A Study of Adherence to Physicians' Instructions for Physical Activity among Patients

with First-Time Acute Myocardial Infarction.

Master of Public Health Integrating Experience Project

Professional Publication Framework

by

Mikhayil Melikov, MPH Candidate

Advisor: Byron Crape MSPH, PhD
Reader: Robert Scharpf MS, PhD

College of Health Sciences
American University of Armenia

Yerevan, Armenia

2009

Table of Contents

ACKNOWLEDGEMENTS

ABSTRACT

BACKGROUND: Myocardial Infarction (MI) survivors are especially at increased risk for recurrent MI. Because of this increased risk of recurrences, cardiac rehabilitation should be carried out within the treatment process to decrease the risk of a second MI. Since there is no current Physical Activity rehabilitative program in Armenia and rehabilitative Physical activity is promoted only through physicians' advice for which adherence is unknown it will be crucial to know 1) the level of non-adherence to physicians' instructions for PA, 2) the proportion of MI patients reportedly receiving instructions for PA from their physicians and various factors associated with them.

METHODOLOGY: A cross-sectional telephone survey of MI patients was utilized for assessing the three research questions. Sample size for this study was 110. Study population was MI patients aged 18 to 70 who were treated at the Yerevan institute of Cardiology from 2007 to 2008 and who can speak and understand Armenian language. Systematic random sampling was conducted to select the sample of MI patients who met the inclusion and exclusion criteria of the study. The survey questionnaire was designed and adapted from an existing standard questionnaire *International physical activity questionnaire*. Additional questions were added to more-completely answer the research questions.

RESULTS: Of the study subjects, 21.8% (24/110) of the study population reported adhering poorly, 52.7% (58/110) reported adhering fairly and 25.5% (28/110) reported adhering well to physicians' instructions for PA. Age was found to be positively associated with the level of adherence to physicians' instructions (adjusted OR=1.12, p=0.009). Amazingly, smoking status appeared to be marginally positively associated with the level of adherence to physicians' instructions (adjusted OR=2.91, p=0.072).

Out of the approached sample, 72.7% (80/110) reported that they received instructions for physical activity from their physicians, with only 27.3% (30/110) of participants not reporting receiving such instructions. Age was negatively associated with receiving instructions for PA (adjusted OR=0.89, p=0.023).

CONCLUSION: Study findings suggest that those MI patients who have more risk factors reportedly adhering better to physicians' instructions for PA than those with fewer risk factors. Older patients were more likely to report not receiving instructions from their physicians than younger patients.

1. INTRODUCTION

1.1 Background/Literature Review

Cardiovascular diseases (CVD) are currently the leading causes of death in industrialized countries and are expected to become the leading causes of death in emerging countries by 2020 (1). In 2001, CVD's were the number one cause of death worldwide and are responsible for almost 15 million deaths in the world each year (2). Overall, the rates of cardiac mortality in the Eastern European countries which were formerly part of the U.S.S.R. are higher than in Western Europe (3).

The World Health Organization (WHO) identifies France in the European region (which includes former Soviet Republics) as having the lowest rates of age-adjusted mortality due to cardiovascular disease, with a rate of 170 CVD deaths per 100,000 men and 69 CVD deaths per 100,000 women for 2002 (4). However in Armenia, the age-adjusted CVD mortality rate was estimated to be 673 deaths per 100,000 population in 2004 for both sexes combined, in comparison with age adjusted 593 and 430 CVD deaths per 100, 000 population within the same year for Azerbaijan and Georgia respectively (5).

Like other countries that were former Republics of the Soviet Union, Armenia has a relatively high rate of mortality due to cardiovascular diseases. According to a 2002 WHO report, mortality rates for non-communicable diseases account for 88.4% of all deaths in Armenia; out of all deaths from non-communicable diseases, 62.2% are due to cardiovascular diseases and 61% percent of all cardiovascular disease deaths are due to ischemic heart disease (IHD) (6, 7). A leading cause of death among IHD's is *myocardial infarction* (MI), commonly known as a "heart attack" (8). MI is the disease of interest in this study.

Coronary artery disease is the most common disease among CVD's and is associated with high mortality rates and morbidity rates (9). Coronary artery disease usually leads to Ischemic Heart Disease (IHD) (10). The clinical signs of ischemic heart disease include silent

ischemia, stable angina pectoris, unstable angina, *myocardial infarction (MI)*, heart failure, and sudden death (11). MI is an especially apparent event in the sequelae of IHD's and will be the focus of this study.

" The term myocardial infarction should be used when there is evidence of myocardial necrosis in a clinical setting consistent with myocardial ischemia. Under these conditions any one of the following criteria meets the diagnosis for myocardial infarction. Any one of the following criteria meets the diagnosis for prior myocardial infarction:

- Development of new pathological Q waves with or without symptoms

- Imaging evidence of a region of loss of viable myocardium that is thinned and fails to contract, in the absence of a non-ischemic cause.

- Pathological findings of a healed or healing myocardial infarction" (12).

Myocardial infarction may be either a minor event in a lifelong chronic disease or it may be major catastrophic event leading to death. MI survivors are especially at increased risk for recurrent MI's (13). Because of this increased risk of recurrence, cardiac rehabilitation should be carried out within the treatment process to decrease the risk of a second MI. The main components for risk reduction are physical activity counseling and exercise training, nutritional counseling, management of lipid levels, management of hypertension, management of weight and diabetes, and smoking cessation (14).

The WHO describes physical activity as "a fundamental means of improving people's physical and mental health and is not necessarily considered exercise training. It reduces the risks of many non-communicable diseases and benefits society by increasing social interaction and community engagement (15, 16)." Physical Activity (PA) as cardiac rehabilitation is a safe and effective way to prevent and to prolong the time to the second MI

(17). Several studies have shown that PA improves health-related quality of life and prolongs the life years for MI patients (18, 19, 20). However, many first-time MI survivors who would benefit from PA as a cardiac rehabilitation are not adhering to physician's instructions for PA. The barriers against participation in PA as a cardiac rehabilitation include both service (health providers) and patient factors. Adherence to physicians' instructions, including physical activity during daily work and medications prescribed, is essential for the proper rehabilitation for MI patients. The sources of first-time MI patient activities which may put the patient at risk may include both physician and patient factors. Some of these factors which are attributed to physicians are lack of advice to their patients, the quality of their advice for PA, and failure to prescribe appropriate medications. Various characteristics and conditions of the patient may be associated with adherence to physicians' instructions, including demographic characteristics, health condition and life-style behaviors. Patient adherence rates for PA as a cardiac rehabilitation reportedly range from 15–59% (21, 22). Non-adherence to physicians' instructions has a potential to cause a number of problems that affect the patient and society. Some of these problems are increases in treatment failures, recurrences, complications, increases in return visits to physicians, increases in number of hospitalization, and increases in health care costs (23). Finally, there are several studies which find that CVD patients who did not follow PA instructions given by their physician have 20-30 % greater likelihood of having a fatal event than those who regularly adhere to PA instructions (24, 25).

