angina OR “Myocardial Infarction” OR “Myocardial Infarctions” OR “Heart Attack” OR “Heart Attacks” OR “Myocardial Infarct” OR “Myocardial Infarcts” OR “Unstable Anginas” OR “Unstable Angina Pectori” OR “Unstable Angina Pectoris” OR “Unstable Angina” OR “heart infarction” OR “heart infarction, acute” OR “acute cardiac infarction” OR “acute heart infarction”

Medline search output: Prevalence and predictors

EBSCOhost

Thursday, May 19, 2022 9:32:53 PM

#	Query	Limiters/Expanders	Last Run Via	Results
S12	S4 AND S7 AND S10	Limiters - Linked Full Text; Date of Publication: 20110101-20211231; Human Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	244
S11	S4 AND S7 AND S10	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1,019
S10	S8 OR S9	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1,386,425
S9	MH "Prevalence"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	329,192
S8	"Prevalence" OR "Correlates" OR "Predictors" OR "Predictor"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1,386,425
S7	S5 OR S6	Expanders - Apply equivalent subjects	Interface - EBSCOhost Research Databases	563,934

		Search modes - Boolean/Phrase	Search Screen - Advanced Search Database - MEDLINE	
S6	(MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	235,862
S5	"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	563,934
S4	S2 OR S3	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	209,350
S3	MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	193,537

			Search Screen - Advanced Search Database - MEDLINE	
S2	Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"	Expanders - Apply equivalent subjects Search modes - SmartText Searching	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	43,191
S1	"Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	320,440

Search output EMBASE: Prevalence and predictors

Embase®

Embase Session Results

No.	Query	Results
#12	#2 AND #5 AND #8 AND [2011-2021]/py AND ([article]/lim OR [article in press]/lim OR [conference paper]/lim) AND [humans]/lim	1,297
#11	#2 AND #5 AND #8 AND [2011-2021]/py AND ([article]/lim OR [article in press]/lim OR [conference paper]/lim)	1,310
#10	#2 AND #5 AND #8 AND [2011-2021]/py	2,482
#9	#2 AND #5 AND #8	4,086
#8	#6 OR #7	2,107,310
#7	'predictors'/exp OR 'prevalence'/exp	884,808
#6	'prevalence' OR 'correlates' OR 'predictors' OR 'predictor'	2,094,116
#5	'acute coronary syndrome' OR 'acute coronary syndromes' OR 'coronary syndrome, acute' OR 'coronary syndromes, acute' OR 'syndrome, acute coronary' OR 'syndromes, acute coronary' OR 'acute myocardial infarction' OR 'acute myocardial infarctions' OR 'myocardial infarction' OR 'myocardial infarctions' OR 'heart attack' OR 'heart attacks' OR 'myocardial infarct' OR 'myocardial infarcts' OR 'unstable anginas' OR 'unstable angina pectori' OR 'unstable angina pectoris' OR 'unstable angina' OR 'heart infarction' OR 'heart infarction, acute' OR 'acute cardiac infarction' OR 'acute heart infarction' OR 'acute coronary syndrome'/exp OR 'heart infarction'/exp OR 'acute heart infarction'/exp OR 'unstable angina pectoris'/exp	537,749
#4	'acute coronary syndrome' OR 'acute coronary syndromes' OR 'coronary syndrome, acute' OR 'coronary syndromes, acute' OR 'syndrome, acute coronary' OR 'syndromes, acute coronary' OR 'acute myocardial infarction' OR 'acute myocardial infarctions' OR 'myocardial infarction' OR 'myocardial infarctions' OR 'heart attack' OR 'heart attacks' OR 'myocardial infarct' OR 'myocardial infarcts' OR 'unstable anginas' OR 'unstable angina pectori' OR 'unstable angina pectoris' OR 'unstable angina' OR 'heart infarction' OR 'heart infarction, acute' OR 'acute cardiac infarction' OR 'acute heart infarction'	533,629
#3	'acute coronary syndrome'/exp OR 'heart infarction'/exp OR 'acute heart infarction'/exp OR 'unstable angina pectoris'/exp	480,186
#2	'major depression' OR 'incident depression' OR 'incident depressive' OR 'incident depressive disorder' OR 'incident depressive illness' OR 'depression' OR 'depressed' OR 'depressing' OR 'low mood' OR 'low moods' OR 'depressions' OR 'depressive symptoms' OR 'depressive symptom' OR 'emotional depression' OR 'emotional depressions' OR 'depressive disorders' OR 'depressive disorder' OR 'depressive syndrome' OR 'depressive syndromes' OR 'feeling blue' OR 'major; depression' OR 'major; major depressive disorder' OR 'major depressive episode'	867,689
#1	'depression'/exp OR 'major depression'/exp	573,549

Search output CINAHL: Prevalence and predictors

EBSCOhost

Thursday, May 19, 2022 9:48:05 PM

#	Query	Limiters/Expanders	Last Run Via	Results
S11	S3 AND S6 AND S9	Limiters - Full Text; Published Date: 20110101-20211231 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	268
S10	S3 AND S6 AND S9	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	636
S9	S7 OR S8	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	423,668
S8	MH "Prevalence"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	104,689
S7	"Prevalence" OR "Correlates" OR "Predictors" OR "Predictor"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	423,668
S6	S4 OR S5	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	206,269

			Search Screen - Advanced Search Database - CINAHL Complete	
S5	(MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	122,472
S4	"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	206,269
S3	S1 OR S2	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	94,034
S2	MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	54,007

			Search Screen - Advanced Search Database - CINAHL Complete	
S1	"Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	94,034

Search output PsycINFO: Prevalence and predictors

EBSCOhost

Thursday, May 19, 2022 10:13:22 PM

#	Query	Limiters/Expanders	Last Run Via	Results
S15	S3 AND S6 AND S10	Limiters - Linked Full Text; Publication Year: 2011-2021; Population Group: Human Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	137
S14	S3 AND S6 AND S10	Limiters - Linked Full Text; Publication Year: 2011-2021 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	145
S13	S3 AND S6 AND S10	Limiters - Linked Full Text; Publication Year: 2011-2022 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	146
S12	S3 AND S6 AND S10	Limiters - Linked Full Text Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	277
S11	S3 AND S6 AND S10	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	457

S10	S7 OR S8	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	366,771
S9	MA predictor	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	0
S8	MA Prevalence	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	33,632
S7	"Prevalence" OR "Correlates" OR "Predictors" OR "Predictor"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	366,771
S6	S4 OR S5	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	392,205
S5	MA Depression	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - APA PsycInfo	55,105
S4	"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	392,205

	Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"			
S3	S1 OR S2	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	7,007
S2	MA Acute Coronary Syndrome OR MA Myocardial Infarction OR MA Angina, Unstable	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	2,372
S1	"Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	7,007

Infarct" OR "Myocardial Infarcts"
OR "Unstable Anginas" OR
"Unstable Angina Pectori" OR
"Unstable Angina Pectoris" OR
"Unstable Angina" OR "heart
infarction" OR "heart infarction,
acute" OR "acute cardiac infarction"
OR "acute heart infarction"

Search output PubMed: Prevalence and Predictors

PubMed Advanced Search Builder

PubMed.gov

Filters applied: Full text, Humans. Clear all

Add terms to the query box

All Fields

Enter a search term

ADD Show Index

Query box

Enter / edit your search query here

Search

History and Search Details

Search	Actions	Details	Query	Results	Time
#15	•••		Search: **(((Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")) AND ((Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) AND (((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"))** Filters: **Full text, Humans, from 2011 - 2021**	565	17:00:12

#13	•••	Search: (((Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")) AND ((Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) AND (((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode")) Filters: Full text, from 2011 - 2021	666	16:59:20
#14	•••	Search: (((Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")) AND ((Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) AND (((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode")) Filters: Free full text, Full text, from 2011 - 2021	342	16:57:29

#12	•••	Search: **(((Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")) AND ((Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) AND (((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"))** Filters: **from 2011 - 2021**	698	16:57:12
#11	•••	Search: **(((Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")) AND ((Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) AND (((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"))** Filters: **from 2011 - 2022**	720	16:57:07

#10	•••	Search: **(((Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")) AND ((Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) AND (((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"))**	1,798	16:56:57
#9	•••	Search: **(Prevalence [MeSH Terms]) OR ("Prevalence" OR "Correlates" OR "Predictors" OR "Predictor")**	1,393,040	16:56:17
#8	•••	Search: **Prevalence [MeSH Terms]**	330,396	16:55:52
#7	•••	Search: **"Prevalence" OR "Correlates" OR "Predictors" OR "Predictor"**	1,393,040	16:55:34
#6	•••	Search: **(Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]) OR ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction")**	308,130	16:55:16
#5	•••	Search: **Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable[MeSH]**	208,052	16:55:00
#4	•••	Search: **"Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"**	304,069	16:51:21

#3	•••	Search: **((MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")) OR ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode")**	586,304	16:50:42
#2	•••	Search: **(MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")**	33,227	16:50:25
#1	•••	Search: **"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; depressive disorder" OR "major depressive episode"**	586,304	16:49:19

Showing 1 to 15 of 15 entries

Appendix II: Search strategy for Trajectories of Depressive Symptoms and their Predictors among Patients with Acute Coronary Syndrome

CONCEPT 1: Acute Coronary Syndrome OR Myocardial Infarction OR Unstable Angina

PubMed: Acute Coronary Syndrome [MeSH] OR Myocardial Infarction [MeSH] OR Angina, Unstable [MeSH]

CINAHL: (MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")

EMBASE: “acute coronary syndrome”/exp OR “heart infarction”/exp OR “acute heart infarction”/exp OR “unstable angina pectoris”/exp

PsycINFO: (MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")

MEDLINE: MH "Acute Coronary Syndrome") OR (MH "Myocardial Infarction") OR (MH "Angina, Unstable")

Keywords: “Acute Coronary Syndrome” OR “Acute Coronary Syndromes” OR “Coronary Syndrome, Acute” OR “Coronary Syndromes, Acute” OR “Syndrome, Acute Coronary” OR “Syndromes, Acute Coronary” OR “Acute myocardial infarction” OR “Acute myocardial infarctions” OR unstable angina OR “Myocardial Infarction” OR “Myocardial Infarctions” OR “Heart Attack” OR “Heart Attacks” OR “Myocardial Infarct” OR “Myocardial Infarcts” OR “Unstable Anginas” OR “Unstable Angina Pectori” OR “Unstable Angina Pectoris” OR “Unstable Angina” OR “heart infarction” OR “heart infarction, acute” OR “acute cardiac infarction” OR “acute heart infarction”

CONCEPT 2: Depression

PubMed: "Depression"[Mesh] OR "Depressive Disorder"[Mesh] OR "Depressive Disorder, Major"[Mesh]

CINAHL: (MH "Depression")

EMBASE: “depression”/exp OR “major depression”/exp

PsycINFO: (MH "Depression")

MEDLINE: (MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major")

Keywords I: “incident depression” OR “incident depressive” OR “incident depressive disorder” OR “incident depressive illness” OR depression OR depressed OR depressing OR “low mood” OR “low moods” OR Depressions OR “Depressive Symptoms” OR “Depressive Symptom” OR “Emotional Depression” OR “Emotional Depressions” OR “Depressive Disorders” OR “Depressive Disorder” OR “Depressive Syndrome” OR “Depressive Syndromes” OR “feeling blue” OR “major; depression” OR “major; depressive disorder” OR “major depressive episode”

CONCEPT 3: Trajectories

PubMed: Longitudinal Studies [MeSH]

CINAHL: (MH "Panel Studies”)

EMBASE: “illness trajectory”/exp OR “longitudinal study”/exp

PsycINFO: (MH "Panel Studies”)

MEDLINE: (MH “Longitudinal Studies”)

Keywords: “Longitudinal Studies” OR “Longitudinal Study” OR "trajectory" OR "trajectories" OR “growth analysis” OR “longitudinal course” OR "Longitudinal" OR “latent class growth analysis” OR “latent class analysis” OR “growth mixture models” OR “growth mixture model” OR "parallel latent class growth analysis” OR “group-based model” OR “group-based models” OR “group-based modelling” OR “Panel Studies” OR “illness trajectory”

Search output EMBASE: Trajectories of depressive symptoms

Embase®

Embase Session Results

No.	Query	Results
#13	('acute coronary syndrome'/exp OR 'heart infarction'/exp OR 'acute heart infarction'/exp OR 'unstable angina pectoris'/exp) AND ('depression'/exp OR 'major depression'/exp OR 'incident depression' OR 'incident depressive' OR 'incident depressive disorder' OR 'incident depressive illness' OR depression OR depressed OR depressing OR 'low mood' OR 'low moods' OR depressions OR 'depressive symptoms' OR 'depressive symptom' OR 'emotional depression' OR 'emotional depressions' OR 'depressive disorders' OR 'depressive disorder' OR 'depressive syndrome' OR 'depressive syndromes' OR 'feeling blue' OR 'major; depression' OR 'major; major depressive disorder' OR 'major depressive episode') AND ('longitudinal studies'/exp OR 'longitudinal studies' OR 'longitudinal study'/exp OR 'longitudinal study' OR 'trajectory' OR 'trajectories' OR 'growth analysis' OR 'longitudinal course' OR 'longitudinal'/exp OR 'longitudinal' OR 'latent class growth analysis'/exp OR 'latent class growth analysis' OR 'latent class analysis'/exp OR 'latent class analysis' OR 'growth mixture models' OR 'growth mixture model'/exp OR 'growth mixture model' OR 'parallel latent class growth analysis' OR 'group based model' OR 'group based models' OR 'group-based modelling' OR 'panel studies' OR 'illness trajectory'/exp OR 'illness trajectory') AND [1999-2021]/py	539
#12	('acute coronary syndrome'/exp OR 'heart infarction'/exp OR 'acute heart infarction'/exp OR 'unstable angina pectoris'/exp) AND ('depression'/exp OR 'major depression'/exp OR 'incident depression' OR 'incident depressive' OR 'incident depressive disorder' OR 'incident depressive illness' OR depression OR depressed OR depressing OR 'low mood' OR 'low moods' OR depressions OR 'depressive symptoms' OR 'depressive symptom' OR 'emotional depression' OR 'emotional depressions' OR 'depressive disorders' OR 'depressive disorder' OR 'depressive syndrome' OR 'depressive syndromes' OR 'feeling blue' OR 'major; depression' OR 'major; major depressive disorder' OR 'major depressive episode') AND ('longitudinal studies'/exp OR 'longitudinal studies' OR 'longitudinal study'/exp OR 'longitudinal study' OR 'trajectory' OR 'trajectories' OR 'growth analysis' OR 'longitudinal course' OR 'longitudinal'/exp OR 'longitudinal' OR 'latent class growth analysis'/exp OR 'latent class growth analysis' OR 'latent class analysis'/exp OR 'latent class analysis' OR 'growth mixture models' OR 'growth mixture model'/exp OR 'growth mixture model' OR 'parallel latent class growth analysis' OR 'group based model' OR 'group based models' OR 'group-based modelling' OR 'panel studies' OR 'illness trajectory'/exp OR 'illness trajectory')	564
#11	'longitudinal studies'/exp OR 'longitudinal studies' OR 'longitudinal study'/exp OR 'longitudinal study' OR 'trajectory' OR 'trajectories' OR 'growth analysis' OR 'longitudinal course' OR 'longitudinal'/exp OR 'longitudinal' OR 'latent class growth analysis'/exp OR 'latent class growth analysis' OR 'latent class analysis'/exp OR 'latent class analysis' OR 'growth mixture models' OR 'growth mixture model'/exp OR 'growth mixture model' OR 'parallel latent class growth analysis' OR 'group based model' OR 'group based models' OR 'group-based modelling' OR 'panel studies' OR 'illness trajectory'/exp OR 'illness trajectory'	521,869
#10	'longitudinal studies'/exp OR 'longitudinal studies' OR 'longitudinal study'/exp OR 'longitudinal study' OR 'trajectory' OR 'trajectories' OR 'growth analysis' OR 'longitudinal course' OR 'longitudinal'/exp OR 'longitudinal' OR 'latent class growth analysis'/exp OR 'latent class growth analysis' OR 'latent class analysis'/exp OR 'latent class analysis' OR 'growth mixture models' OR 'growth mixture model'/exp OR 'growth mixture model' OR 'parallel latent class growth analysis' OR 'group based model' OR 'group based models' OR 'group-based modelling' OR 'panel studies' OR 'illness trajectory'/exp OR 'illness trajectory'	521,869
#9	'illness trajectory'/exp OR 'longitudinal study'/exp	166,317
#8	'longitudinal study'/exp	164,487
#7	'illness trajectory'/exp	2,201
#6	'depression'/exp OR 'major depression'/exp OR 'incident depression' OR 'incident depressive' OR 'incident depressive disorder' OR 'incident depressive illness' OR depression OR depressed OR depressing OR 'low mood' OR 'low moods' OR depressions OR 'depressive symptoms' OR 'depressive symptom' OR 'emotional depression' OR 'emotional depressions' OR 'depressive disorders' OR 'depressive disorder' OR 'depressive syndrome' OR 'depressive syndromes' OR 'feeling blue' OR 'major; depression' OR 'major; major depressive disorder' OR 'major depressive episode'	885,965
#5	'incident depression' OR 'incident depressive' OR 'incident depressive disorder' OR 'incident depressive illness' OR depression OR depressed OR depressing OR 'low mood' OR 'low moods' OR depressions OR 'depressive symptoms' OR 'depressive symptom' OR 'emotional depression' OR 'emotional depressions' OR 'depressive disorders' OR 'depressive disorder' OR 'depressive syndrome' OR 'depressive syndromes' OR 'feeling blue' OR 'major; depression' OR 'major; major depressive disorder' OR 'major depressive episode'	840,252
#4	'depression'/exp OR 'major depression'/exp	550,750
#3	'major depression'/exp	72,464
#2	'depression'/exp	550,750