In the existing literature, negative and positive factors which may be associated with adherence to physician's instructions for PA include age, gender, socio-economic status (SES), occupation, education, body mass index (BMI), smoking status, current self-perceived health status of the patients, fearful that PA may cause another MI, not believing that PA is

good for health, the absence of physicians' advice and family support (26, 27, 28). These factors were all evaluated in this study.

The current study examining factors associated with adherence of MI survivors to physician's instructions for PA rehabilitation is the first study of its kind in Armenia. The vast majority of studies which were reviewed studied adherence to PA rehabilitation programs by MI survivors (29, 30, 31). There is no current program for PA rehabilitation for MI survivors in Armenia; rehabilitative PA is only promoted through physician's instructions, for which adherence is unknown.

1.2 Study Objectives/ Research Questions/ Study Variables

The purpose of this study was to evaluate the adherence to physical activity instructions provided by physicians and the frequency by which physician's provided advice for cardiac rehabilitation within the treatment process for myocardial infarction patients and to test some factors, which are associated with physicians' instructions for PA and receiving instructions for PA from physicians.

The research objectives were:

➢ To investigate the prevalence of non-adherence to physicians' instructions for PA among MI patients with a first MI within the period 2007-2008 who are patients at Institute of Cardiology.

➢ To investigate the prevalence of those patients with a first MI who recall receiving instructions for PA from their physician.

➢ To identify the factors which are associated with adherence to physicians' instructions for PA and with receiving instructions for PA from the physicians among patients with a first MI.

Corresponding research questions were:

➢ What is the prevalence of non-adherence to physicians' instructions for PA among MI patients with a first MI within the period 2007-2008 who are patients at Institute of Cardiology?

➢ What is the prevalence of those patients who recall receiving instructions for PA among patients with a first MI?

➢ What are the factors, which are associated with adherence to physicians' instructions and receiving instructions for PA from the physicians?

The outcome variables of the study are the level of adherence to physicians' instructions for PA and the proportion of patients reportedly receiving instructions for PA from their physicians. The independent variables are age, gender, education, SES, marital status, BMI, smoking status, occupation, self-perceived health conditions, fear to PA, belief towards PA and social support. Studies indicate that measure of severity of the MI as defined by segment-elevated and non-segment-elevated myocardial infarction are *not* associated with risk of MI or time-to-second MI (32).

Table 1 shows the measurements and scales of measurement of study variables.

2. METHODOLOGY

2.1 Study design

A cross-sectional telephone survey of MI patients was utilized for assessing the three research questions. The study is not only descriptive but also analytical, which aims to find some associations between dependent and independent variables. Study design has its advantages and disadvantages. The major advantages of this study design are cost-effectiveness in identifying the associations between study variables. It is very cheap and simple to conduct and the data collection is performed very quickly by "one-shot" interview. The major disadvantage of this study was inability to identify causal relationships (33).

2.2 Study population

The *target population* was adult MI patients.

The *study population* consisted of the MI patients who meet the following inclusion and exclusion criteria:

Inclusion criteria:

- Patients with first acute myocardial infarction who were treated at the Yerevan Institute of Cardiology within the period 2007-2008

- Patients with the age of 18-70 years

- Patients who can speak and understand Armenian

Exclusion criteria:

- First MI patients who have Lerish's syndrome (vascular complications)

- Patients with articular complications

- Patients at the time of the study who were out of country

- Prisoners

Rationale for choosing the study population

Patients with Lerish's syndrome or with articular complications are excluded because their conditions would not allow them to adhere to PA regimens (34).

2.3 Study settings

The study was based on patients registered at the Yerevan at the Institute of Cardiology, which is located in Zeytun district.

2.4 Sample size

Sample size calculations were based on computations in EpiInfo for cross-sectional studies (35), with assumptions including 5% of type one error α and .80 for Power. The third research question was used, specifically for the factor of fear that *physical activity may lead*

to recurrent MI with the outcome of *adherence to physician's instructions for physical activity*; those reporting fear of physical activity were assumed to consist of 30% of all participants and that 10% of those adhere to instructions for physical activity. Those without fear (70% of all participants) were assumed to adhere to instructions at a rate of 40%. These assumptions were in part based on literature previously cited. Sample size calculations produced a sample size of 93 with adjusted for non-response of 10%, producing a final sample size of 103.

2.5 Sampling methodology

Systematic random sampling was conducted to select the sample of patients to be interviewed by telephone using the sampling frame of MI patients enrolled at the Yerevan Institute of Cardiology, based on the exclusion and inclusion criteria. The *sampling frame* was the list of all MI patients at the Institute of Cardiology.

2.6 Study instrument

The survey questionnaire was designed and adapted from an existing standard questionnaire *(International physical activity questionnaire, November 2002 long last 7 days format)* (36). Additional questions were added to more-completely answer the research questions. The study instrument had three major domains: 1) physicians' instructions for physical activity, 2) socio-demographic questions (such as age and educational level) and 3) behavior and psychological factors (including smoking status and fear towards PA).

2.7 Data collection

Telephone-based interviews were performed by two interviewers from the 5th to the 20th of June 2009. Each interview lasted from 10 to 15 minutes.

2.8 Data coding

The outcome variables of the study are the level of adherence to physicians' instructions for PA (poorly=1, fairly=2, well=3) and the proportion of patients reportedly receiving instructions for PA (Table 1). The adherence score to physicians' instructions for PA was created based on the means of six physical activities types such as walking, running, weight lifting, swimming, gardening, and working capacity. As the result according to the natural break the cut point for adhering poorly, fairly and well was between 1.00 to 2.20, 2.25 to 2.75 and 2.80 to 3.00 respectively. However in bivariate and multivariate logistic models adherence score to physicians' instructions was categorized into two categories (fairly/well) 2.25 to 3.00 as a better adherence and 1.00 to 2.20 as a poor adherence in order to handle distribution of independent variables with statistical limitations. Based on natural break, the participants' age was divided into two categories: 42-54 years and 55–68 years. Body Mass Index (BMI) was calculated by dividing body mass by height squared (kg/m^2). A BMI of less than $25 \ kg/m^2$ was classified as normal weight, from $25 \ kg/m^2$ and higher as overweight/obesity weight. Highest educational level was coded as university/postgraduate, college and the lowest educational level was coded as a secondary school completed or not completed. For SES, the sample was divided into 2 groups: less than or equal to 50000 and greater than 50000 AMD's. Participants also reported about their beliefs towards PA, in which the variable was collapsed into three categories: agree, neither agree nor disagree and disagree.

Self-perceived health status of participants was coded into 3 categories: good, fair and poor. Social support was coded into two categories: first category included any family members or best friends, with the second category including neither support from family members nor best friends. Some variables were collapsed because of small numbers in some cells did not allow statistical testing.

3. ETHICAL CONSIDERATIONS

The study was approved by the Institutional Review Board of the American University of Armenia. Participants of the study were provided oral consent before starting the telephone-based interview. The interviewees were informed about the purpose of the study, expected risks or discomforts and benefits from participation. The only discomfort for the interviewees was the time spent on the interview. Participants were informed about the confidentiality of data collection procedures and the voluntary nature of the study. The list of information on names and phone numbers was kept in separate locked room to which only the head nurse of the department and the study's student investigator have access. This list was linked with the survey data form by an identification number with no personal identifiers included on the form itself. All reporting of the results were in aggregate form. The list with personal identifiers and the data forms will be destroyed after 6 months following the study termination. There are no risks and no direct benefits for participants.

4. DATA ANALYSIS

Data entry and recoding was being done by the SPSS 11.0 statistical package. All univariate statistical, bivariate and multivariate analysis was performed by means of the SPSS 11.0 software package.

5. RESULTS

5.1 Response Rate Calculation

A total of 110 interviews were completed out of 135 attempts (with 10 refusals, nine wrong numbers and six persistently busy lines), producing a response rate of 81% (110/135); the response rate was computed as the percent of completed interviews out of the total number of attempts based on the sampling frame.

5.2 Socio-demographic Data

Of the 110 completed interviews, 82.7% (91/110) were males and 17.3% (19/110) were females (see Table 2). The mean age of the participants was 55 years old with a standard deviation of six years. Out of all participants, 5.5% (6/110) had not completed secondary education , 15.5% (17/110) had complete secondary education with no further education , 35.5 % (39/110) were college graduates and 43.6 % (48/110) had higher levels of education (institute, university and post graduate). The percent for higher levels of education was higher than expected; according to the 2001 census, only 27% of the Yerevan population had higher levels of education (37). More than half of the study population was employed 51.2% (57/110), very similar to the 2001 census of 52.0% of employment among adults in Yerevan (37).

A little more than three-quarters of the study population, 75.5 % (83/110), reported monthly household expenses from 50,001 to 200,000 AMD, 15.4 % (17/110) reported expenditures of 25,000 to 50,000 AMD per month and only 9.1 % (10/110) reported spending more than 200,001 AMD monthly (Table 2).

Results are reported separately in distinct section. Results for the analyses of the first outcome variable (*level of adherence to physicians' instructions for PA*) are provided in section 5.3. Results for the analyses of the second outcome variable (*receiving instructions for PA*) are provided in section 5.4.

5.3 Bivariate analyses results with the primary dependent variable of "level of adherence to physician's instructions for physical activity" and independent factors

Based on the results, 21.8% (24/110) of the study population reported adhering poorly, 52.7% (58/110) reported adhering fairly and 25.5% (28/110) reported adhering well to *physicians' instructions for PA.* Out of all independent factors, only four bivariately were statistically-significantly associated with level of adherence to *physicians' instructions for PA*

(Table 3): 1) *age* of participants was found to be a statistically significant (unadjusted p=0.003) – with older patients reportedly adhering better to *physician's instructions for PA* than younger patients, 2) *gender* was found to be marginally statistically significant (unadjusted p=0.100) – with male adhering better to the *physicians' instructions for PA* than females, 3) *tobacco smoking status* was identified as statistically significant (unadjusted p=0.035), where smokers were adhering better to the *physicians' instructions for PA* than non-smokers, and 4) finally, *fear that PA may cause another MI* was also statistically significant (unadjusted p=0.003), with those MI patients who did not have fear were adhering better than those who had fear.

Each of these four factors was also associated with other covariates, which may be potential confounders for these four factors. Spearman's non-parametric correlation test was used to check for colinearity between binary independent variables; as a result none of the correlation coefficients of the independent variables had coefficients more than 0.4 and -0.4. Thus, *age* was associated with *self-perceived health conditions* of the participant – young participants have better self-perceived health conditions than older participants (unadjusted p=0.035). The age of participants was found to be associated with *employment status* as well – younger patients were more employed than older p< 0.0005. *Gender* was associated with *smoking* and *socio-economic status*. The associations between gender and these last two factors was statistically significant (p<0.0005 and p= 0.005 respectively); males were much more likely to smoke than women and socio-economic status of females were lower than males. *Smoking status* of participants was also statistically significantly (p=0.006) associated with the *type of occupation* – more smokers were working manually than non-smokers. *Smoking* was also associated with *self- perceived health conditions* – smokers had worse self-perceived health conditions than non-smokers (p=0.003).

The factor fear *that PA may cause another MI* was associated with both *social support* and *belief that PA is good for health.* Those MI patients who had fear that PA may cause another MI had more social support than those MI patients who had no fear (p= 0.030). Marginal statistically significant association was found between *belief that PA is good for health* and *fear that PA may cause* MI (p=0.064). MI patients who did not have fear to PA had more belief to PA than those who had fear to PA.

In further analysis, a multivariate logistic regression model was used to test the associations between independent factors and the primary outcome variable poor adherence to physicians' instructions for PA, controlling for potential confounding. The factor *adherence to physicians' instructions for PA* was categorical (with three categories) variable in bivariate analysis and dichotomous in sub-analysis with logistic regression. Out of the independent variables only age and socio-economic status were changed into the continuous variables; all other factors remained the same as in bivariate analysis.

The covariates which were included in the final multivariate logistic regression were *age, gender* and *smoking status* (Table 5). Covariate were tested in a multivariate logistic regression if they were near statistically significant with the outcome variable in bivariate analysis. Covariates were retained in the final model if they had statistical significance (p≤0.05), borderline statistical significance (p≤0.10), or were substantial confounders for these variables. Out of the covariates included in the final model, *age* was found to be statistically significantly associated with the level of adherence to physicians' instructions for PA (adjusted OR=1.12, p=0.009) and *current smoking status* was found to have borderline statistical significance (adjusted OR=2.91, p=0.072). *Gender* substantially confounded *smoking*, tested by removing (OR for *smoking*=3.70, p=0.017 adjusting only for age) and including *gender* (OR for *smoking*=2.91, p=0.072 adjusting for age and gender), thus was retained in the final model. The Hosmer-Lemeshow goodness-of-fit test was run to test if the

covariates in the final model for the first outcome variable – *level of adherence to physicians' instructions*- fits the logistic regression adequately. The result was equal to a non-significant p=0.61, indicating that model is a good fit.

5.4 Bivariate analyses results comparing independent factors with the secondary dependent variable "Number of MI patients reportedly receiving instructions for PA from their physicians"

Out of the entire study population, 72.7% (80/110) reported that they received instructions for physical activity from their physicians, with only 27.3% (30/110) of participants not reporting receiving such instructions. However, the follow-up questions triggered the memory of those 27.3%, indicating that they *did* receive some instructions from their physician for PA; out of six PA domains in the study instrument, the mean number of domains where physicians provided instructions on PA for those participants who had initially reported receiving *no* instructions on PA, was 2.43 as compared to 3.12 for those who had initially reported receiving instructions (not on table).