Search output CINAHL: Trajectories of depressive symptoms

Saturday, December 04, 2021 12:40:15 AM

#	Query	Limiters/Expanders	Last Run Via	Results
S14	S6 AND S9 AND S13	Limiters - Published Date: 19990101-20211231 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	148
S13	S11 OR S12	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	130,146
S12	"Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	130,123
S11	(MH "Panel Studies")	Expanders - Apply equivalent subjects Search modes - SmartText Searching	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	6,094

S10	(MH "Panel Studies")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	972
S9	S7 OR S8	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	199,546
S8	"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	199,546
S7	(MH "Depression")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	118,850
S6	S4 OR S5	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	91,846
S5	"Acute Coronary Syndrome" OR	Expanders - Apply equivalent subjects	Interface - EBSCOhost Research Databases	91,846

	"Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"	Search modes - Boolean/Phrase	Search Screen - Advanced Search Database - CINAHL Complete	
S4	S1 OR S2 OR S3	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	53,063
S3	(MH "Angina, Unstable")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	2,557
S2	(MH "Myocardial Infarction")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	46,508
S1	(MH "Acute Coronary Syndrome")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	7,184

Search strategy PsycINFO: Trajectories of depressive symptoms

Saturday, December 04, 2021 1:20:29 PM

#	Query	Limiters/Expanders	Last Run Via	Results
S14	S5 AND S8 AND S12	Limiters - Publication Year: 1999-2021 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	166
S13	S5 AND S8 AND S12	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	190
S12	S9 OR S10 OR S11	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	191,120
S11	"Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	191,089
S10	MA Panel Studies	Expanders - Apply equivalent subjects	Interface - EBSCOhost Research Databases	9,183

		Search modes - SmartText Searching	Search Screen - Basic Search Database - APA PsycInfo	
S9	MA Panel Studies	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	9,183
S8	S6 OR S7	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	382,929
S7	"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR "depression" OR "depressed" OR "depressing" OR "low mood" OR "low moods" OR "Depressions" OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	382,929
S6	MA depression	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	54,331
S5	S1 OR S2 OR S3 OR S4	Expanders - Apply equivalent subjects	Interface - EBSCOhost Research Databases	6,919

		Search modes - Boolean/Phrase	Search Screen - Basic Search Database - APA PsycInfo	
S4	"Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pecton" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	6,919
S3	MA unstable angina	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	68
S2	MA myocardial infarction	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	2,093
S1	MA acute coronary syndrome	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - APA PsycInfo	278

Search output Medline: Trajectories of depressive symptoms

Saturday, December 04, 2021 12:02:29 AM

#	Query	Limiters/Expanders	Last Run Via	Results
S14	S6 AND S9 AND S13	Limiters - Date of Publication: 19990101-20211231 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	300
S13	S11 OR S12	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	433,083
S12	"Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	432,508
S11	(MH "Panel Studies")	Expanders - Apply equivalent subjects Search modes - SmartText Searching	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	47,438

S10	(MH "Panel Studies")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	0
S9	S7 OR S8	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	547,837
S8	"incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	547,837
S7	(MH "Depression")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	135,137
S6	S4 OR S5	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	314,527
S5	"Acute Coronary Syndrome" OR	Expanders - Apply equivalent subjects	Interface - EBSCOhost Research Databases	314,527

	"Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"	Search modes - Boolean/Phrase	Search Screen - Advanced Search Database - MEDLINE	
S4	S1 OR S2 OR S3	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	190,366
S3	(MH "Angina, Unstable")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	9,230
S2	(MH "Myocardial Infarction")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	171,692
S1	(MH "Acute Coronary Syndrome")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	17,919

Search output PubMed: Trajectories of depressive symptoms

Search	Actions	Details	Query	Results	Time
#14	•••		Search: ((((("Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory"))) OR "Longitudinal Studies"[Mesh])) AND ((((("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode"))) OR ("Depression"[Mesh] OR "Depressive Disorder"[Mesh] OR "Depressive Disorder, Major"[Mesh]))) AND (((((("Acute Coronary Syndrome"[Mesh]) OR "Myocardial Infarction"[Mesh]) OR "Angina, Unstable"[Mesh])) OR (("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) Filters: from 1999 - 2021 Sort by: Most Recent	294	08:49:17

#13	•••	Search: ((((((("Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory")))) OR "Longitudinal Studies"[Mesh])) AND ((((("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode"))) OR ("Depression"[Mesh] OR "Depressive Disorder"[Mesh] OR "Depressive Disorder, Major"[Mesh]))) AND (((((("Acute Coronary Syndrome"[Mesh]) OR "Myocardial Infarction"[Mesh]) OR "Angina, Unstable"[Mesh])) OR (("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) Sort by: **Most Recent**	339	08:43:51

#12	•••	Search: ("Longitudinal Studies"[Mesh]) OR ("Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory") Sort by: **Most Recent**	425,638	08:42:25
#11	•••	Search: "Longitudinal Studies" OR "Longitudinal Study" OR "trajectory" OR "trajectories" OR "growth analysis" OR "longitudinal course" OR "Longitudinal" OR "latent class growth analysis" OR "latent class analysis" OR "growth mixture models" OR "growth mixture model" OR "parallel latent class growth analysis" OR "group based model" OR "group based models" OR "group-based modelling" OR "Panel Studies" OR "illness trajectory" Sort by: **Most Recent**	425,638	08:41:03
#10	•••	Search: "Longitudinal Studies"[Mesh] Sort by: **Most Recent**	153,048	08:40:41
#9	•••	Search: ((("Depression"[Mesh]) OR ("Depressive Disorder"[Mesh])) OR ("Depressive Disorder, Major"[Mesh])) OR (("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode")) Sort by: **Most Recent**	570,083	08:39:50

#8	•••	Search: ("incident depression" OR "incident depressive" OR "incident depressive disorder" OR "incident depressive illness" OR depression OR depressed OR depressing OR "low mood" OR "low moods" OR Depressions OR "Depressive Symptoms" OR "Depressive Symptom" OR "Emotional Depression" OR "Emotional Depressions" OR "Depressive Disorders" OR "Depressive Disorder" OR "Depressive Syndrome" OR "Depressive Syndromes" OR "feeling blue" OR "major; depression" OR "major; major depressive disorder" OR "major depressive episode") Sort by: Most Recent	570,083	08:38:59
#7	•••	Search: (("Depression"[Mesh]) OR ("Depressive Disorder"[Mesh])) OR ("Depressive Disorder, Major"[Mesh]) Sort by: Most Recent	237,109	08:38:30
#6	•••	Search: ((("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction"))) OR ((("Angina, Unstable"[Mesh]) OR "Myocardial Infarction"[Mesh]) OR "Acute Coronary Syndrome"[Mesh]) Sort by: Most Recent	302,075	08:36:56

#5	•••	Search: ("Acute Coronary Syndrome" OR "Acute Coronary Syndromes" OR "Coronary Syndrome, Acute" OR "Coronary Syndromes, Acute" OR "Syndrome, Acute Coronary" OR "Syndromes, Acute Coronary" OR "Acute myocardial infarction" OR "Acute myocardial infarctions" OR unstable angina OR "Myocardial Infarction" OR "Myocardial Infarctions" OR "Heart Attack" OR "Heart Attacks" OR "Myocardial Infarct" OR "Myocardial Infarcts" OR "Unstable Anginas" OR "Unstable Angina Pectori" OR "Unstable Angina Pectoris" OR "Unstable Angina" OR "heart infarction" OR "heart infarction, acute" OR "acute cardiac infarction" OR "acute heart infarction") Sort by: **Most Recent**	298,184	08:35:52
#4	•••	Search: (("Acute Coronary Syndrome"[Mesh]) OR ("Myocardial Infarction"[Mesh])) OR ("Angina, Unstable"[Mesh]) Sort by: **Most Recent**	203,676	08:35:04
#3	•••	Search: "Angina, Unstable"[Mesh] Sort by: **Most Recent**	11,149	08:34:31
#2	•••	Search: "Myocardial Infarction"[Mesh] Sort by: **Most Recent**	184,133	08:34:11
#1	•••	Search: "Acute Coronary Syndrome"[Mesh] Sort by: **Most Recent**	17,954	08:33:23

Showing 1 to 14 of 14 entries

Appendix III: Structured Interview Questions and All Questionnaires

Structured Interview Questions

"Have you ever been diagnosed with or had a history of depression for a period of two weeks or more?" A. Yes B. No

If yes, the patient will be further assessed by the following version of Patient Health Questionnaire:

"For the 2 weeks in your life that you were the most blue, sad, or depressed, how often were you bothered by any of the following problems?"	**Not at all**	**Several Days**	**More than half the days**	**Nearly Every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling asleep or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself- or that you are a failure or have let yourself or family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite- being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
Add Columns	_____	+	_____	+

_____Total __

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of the things at home, or g*et al*ong with other people?

Not difficult at all	Somewhat Difficult	Very difficult	Extremely difficult

Self-Reported Questionnaires

Personal details

Instructions: Please provide a response for each of the following questions:

1- What is your age? _____ years

2- Are you ○ Female ○ Male

3-What is your marital status?

○ Single ○ Married ○ Divorced ○ Widowed

4- What is your average monthly income?

○ 500 Jordanian Dinar or less ○ More than 500 Jordanian Dinar.

5-What is your highest level of education?

○ Primary level or less ○ Secondary level ○ University level or above

6-Which of the following describes your living arrangement?

○ Alone ○ With family

○ With significant other ○ In Institutional organization.

7-Do you have medical insurance?

○ Yes ○ NO

8-What is your current employment status?

○ Employed ○ Unemployed ○ Retired

9-What is your smoking status?

○ Currently Smoker ○ Former smoker ○ Non-smoker

10. Is there a history of depression in your family?

○ Yes ○ NO

Medical History and Clinical Data (Completed by the Research Nurse)

1. Medical diagnosis:

   ○ ST elevation Myocardial Infarction

   ○ Non- ST elevation Myocardial Infarction

   ○ Unstable Angina

2. Length of hospital stay ……. days
3. Total blood cholesterol level …… mmol / L, or…….. mg/dL
4. Body Mass Index ○ ≥ 30 kg/m^2 ○ <30 kg/m^2
5. Left Ventricular Ejection Fraction ○ ≥40% ○ < 40%
6. Global Registry for Acute Coronary Events score (GRACE) …….
7. Charlson Comorbidity Index score (CCI) ……

Charlson Comorbidity Index (CCI)		
Comorbidities		**Score**
Myocardial Infarction		1
Congestive Heart Failure		1
Peripheral Vascular disease		1
Cerebrovascular disease		1
Dementia		1
Chronic obstructive pulmonary disease		1
Connective Tissue disease		1
Peptic Ulcer disease		1
Diabetes Mellitus		1 point if uncomplicated 2 points if end-organ damage
Moderate to severe chronic kidney disease		2
Hemiplegia		2
Leukemia		2
Malignant Lymphoma		2
Solid Tumor		2 points 6 points if metastatic
Liver disease		1 point if mild 3 points if moderate to severe
AIDS		point

PHQ Questionnaire- Baseline

Since your hospitalisation on this occasion, how often have you been bothered by any of the following problems?	**Not at all**	**Several Days**	**More than half the days**	**Nearly Every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling asleep or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself- or that you are a failure or have let yourself or family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
Add Columns _____	+	_____	+	

_____

Total _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of the things at home, or g*et al*ong with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Brief COPE

These items deal with ways you've been coping with the stress in your life. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

	I haven't been doing this at all	I've been doing this a little bit	I've been doing this a medium amount	I've been doing this a lot
1. I've been turning to work or other activities to take my mind off things.	1	2	3	4
2. I've been concentrating my efforts on doing something about the situation I'm in.	1	2	3	4
3. I've been saying to myself "this isn't real.".	1	2	3	4
4. I've been using alcohol or other drugs to make myself feel better.	1	2	3	4
5. I've been getting emotional support from others.	1	2	3	4
6. I've been giving up trying to deal with it.	1	2	3	4
7. I've been taking action to try to make the situation better.	1	2	3	4

8. I've been refusing to believe that it has happened.	1	2	3	4
9. I've been saying things to let my unpleasant feelings escape.	1	2	3	4
10. I've been getting help and advice from other people	1	2	3	4
11. I've been using alcohol or other drugs to help me get through it.	1	2	3	4
12. I've been trying to see it in a different light, to make it seem more positive.	1	2	3	4
13. I've been criticizing myself.	1	2	3	4
14. I've been trying to come up with a strategy about what to do.	1	2	3	4
15. I've been getting comfort and understanding from someone.	1	2	3	4
16. I've been giving up the attempt to cope.	1	2	3	4
17. I've been looking for something good in what is happening.	1	2	3	4
18. I've been making jokes about it.	1	2	3	4
19. I've been doing something to think about it less, such as going to movies, watching TV, reading,	1	2	3	4

daydreaming, sleeping, or shopping.				
20. I've been accepting the reality of the fact that it has happened	1	2	3	4
21. I've been expressing my negative feelings.	1	2	3	4
22. I've been trying to find comfort in my religion or spiritual beliefs.	1	2	3	4
23. I've been trying to get advice or help from other people about what to do.	1	2	3	4
24. I've been learning to live with it.	1	2	3	4
25. I've been thinking hard about what steps to take.	1	2	3	4
26. I've been blaming myself for things that happened.	1	2	3	4
27. I've been praying or meditating.	1	2	3	4
28. I've been making fun of the situation	1	2	3	4

Type D Personality (DS14)

Below are a number of statements that people often use to describe themselves. Please read each statement and then *circle* the appropriate number next to that statement to indicate your answer. There are no right or wrong answers: Your own impression is the only thing that matters.

0 = FALSE **1** = RATHER FALSE **2** = NEUTRAL **3** = RATHER TRUE **4** = TRUE

1	I make contact easily when I meet people	0	1	2	3	4
2	I often make a fuss about unimportant things	0	1	2	3	4
3	I often talk to strangers	0	1	2	3	4
4	I often feel unhappy	0	1	2	3	4
5	I am often irritated	0	1	2	3	4
6	I often feel inhibited in social interactions	0	1	2	3	4
7	I take a gloomy view of things	0	1	2	3	4
8	I find it hard to start a conversation	0	1	2	3	4
9	I am often in a bad mood	0	1	2	3	4
10	I am a closed kind of person	0	1	2	3	4
11	I would rather keep other people at a distance	0	1	2	3	4
12	I often find myself worrying about something	0	1	2	3	4
13	I am often down in the dumps	0	1	2	3	4
14	When socializing, I don't find the right things to talk about	0	1	2	3	4

Multidimensional Scale of Perceived Social Support

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Very Strongly Disagree**

Circle the "2" if you **Strongly Disagree**

Circle the "3" if you **Mildly Disagree**

Circle the "4" if you are **Neutral**

Circle the "5" if you **Mildly Agree**

Circle the "6" if you **Strongly Agree**

Circle the "7" if you **Very Strongly Agree**

1.	There is a special person who is around when I am in need.	1	2	3	4	5	6	7	SO
2.	There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7	SO
3.	My family really tries to help me.	1	2	3	4	5	6	7	Fam
4.	I get the emotional help and support I need from my family.	1	2	3	4	5	6	7	Fam
5.	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7	SO
6.	My friends really try to help me.	1	2	3	4	5	6	7	Fri
7.	I can count on my friends when things go wrong.	1	2	3	4	5	6	7	Fri
8.	I can talk about my problems with my family.	1	2	3	4	5	6	7	Fam
9.	I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7	Fri
10.	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7	SO
11.	My family is willing to help me make decisions.	1	2	3	4	5	6	7	Fam
12.	I can talk about my problems with my friends.	1	2	3	4	5	6	7	Fri

Patient Health Questionnaire (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?	**Not at all**	**Several Days**	**More than half the days**	**Nearly Every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling asleep or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself- or that you are a failure or have let yourself or family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3

Add Columns _____ + _____ +

Total __

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of the things at home, or g*et al*ong with other people?

Not difficult at all	Somewhat Difficult	Very difficult	Extremely Difficult

Appendix IV: Permission to use instruments

MYZONE

Nedal Alfasfos <alfasfon@tcd.ie>

Permission to use Personality Type D scale (D14)

J.K.L. Denollet <J.Denollet@uvt.nl> 28 November 2016 at 13:59
To: Nedal Alfasfos <alfasfon@tcd.ie>

Dear Nedal Alfasfos,

I am happy to grant you permission to translate the DS14 measure of Type D personality into the Arabic language and to use this translation for the purpose of your study on depression in patients with an Acute Coronary Syndrome.

Attached you will find the DS14 scale, and a blueprint of an Egyptian-Arabic translation of the DS14.

This translation was made in 2012 by 3 researchers of the Mansoura University: professors Mohamed Hafez and Sayed Saleh from the Department of Psychiatry, and professor Salma from the Faculty of Psychology. However, I am not able to judge the accuracy of this translation. consideration. For example, I noticed a number of issues in the back-translation:
(1) Response scale, "*May be true*" instead of "*Neutral*": neutral means that the respondent does not have a real opinion about the statement; hence, it may be true but it also may be false. Please reconsider this translation in the sense of no opinion.
(2) Item 6, '*I often feel "frustrated" in social occasions*' instead of '*I often feel "inhibited" in social occasions*'. I am not sure that "frustrated" and "inhibited" mean the same thing in Arabic. Inhibited means that a person does not express his true feelings and thoughts while interacting with other people, that he/she is rather shy or insecure in this type of situations.
(3) Item 11, '*I prefer "to have a space" between me and the people*' instead of '*I prefer to "keep people at a distance"*. The word "distance" in this item is a matter of speaking. It does not refer to a real distance in space, but it refers to a psychological distance in the sense that the respondent does not like that other people get to know his/her feelings and thoughts too well. Hopefully, this translation is helpful to you in further adapting your Arabic version of the DS14 measure.

Please notice that the process of translation also involves back-translation, and I would like to advise you to get a number of people involved in this process of translation/back-translation.

I would appreciate it, if you would mail me the definitive version of your Arabic translation of the DS14, and if you would be willing to keep me posted on the findings of your research.

Kind regards,

Johan Denollet, PhD
Professor of Medical psychology
Tilburg University

Van: Nedal Alfasfos [alfasfon@tcd.ie]

Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS) is a brief research tool designed to measure perceptions of support from 3 sources: Family, Friends, and a Significant Other. The scale is comprised of a total of 12 items, with 4 items for each subscale. My colleagues, Nancy Dahlem, Sara Zimet, Gordon Farley, and I (Gregory Zimet) first published on the MSPSS in the Journal of Personality Assessment in 1988.

Across many studies, the MSPSS has been shown to have good internal and test-retest reliability, good validity, and a fairly stable factorial structure. It has been translated into many languages, including Urdu, Hebrew, Tamil, Danish, Farsi (Persian), French, Italian, Korean, Lithuanian, Hausa, Norwegian, Simplified Chinese, Traditional Chinese, Slovene, Malay, Slovak, Spanish, Swedish, Polish, Portuguese, Romanian, and Thai. For linguistically-validated translations, consider using TransPerfect.

The MSPSS is free to use. Please simply credit the following paper (and any others that are relevant), if you use the scale:

Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment 1988;52:30-41.

MSPSS.pdf

Graduate

Brief COPE

The items below are an abbreviated version of the COPE Inventory. We have used it in research with breast cancer patients, with a community sample recovering from Hurricane Andrew, and with other samples as well. The citation for the article reporting the development of the Brief COPE, which includes information about factor structure and internal reliability from the hurricane sample is below. The Brief COPE has also been translated into several other languages, which have been published separately by other researchers (see below).

We created the shorter item set partly because earlier patient samples became impatient at responding to the full instrument (both because of the length and redundancy of the full instrument and because of the overall time burden of the assessment protocol). In choosing which items to retain for this version (which has only 2 items per scale), we were guided by strong loadings from previous factor analyses, and by item clarity and meaningfulness to the patients in a previous study. In creating the reduced item set, we also "tuned" some of the scales somewhat (largely because some of the original scales had dual focuses) and omitted scales that had not appeared to be important among breast cancer patients. In this way the positive reinterpretation and growth scale became positive reframing (no growth); focus on and venting of emotions became venting (focusing was too tied to the experiencing of the emotion, and we decided it was venting we were really interested in); mental disengagement became self-distraction (with a slight expansion of mentioned means of self-distraction). We also added one scale that was not part of the original inventory--a 2-item measure of self-blame--because this response has been important in some earlier work.

You are welcome to use all scales of the Brief COPE, or to choose selected scales for use. Feel free as well to adapt the language for whatever time scale you are interested in.

Citation: Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine*, 4, 92-100. [abstract]

Following is the BRIEF COPE as we are now administering it, with the instructional orientation for a presurgery interview (the first time the COPE is given in this particular study). Please feel free to adapt the instructions as

MYZONE

Nedal Alfasfos <alfasfon@tcd.ie>

The Arabic Version of Multidimensional Scale of Perceived Social Support

5 messages

Nedal Alfasfos <alfasfon@tcd.ie>
To: a.khalil@ju.edu.jo
Cc: Nedal Alfasfos <alfasfon@tcd.ie>
2 April 2017 at 07:47

Dear Dr.Amani,

I hope this email finds you well. I am currently doing a PhD in Nursing at Trinity College Dublin. I am doing a study on trajectories of depressive symptoms among patients with Acute Coronary Syndrome. I would appreciate if you could send me the Arabic version of Multidimensional Scale of Perceived Social Support (MSPSS) that was used in your studies among Jordanian patients.

I look forward to hearing from you.

Regards,
Nedal Alfasfos

Amani Khalil <A.khalil@ju.edu.jo>
To: Nedal Alfasfos <alfasfon@tcd.ie>
2 April 2017 at 08:10

Dear Nedal
I am happy of this great news, please let me know if you have any question or further inquery, attached is the Arabic version of the PSS (perceived social support scale) that have been used in our publications.
thanks
Amani

Our Vision: to be a leading, global school in the area of nursing education, research, and community services

Amani Anwar Khalil, Associate Professor
Head, Clinical Nursing Department
President, Psi Kappa Chapter-STTI
The University of Jordan, School of Nursing
Quessn Rania AlabdaAllah St
Amman 11942 Jordan
Work phone: +962-6-5355000 ext-23146/23131

From: Nedal Alfasfos [alfasfon@tcd.ie]
Sent: Sunday, April 02, 2017 9:47 AM
To: Amani Khalil
Cc: Nedal Alfasfos
Subject: The Arabic Version of Multidimensional Scale of Perceived Social Support

[Quoted text hidden]

Appendix V: Psychometric properties of DS14 measure of Type D personality.

Factor analysis is a statistical method that includes Exploratory (EFA) and Confirmatory factor analysis (CFA) (Brown, 2015). The EFA can be used to explore the factor structure of a set of items without having a previous assumption on number of latent factors or relationship between these factors (Polit & Beck, 2012). EFA is an exploratory method of investigation that can produce unlimited number of solutions. By running EFA, researchers can evaluate the dimensionality of scales, reduce the number of their items and examine their construct validity (Brown, 2015). EFA has been criticised of being subjective method of investigation due to lack of analysis based on theory or research. On the other hand, CFA is commonly used to verify the factor structure based on previous research or theory (Williams *et al.*, 2010). It can be used by researchers to test specific model based on previous assumptions on number of latent factors, and the relationship between factors and items. To ensure appropriate translation of the DS14 into the Arabic language, a validation of factorial structure is required. CFA was carried out using Mplus software version 8.3 to evaluate the hypothesised model of two- factor structure (Negative affectivity and Social inhibition) as indicated by (Denollet, 2005).

Confirmatory Factor Analysis.

CFA was conducted using Weighted Least Squares Mean and Variance Adjusted (WLSMV) as a model estimator. The WLSMV estimator was chosen because items of DS14 measured on a five-point ordinal scale. Proitsi and colleagues (2009) reported that WLSMV method of estimation would be the best choice when the data is ordinal. One factor solution was compared to two-factor solution based on model fit indices. In one-factor model, all items of DS14 were loaded into a single factor. However, in the two-factor model, we specified 7 items (2,4,5,7,9,12,13) for one factor (Negative affectivity) and 7 items (1,3,6,8,10,11,14) for another factor (Social inhibition).

Several model fit indices were considered to estimate model fit such as Chi-squared statistics ($\chi 2$), Root Mean Square Error of Approximation (RMSEA), Comparative fit indices (CFI), Tuker-Lewis index (TLI) and Standardized Root Mean Square Residual (SRMR). Kline (2005) suggested to use several indices simultaneously to indicate a goodness of model fit. The interpretation of goodness of fit was based on the previously recommended cut-off points (Plichta *et al.*, 2013). For $\chi 2$ test, a good model of fit indicated by insignificant *p* value (>0.05) and when the ratio of $\chi 2$ value to degree of freedom (*df*) was equal to three or less. Regarding RMSEA and SRMR indices, values

blow a cut-off point of 0.08 and 0.05 suggest adequate and good model of fit, respectively. For CFI and TLI indices, values above 0.9 indicated reasonable fit and values above 0.95 suggest a good model of fit. Accordingly, the fit indices for one factor model $\chi 2$ (77) = 871.624; P < 0.001; RMSEA = 0.154; CFI =0.886, TLI = 0.886, SRMR =0.118) indicted a poor model fit.

By comparing the fit indices of one-factor to two-factor model ($\chi 2$ (76) = 113.475, *P*=0.0035; RMSEA = 0.034; CFI =0.995, TLI = 0.994, RMR =0.028), the two-factor model had good fit indices of RMSEA, TLI, CFI, and SRMR whereas the one factor had not. However, both models showed nonsignificant *P* value on $\chi 2$ test. As shown in Table 2, the two-factor model has a lower $\chi 2$ value and Degree of freedom (*df*) than those for one factor model, indicating a better fit to the data.

Table 1: Fit indices for one factor and two factor models of the Arabic version of DS14 (N= 434)

Model	$\chi 2$	*df*	*P*	$\chi 2$ /df	RMSEA	CI 90% for RMSEA	CFI	TLI	SRMR
1-Factor Model	871.624	77	0.000	11.30	0.154	(0.145-0.163)	0.886	0.886	0.118
2 Factor Model	113.475	76	0.0035	1.49	0.034	(0.020-0.046)	0.995	0.994	0.028

External validity and Reliability

Using the cut-off point of 10 or more for both NA and SI. The prevalence of Type D personality in patients with ACS was 25.6% (N=111). Reliability of the DS14 was evaluated using the measure of internal consistency (Cronbach's Alpha) and corrected item- total correlation. The NA and SI scales had a Cronbach's alpha of 0.88 and 0.85, respectively. A Cronbach's alpha greater than 0.8 indicates a very good internal constancy. As shown in Table 1, the item-total correlations for NA were between 0.62 and 0.73, and between 5.3 and 6.5 for SI. The item total correlation scores were higher than 0.3, which is the acceptable cut off value to consider item appropriate for the subscale. These findings indicate that the Arabic version of DS 14 has high reliability in patients with ACS. The external validity of the instrument was tested by evaluating ability of each item of NA and SI to distinguish the construct of Type D. Independent t test showed a statistically significant difference between Type D and Non-Type D in all

items of negative affectivity and social inhibition (Table 2). All items of NA and SI had higher mean scores in individuals with type D than in those with non-type D.

In addition, validity was evaluated against other instruments such as PHQ-9, MSPSS and Brief COPE. The results showed a statistically significant difference between patients with Type D compared to those with non-type D in relation to depressive symptoms, perceived social support and coping strategies in which, patients with Type D had significantly higher depressive symptoms and lower perceived social support than those with non-Type D. In addition, patients with Type D personality had higher score of dysfunctional coping and lower score in social coping compared to non-Type D patients (Table 3).

Table 2: Internal consistency and item-total correlation of the Arabic version of DS14

Items	Mean (SD)	Corrected Item-total correlation	α if item deleted	Mean Item	
				Non-Type D	Type D
Negative Affectivity					
D2	1.04 (1.15)	0.670	0.86	0.73	1.95**
D4	1.10 (1.12)	0.728	0.86	0.76	2.08**
D5	1.20 (1.11)	0.624	0.87	0.93	2.01**
D7	1.02 (1.12)	0.678	0.86	0.69	1.95**
D9	1.03 (1.12)	0.656	0.87	0.75	1.87**
D12	0.92 (1.07)	0.675	0.86	0.61	1.83**
D13	1.26 (1.11)	0.630	0.87	1.00	2.04**
	7.58 (5.96)	**α = 0.881**			
Social Inhibition (SI)					
D1®	1.15 (0.94)	0.649	0.82	0.89	1.89**
D3®	1.16 (0.96)	0.648	0.82	0.92	1.86**
D6	1.07 (1.15)	0.525	0.84	0.82	2.28**
D8	1.21 (1.13)	0.646	0.82	0.55	1.80**
D10	0.94 (0.94)	0.594	0.83	0.72	1.59**
D11	0.87 (1.07)	0.571	0.83	0.76	1.99**
D14	1.13 (1.07)	0.622	0.82	0.80	2.11**
	7.54 (5.26)	**α= 0.847**			

* P< 0.01 level (2-tailed).
® Reverse coded items

Table 3: Differences in psychological factors between patients with Type D and non-Type D (N=434)

Measures	Type D	Non-Type D	*p*
	M (SD)	M(SD)	
PHQ-9	8.78 (4.20)	5.54 (4.15)	<.001
MSPSS	55.88(12.41)	60.69(12.59)	<.01
Dysfunctional coping	21.4 (7.36)	18.7(6.43)	<.01
Problem-focused coping	7.98(3.27)	9.08 (3.50)	<.01
Social coping	7.07 (2.38)	8.03 (2.96)	< .01

PHQ: Patient health questionnaire, MSPSS multidimensional scale of perceived social support.

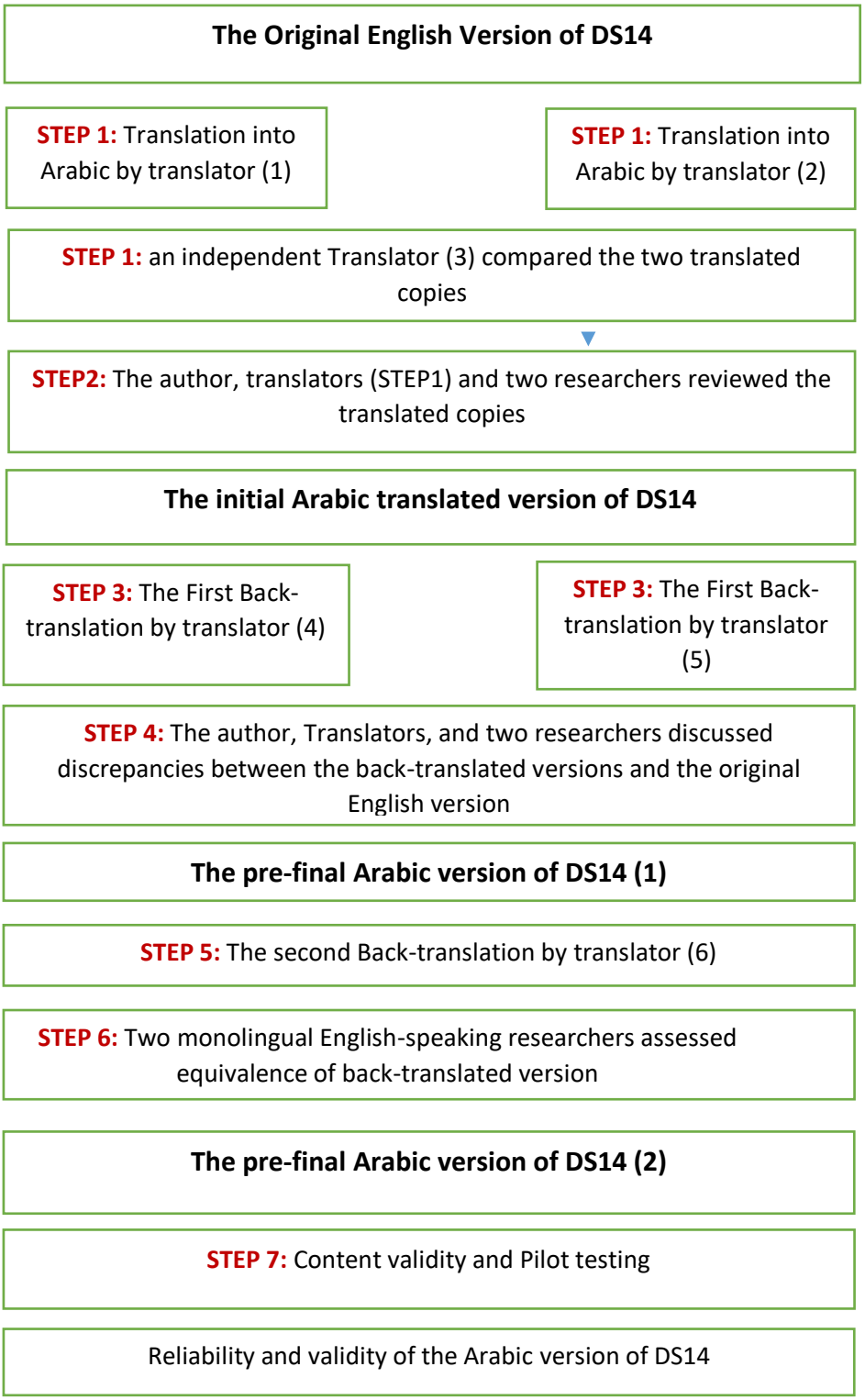
Translation of Personality Type D scale (DS14) into the Arabic language

Forward translation

In the first step of translation, the original version of DS-14 was translated into the Arabic language by two independent professional translators. The translators were bilingual and bicultural. One of them was familiar with psychological terminologies and translation of instruments, whereas the second was specialised in linguistics and idiomatic expressions. The author asked them to focus their translations on the conceptual meaning of the sentences rather than on the strict meaning of the words. The second step was initiated by a third professional translator who was bilingual and bicultural. The third translator reviewed the forward- translated versions item by item and compared them to the original English version. The differences between the translated copies and the original English version were highlighted and resolved between the author, the three translators and a bilingual academic researcher in Mental Health Nursing (MHN). This discussion ended with a consensus on the Initial Arabic Version of DS14 (IAV-DS14).