Out of all study variables, two were statistically significantly associated and one was marginally statistically significantly associated with the second dependent variable *receiving instruction for PA from their physicians* in bivariate analysis (Table 4). In the bivariate analysis, *age* statistically significantly (unadjusted p=0.003) increased the likelihood of reporting *no instructions*, along with older MI patients (55-68 years-of-age) as compared to younger MI patients (42-54 years-of-age). The factor *self-perceived health condition* was also statistically significant (unadjusted p=0.015). Those MI patients who had better self-perceived health conditions reported receiving instructions for PA from physicians more often than those who had poor self-perceived health conditions. *Gender* had border-line statistically significant for receiving instructions for PA (unadjusted p=0.087). Males reported receiving instructions on PA more often than females.

13

Based on these bivariate results, these factors were included in a multivariate logistic regression model along with potential confounders to clarify the associations between these three independent variables and the second dependent variable *receiving instruction for PA from their physicians* (Table 6).

In this final model only *age* was found to be statistically significantly associated with *receiving instructions for PA from their physicians* (adjusted OR= 0.90, p=0.028). The other variables in the final model were included for their confounding effects. A Hosmer-Lemeshow goodness-of-fit test statistic was equal to a non-significant p=0.65, indicating that the elected final model for the outcome *receiving instructions for PA* was a good fit for logistic regression.

6. DISCUSSION

First outcome variable – level of adherence to physicians instructions for PA

The current study examined the prevalence of adherence, factors associated with adherence to physicians' instructions for physical activity and factors associated with receiving instructions from physicians for PA by MI survivors. There is no cardiac rehabilitative program in Armenia and rehabilitative PA is promoted only through physicians' instructions; it is important to know the profile of non-adhering patients to physicians' instructions for physical activity and the factors which lead to poor adherence to these instructions for PA for the protection of the public health of MI survivors.

Adherence to physicians' instructions for physical activity depends on two major interdependent variables, physician and patient factors (38). Accordingly, further discussions of findings are related to these factors.

The current study revealed that 21.8% (24/110) of the study population reported adhering poorly, 52.7% (58/110) reported adhering fairly and 25.5% (28/110) reported adhering well to *physicians' instructions for PA*. According to the *Eurobarometer large Scale*

Healthy Population studies, the level of adherence for recommendations of physical activity was 66% among European Union countries; almost the same figure was observed (63%) for adherence to physical activity recommendations among Swedish adults (39, 40). Other research suggests that the prevalence of adherence to physical activity regimens in various countries fluctuates from 31.7% to 61.7% among patients who are seeking care at tertiary hospitals (41). These estimates are similar to the findings from the current study of MI survivors. However a study on compliance for taking prescribed medications conducted in Nork Marash Medical Hospital found that compliance rates for following physicians' instructions for taking medication was 69% (42). Adherence for following instructions for PA from physicians by MI patients in the current study was relatively similar, with 53.7% reportedly adhering fairly and another 25.5% adhering well. The compliance for taking medications study found that 8.1% of study participants reportedly perceive their health condition as fair or poor, as compared with the findings of this current PA adherence study where 71.8% of study participants reportedly had fair health condition and 6.4% with poor health condition. This may be explained by the fact that shortly after stent or CABG procedures, patients feel much improved, whereas MI patients can have protracted periods of feeling poorly. The medication compliance study also found that more risk factors decreased compliance, whereas in the current PA adherence study of MI patients, more risk factors increased adherence. The perception of patients towards medications as compared to physical activity may differ, influencing their adherence or compliance to directions; this open question requires further study.

Out of the independent variables which were tested in a multivariate logistic regression model, adjusting for confounders, with the primary outcome variable of *level of adherence to physicians' instructions*, *age* was found to be statistically significantly associated and *smoking* with borderline statistically significantly associated with *adherence to physicians' instructions for PA* (adjusted OR=1.12, p=0.009 and adjusted OR=2.91, p=0.072 respectively); one year increase

in the age of patients on the average increased the odds of adhering to physicians' instructions by 12%. *Current smoking* increased the odds for *adherence to physicians' instructions for PA* by almost threefold.   According to the published literature, those CHD patients with more risk factors (such as smoking and age) for recurrent adverse events are more adherent to physicians' instructions for PA than those CHD patients with fewer risk factors (43, 44). A study of adherence to heart-healthy behaviors among patients with coronary heart disease found that the highest age quintile was associated with improved adherence to physical activity (45). The findings of this current study, which showed that older patients were adhering better than younger and smokers were more likely to adhere to instructions than non-smokers, was consistent with this general trend in the published literature.

Second outcome variable – proportion of receiving instructions from physicians for PA among MI Patients

Findings presented in this section cover *physicians' advice to MI patients for PA*. Health professional counseling their patients about physical activity protects the health of these patients. Physicians' advice to exercise has been shown to increase the duration of physical activity (46). Good adherence to physicians' recommendations for PA is consistently associated with better health outcomes (47, 48).

According to the study findings, 72.7% (80/110) reported that they received instructions for physical activity from their physicians and only 27.3% (30/110) of participants reported not receiving such instructions. Based on one study, 99% of U.S. patients reported receiving instructions for PA from their physician (49). From another study, during check-up visits 56% of all patients were asked about their physical activity and only 34% reported receiving any instructions for PA (50). The findings of current study suggest that the most common recommendations by physicians in the Institute of Cardiology in Armenia were given on walking, weight lifting and working capacity. A total of 91.8%,

82.7% and 70.0% of the study population reported receiving instructions on walking, weight lifting and working capacity respectively.

Out of all variables tested in multiple logistic regression, *age* was found to be the only statistically significantly associated covariate with the second outcome variable of *receiving instructions for PA from physicians (*adjusted OR=0.90, p=0.028)*. This indicated that one year increase in age on average decreases the odds of reportedly receiving instructions by 10%. In other words older MI patients were less likely to recall receiving instructions for PA from physicians than younger MI patients. However, in contrast when older patients reported receiving instructions from their physician, they adhered better to these instructions than younger patients. It is possible that older patients may have received instructions for PA from their physician, but were less likely to recall those instructions because of their advanced age. Another explanation may be related to physicians' tendency to more often provide instructions to younger patients than older patients. In other countries, findings have shown that 22% to 48% of older people received instructions for PA from their physicians (51). Literature also suggested that physicians are more likely to counsel younger patients for PA than older patients (52). In addition, according to the literature, patients with more risk factors (other than age) are more likely to receive instructions for PA than those patients with fewer risk factors for health (53); if younger MI patients had more risk conditions (other than age) than older MI patients, then this would further provide an explanation for this association.

7. STUDY LIMITATIONS

A study by Kjaer et al. suggested that indicators for adherence may be somewhat susceptible to bias (54). In this study, the factors *adherence to physicians' instructions* and *receiving instructions from physicians* were both based on patient recall, which could be a source of some recall bias.

In addition, the present study was cross-sectional in design, where temporality between dependent and some independent variables could not be determined. Finally, there might be some unknown confounders, which were not adjusted for during the analysis.