Backward-Translation

In the third step of translation, the IAV-DS14 was back-translated into the English by two independent professional translators who had no knowledge about the original English version. The translators were bilingual and bicultural with same backgrounds to those who participated in the forward translation. In the fourth step, the author discussed the back-translated copies with the five translators who participated in forward-backward translation and two researchers in MHN. This step found some ambiguous words that were replaced by familiar expressions. Then, a consensus on the Pre-Final Arabic version of DS14 (PA-DS14) was achieved. This copy was back-translated into the English by a professional translator (Step 5). The second back-translated copy was evaluated by two native English-speaking researchers who reported a conceptual, semantic, and content equivalence of the second back-translated version to the original English version (Step 6).


The Original English Version of DS14
STEP 1: Translation into Arabic by translator (1)
STEP 1: Translation into Arabic by translator (2)
STEP 1: an independent Translator (3) compared the two translated copies
STEP2: The author, translators (STEP1) and two researchers reviewed the translated copies
The initial Arabic translated version of DS14
STEP 3: The First Back-translation by translator (4)
STEP 3: The First Back-translation by translator (5)
STEP 4: The author, Translators, and two researchers discussed discrepancies between the back-translated versions and the original English version
The pre-final Arabic version of DS14 (1)
STEP 5: The second Back-translation by translator (6)
STEP 6: Two monolingual English-speaking researchers assessed equivalence of back-translated version
The pre-final Arabic version of DS14 (2)
STEP 7: Content validity and Pilot testing
Reliability and validity of the Arabic version of DS14

Appendix VI: Validation of the Arabic version of Brief COPE scale

First analysis: Principal Component Analysis

In this analysis, I followed a similar EFA approach used by Carver (1997) to identify the high-order dimension of coping. The EFA was conducted on the scale level of the 14 scales of Brief COPE. The analysis was conducted using Principal Component Analysis with Oblimin rotation. The results indicated four distinct components: Instrumental and Emotional social support scales loaded into the first factor and labelled "Social Coping". The active coping and planning scales loaded into the second factor and labelled "Problem-focused Coping". Further, religion, humour, acceptance and positive reframing scales loaded into a third factor and labelled "Emotional-focused Coping". Finally, venting of emotions, Denial, Behavioural disengagement, Self-distraction, Self-blame, and substance use scales were loaded into the fourth component and labelled Dysfunctional Coping. As shown in Table 1, all scales loaded into the corresponding factor with a value above 0.4. Venting and self-distraction loaded into one factor with denial, substance use, self-blame and behavioural disengagement coping strategies but cross-loaded negatively (-.3) into another factor, "Problem Focused Coping". The four-factor solution explained 57.4% of the total variance. Cronbach's α for the four scales were good and ranged from .76 to .84. The correlations between the four scales are shown in table (2). The results indicate that dysfunctional coping strategies had a significant negative correlation with problem-focused coping and other functional emotion-focused strategies. Further, there is a significant positive association between social coping and emotion-focused coping scales and problem-focused coping. These findings indicated the Arabic version of the Brief COPE scale has criterion-related validity.

Table 1: Second order EFA based on total score of scales.

		Component			
	Communality	1	2	3	4
Distraction	.521	**.625**	-.023	-.362	-.209
Denial	.597	**.759**	-.110	-.121	.179
Self-blame	.490	**.693**	-.115	-.208	.027
Venting	.597	**.676**	-.048	-.373	-.224
Behavioral disengagement	.569	**.751**	-.116	-.075	.053
Substance use	.407	**.521**	-.097	.222	.200
Active coping	.740	-.237	.160	**.824**	-.269
Planning	.770	-.197	.155	**.862**	-.195
Emotional Social	.615	-.088	.271	.127	**-.768**
Instrumental social	.664	-.047	.062	.222	**-.789**
Positive reframing	.566	.054	**.731**	.041	-.018
Acceptance	.584	-.121	**.763**	.080	-.150
Humor	.500	-.179	**.696**	.004	-.081
Religion	.413	-.113	**.603**	.192	-.279
Cronbach's alpha		.846	.762	.844	.748
Eigenvalue		3.32	2.10	1.55	1.10
% of variance		23.69	14.78	11.05	7.87
Total Variance	57.39				

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization

Table 2: Correlation and descriptive statistics for the four factor solution of the Arabic Brief COPE

Scales	Mean (SD)	Skewness	Pearson's correlation			
1. Dysfunctional Coping	19.39 (6.78)	.993	1			
2. Emotion-focused coping	17.84 (4.53)	.342	-.137**	1		
3. Problem focused Coping	8.80 (3.48)	.317	-.291**	.192**	1	
4. Social Coping	7.79 (2.85)	.561	-.062	.218**	2.93**	1

** Correlation is significant at the 0.01 level (2-tailed)

Second Analysis: Confirmatory Factor analysis

CFA was performed to identify first-order factors based on three models. The first model (M1) included 14 factors according to the original structure of Brief COPE, whereas other models were based on the EFA performed by Carver (1997). The EFA in that study suggested the following 9 factors: (1) humor, (2) religion, (3) substance use, (4) behavioural disengagement, (5) denial and self-blame (6) self-distraction and venting, (7) instrumental social support and emotional support, (8) active coping, planning, positive reframing and one item from the acceptance scale, (9) the remaining item of acceptance scale. Given that acceptance scale includes a single item and CFA requires at least two items per factor, we decided to evaluate two further models. One of these models (M2) included both items of acceptance scale together in a single factor, whereas an alternative model (M3) included both items in the "active coping factor".

CFA was conducted using Mplus software package version 8.1 (Muthen & Muthen, 1998-2017). The CFA models were tested using Diagonally Weighted Least Squares-Mean and Variance adjusted "WLSMV" estimator. This estimator was chosen because items of Brief COPE were measured by a four- point ordinal scale. The WLSMV is recommended for ordinal items. This estimator has been also used with several studies that examined the factor structure of COPE (Rand *et al*., 2019, Halamová *et al*., 2021, Fernández-Martín *et al*., 2022). The second order factor analysis was explored in this study through using 28 items of Brief COPE as indictors for 14 factors and then using these factors as indictors for second-order factor.

Five models were tested based on previous theories and research. The first model was based on a previous EFA conducted by Sanjuan *et al*. (2016) on cardiac patients, which classified coping into effective and non-effective coping strategies. The second model was another two-dimensional model of problem-focused and emotion-focused coping based on Lazarus and Folkman's (1984) transactional theory of coping. The third model was based on a different two-dimensional model of coping based on a previous EFA on cardiac patients, which classified coping into approach coping and avoidant coping (Bean *et al*. 2009). The fourth model was based on the theoretical structure of COPE inventory as suggested by carver (1989) but operationally measured in Brief COPE by Cooper (2006). This model distinguished between problem-focused, emotion-focused and dysfunctional coping. The fifth and last model was based on the second-order EFA of COPE inventory as suggested by Carver (1989). This classification is similar to the previous model but with additional dimension labelled a social coping. Dimensionality of Brief COPE in these studies are presented in Table 4.

Results

The fit indices for the three first-order models are shown in Table below. The 14-factor model (M1) demonstrated a good fit. However, the other models (M2, M3) showed less satisfactory and poor fit indices, respectively. The standardised factor loading of the 28 items in M1 exceeded the minimum acceptable value of 0.4 (Table 4) indicating a convergent validity. Moreover, all residual variances were significantly different from zero. Correlations between the 14 scales of the Brief COPE are presented in Table 5. Cronbach's alpha was acceptable for the whole scale and for each of the 14 scales (alpha> 0.6) (Table 6).

Table 1: The fit indices for the three first order models

Model**/ First order CFA**	χ^2	*Df*	χ^2/df	RMSEA	90% CI	CFI	TLI	SRMR
M1 (14-factor model)	348.37**	259	1.35	.028	.020-.036	.989	.983	.038
M2 (9-factor model)	1059.6**	314	3.75	.074	.069-.079	.905	.886	.071
M3 (8-factor model)	1309.9**	322	4.07	.084	.079-.089	.874	.853	.085

**P<.001

χ^2 : Chi-Square statistic, df: Degree of freedom, RMSEA: Root Mean Square of Approximation, CFI: Comparative Fit Indices, TLI: Tucker Lewis Index, SRMR: Standardized Root Mean-Square Residual (SRMR).

Given that the 14-factor model (M1) showed a better fit than the other solutions, it has been used as a baseline for the second order model. The first two-dimensional models which were based on the EFA by Sanjuan *et al* (2016) and Lazarus and Folkman showed a poor model fit in all indices. The alternative 2-factor model proposed by Bean *et al* (2009) had better RMSEA and CFA indices than the previous models but still the model showed unacceptable fit. The 3-factor model as suggested by Cooper *et al*. (2008b) demonstrated an acceptable model fit. The final and 4-factor model proposed by EFA conducted by Carver (1989) showed a good fit based on all indices except the SRMR index was acceptable (SRMR=.64). The standardised factor loadings in the final model were above .60 (Fiqure1) and all residual variances were different form zero.

Table 3: The fit indices for the five second order models based on the second approach

Model/Second order CFA	χ^2	*df*	χ^2/df	RMSEA	90% CI	CFI	TLI	SRMR
2-Factor (Sanjuan)	1790.84**	335	5.35	.10	.10-.11	.815	.791	0.11
2-Factor (Lazarus)	1373.87**	335	4.10	.085	.080-.089	.868	.851	.098
2-Factor (Bean)	1144.25**	335	3.42	.075	.070-.079	.897	.884	.089
3-Factor (Cooper)	780.69**	333	2.34	.056	.051-.061	.943	.935	.073
4 -Factor (EFA Carver)	574.52**	330	1.74	.041	.036-.047	.969	.964	.064

**P<.001

χ^2 : Chi-Square statistic, df: Degree of freedom, RMSEA: Root Mean Square of Approximation, CFI: Comparative Fit Indices, TLI: Tucker Lewis Index, SRMR: Standardized Root Mean-Square Residual (SRMR).

Table 4: Dimensionality of the Brief COPE based on the previous theories and research

	Lazarus& Folkman 1984	Bean *et al*. 2009	Cooper *et al*. 2008	Carver 1989	Sanjuan *et al* 2016
Active coping	P	AP	P	P	EF
Planning	P	AP	P	P	EF
Instrumental social support	P	AP	P	S	EF
Emotional social Support	E	AP	E	S	NE
Acceptance	E	AP	E	E	EF
Positive reframing	E	AP	E	E	EF
Humor	E	AV	E	E*	EF
Religion	E	AP	E	E	NE
Substance use	E	AV	D	D**	NE
Behavioural disengagement	E	AV	D	D	NE
Denial	E	AV	D	D	NE
Self-blame	E	AV	D	D	NE
Self-Distraction	E	AV	D	D	EF
Venting	E	AV	D	D	NE

P= Problem-focused coping; E= Emotion-focused coping; AP= Approach coping; AV= Avoidance coping; D= Dysfunctional coping; S= Social Coping; EF= Effective Coping; NE= Non-effective Coping.

*The scale was not included in the higher order EFA by Carver *et al*. (1989) because it has been developed later.

**The scale was not included in the Higher order EFA by Carver *et al*. (1989) because it was only single item

Table 5: Standardized factor loadings of the 28 items based on 14-factor structure model (M1) and the internal consistency reliability of the factors

Scales and items	β	α^a	α^b
Instrumental Support		.75	.64
C10. I've been getting help and advice from other people.	.82		
C23. I've been trying to get advice or help from other people about what to do	.85		
Positive reframing		.62	.64
C12. I've been trying to see it in a different light, to make it seem more positive.	.62		
C17. I've been looking for something good in what is happening.	.83		
Self-blame		.77	.69
C13. I've been criticizing myself.	.91		
C26. I've been blaming myself for things that happened.	.82		
Self-Distraction		.71	.71
C1. I've been turning to work or other activities to take my mind off things.	.78		
C19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	.87		
Acceptance		.68	.57
C20. I've been accepting the reality of the fact that it has happened.	.69		
C24. I've been learning to live with it.	.84		
Religion		.81	.82
C22. I've been trying to find comfort in my religion or spiritual beliefs.	.86		
C27. I've been praying or meditating.	.85		
Humor		.63	.73
C18. I've been making jokes about it.	.71		
C28. I've been making fun of the situation.	.75		
Planning		.74	.73
C14. I've been trying to come up with a strategy about what to do.	.83		
C25. I've been thinking hard about what steps to take.	.81		

Active Coping		.81	.68
C2. I've been concentrating my efforts on doing something about the situation I'm in.	.90		
C7. I've been taking action to try to make the situation better.	.89		
Substance Use		.81	.90
C4. I've been using alcohol or other drugs to make myself feel better.	.93		
C11. I've been using alcohol or other drugs to help me get through it.	.95		
Emotional support		.76	.71
C5. I've been getting emotional support from others.	.86		
C15. I've been getting comfort and understanding from someone.	.83		
Behavioural disengagement		.76	.65
C6. I've been giving up trying to deal with it.	.85		
C16. I've been giving up the attempt to cope.	.89		
Denial		.83	.54
C3. I've been saying to myself "this isn't real".	.94		
C8. I've been refusing to believe that it has happened.	.88		
Venting		.72	.50
C9. I've been saying things to let my unpleasant feelings escape.	.80		
C21. I've been expressing my negative feelings.	.87		

β standardized factor loading of the 28 items based on the 14-factor model (Carver, 1997, M1)
α^a Cronbach's alpha in this study
α^b Cronbach's alpha as reported by Carver (1997)

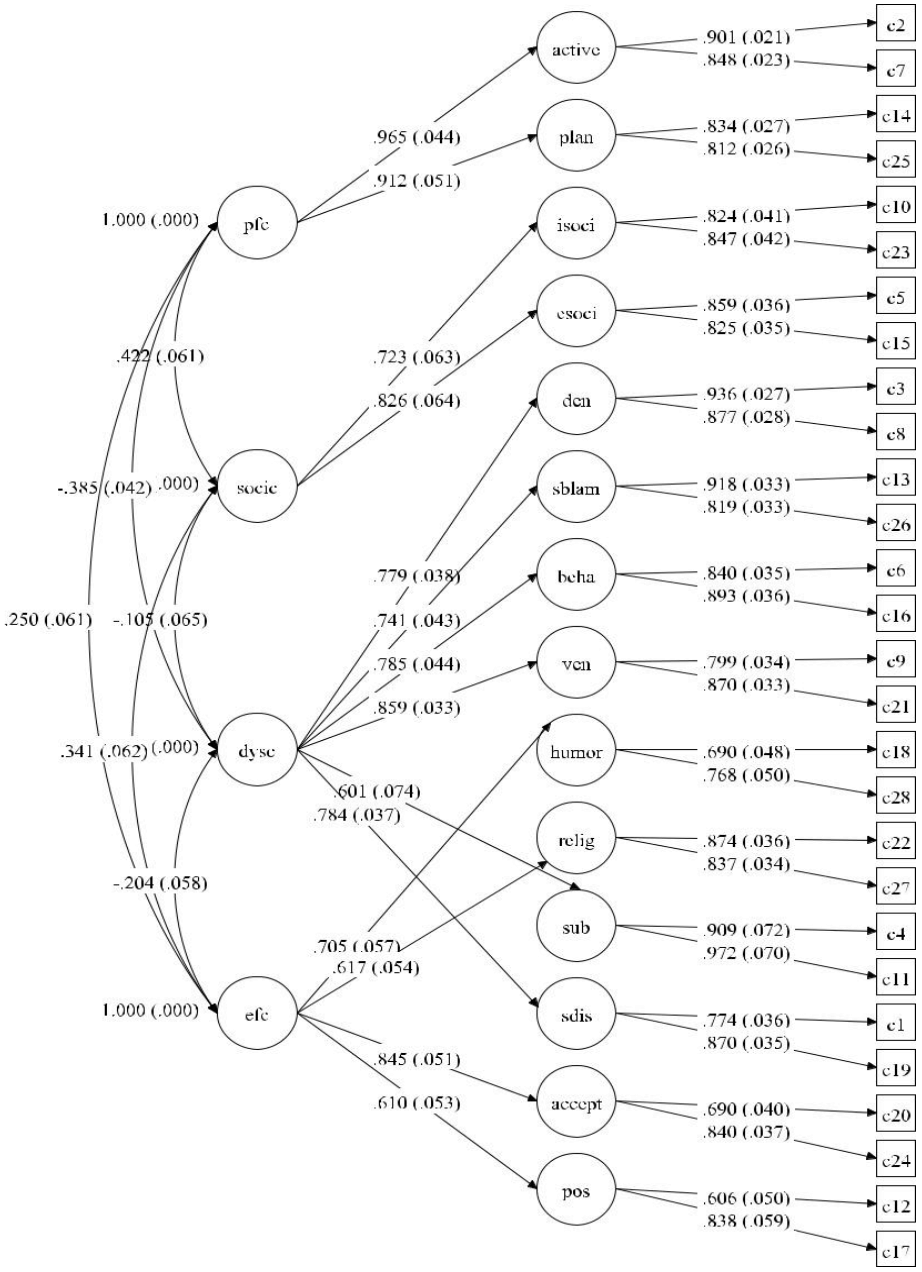
Table 6: Descriptive statistics and reliability of the 14 scales of Brief COPE

	M(SD)	Skewness	α (Carver 1997)	α in this study
Active coping	4.32 (1.90)	.40	.68	.81
Planning	4.48 (1.90)	.26	.73	.74
Instrumental social support	3.92(1.75)	.57	.64	.75
Emotional social Support	3.87(1.63)	.71	.71	.76
Acceptance	4.66(1.62)	.34	.82	.81
Positive reframing	4.16(1.42)	.54	.64	**.62**
Humor	4.20(1.47)	.41	.73	**.63**
Religion	4.88(1.83)	.34	.82	**.81**
Substance use	2.19 (.77)	4.6	.90	**.81**
Behavioural disengagement	3.24 (1.72)	1.3	.65	.76
Denial	3.44(1.87)	1.1	.54	.83
Self-blame	3.61(1.96)	1.1	.69	.77
Self-Distraction	3.57(1.75)	.86	.71	.71
Venting	3.35(1.66)	1.1	.50	.72

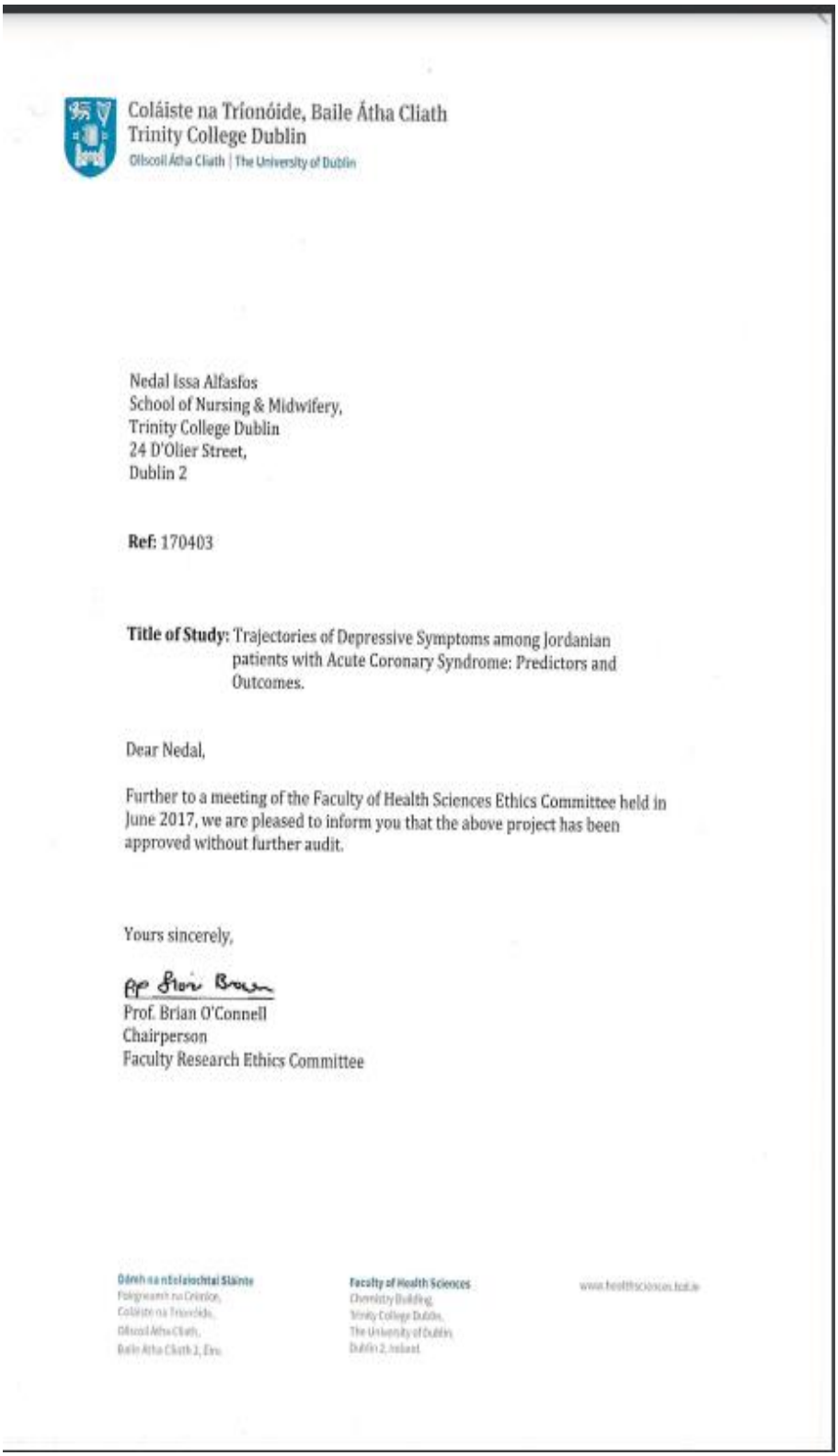
Table 7: Correlations among the 14 scales of the Arabic version of Brief COPE

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Active coping	1												
2. Self-blame	-.24	1											
3.Instrumental social support	.29**	-.01	1										
4. Humor	.08	-.10*	.07	1									
5. Acceptance	.14**	-.09	.06	.34**	1								
6. Behavioural disengagement	-.17**	.48**	-.01	-.11*	-.08	1							
7. Denial	-.23**	.49**	-.11*	-.14**	-.10*	.52**	1						
8.Planing	.67**	-.1.9**	.22**	.062	.12**	-.15**	-.21**	1					
9. Self-Distraction	-.16**	.31**	-.02	-.09	-.05	.29**	.31**	-.2**	1				
10.Venting	-.23**	.34**	.003	-.11*	-.08	.38**	.35**	.-.20**	.63**	1			
11. Positive reframing	.09	-.03	.02	.35**	.39**	-.02	-.08	. 07	.07	.04	1		
12.Emotional Support	.21**	-.06	.42**	.15**	.21**	-.04	-.11*	.19**	.02	-.01	.12*	1	
13. Religion	.17**	.10*	.15**	.26**	.37**	-.12**	-.11*	. 21**	.06	-.03	.23**	.23**	1
14. Substance use	-.06	.16**	-.04	-10*	-.10*	.27**	.29**	-.01	.19**	.20**	-.01	-.03	-.04

Figure (1): The standardised factor loading of all items in the 4-factor model



Appendix VII: Ethical approval Letter from the Faculty of Health Sciences Research Ethics Committee, Trinity College Dublin



Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Nedal Issa Alfasfos
School of Nursing & Midwifery,
Trinity College Dublin
24 D'Olier Street,
Dublin 2

Ref: 170403

Title of Study: Trajectories of Depressive Symptoms among Jordanian patients with Acute Coronary Syndrome: Predictors and Outcomes.

Dear Nedal,

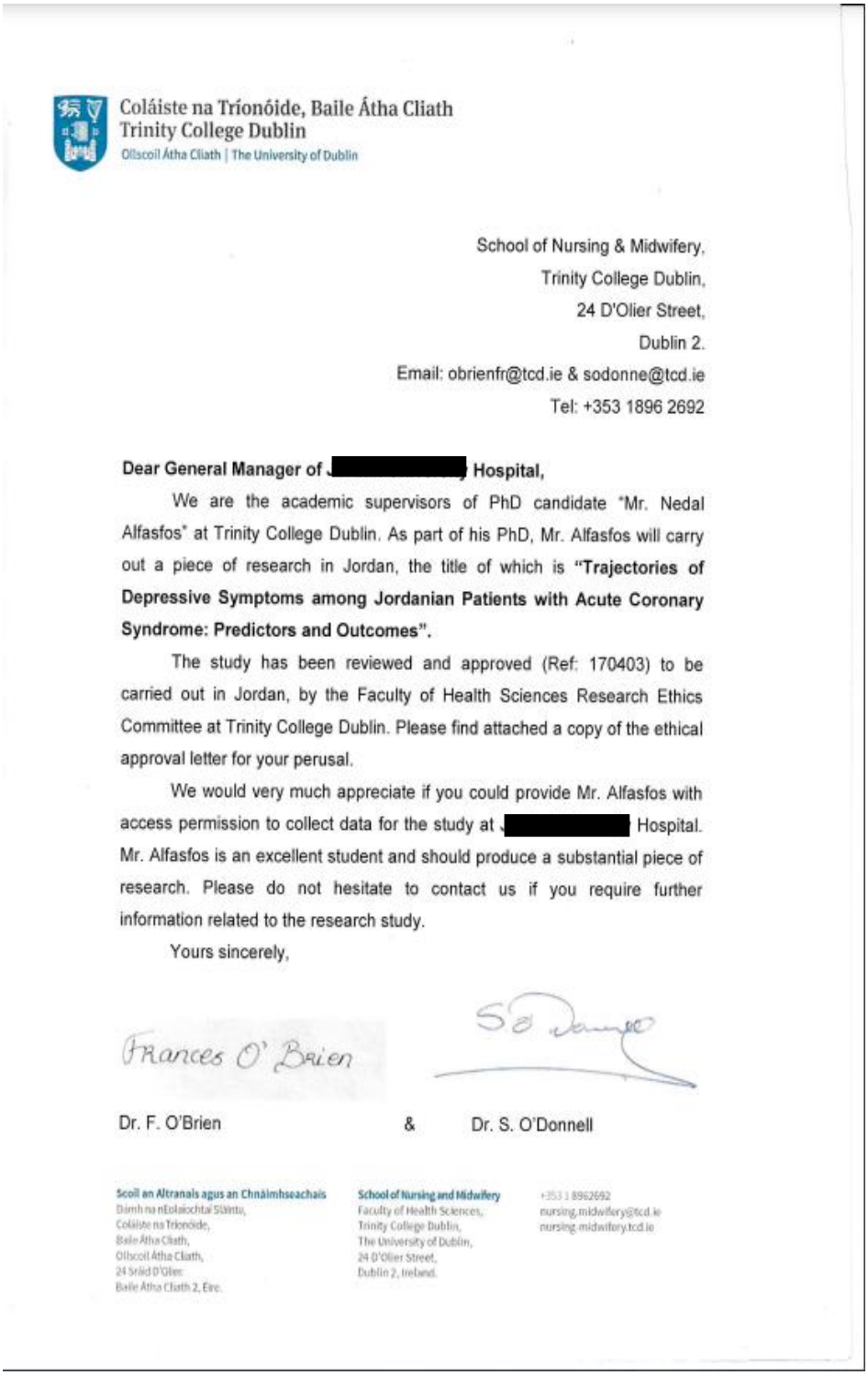
Further to a meeting of the Faculty of Health Sciences Ethics Committee held in June 2017, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely,

Prof. Brian O'Connell
Chairperson
Faculty Research Ethics Committee

Dámh na nEolaíochtaí Sláinte
Faculty of Health Sciences

Appendix VIII: Ethics approval from each of the four participating hospitals at Jordan



Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

School of Nursing & Midwifery,
Trinity College Dublin,
24 D'Olier Street,
Dublin 2.
Email: obrienfr@tcd.ie & sodonne@tcd.ie
Tel: +353 1896 2692

Dear General Manager of [redacted] Hospital,

We are the academic supervisors of PhD candidate "Mr. Nedal Alfasfos" at Trinity College Dublin. As part of his PhD, Mr. Alfasfos will carry out a piece of research in Jordan, the title of which is **"Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes".**

The study has been reviewed and approved (Ref: 170403) to be carried out in Jordan, by the Faculty of Health Sciences Research Ethics Committee at Trinity College Dublin. Please find attached a copy of the ethical approval letter for your perusal.

We would very much appreciate if you could provide Mr. Alfasfos with access permission to collect data for the study at [redacted] Hospital. Mr. Alfasfos is an excellent student and should produce a substantial piece of research. Please do not hesitate to contact us if you require further information related to the research study.

Yours sincerely,

Frances O' Brien

Dr. F. O'Brien & Dr. S. O'Donnell

Scoil an Altranais agus an Chnáimhseachais
Dámh na nEolaíochtaí Sláinte,
Coláiste na Tríonóide,
Baile Átha Cliath,
Ollscoil Átha Cliath,
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School of Nursing and Midwifery
Faculty of Health Sciences,
Trinity College Dublin,
The University of Dublin,
24 D'Olier Street,
Dublin 2, Ireland.

+353 1 8962692
nursing.midwifery@tcd.ie
nursing.midwifery.tcd.ie

[redacted]

[redacted]

[redacted]

Ref. 4690/10/2017

Date: 13/8/2017

الرقم: _____

التاريخ: _____

Dr. Nedal Issa Alfasfos

The Institution Review board committee discussed and approved in its meeting No. (11/2017) , Date : 1/8/2017 ,the research project entitled :

Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes.

1. A bide by the hospital pharmaceutical policy studies at the hospital (Adm po21/3. Adm po32/1).
2. Data is confidential must not be used except for research project aims.
3. The committee has the right to question the ca-authors about their participation in the study project.
4. Must coordinate with heads of cardiology and nursing.

Chairman of the IRB

[redacted]

[redacted]

[redacted]

[redacted]

Ref. _____

Date: _____

الرقم: _____

التاريخ: ٢٠١٧/٨/٢٦

Nedal Alfasfos,

School of Nursing and Midwifery,

Trinity College Dublin,

Email: Alfasfon@tcd.ie

Research title: "Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes."

Dear Mr. Nedal,

This is in response to your letter regarding permission to access patients from the Coronary Care Units and cardiology wards at [redacted] hospital and nominating gatekeepers in these units. It is my pleasure to provide you with permission to conduct your study at out institution and I nominate Mr. [redacted] (CHARGE NURSE/ CORONARY CARE UNIT & CARDIOLOGY WARD), to act as a gatekeeper to the above research project.

Yours sincerely,

Director of Nursing

[redacted]

[redacted]

School of Nursing and Midwifery,
Trinity College Dublin,
24 D'Olier Street,
Dublin 2
Email: alfasfon@tcd.ie
Tel: 00353892026373
00962796366845

Date: August 16, 2017.

Dear Mr. [redacted]

My name is Nedal Alfasfos and I am currently conducting a research project as a part of my Doctoral Degree in Nursing and Midwifery at Trinity College Dublin.

Subject to approval by the Institutional Review Board [redacted] Hospital, I am carrying out a piece of research in this institutionto asses "Trajectories of depressive symptoms among Jordanian patients with Acute Coronary syndrome: Predictors and Outcomes."

As you are nominated by the Director of Nursing to be as a gatekeeper in this research project, it is my pleasure to provide you with some information about your role.

Your role is to identify patients who have a diagnosis of Acute Coronary Syndrome and when these patients are hemodynamically stable, you will leave the Participant Information Leaflet (PIL) with them to pursue and ascertain which patients are interested in the study versus those who are not. When doing so, you will inform the patient that you are not part of the research team and that you have no vested interest in the study. Then, you need to provide a list of the names of only interested patients to the researcher/ research nurse.

If you are happy with your role as a gatekeeper in this research project, please sign below to show that you understand this information.

Yours sincerely,

Researcher

Nedal Alfasfos

Gatekeeper

[redacted]

16/8/2017

10Am

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Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

School of Nursing & Midwifery,
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Dublin 2.
Email: obrienfr@tcd.ie & sodonne@tcd.ie
Tel: +353 1896 2692

Dear Minister of Health,

We are the academic supervisors of PhD candidate "Mr. Nedal Alfasfos" at Trinity College Dublin. As part of his PhD, Mr. Alfasfos will carry out a piece of research in Jordan, the title of which is **"Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes".**

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Yours sincerely,

Frances O' Brien

Dr. F. O'Brien & Dr. S. O'Donnell

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nursing.midwifery@tcd.ie
nursing.midwifery.tcd.ie

وزارة الصحة

CODE : MOH REC 170101

الرقم .....

التاريخ .....

الموافق .....

قرار لجنة اخلاقيات البحث العلمي

اجتمعت لجنة اخلاقيات البحث العلمي بتاريخ2017/7/6 لمناقشة البحث العلمي المقدم من قبل طالب الدكتوراه/نضال عيسى محمد الفسفوس.