8. CONCLUSIONS AND RECOMMENDATIONS

More than half of the study population reportedly adhered fairly to physicians' instructions, with roughly equal numbers of the rest divided between adhering poorly and adhering well. The factors found to be associated with the level of adherence to physicians' instructions were *age* and *smoking status*. In the literature, age is a consistent predictor of adherence to physicians' recommendations for PA. Surprisingly, smoking status was found to be positively associated (borderline statistical significance) with the level of adherence to physicians' instructions for PA. Study findings suggest that those MI patients who have more risk factors were reportedly adhering better to physicians' instructions for PA than those MI patients with fewer risk factors.

A little more than a quarter of the patients reported *not* receiving instructions for PA from their physician. The only factor, which was associated with receiving instructions for PA was *age*. More often older patients reported receiving *no* instructions for PA from their physician than younger patients. This could be due to recall problems by older patients or it is also possible that physicians counseled younger patients more often.

In addition to verbal instructions from physicians concerning PA for MI patients, written instructions for supporting PA adherence (for example, instructions for PA written in discharge forms) would further improve adherence for cardiac rehabilitation among MI patients; these written instructions, with possible follow-up by physicians, would further assure that older patients would receive and recall receiving instructions from their physicians. Moreover, to increase adherence by patients with fewer risk factors, physicians

should emphasize the importance of adherence to PA for all patients. Follow-up programs outside of the medical institution to support patients in adherence to these instructions would potentially to lower the rates of complications, reducing the risk of recurrent MI's and to prolong life. Finally, it is important to conduct further studies to better understand the dynamics of these factors in adherence and to design effective programs and interventions to meet these needs.

REFERENCES/BIBLIOGRAPHY

1. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. Lancet 1997; 349: 1498-1504

2. The Global Burden of Cardiovascular Disease
   http://www.medscape.com/viewarticle/425437

3. Salim Yusuf et al. Global burden of cardiovascular diseases. Circulation 2001; 104; 2855-2864

4. Death rates due to Cardiovascular diseases worldwide:
   http://encarta.msn.com/media_701500667_761572608_-
   1_1/Death_Rates_for_Cardiovascular_Disease_(CVD)_in_the_World.html

5. Cause-specific mortality and morbidity
   http://www.who.int/whosis/whostat/EN_WHS09_Table2.pdf

6. Jean-Pire Bassand, Christian W. Hamm. " Guidelines for the diagnosis and treatment of non-ST-segment elevation acute coronary syndromes". European Heart Journal (2007) 28, 1598-1660

7. Highlights on health in Armenia 2005
   http://www.euro.who.int/document/CHH/ARM_Highlights_rev1.pdf

8. The burden of myocardial infarction
   http://www.americanheart.org/presenter.jhtml?identifier=4478

9. Yusuf S, Reddy S, Ounpuu S, Anand S. Global burden of cardiovascular diseases: part 1: general considerations, the epidemiologic transition, risk factors, and impact of urbanization. Circulation 2001; 104(22):2746–53.

10. Coronary Heart Disease:
    http://en.wikipedia.org/wiki/Ischaemic_heart_disease

11. Jean-Pirre Bassand, Christian W. Hamm. " Guidelines for the diagnosis and treatment of non-ST-segment elevation acute coronary syndromes". European Heart Journal (2007) 28, 1598-1660

12. Kristian Thygesen, Joseph S. Alpert and Harvey D. white on behalf of the Joint ESC/ACCF/AHA/WHF Task force for the Redefinition of Myocardial Infarction. European Heart Journal (2007) 28, 2525-2538

13. American Heart Association. Heart Disease and Stroke Statistics- 2003 update. Dallas, Texas: American Heart Association, 2002.

14. Balady GJ, Ades, PA, Commos P, et al. Core components of cardiac rehabilitation/secondary prevention programs: a statement for health care professionals from the American Heart Association and the American Association of

Cardiovascular and Pulmonary Rehabilitation Writing group. Circulation 2000; 102: 1069-71

15. World Health Organization
http://www.euro.who.int/mediacentre/PR/2006/20061117_1

16. Blackburn G, Foody JM, Sprecher DL, et al. Cardiac rehabilitation participation patterns in a large tertiary care center: evidence for selection bias. J Cardiopulm Rehab 2000; 20: 189-95

17. Ewa Trzos, Małgorzata Kurpesa. " The influence of physical rehabilitation on arterial compliance in patients after myocardial infarction". Cardiology Journal 2007, Vol. 14, No. 4, pp. 366–371

18. Whellan DH, Shaw LK, Bart BA, et al. Cardiac rehabilitation and survival in patients with left ventricular systolic dysfunction. Am Heart J 2001; 142: 160-6.

19. Marchionni N, Fattirolli F, Fumagalli S, Oldridge N, Del Lungo F and Morosi L et al.: Improved exercise tolerance and quality of life with cardiac rehabilitation of older patients after myocardial infarction: results of a randomized controlled trial. Circulation 2003, 107: 2201-2206.

20. Patem RR, Pratt M, Blair SN, et al. Physical activity and public health. A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. JAMA 1995; 273: 402–7.

21. Pell J, Pell A, Morrison C, Blatchford O and Dargie H: Retrospective study of influence of deprivation on uptake of cardiac rehabilitation. BMJ 1996, 313:267-268.

22. Gattiker H, Goins P and Dennis C: Current status and future directions. West J Med 1992, 156:183-188.

23. Marije S Koelewijn-van Loon, Ben van Steenkiste, Gaby Ronda, Michel Wensing, Henri E Stoffers, Glyn Elwyn, Richard Grol and Trudy van der Weijden "Improving patient adherence to lifestyle advice (IMPALA): a cluster-randomized controlled trial on the implementation of a nurse-led intervention for cardiovascular risk management in primary care (protocol)" *BMC Health Services Research* 2008, 8**:9**

24. Mihaela Tanasescu, Michael F. Leitzmann. Physical Activity in Relation to Cardiovascular Disease and Total Mortality among Men with Type 2 Diabetes. Circulation 2003; 107; 2435-2439; originally published online Apr 28, 2003.

25. Patrick Bergman, Andrej M Grjibovski. Adherence to physical activity recommendations and the influence of socio-demographic correlates – a population-based cross-sectional study. BMC Public Health 2008, 8:367.

26. Jenny Wingham, Hasnain M. Dalal. Listening to patients: Choice in cardiac rehabilitation European Journal of Cardiovascular Nursing 5 (2006) 289 – 294.

27. Saito Daiji, Shiraki Teruo, Oka Takefumi. Risk Factors Indicating Recurrent Myocardial Infarction After Recovery From Acute Myocardial Infarction. Circ J 2002; 66: 877-880

28. Kate Jolly, Gregory YH Lip. Home-based versus hospital-based cardiac rehabilitation after myocardial infarction or revascularization: design and rationale of the Birmingham Rehabilitation Uptake Maximization Study (BRUM): a randomized controlled trial [ISRCTN72884263]. BMC Cardiovascular Disorders 2003, 3:10

29. Choo J, Burke LE, Pyo Hong K. Improved quality of life with cardiac rehabilitation for post-myocardial infarction patients in Korea. 2007 Sep; 6(3):166-71. Epub 2006 Aug 23.