بعنوان:

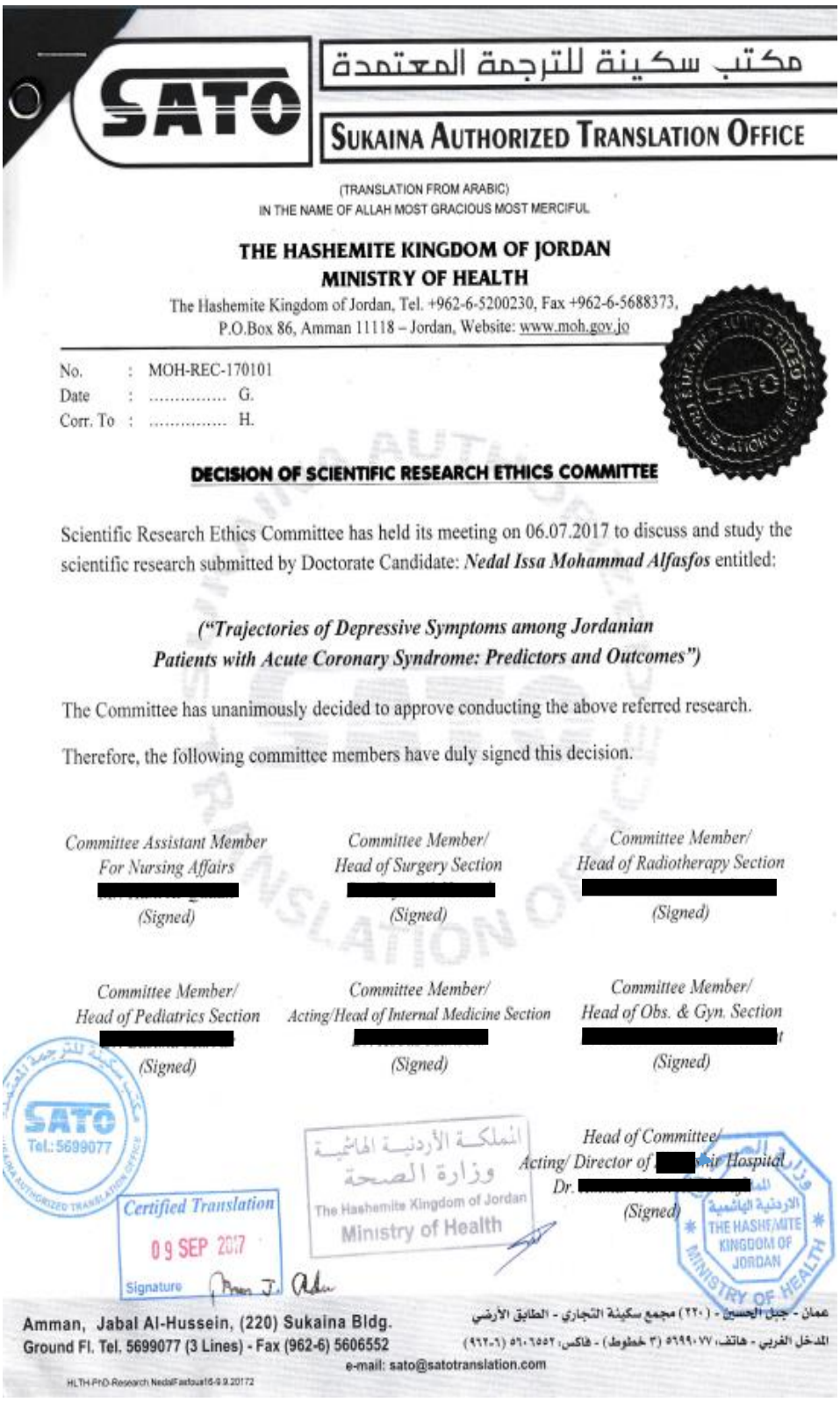
*** Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome:Predictors and Outcomes***

وقد قررت اللجنه بالاجماع الموافقه على اجراء البحث المشار اليه اعلاه.

وعليه تم التوقيع من قبل اعضاء اللجنه حسب الاصول .

عضو اللجنه المساعد للتمريض	عضو اللجنه رئيس قسم الجراحة	عضو اللجنه رئيس قسم الاشعة العلاجية
عضو اللجنه رئيس قسم الاطفال	عضو اللجنه رئيس قسم الباطني/المكلف	عضو اللجنه رئيس قسم النسائية ء التوليد

رئيس اللجنه /



مكتب سكينة للترجمة المعتمدة

SUKAINA AUTHORIZED TRANSLATION OFFICE

(TRANSLATION FROM ARABIC)
IN THE NAME OF ALLAH MOST GRACIOUS MOST MERCIFUL

THE HASHEMITE KINGDOM OF JORDAN
MINISTRY OF HEALTH

The Hashemite Kingdom of Jordan, Tel. +962-6-5200230, Fax +962-6-5688373,
P.O.Box 86, Amman 11118 – Jordan, Website: www.moh.gov.jo

No. : MOH-REC-170101
Date : ..... G.
Corr. To : ..... H.

DECISION OF SCIENTIFIC RESEARCH ETHICS COMMITTEE

Scientific Research Ethics Committee has held its meeting on 06.07.2017 to discuss and study the scientific research submitted by Doctorate Candidate: ***Nedal Issa Mohammad Alfasfos*** entitled:

("Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes")

The Committee has unanimously decided to approve conducting the above referred research.

Therefore, the following committee members have duly signed this decision.

Committee Assistant Member For Nursing Affairs [redacted] *(Signed)*	*Committee Member/ Head of Surgery Section* [redacted] *(Signed)*	*Committee Member/ Head of Radiotherapy Section* [redacted] *(Signed)*
Committee Member/ Head of Pediatrics Section [redacted] *(Signed)*	*Committee Member/ Acting/Head of Internal Medicine Section* [redacted] *(Signed)*	*Committee Member/ Head of Obs. & Gyn. Section* [redacted] *(Signed)*

Head of Committee/ Acting/ Director of [redacted] Hospital
Dr. [redacted]
(Signed)

SATO Tel.: 5699077

Certified Translation
09 SEP 2017
Signature

المملكة الأردنية الهاشمية
وزارة الصحة
The Hashemite Kingdom of Jordan
Ministry of Health

THE HASHEMITE KINGDOM OF JORDAN
MINISTRY OF HEALTH

Amman, Jabal Al-Hussein, (220) Sukaina Bldg.
Ground Fl. Tel. 5699077 (3 Lines) - Fax (962-6) 5606552
e-mail: sato@satotranslation.com

عمان - جبل الحسين - (٢٢٠) مجمع سكينة التجاري - الطابق الأرضي
المدخل الغربي - هاتف: ٥٦٩٩٠٧٧ (٣ خطوط) - فاكس: ٥٦٠٦٥٥٢ (٩٦٢-٦)

HLTH-PhD-Research NedalFasfous16-9.9.20172

وزارة الصحة

نهضة

الرقم تطوير/خطط/٥٦٨٢

التاريخ

الموافق ١٣/٧/٢٠١٧ م

[redacted]

تحية طيبة وبعد :

ارفق طيا صورة عن كتاب مدير مستشفى [redacted] رئيس لجنة اخلاقيات البحث العلمي رقم م ب ا/ لجنة اخلاقيات/٩١٦١ تاريخ ٢٠١٧/٧/١٠ المتضمن الموافقة لطالب الدكتوراة نضال عيسى محمد الفسفوس اجراء بحث بعنوان :

"مسارات اعراض الاكتئاب عند المرضى الاردنيين الذين يعانون من متلازمة الشريان التاجي الحادة : المتنبئات والنواتج "

"Trajectories of depressive symptoms among Jordanian patients with acute coronary syndrome: predictors and outcomes "

عن طريق تعبئة الاستبيان المرفق من المرضى الذين يعانون من متلازمة الشريان التاجي في مستشفى [redacted] .

ارجو التكرم بالاطلاع وتسهيل مهمة اجراء البحث المشار اليه اعلاه .

وتفضلوا بقبول فائق الاحترام ،،،

مدير تطوير الموارد البشرية/ المكلف

[redacted]

(TRANSLATION FROM ARABIC)
IN THE NAME OF ALLAH MOST GRACIOUS MOST MERCIFUL

THE HASHEMITE KINGDOM OF JORDAN
MINISTRY OF HEALTH

The Hashemite Kingdom of Jordan, Tel. +962-6-5200230, Fax +962-6-5688373,
P.O.Box 86, Amman 11118 – Jordan, Website: www.moh.gov.jo

No. : Development/Plans/ 5682
Date : 13.07.2017 G.
Corr. to : ..... H.

Director of [redacted] Hospital

Dear Sir,

Attached herewith please find a copy of the letter of [redacted] Hospital Director/ Head of Scientific Research Ethics Committee No. (M.B.A./Ethics-Committee/9161) dated 10.07.2017 related to permitting the Doctorate Candidate: ***Nedal Issa Mohammad Alfasfos*** to conduct a research entitled:

("Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes")

through filling out the attached questionnaire by the patients with Acute Coronary Syndrome at [redacted] Hospital.

Your directing the relevant personnel to facilitate the above-mentioned researcher's task will be highly appreciated.

With kind regards.

Acting/ Director of
Human Resources Development
[redacted]
(Signed)

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

School of Nursing & Midwifery,
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Email: obrienfr@tcd.ie & sodonne@tcd.ie
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Yours sincerely,

Frances O'Brien

Dr. F. O'Brien & Dr. S. O'Donnell

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بسم الله الرحمن الرحيم

[redacted]

Amman - Jordan

[redacted]

[redacted]

عمان - الأردن

[redacted]

Ref : 1/2017/3072

Date: 15th July 2017.

الرقم : .....

التاريخ: .....

الموافق : .....

Dear Dr. F. O'Brien
Dear Dr. S. O'Donnell
School of Nursing and Midwifery
Trinity College Dublin
E-mail: obrienfr@tcd.ie ; sodonne@tcd.ie

SUBJECT: RESEARCH PROJECT:
TRAJECTORIES OF DEPRESSIVE SYMPTOMS AMONG JORDANIAN PATIENTS WITH ACUTE CORONARY SYNDROME: PREDICTORS AND OUTCOMES

In reference to your letter related to the above research project to be conducted by MR. NEDAL ALFASFOS, it is my pleasure to inform you that the Institutional Review Board (IRB) at the [redacted] Hospital, Amman-Jordan has approved conducting the study at our Institution.

The student is required to provide copy of the final version of the study outcomes to the IRB.

General Director

[redacted]

AMMAN

Dr. [redacted]

- General File.
- Medical Director.
- IRB File.

S043D

بسم الله الرحمن الرحيم

[redacted]

Amman - Jordan

[redacted]

[redacted]

[redacted]

عمان - الأردن

[redacted]

[redacted]

Ref :.....

01/08/2017

Date:.....

الرقم :.....

التاريخ:.....

الموافق :.....

Nedal Alfasfos

School of nursing and Midwifery

Trinity College Dublin,

E-mail: alfasfon@tcd.ie

RESEARCH PROJECT: TRAJECTORIES OF DEPRESSIVE SYMPTOMS AMONG JORDANIAN PATIENTS WITH ACUTE CORONARY SYNDROME: PREDICTORS AND OUTCOMES

Dear Nedal Alfasfos,

This is in response to your letter regarding (i) permission to access patients from the coronary care units/cardiology wards at the [redacted] Hospital and (ii) nominating gatekeepers in these research sites. It is my pleasure to provide you with permission to conduct your study in the coronary care unit/cardiology wards at our institution, and I nominate Mr. [redacted] (Charge Nurse-Coronary Care Unit) and Mr. [redacted] (Charge Nurse-Intensive Care Unit) to act as a gatekeepers to the above research project.

Yours sincerely,

Director of Nursing

Mohammad S. Salah [redacted]

[redacted]

S043D

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

School of Nursing & Midwifery,
Trinity College Dublin,
24 D'Olier Street,
Dublin 2.
Email: obrienfr@tcd.ie & sodonne@tcd.ie
Tel: +353 1896 2692

Dear General Manager of [redacted] Hospital,

We are the academic supervisors of PhD candidate "Mr. Nedal Alfasfos" at Trinity College Dublin. As part of his PhD, Mr. Alfasfos will carry out a piece of research in Jordan, the title of which is **"Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes".**

The study has been reviewed and approved (Ref: 170403) to be carried out in Jordan, by the Faculty of Health Sciences Research Ethics Committee at Trinity College Dublin. Please find attached a copy of the ethical approval letter for your perusal.

We would very much appreciate if you could provide Mr. Alfasfos with access permission to collect data for the study at [redacted] Hospital. Mr. Alfasfos is an excellent student and should produce a substantial piece of research. Please do not hesitate to contact us if you require further information related to the research study.

Yours sincerely,

Frances O' Brien

Dr. F. O'Brien & Dr. S. O'Donnell

Scoil an Altranais agus an Chnáimhseachais
Dámh na nEolaíochtaí Sláinte,
Coláiste na Tríonóide,
Baile Átha Cliath,
Ollscoil Átha Cliath,
24 Sráid D'Olier
Baile Átha Cliath 2, Éire.

School of Nursing and Midwifery
Faculty of Health Sciences,
Trinity College Dublin,
The University of Dublin,
24 D'Olier Street,
Dublin 2, Ireland.

+353 1 8962692
nursing.midwifery@tcd.ie
nursing.midwifery.tcd.ie

وزارة الصحة

[redacted]

الرقم HH/32/2006

التاريخ

الموافق 10/8/2017

Dear . Dr . O,Brien &Dr . S. O'Donnell

In reference to the research request submitted to The Institute Review Board in [redacted] Hospital by **Mr . Nedal Alfasfos** for the research titled :

" Trajectories of Depressive Symptoms among Jordanian Patients with Acute Coronary Syndrome : Predictors and Outcomes"

the IRB committee in its meeting on July 18th 2017 has reviewed the submitted package and concluded that the request is fully approved taking into consideration the following recommendations :

- This approval is valid for one year from the date of this letter .
- Full compliance with [redacted] Hospital research policy ADM-PR-07
- Adhering to **GCP** guidelines and data confidentiality .
- Submitting update reports on quarterly basis to the IRB .
- Submission of the research result to the IRB is required .
- No publication of any study results before obtaining the IRB written approval .

Best Regards

IRB Chairperson

[redacted]

copy:
- Head of Human resources
- [redacted]
- General Directory

[redacted]

Human Resources Director

Appendix IX: Patient Information Leaflet (PIL)

1.Title of study: Trajectories of depressive symptoms among Jordanian patients with Acute Coronary Syndrome: Predictors and Outcomes.

2. **Introduction**: We are asking for your help with a study that we are carrying out to find out the changes that occur in your psychological well-being in the first six months after you have experienced a heart event condition. We wish to find out which of your characteristics (individual, clinical and personality) are more likely to predict changes to your psychological well-being, which may also affect your quality of life. The hospital has given us permission, to carry out this study and we would like you to take part. If you do not want to take part in the study, this will not affect your care in any way.

3. What will happen to me if I agree to take part in the study? When you are feeling well, a nurse will leave this information leaflet with you to read as you might be interested in taking part in the study. The nurse is not part of the research team and has no vested interest in the study, he/she is just giving you the information. Then, the research nurse will come to meet you and ask you if you want to hear more about the study. If you are not interested, that is ok, and it will not affect your care in any way. If you are interested, then the research nurse will tell you all about the study and what is involved. The research nurse will also answer any questions that you may have. If, after being given all the information you would like to be involved in the study, the research nurse will ask you to sign a consent form. During the study, you will be asked to fill out some questionnaires at 4 different times. The first time you will be asked to do this is before you are discharged home. The research nurse will help you to fill out the questionnaires and it will take about 25 minutes to do so. The questionnaires will ask you questions about your personal details, your personality, if you have symptoms of depression, things you do to cope with difficulties and how much support you feel you get from others, along with your quality of life. With your permission, the research nurse will also obtain some medical information from your medical notes.

The research nurse will then phone you at 1, 3 and 6 months after discharge, to fill out the rest of the questionnaires. These phone calls will be very short and will only take 5-10 minutes, as the research nurse will only ask you questions about your psychological well-being and quality of life.

4**. Benefits**: There is no direct benefit to you for taking part in this study. However, we hope that the results of this study will be used to improve health care for patients in the future. We also hope that the study findings will improve what is known about changes that occur to the psychological well-being of patients after their heart event. This will be important information for nurses and doctors who are looking after patients in the future who need psychological support.

5**. Risks**: We do not see any risks from taking part in this study. However, you may find some questions, especially those about symptoms of depression, might cause you upset. If you feel upset at any time while you are filling out the questionnaires or during the phone calls, you can decide to postpone or stop your participation without any consequences. A clinical psychologist is available to support you if you get upset and need to talk about your feelings. With your permission, the researcher can contact the clinical psychologist on your behalf. Alternatively, if you prefer to contact him/her yourself, you can do so at the following number (this number will be inserted when obtained from the clinical site). You can also contact the researcher Nedal Alfasfos at 0799187320 who is always available to provide you with support.

6. **Adverse outcomes**: We do not anticipate any adverse outcomes from taking part in this study. However, you may feel some inconvenience because the research nurse will phone you on three occasions after you go home. At the beginning of each phone call, the research nurse will ask you if you are still willing to be in the study. If you tell him/her that the follow-up calls are inconvenient for you, or that you wish to withdraw from the study, your decision will be respected. This will not affect your care in any way.