30. Dalal HM, Evans PH, Home-based versus hospital-based rehabilitation after myocardial infarction: A randomized trial with preference arms--Cornwall Heart Attack Rehabilitation Management Study (CHARMS). Int J Cardiol. 2007 Jul 10; 119(2):202-11.

31. Kate Jolly, Gregory YH Lip. Home-based versus hospital-based cardiac rehabilitation after myocardial infarction or revascularization: design and rationale of the Birmingham Rehabilitation Uptake Maximization Study (BRUM): a randomized controlled trial [ISRCTN72884263]. BMC Cardiovascular Disorders 2003, 3:10

32. Gilles Montalescot, Jean Dallongeville. STEMI and NSTEMI: are they so different? 1 year outcomes in acute myocardial infarction as defined by the ESC/ACC definition (the OPERA registry. European Heart Journal Advance Access published April 5, 2007

33. Lu Ann Aday. Designing and conducting health surveys: a comprehensive guide/ 2nd ed. p. 25-43

34. Jonathan McGavock, Cardiovascular adaptations to exercise training in postmenopausal women with type 2 diabetes mellitus. Cardiovasc Diabetol. 2004; 3: 3.

35. Fleiss, Statistical Methods for Rates and Proportions, 2nd Edition. Wiley, 1981

36. Craig CL, Marshall AL, Sjosstrom M, Bauman AE, Booth ML, Ains-worth BE, Pratt M. Ekelund U, Yngve A, Sallis JF, Oja P: International physical activity questionnaire: 12-country reliability and validity. Medicine and Science in Sports and Exercise 2003, 35(8): 1381-1395

37. National Statistical Service of the Republic of Armenia The Results of 2001 Population Census of the Republic of Armenia 2001 (Figures of Yerevan City) Yerevan 2003

38. Adnan S. Dajani Adherence to Physicians' Instructions as a Factor in Managing Streptococcal Pharyngitis Pediatrics 1996; 97; 976-980.

39. Rutten A, Abu-Omar K: Prevalence of physical activity in the European Union. *Sozial- und Präventivmedizin/Social and Preventive Medicine* 2004, 49(4):281-289

40. Patrick Bergman, Andrej M Grjibovski. Adherence to physical activity recommendations and the influence of socio-demographic correlates – a population-based cross-sectional study. BMC Public Health 2008, 8:367.

41. Howteerakul, N. et al. Adherence to Regimens and Glycemic Control of Patients with Type 2 Diabetes Attending a Tertiary Hospital Clinic. Journal of Public Health, 19 (1). pp. 43-49.

42. Seda Aghabekyan, Patients Satisfaction and Medication Non-compliance following Percutaneous Coronary Intervention in Armenia. College of Health Science, 2009.

43. Kallings, Lena Physical activity on prescription : Studies on physical activity level, adherence and cardiovascular risk factors. Fredagen den 5 september 2008, kl. 09.00. Hörsal CMB, Berzelius väg 21, Karolinska Institutet, Solna.

44. Prevalence of multiple chronic disease risk factors2001 National Health Interview Survey *American Journal of Preventive Medicine*, Volume 27, Issue 2, Pages 18-24 L.Fine, G.Philogene, R.Gramling, E.Coups, S.Sinha

45. Rosalie R. et al. Adherence to Heart-Healthy Behaviors in a Sample of the U.S. Population. Preventing Chronic Disease, volume 2: No 2.

46. Lewis BS, Lynch WD. The effect of physician advice on exercise behavior. Prev Med. 1993; 22(1):110-21.

47. Simpson SH, Eurich DT, Majumdar SR, et al. A meta-analysis of the association between adherence to drug therapy and mortality. BMJ 2006; 333:15.

48. Good adherence improves health outcomes
http://www.ingentaconnect.com/content/adis/inp/2006/00000001/00001544/art00002

49. Cheryl L Albright PhD et al. **"**Incorporating physical activity advice into primary care: Physician-delivered advice within the activity counseling trial" American Journal of Preventive Medicine Volume 18, Issue 3, April 2000, Pages 225-234

50. Nawaz H, Adams ML, Katz DL. Physician-patient interactions regarding diet, exercise, and smoking. Prev Med.2000; 31(6): 652-7.

51. Damush TM, Stewart AL, Mills KM, King AC, Ritter PL. Prevalence and correlates of physician recommendations to exercise among older adults. J Gerontol A Biol Sci Med Sci.1999;54(8):M423-7

52. Morey MC, Sullivan RJ. Medical assessment for health advocacy and practical strategies for exercise initiation. Am J Prev Med. 2003; 25 (3Sii): 204-208.

53. Kreuter MW, Scharff DP, Brennan LK, Lukwago SN. Physician recommendations for diet and physical activity: which patients get advised to change? Prev Med. 1997; 26(6):825-33.

54. Kjaer ML, Jorgensen B, Karlsmark T, Holstein P, Simonsen L, Ottrup F. Does the pattern of venous insufficiency influence healing of venous leg ulcers after skin transplantation? *Eur J Vasc Endovasc Surg*. 2003; 25(6):562-567.

Table 1. Code list of all study variables

Dependant variable		
Variable	**Mode of measurement**	**Scale**
Adherence to physicians' instructions for PA	How well are you following physicians' instructions for PA? **1= poorly** (1.00-2.20) **2= fairly** (2.25-2.75) **3= well** (2.80-3.00)	**Ordinal** poorly/fairly/well
	1=poorly (1.00-2.20) **2= well** (2.25-3.00)	**Dichotomous** poorly/well
Number of people who recalled receiving instructions for PA from physicians	Do you recall that your physician give you instructions for PA?	**Dichotomous** 1=Yes, 0=No
Independent variables		
Variable	**Mode of measurement**	**Scale**
Age	What was your age on your last birthday?	**Continuous** ----
Gender		**Dichotomous** Males=0, Females=1
Educational level	What is your level of education?	**Ordinal** 1= Incomplete / Complete secondary 2= College (2 years) 3= Institute/ university/ Postgraduate
SES	On average how much money does your household spend monthly?	**Dichotomous** 1= Below 25 000 drams/25,001 to 50,000 drams 2= 50 001 to 200 000 drams/ More than 200 001 drams
Work occupation	Are you occupied?	**Dichotomous** 1=Yes, 0=No
Marital Status	What is your marital status?	**Nominal** 1= Single 2= Married 3= Divorced 4=Widowed
Belief towards PA	Please indicate if you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree with the following statement:	**Ordinal** 1=Strongly agree /Agree 2= Neither agree nor disagree 3= Disagree/Strongly

	Physical activity is beneficial for health	disagree
Smoking status	Are you currently smoking?	**Dichotomous** 1=Yes, 0=No
Self-perceived health status	Which of the following best describes your health today?	**Ordinal** 1= very good/good 2= fairly 3= bad
BMI	What is your weight/height? -------------------------------------- Weight/height^2 score	**Continuous** -------- **Dichotomous** 1= <18.5-24.99 2= 25.0>30
Fear to PA	Are you afraid currently that PA might cause MI?	**Dichotomous** 1=Yes, 0=No
Social support	Is there anybody who can help you to adhere to physicians instructions' for PA?	**Dichotomous** 1=all family members i.e. wife, husband, son, daughter and e.c. also best friends 2= Neither family members nor best friends

Table 2. Descriptive Characteristics of the Study Population

Characteristics	Categories	Percent (Count) or Mean*
Level of adherence to *physicians' instructions for PA*	Poorly Fairly Well	21.8% (24) 53.7% (58) 25.5% (28)
Recall that your *physician gave you instructions for PA?*	Yes No	72.7% (80) 27.3% (30)
Age		55 *
Gender	Male Female	82.7% (91) 17.3 % (19)
Education	Secondary *Incomplete* *Complete* College graduate Institute/university/post graduate	 5.5% (6) 15.5% (17) 35.5 % (39) 43.6 % (48)
Employed?	Yes No	51.8 % (57) 48.2 % (53)
Household monthly expenses	25000-50000 50001-200000 >200000	15.4 % (17) 75.5 % (83) 9.1 % (10)
Marital status	Single Married Divorced Widowed	4.5% (5) 86.4% (95) 4.5% (5) 4.5% (5)
BMI	<25 ≥25<30 >30	28.2% (31) 54.5% (60) 17.3% (19)
Self-perceived health condition	Good Fair Bad	21.8% (24) 71.8% (79) 6.4% (7)
PA is good for health?	Agree Neither agree nor disagree disagree	53.6% (59) 39.1% (43) 7.3% (8)
Fearful that PA can cause another MI?	Yes No	53.6% (59) 46.4% (51)
Smoking tobacco?	Yes No	44.5% (49) 55.5% (61)
Social support	None Family members, best friends	30.9% (34) 69.1% (76)

Table 3. Bivariate chi square analysis with first outcome variable

Independent variables	The level of adherence to physicians' instructions for PA, %(count)			P *value**
	poorly	fairly	well	
Age 42-54	31.3(15)	58.3(28)	10.4 (5)	0.003
55-68	14.5(9)	48.4(30)	37.1 (23)	
Gender Males	18.7 (17)	53.8 (49)	27.5 (25)	0.100
Females	36.8 (7)	47.4 (9)	15.8 (3)	
Education level Secondary Complete/Incomplete	21.7 (5)	47.8 (11)	30.4(7)	0.723
College graduate	20.5 (8)	48.7 (19)	30.8(12)	
Institute/university/post-graduate	22.9 (11)	58.3(28)	18.8(9)	
Employment status Yes	24.6 (14)	50.9 (29)	24.6 (14)	0.770
No	18.9 (10)	54.7 (29)	26.4 (14)	
Household monthly expenses ≤50.000	17.6 (3)	52.9 (9)	29.4 (5)	0.868
>50.000	22.6 (21)	52.7 (49)	24.7 (23)	
Smoking status Yes	12.2 (6)	65.3 (32)	22.4 (11)	0.035
No	29.5 (18)	42.6 (26)	27.9 (17)	
BMI <25 (normal)	29.0 (9)	48.4 (15)	22.6 (7)	0.827
≥25<30 (overweight)	20.0 (12)	53.3 (32)	26.7 (16)	
>30 (obese)	15.8 (3)	57.9 (11)	26.3 (5)	
Belief that PA is good for health Agree	22.0 (13)	45.8 (27)	32.2 (19)	0.203
Neither agree nor disagree	20.9 (9)	65.1 (28)	14.0 (6)	
disagree	25.0 (2)	37.5 (3)	37.5 (3)	
Fearful that PA may cause MI Yes	20.3 (12)	66.1 (39)	13.6 (8)	0.003
No	23.5 (12)	37.3 (19)	39.2 (20)	
Self-perceived health condition Good	33.8 (8)	54.2 (13)	12.5 (3)	0.294
Fair	17.7 (14)	51.9 (41)	30.4 (24)	
Bad	28.6 (2)	57.1 (4)	14.3 (1)	
Social support None	26.5 (9)	47.1 (16)	26.5 (9)	0.668
Family members and best friends	19.7 (15)	55.3 (42)	25.0 (19)	
*Based on Chi square test				

Table 4. Bivariate chi square analysis with second outcome variable

Independent variables	Number of MI patients who reported receiving instruction for PA from their physicians, % (count)		P *value**
	Yes	No	
Age 42-54	87.5 (42)	12.5 (6)	0.003
55-68	62.9 (39)	37.1 (23)	
Gender Males	76.9 (70)	23.1 (21)	0.087
Females	57.9 (11)	42.1 (8)	
Education level Secondary Complete/Incomplete	73.9 (17)	26.1 (6)	0.420
College graduate	66.7 (26)	33.3 (13)	
Institute/university/post-graduate	79.2 (38)	20.8 (10)	
Employment status Yes	73.7 (42)	26.3 (15)	0.991
No	73.6 (49)	26.4 (15)	
Household monthly expenses ≤50.000	70.6 (12)	29.4 (5)	0.756
>50.000	74.2 (69)	25.8 (24)	
Smoking status Yes	75.5 (37)	24.5 (12)	0.689
No	72.1 (44)	27.9 (17)	
BMI <25 (normal)	77.4 (24)	26.6 (7)	0.633
≥25<30 (overweight)	70.0 (42)	30.0 (18)	
>30 (obese)	78.9 (15)	21.1 (4)	
Belief that PA is good for health Agree	79.7 (47)	20.3 (12)	0.154
Neither agree nor disagree	69.8 (30)	30.2 (13)	
disagree	50.0 (4)	50.0 (4)	
Fearful that PA may cause MI Yes	72.9 (43)	27.1 (16)	0.847
No	74.5 (38)	25.5 (13)	
Self-perceived health condition Good	70.8 (17)	29.2 (7)	0.015
Fair	78.5 (62)	21.5 (17)	
Bad	28.6 (2)	71.4 (5)	
Social support None	67.6 (23)	32.4 (11)	0.340
Family members and best friends	76.3 (58)	67.6 (23)	
*Based on Chi square test			

Table 5. The final multivariate logistic model for the first outcome variable - *the level of adherence to physicians' instructions for PA*

Covariates	Adjusted Odds Ratio (OR)	p-*value*
Age	1.12	0.009
Gender		
Male	1.00	
Female	0.49	0.255
Current smoking status		
No	1.00	
Yes	2.91	0.072

Table 6. The final multivariate logistic model for the second outcome variable - *the proportion of MI patients reported receiving instructions for PA from their physicians*

Covariates	Adjusted Odds Ratio (OR)	p-*value*
Age	0.89	0.023
Current smoking status		
No	1.00	
Yes	0.52	0.626
Self-perceived health condition		
Good	1.00	
Fair	2.72	0.111
Bad	0.21	0.108

APPENDIX 2. QUESTIONNAIRE (ENGLISH AND ARMENIAN)

Questionnaire

ID_____
Date of the interview _____ (Day/Month/Year)
Start time of the interview_____ (Hour/Minute)
End time of the interview _____ (Hour/Minute)

Well, now we will speak about following to physicians' instructions for Physical Activity, consider Physical Activity as at least being 10 minutes whether in moderate or vigorous motions, such as washing a car/ window or shoveling the snow respectively.