7. **Risks on women of childbearing potential**: We do not see any risks from taking part in this study if you are pregnant or if you become pregnant during the study. This study is only asking questions and poses no physical threat to mother or foetus.

8. Taking part in the study: To be part of the study, we need patients to be alike in certain ways. You must: 1) have had a recent heart event as defined by this study, 2)

be over 18 years of age, 3) be able to read, understand and speak Arabic because you need to fill out the questionnaire in hospital and 4) have a telephone, because we will need to contact you three times after you go home from hospital to fill out the questionnaires.

9. Exclusion from participation in the study: Unfortunately, you will not be able to be in the study if: 1) you are not willing to take part in the study after you go home, 2) you are too ill to complete the questionnaire, 3) you have a major or uncorrected hearing loss, 4) you have a profound learning disability, 5) you have current substance abuse or dependence or 6) you have a terminal illness.

10. Privacy: All information that we get during the study will be private. With your permission, the cardiac physician will be notified if continuous changes in your psychological wellbeing are identified during the study. As we want to improve practice, the results of the study may be written about or presented at conferences. However, these results will be reported in a group manner and at all times your identity and that of the hospital will remain private. The researcher knows your name at the start, but you will be given a code, which replaces your name on all information you give us. Your name will never appear beside any information that you give us.

11. **What if something goes wrong**: There is no likely risk with taking part in this study. This study is covered by standard institutional indemnity insurance. Nothing in this document restricts or curtails your rights.

12. **Taking part in this study is your own choice**: If you decide not to take part in the study or to withdraw from the study later, this will not affect your hospital care in any way.

13. **Stopping the study**: In some cases, as with all research studies, the research team may stop you taking part in the study at any time without your consent.

14. **Permission**: The study has ethical approval from the Research Ethics Committee at this hospital and from the Faculty of Health Sciences Ethics Committee at Trinity College Dublin.

15. **Further information**: You can get more information or answers to your questions about the study, your taking part in the study, and your rights, from the researcher Nedal Alfasfos. Nedal can be contacted by telephone at 0799187320 or by email at alfasfon@tcd.ie. If the study team learns of important new information that might affect your wish to remain in the study, you will be informed at once.

Thank you for taking the time to consider being part of this study

Appendix X: Consent Form

Title of study: Trajectories of depressive symptoms among Jordanian patients with Acute Coronary Syndrome: Predictors and Outcomes.

Researchers: Mr. Nedal Alfasfos, Dr Frances O'Brien, & Dr Sharon O'Donnell

I understand that I am taking part in a study to identify any changes that may occur in my psychological well-being during the first six months following a heart event and how these may affect my quality of life. I understand that there are no likely risks from taking part in this study, I will fill out some questionnaires before discharge from hospital and the research nurse will fill out some of my medical history and clinical data from my medical notes. The research nurse will phone me at one, three and six months after discharge to fill out some questionnaires over the telephone.

I understand that all information obtained during the study will be treated as strictly private. It will be used for the purpose of the study and for no other reason. Only the researchers will have the names of the people in the study. I understand that the general study results may be published in journals or presented at conferences, but neither the hospital nor the person taking part in the study will be identifiable. I am aware that I may withdraw from this study at any time.

DECLARATION:

I have read, or had read to me, the Patient Information Leaflet and I understand this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I have received a copy of this agreement.

I understand that I may withdraw from the study at any time.

PATIENT'S NAME: ……

PATIENT'S SIGNATURE:……Date:……

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the patient understands my explanation and has freely given informed consent.

RESEARCHERS SIGNATURE: …… Date:……

Appendix XI: Cover letter: Invitation to patients

Dear Patient,

My name is Nedal Alfasfos and I am currently undertaking a doctoral degree in Nursing in Trinity College Dublin. As part of that degree, I am carrying out a study on "The trajectories of Depressive Symptoms Among Jordanian Patients with Acute Coronary Syndrome: Predictors and Outcomes". This means finding out the changes that occur in patients' psychological well-being during the first six months following a heart event. The study is being carried out in four hospitals in Jordan, and your hospital is one of them.

You are invited to be in the study because you had a heart Being in the study will involve the research nurse asking you some questions while you are in hospital, and she will ask you to fill out some questionnaires. This will take about 25 minutes. The research nurse will also phone you three times when you go home and ask you some more questions, but these phone calls are short and will only take 5-10 minutes.

If you are interested in learning more about this study, please read the enclosed Patient Information Leaflet. If you think you might be interested in being in the study, a research nurse can visit you in your room and give you more information about the study. You can also contact me at 0799187320 for any further information

It is important that you know that this letter is not telling you to join this study. It is your decision if you wish to take part in the study or not. If you do not want to take part in the study, this will not affect your care in any way.

Thank you for your time and consideration.

Yours sincerely,

Nedal Alfasfos

Appendix XII: Correlating Appendices in the Arabic language (as appropriate)

- Structured Interview Questions and All Questionnaires (Appendix VI)
- Patient Information Leaflet (Appendix X)
- Consent Form (Appendix XI):

Structured Interview Questions and all Questionnaire in Arabic

أ . أسئلة المقابلة

هل سبق وأن تم تشخيصك بالإكتئاب أوعانيت من الإكتئاب سابقاً لمدة أسبوعين او اكثر؟

1. نعم
2. لا

اذا نعم، سيتم تقييم المشارك بإستبيان صحة المرضى التالي:

خلال فترة الأسبوعين في حياتك والتى كنت فيهم أكثر حزناً، واكتئاباً، كم مرة عانيت من أي من المشاكل التالية؟	ولا مرة	عدة ايام	اكثر من نصف الأيام	تقريبا كل يوم
قلة الاهتمام أو قلة الاستمتاع بممارسة بالقيام بأي عمل .1	1	2	3	4
الشعور بالحزن أو ضيق الصدر أو اليأس .2	1	2	3	4
صعوبة في النوم أو نوم متقطع أو النوم أكثر من المعتاد .3	1	2	3	4
4. الشعور بالتعب أو بامتلاك القليل جدا من الطاقة	1	2	3	4
قلة الشهية أو الزيادة في تناول الطعام عن المعتاد.5	1	2	3	4
الشعور بعم الرضا عن النفس أو الشعور بأنك قد أخذلت .6 نفسك أو عائلتك	1	2	3	4
صعوبة في التركيز مثلا أثناء قراءة الصحيفة أو مشاهدة .7 التلفيزيون	1	2	3	4
بطء في الحركة أو بطء في التحدث عما معتاد لدرجة .8 ملحوظة من الآخرين / أو على العكس من ذلك التحدث بسرعة وكثرة الحركة أكثر من المعتاد	1	2	3	4
9.راودتك أفكار بأنه من الأفضل لو كنت ميتاً او أفكار كأن تقوم بإيذاء النفس	1	2	3	4

Add Columns _____ + _____ + _____

_____Total _____

عليك هذه المشاكل القيام بعملك، الاعتناء بالأمور من مشاكل أعلاه، فإلى أية درجة صّعبت إذا أشرت إلى أية المنزلية، أو الانسجام مع أشخاص آخرين؟

ليست هناك أي صعوبة هناك بعض الصعوبات هناك صعوبات شديدة
هناك صعوبات بالغة التعقيد

.ب. الاستبيانات التي تم تعبئتها من قبل المشارك

:المعلومات الشخصية

:ارشادات: يرجى الاجابة على الأسئلة التالية

1. كم عمرك ..... سنة
2. ما جنسك؟ ○ ذكر ○ انثى
3. ما هي حالتك الاجتماعية:

○ اعزب ○ متزوج ○ مطلق ○ ارمل

ما معدل دخلك الشهري

○ 500 دينار او اقل ○ أكثر من 500 دينار

4. ما هو أعلى مستوى تعليمي لك؟؟

○ المستوى الأساسي او ما دون ○ المستوى الاعدادي ○ المستوى الجامعي او اعلى

5. أي واحدة من الأتية توصف طبيعة معيشتك ؟
6.

○ لوحدي ○ مع العائلة ○ مع اشخاص اخرين /اصدقاء ○ في مؤسسات الرعاية

7. ما وضعك من الناحية الوظيفية ؟

○ موظف ○ غير موظف ○ متقاعد

8. هل انت مغطى بالتأمين صحي؟

○ نعم ○ لا

9. ما هي حالتك من حيث التدخين

○ مدخن حالي ○ مدخن سابق ○ غير مدخن

10. هل يوجد تاريخ مرضي للاكتئاب في عائلتك؟

○ نعم ○ لا

استبيان عن صحة المرضى(PHQ-9) 1

منذ دخولك المستشفى هذه الزيارة، كم مرة عانيت من أي من المشاكل التالية؟ للإشارة لجوابك "√" ضع اشارة	ولا مرة	عدة ايام	اكثر من نصف الأيام	تقريبا كل يوم
1. قلة الاهتمام أو قلة الاستمتاع بممارسة بالقيام بأي عمل	1	2	3	4
2.الشعور بالحزن أو ضيق الصدر أو اليأس	1	2	3	4
3.صعوبة في النوم أو نوم متقطع أو النوم أكثر من المعتاد	1	2	3	4
4. الشعور بالتعب أو بامتلاك القليل جدا من الطاقة	1	2	3	4
5.قلة الشهية أو الزيادة في تناول الطعام عن المعتاد	1	2	3	4
6.الشعور بعدم الرضا عن النفس أو الشعور بأنك قد أخذلت نفسك أو عائلتك	1	2	3	4
7.صعوبة في التركيز مثلا أثناء قراءة الصحيفة أو مشاهدة التلفيزيون	1	2	3	4
8.بطء في الحركة أو بطء في التحدث عما معتاد لدرجة ملحوظة من الآخرين / أو على العكس من ذلك التحدث بسرعة وكثرة الحركة أكثر من المعتاد	1	2	3	4
9.راودتك أفكار بأنه من الأفضل لو كنت ميتاً او أفكار كأن تقوم بإيذاء النفس	1	2	3	4

Add Columns _____ + _____ + _____

Total _____

إذا أشرت إلى أية من مشاكل أعلاه، فإلى أية درجة صّعبت عليك هذه المشاكل القيام بعملك، الاعتناء بالأمور المنزلية، أو الانسجام مع أشخاص آخرين؟

ليست هناك أي صعوبة هناك بعض الصعوبات هناك صعوبات شديدة

هناك صعوبات بالغة التعقيد

.2مقياس التكيف

البنود التالية تسألك عن ماذا تفعل للتكيف مع المشاكل التي تواجهك. من الواضح ان الاشخاص يتعاملون مع الاشياء بطرق مختلفة، ولاكنني مهتم بكيف تحاول انت التعامل معها. كل بند يتكلم شيئ ما عن طريقة معينة للتكيف. اود معرفة لاي درجة تقوم بفعل ما تسأل عنه هذه البنود. الرجاء الإجابة على الأسئلة التالية مشيراً إلى أي مدى توافق أو لا توافق على كل عبارة. ضع إشارة مقابل التكرار المناسب

	البند	أنا لم أفعل ذلك على الإطلاق	لقد فعلت هذا قليلا	لقد كنت أفعل هذا بشكل متوسط	لقد فعلت هذا كثيرا
1	تحولت إلى العمل أو الأنشطة الأخرى لتصفية ذهني.	1	2	3	4
2	ركّزت جهودي على القيام بشيء حيال الوضع الذي انا فيها.	1	2	3	4
3	كنت أقول لنفسي "هذا ليس حقيقيا".	1	2	3	4
4	استخدمت الكحول أو المخدرات لاشعر على نحو أفضل.	1	2	3	4
5	حصلت على الدعم العاطفي من الآخرين.	1	2	3	4
6	تخليت عن محاولة التعامل مع الموقف.	1	2	3	4
7	اتخذت اجراءات في محاولة لجعل الوضع يبدو أفضل.	1	2	3	4
8	كنت ارفض أن اصدق أنه ما حدث قد حدث فعلا.	1	2	3	4
9	قلت أشياء حتى اتخلص او اهرب من من المشاعر غير السارة المتعلقة بالحدث .	1	2	3	4
10	حصلت على المساعدة والمشورة من أشخاص آخرين.	1	2	3	4
11	استخدمت الكحول أو المخدرات لتساعدني في الخروج من ذلك الموقف.	1	2	3	4
12	حاولت أن أرى الموقف في صورة مختلفة، لجعله يبدو أكثر إيجابية.	1	2	3	4
13	انتقدت نفسي.	1	2	3	4
14	حاولت الخروج باستراتيجية حول ما يجب القيام به.	1	2	3	4
15	حصلت على الراحة والتفهم من شخص ما.	1	2	3	4
16	تخليت عن محاولة التأقلم مع الموقف.	1	2	3	4

17	بحثت عن شيء جيد في ما يحدث.	1	2	3	4
18	صنعت و قلت النكات حول هذا الموضوع.	1	2	3	4
19	فعلت أ شياء لاقلل من التفكير في الموقف ، مثل الذهاب إلى السينما ، ومشاهدة التلفزيون والقراءة وأحلام اليقظة ,النوم، أو التسوق.	1	2	3	4
20	قبلت بواقع الحقيقة أنه حدث	1	2	3	4
21	عبرت عن مشاعري السلبية.	1	2	3	4
22	حاولت أن أجد الراحة في ديني و معتقداتي الروحية.	1	2	3	4
23	حاولت الحصول على مشورة أو مساعدة من الآخرين حول ما يجب القيام به.	1	2	3	4
24	تعلمت كيفية العيش معه.	1	2	3	4
25	فكرت مليا في الخطوات التي يجب اتخاذها.	1	2	3	4
26	لومت نفسي عن الأشياء التي حدثت.	1	2	3	4
27	صليت أو لجأت الى التأمل.	1	2	3	4
28	سخرت من هذا الموقف.	1	2	3	4

.3.نموذج استبيان دي.اس

مدرج ادناه عدد من الجمل التي يستخدمها الناس غالبا لوصف أنفسهم. يرجى قراءة كل جملة ومن ثم ضع دائرة حول الرقم المناسب بجانب تلك الجملة لتوضيح إجابتك. لا توجد إجابات صحيحة أو خاطئة: الانطباع الخاص بك هو الشيء الوحيد الذي يهمنا.

		خطأ	اقرب الى الخطأ	محايد	اقرب الى الصحيح	صحيح
1	أتواصل مع الناس بسهولة عند الالتقاء بهم	**0**	**1**	**2**	**3**	**4**
2	غالباً ما أميل إلى تضخيم الأمور الغير مهمة	**0**	**1**	**2**	**3**	**4**
3	غالباً ما أتحدث الى الغرباء	**0**	**1**	**2**	**3**	**4**
4	اشعر بعدم السعادة في أغلب الاحيان	**0**	**1**	**2**	**3**	**4**
5	أشعر بالانزعاج في أغلب الاحيان	**0**	**1**	**2**	**3**	**4**
6	غالباً ما اشعربأنني مكبوت في التفاعلات الاجتماعية	**0**	**1**	**2**	**3**	**4**
7	غالباً ما تكون نظرتي للأمور تشاؤمية	**0**	**1**	**2**	**3**	**4**
8	أجد من الصعوبة البدء في حوار ما	**0**	**1**	**2**	**3**	**4**
9	أكون في مزاج سيء في أغلب الأحيان	**0**	**1**	**2**	**3**	**4**
10	أنا شخص منغلق (انطوائي)	**0**	**1**	**2**	**3**	**4**
11	أفضل إبقاء الاخرين بعيدين عني	**0**	**1**	**2**	**3**	**4**
12	غالباً ما اجد نفسي قلقاً حول أمر ما	**0**	**1**	**2**	**3**	**4**
13	غالباً ما أكون في مزاج كئيب	**0**	**1**	**2**	**3**	**4**
14	عندما أتواصل مع الأخرين، لا أجد الاشياء المناسبة لأتحدث عنها	**0**	**1**	**2**	**3**	**4**

.4. مقياس الدعم الاجتماعي

الرجاء قراءة العبارات التالية وتحديد إلى أي حد توافق من خلال اختيار الأرقام التالية:

	العبارات	أعارض بشدة	اعارض بإعتدال	اعارض قليلاً	حيادي	أوافق قليلاً	أوافق بإعتدال	أوافق بشدة
1	إن هناك شخص معين يكون بجانبي عند الحاجة	1	2	3	4	5	6	7
2	إن هناك شخص معين استطيع أن أشاركه أفراحي و أحزاني	1	2	3	4	5	6	7
3	إن عائلتي تحاول أن تساعدني	1	2	3	4	5	6	7
4	احصل على الدعم العاطفي و المساعدة التي احتاجها من عائلتي	1	2	3	4	5	6	7
5	أنا يوجد عندي شخص معين يعتبر المصدر الأساسي لتقديم الراحة لي	1	2	3	4	5	6	7
6	أصدقائي يحاولون تقديم المساعدة لي	1	2	3	4	5	6	7
7	أنا ارتكز و الجأ إلى أصدقائي عند حدوث مشاكل	1	2	3	4	5	6	7
8	استطيع التحدث عن مشاكلي مع عائلتي	1	2	3	4	5	6	7
9	لدي أصدقاء استطيع أن أشاركه أفراحي و أحزاني	1	2	3	4	5	6	7
10	إن هناك شخص معين في حياتي يهتم بمشاعري	1	2	3	4	5	6	7
11	عائلتي لديها الاستعداد لمساعدتي في اتخاذ قراراتي	1	2	3	4	5	6	7
12	استطيع التحدث عن مشاكلي مع أصدقائي	1	2	3	4	5	6	7

5 .استبيان عن صحة امرضى (PHQ-9)

خلال الأسبوعين الماضيين، كم مرة عانيت من أي من المشاكل التالية؟ للإشارة لجوابك "٧" ضع اشارة	ولا مرة	عدة ايام	اكثر من نصف الأيام	تقريبا كل يوم
1. قلة الاهتمام أو قلة الاستمتاع بممارسة بالقيام بأي عمل	1	2	3	4
2.الشعور بالحزن أو ضيق الصدر أو اليأس	1	2	3	4
3.صعوبة في النوم أو نوم متقطع أو النوم أكثر من المعتاد	1	2	3	4
الشعور بالتعب أو بامتلاك القليل جدا من الطاقة4.	1	2	3	4
555.قلة الشهية أو الزيادة في تناول الطعام عن المعتاد	1	2	3	4
6.الشعور بعم الرضا عن النفس أو الشعور بأنك قد أخذلت نفسك أو عائلتك	1	2	3	4
7.صعوبة في التركيز مثلا أثناء قراءة الصحيفة أو مشاهدة التلفيزيون	1	2	3	4
8.بطء في الحركة أو بطء في التحدث عما معتاد لدرجة ملحوظة من الآخرين / أو على العكس من ذلك التحدث بسرعة وكثرة الحركة أكثر من المعتاد	1	2	3	4
9.راودتك أفكار بأنه من الأفضل لو كنت ميتاً او أفكار كأن تقوم بإيذاء النفس	1	2	3	4

\+ _____ + _____ Add Columns

_____

Total _____

إذا أشرت إلى أية من مشاكل أعلاه، فإلى أية درجة صّعبت عليك هذه المشاكل القيام بعملك، الاعتناء بالأمور المنزلية، أو الانسجام مع أشخاص آخرين؟

ليست هناك أي صعوبة هناك بعض الصعوبات هناك صعوبات شديدة

هناك صعوبات بالغة التعقيد

Patient Information Leaflet

الملحق 4: نشرة معلومات المشارك

1.عنوان الدراسة" :مسارات أعراض الاكتئاب عند المرضى الأردنيين الذين يعانون من متلازمة الشريان التاجي الحادة: المتنبئات والنواتج**."**

2.المقدمة **:**نطلب منكم المساعدة في الدراسة التى نقوم بها للتعرف على التغيرات التي تحدث لصحتكم النفسية خلال الاشهر الستة الاولى والتي تلي الإصابة بالحادثة القلبية. نسعى إلى تحديد أي من صفاتك (الفردية, السريرية, والشخصية) هي الأكثر مقدرة للتنبؤ بالتغيرات التي تحدث في صحتك النفسية, والتي من الممكن أن تؤثر أيضاً على جودة الحياة عندك. لقد حصلنا على موافقة من المستشفى لإجراء هذه الدراسة ونود منك أن تشارك معنا. إذا كنت لا ترغب في المشاركة بالدراسة, فإن ذلك لن يؤثر على الرعاية المقدمة لك بأي شكل من الاشكال.

ماذا سيحدث لو وافقت على المشاركة في هذه الدراسة؟ عندما تشعر بالتحسن، سوف يقوم ممرض القسم -وهو ليس من الفريق البحثي- بتزويدك بنشرة معلومات المشارك لتقرأها وتحدد رغبتك في المشاركة بالدراسة. . بعد ذلك, سيقوم "ممرض البحث" بزيارتك وسؤالك عن رغبتك بمعرفة المزيد عن الدراسة. اذا كنت لا ترغب في المشاركة بالدراسة، فإن ذلك لن يؤثر على الرعاية الصحية المقدمة لك بأي شكل من الاشكال. إذا كنت ترغب بالمشاركة هذه الدراسة, سوف يتحدث اليك "ممرض البحث" عن كل معلومات الدراسة وسيقوم بالاجابة على أي أسئلة او استفسارات قد تطرحها. بعد ذلك، سيطلب منك "ممرض البحث" القيام بالتوقيع على نموذج موافقة على المشاركة بالدراسة خلال الدراسة, سوف يُطلب منك أيضاً تعبئة بعض الإستبيانات على أربعة مرات مختلفة. في المرة الاولى ستقوم بذلك قبل خروجك من المستشفى وعندها سيقوم "ممرض البحث" بمساعدتك على تعبئة الإستبيانات والتي يستغرق القيام بذلك ما يقاررب ال 25 دقيقة. تحتوي الإستبيانات على أسئلة عن معلوماتك الشخصية, شخصيتك, أعراض الاكتئاب,الطرق التي تستخدمها بها للتكيف مع الصعوبات التي تواجهك وعن حجم الدعم الذي تتلقاه من الأخرين, بالاضافة الى جودة الحياة عندك. وبعد موافقتك, سوف يقوم "ممرض البحث" بتعبئة المعلومات طبية من ملفك الطبي

سيقوم "ممرض البحث" بالاتصال بك بعد خروجك من المستشفى بشهر, ثلاثة اشهر وستة أشهر لتعبئة ما تبقى من الاستبيانات. هذه المكالمات ستكون قصيرة وستستغرق 5-10 دقائق, حيث أن "ممرض البحث" سوف يسألك عن صحتك النفسية وجودة الحياة عندك.

4. الفوائد: ليس هناك فائدة مباشرة من مشاركتك في هذه الدراسة. ولكننا نأمل أن تساهم نتائج هذه الدراسة في تحسين الرعاية الصحية للمرضى في المستقبل. كما نأمل أن تقوم نتائج هذه الدراسة بتطوير المعلومات الحالية فيما يتعلق بالتغيرات التي تحدث للصحة النفسية عند المرضى الذين يصابون

بحادثة القلبية. هذه المعلومات ستكون قيمة للممرضين والاطباء الذين يقومون برعاية المرضى ممن يحتاجون الى دعم نفسي.

5. المخاطر: لانرى أية خطورة في المشاركة بهذه الدراسة. ولكن قد تجد أن بعض الأسئلة, خاصة تلك المتعلقة بأعراض الاكتئاب, قد تسبب لك شيء من الانزعاج. إذا شعرت بالانزعاج أثناء تعبئة الاستبيانات أو خلال المكالمات الهاتفية, يمكنك أن تطلب تأجيل أو إلغاء إشتراكك في الدراسة دون أية عواقب . كما ويتواجد أخصائي نفسي لدعمك إذا ما شعرت بالانزعاج وأردت التحدث عن مشاعرك. وبموافقتك، يستطيع الباحث أن يتواصل معه بالأصالة عنك، وإذا كنت ترغب بالتواصل معه/معها بنفسك، يمكنك ذلك من خلال الاتصال على الرقم التالي (سيتم ادراج هذا الرقم عند تحصيله من الموقع الطبي). كما يمكنك التواصل مع الباحث نضال الفسفوس على الرقم 0799187320 والذي سيكون دائما متواجدا لتوفير الدعم لك.

6. النتائج السلبية: لا نتوقع حدوث أية نتائج سلبية من المشاركة في هذه الدراسة. ولكن، من الممكن أن تشعر بشيء من عدم

الراحه لأن "ممرض البحث" سوف يقوم بالاتصال بك ثلاث مرات مختلفة بعد عودتك الى المنزل. في بداية كل مكالمة, سوف يقوم الممرض بسؤالك فيما اذا كنت لا تزال ترغب بالمشاركة في الدراسة. إذا قمت بإخباره\اخبارها بأن المكالمات تزعجك, او انك ترغب بالانسحاب من الدراسة, سوف نحترم قرارك. ولن يؤثر ذلك على رعايتك بأي شكل من الاشكال.

7. المخاطرالمتعلقة بإمكانية الإنجاب لدى النساء: لا نرى أية خطورة من مشاركتك في هذه الدراسة إذا كنتِ أو اصبحتِ حامل خلال فترة الدراسة. هذه الدراسة عبارة عن طرح اسئلة فقط ولا تعرض أي من الأم او الجنين لأية مخاطر.

8. المشاركة في الدراسة: لتكون جزءاً من هذه الدراسة, نحتاج لمرضى متشابهين من نواحٍ معينة. يجب أن تكون: 1) قد تعرضت لحادثة قلبية كما تم التحديد في هذه الدراسة, 2) عمرك اكبر من 18 سنة, 3) قادراًعلى قراءة, استيعاب وتحدث اللغة العربية لأنه يتطلب منك تعبئة الاستبيان في المستشفى, و 4) تمتلك هاتفاً, لأنه سيتم الإتصال بك ثلاث مرات بعد خروجك من المستشفى لتعبئة بقية الاستبيانات.

9.إستثناءات من المشاركة في الدراسة: للأسف لن تستطيع المشاركة في هذه الدراسة اذا: 1) لم تكن ترغب بالمشاركة بالدراسة بعد عودتك للمنزل, 2) كنت مريضاً جدا وغير قادر على إكمال الاستبيانات, 3) كنت تعاني من مشكلة فقدان السمع الرئيسي او غير المصحح, 4) كان لديك صعوبات تعلم شديدة, 5) كان لديك مشكلة تعاطي للمواد او الاعتماد عليها, او 6) كان لديك مرض عضال.

10. الخصوصية: جميع المعلومات التي نحصل عليها خلال الدراسة ستكون سرية. سوف يتم مشاركة المعلومات المتعلقة بصحتك النفسية بعد تعرضك للحادثة القلبية مع طبيب القلب المشرف على علاجك وذلك بموافقتك. وحيث اننا نسعى الى تحسين التطبيق العملي, فإن نتائج الدراسة سيتم تدوينها أو عرضها في مؤتمرات. ولكن, هذه النتائج سيتم تقريرها بصيغة جماعية وجميع المعلومات الخاصة المتعلقة بك وبمعلومات المستشفى سوف تبقى سرية. سوف يتعرف الباحث على اسمك في البداية, ولكن بعد ذلك سيتم منحك رمز يستبدل بإسمك الشخصي على كل المعلومات اللتي تمنحنا اياها. لن يظهر إسمك بجانب أي معلومة تقوم بتزويدنا بها.

11. ماذا لو حدث خطأ ما: لا توجد أية خطورة من المشاركة في هذه الدراسة. كما أن هذه الدراسة مغطاة من قبل التأمين المؤسسي الموحد للتعويضات. كما انه ليس في هذه الوثيقة ما يقيد او يقلل حقوقك.

12. المشاركة في هذه الدراسة هو قرارك الشخصي: إذا لم تُرد المشاركة أو أردت الانسحا ب من الدراسة لاحقا, فإن هذا لن يؤثر على الرعاية المقدمة لك بأي شكل من الاشكال.

13. إيقاف الدراسة: في بعض الحالات, كما هو الحال في جميع الدراسات البحثية, قد يتم ايقاف مشاركتك في هذه الدراسة بدون موافقتك.

14. الموافقة: لقد حصلت الدراسة على موافقة أخلاقية من لجنة أخلاقيات البحث في هذا المستشفى ومن لجنة أخلاقيات البحث في كلية العلوم الصحية في جامعة ترينيتي دبلن.

15: معلومات اضافية: يمكنك الحصول على المزيد من المعلومات أو على إجابات اسئلتك عن هذه الدراسة, مشاركتك في الدراسة, وحقوقك, من قبل الباحث نضال الفسفوس. حيث يمكنك التواصل مع نضال من خلال الاتصال بالرقم 0799187320 او عبر الايميل alfasfon@tcd.ie

إذا عَلِمَ فريق الدراسة بأي معلومات قد تؤثر على رغبتك بالمشاركة, سوف يتم ابلاغك فورا.

شكراً على وقتك للنظر في أن تكون جزءا من هذه الدراسة

Consent Form

الملحق 5: نموذج الموافقة

عنوان الدراسة: " مسارات أعراض الاكتئاب عند المرضى الأردنيين الذين يعانون من متلازمة الشريان التاجي الحادة: المتنبئات والنواتج**".**

الباحثون: السيد نضال الفسفوس, الدكتور فرانسيس او براين, والدكتور شارون او دونيل.

أدرك بأنني أشارك في هذه الدراسة والتي تهدف الى التعرف على أي تغيرات يمكن أن تحدث لصحتي النفسية خلال الاشهرالستة الاولى من تعرضي لحادثة قلبية وكيف تؤثر هذه التغيرات على جودة الحياة عندي. أتفهم انه لا يوجد اي خطورة محتملة من مشاركتي في هذه الدراسة, وسوف أقوم بتعبئة بعض الاستبيانات قبل خروجي من المستشفى وسوف يقوم "ممرض البحث" بتعبئة التاريخ المرضي وبعض البيانات الطبية من ملفي الطبي. سوف يقوم "ممرض البحث" بالاتصال بي بعد شهر, 3 و6 شهور من مغادرتي للمستشفى لتعبئة بعض الاستبيانات عبر الهاتف.

أدرك أن جميع المعلومات التي يتم الحصول عليها من قبلي خلال الدراسة سوف تتم معاملتها بسرية تامة. سوف يتم استعمالها لاغراض الدراسة فقط وليس لأي غرض اخر. وأن الباحثون هم فقط من يعرفون أسماء المشاركين في هذه الدراسة. أتفهم ان النتائج العامة للدراسة قد يتم نشرها في مجلات بحثية أو عرضها في المؤتمرات, ولكن لن يتم تحديد إسم المستشفى او الشخص المشارك في هذه الدراسة. أدرك انه يمكنني الانسحاب من هذه الدراسة في اي وقت اشاء.

لقد قمت بقراءة, او قرأت لي, نشرة معلومات المريض وافهم نموذج الموافقة هذا. لقد كانت لدي الفرصة لطرح الاسئلة وتم الاجابة على جميع اسئلتي بشكل مرض. اوافق بحريتي وطوعي على المشاركة في هذه الدراسة, مع عدم الاخلال بحقوقي القانونية والاخلاقية. لقد تلقيت نسخة من هذا الاتفاق.

كما اتفهم انه يمكنني الانسحاب من هذه الدراسة في اي وقت.

اسم المشارك:

.....

توقيع المشارك:..... التاريخ:.....

بيان مسؤولية الباحث: لقد قمت بايضاح طبيعة وهدف هذه الدراسة البحثية, الخطوات التي سيتم اجراؤها وأية مخاطر محتملة. لقد عرضت الاجابة على أي أسئلة وقمت بالاجابة التامة عنها. وأعتقد أن المشارك يفهم توضيحي وقد قام بمنحي موافقته المسبقة بحرية

توقيع الباحث:..... التاريخ :

.....

Cover letter: Invitation to patients

رسالة تغطية: دعوة للمشاركين الملحق:6

عزيزي المشارك /عزيزتي المشاركة

أُدعى نضال الفسفوس وانا حاليا أسعى للحصول على درجة الدكتوراه في التمريض من كلية ترينيتي دبلن. وكجزء من متطلبات هذه الدرجة, فإنني أقوم بعمل دراسة بعنوان "مسارات أعراض الاكتئاب عند المرضى الأردنيين الذين يعانون من متلازمة الشريان التاجي الحادة: المتنبئات والنواتج".. وهذا يعني التعرف على التغيرات التي تحدث للصحة النفسية خلال الستة اشهرالاولى من تعرض المريض للحادثة القلبية. تقام الدراسة في اربعة المستشفيات في الاردن, وهذا المستشفى واحد منهم.

أنت مدعو للمشاركة في هذه الدراسة لأنك قد تعرضت لحادثة قلبية. مشاركتك في هذه الدراسة تتضمن أجابتك لممرض البحث عن بعض الاسئلة وذلك خلال تواجدك في المستشفى وتعبئتك لبعض الاستبيانات اللتي سيقدمها لك. هذا سيستغرق حوالي 25 دقيقة. سوف يتصل "ممرض البحث" بك ايضا ثلاث مرات بعد عودتك للمنزل لطرح المزيد من الاسئلة, ولكن هذه المكالمات ستكون قصيرة ستستغرق فقط 5 -10 دقائق.

اذا كنت مهتما بمعرفة المزيد عن هذه الدراسة, رجاء قم بقراءة نشرة المعلومات الخاصة بالمشاركين المرفقة. واذا كنت مهتماً بالمشاركة بهذه الدراسة, يستطيع "ممرض البحث" زيارتك في غرفتك لتزويدك بالمزيد من المعلومات عن الدراسة. يمكنك ايضاً أن تتواصل معي على الرقم 0799187320 لأي استفسارات اخرى.

من المهم ان تعلم ان هذه الرسالة لا تجبرك على الانضمام لهذه الدراسة. القرار يعود لك فيما اذا رغبت بالمشاركة او لا. واذا لم ترغب بالمشاركة, لن يؤثر ذلك على الرعاية المقدمة لك بأي شكل من الاشكال.

أشكرك على وقتك واهتمامك.

تفضلوا بقبول فائق الاحترام,

نضال الفسفوس