Check only one option that applies(refers to all questions)

1. **Have you ever had a Myocardial Infarction?**
   1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal *(if "NO" stop the interview)*

2. **Do you recall your physician giving you instructions on Physical Activity?**
   1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal

3.1 Has your physician ever given you instructions on "Walking"?
1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal

3.2 What exactly did your physician tell you about walking?
…………………………

3.3 How well are you following the instructions on walking?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know 99.□Refusal,

3.4 Has your physician ever told you to walk no more than 5 km.
1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal *(if "yes" skip question 3.5)*

3.5 How many km exactly did your physician tell you to walk?

....

3.6 How well are you following the instructions on walking no more than X km?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

4.1 Has your physician ever given you instructions on "Running"?
1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal

4.2 What exactly did your physician tell you about running?
................……………….............

4.3 How well are you following the instructions on running?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

5.1 Has your physician ever given you instructions on "Lifting"?
1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal

5.2 What exactly did your physician tell you about weight lifting?
………………………………………….

5.3 How well are you following the instructions on weight lifting?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

5.4 Has your physician ever told you to do any weight lifting no more than 5kg?
1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal *(if "yes" skip question 5.5)*

5.5 How much kg exactly did your physician tell you to lift?
...

5.6 How well are you following the instructions to do weight lifting no more than 5kg?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

6.1 Has your physician ever given you instructions on "Swimming"?
1.□Yes, 0.□No, 90.□Don't know 99.□Refusal

6.2 What exactly did your physician tell you about swimming?
………………………………………….

6.3 How well are you following the instructions on swimming?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

7.1 Has your physician ever given you instructions on "Working"?
1.□Yes, 0.□No, 90.□Don't know, 99.□Refusal

7.2 What exactly did your physician tell you about Working?
………………………………………….

7.3 How well are you following the instructions on Working?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

8.1 Has your physician ever given you instructions on "Gardening"?
1.□Yes, 0.□No, 90.□Don't know 99.□Refusal

8.2 What exactly did your physician tell you about gardening?
………………………………………….

8.2.1 Do you have a garden?

1.□Yes, 0.□No, 90.□Don't know 99.□Refusal *(if No go to question 9)*

8.3 How well are you following the instructions on gardening?
 1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know 99.□Refusal

Note: In case of all "NO" answers on questions x.1 stop the interview

9.1 What else did your physician tell you to do?
…………………………………………………….

9.2 How well are you following the instructions on that?
1. □Poorly, 2. □Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

10.1 Has your physician ever told you to come for checkups once a month?
1.□Yes, 0.□No, , 90.□Don't know 99.□Refusal *(if "yes" skip question 9.2)*

10.2 What exactly did your physician tell you about how often to come in for checkups?
....

 10.3 How well are you following the instructions on how often to come in for checkups?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know, 99.□Refusal

11.1 Has your physician ever given you instructions on work capacity?
1.□Yes, 0.□No, 90.□Don't know 99.□Refusal

11.2 What exactly did your physician tell you about work capacity?
....

11.3 How well are you following the instructions on work capacity?
1.□Poorly, 2.□Fairly, 3.□Well, 90.□Don't know 99.□Refusal

Socio-demographic Questions

Now I am going to ask you some questions regarding your age, etc.

12. What was your age on your last birthday? -----------
99. □ Refused to answer

13. What is your level of education?

1. □Incomplete secondary (up to 8 years)
2. □Complete secondary (up to 10 years)
3. □ College (2 years)
4. □ Institute/ university (5-6)
5. □Postgraduate
6. Other (please, specify) ---------
90. □ Don't know
99. □ Refused to answer

14. Do you have an occupation?
1. □ Yes
0. □No (go to question 18)
99. □Refused to answer

15. Is your work manual?
1. □ Yes (if yes go to question 17)
0. □No
99. □ Refused to answer

16. Is your work in office environment?
1. □ Yes
0. □No
99. □ Refused to answer

17. What is your occupation?
----
99. □ Refused to answer

18. What is your marital status?
1. □Single
2. □Married
3. □ Divorced
4. □Widowed
99. □Refused to answer

19. How many people live in your family, including you?
....
99. □Refusal

20. Circle gender of respondent (*Ask only if unable to identify.*)
0. □Male
1. □Female

Questions about anticipated factors:

21. What is your average weight in kg?
……………….
90. □ Don't know
99. □Refusal

22. What is your average height in cm?
………………………
90. □ Don't know
99. □Refusal

23. Are you smoking currently?
1. □Yes

0. □No (go to question 25)
99.□Refusal

24. On average, how many cigarettes do you smoke in a day?
....
90. □ Don't know
99. □Refusal

25. Which of the following best describes your health today?
1. □ Excellent
2. □ Very good
3. □ Good
4. □ Fair
5. □Poor
90.□ Don't Know
99.□ Refused to answer

26. Have you ever been afraid that physical activity might cause a myocardial infarction?
1. □Yes
0. □NO
90. □ Don't Know
99. □ Refused to answer

27. Are you afraid to do Physical Activity now because it might cause a myocardial infarction?
 1. □Yes
 0. □NO
90. □ Don't Know
99. □ Refused to answer

28. Please indicate if you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree with the following statement:
Physical activity prevents and prolongs the time period to second heart attack.
1. □ Strongly agree
2. □Agree
3. □Neither agree nor disagree
4. □ Disagree
5. □Strongly disagree
90.□Don't Know
99.□Refused

29. Is there anybody who supports you to follow the physicians' instructions for Physical Activity.
....
90. □Don't Know
99. □Refused

30. On average how much money does your household spend monthly?

1. □Below 25 000 dram
2. □ 25 001 to 50 000 dram
3. □50 001 to 200 000 dram
4. □More than 200 001 dram
90.□ Don't know
99.□ Refused to answer

This is the end of our conversation.
Thank you very much for your participation

<div align="center">Հարցաթերթիկ</div>

Տարբերակման համարը   _____

Հացման օրը   _____ օր/ամիս/տարի)

Հարցման սկիզբը   _____ (ժամ/րոպե)

Հարցման ավարտը   _____ (ժամ/րոպե)

Ա. Լավ այժմ կխոսենք Ձեր ֆիզիկական ակտիվության վերաբերյալ բժիշկների հրահանգներին հետևելուն պես։ Ֆիզիկական ակտիվություն է համարվում տաս րոպեից ոչ պակաս շարժողական միջին կամ բարձր լարվածության գործողություններ, ինչպես օրինակ մեքենա լվանալ, ձուն մաքրել։

(Բոլոր հարցերին նշել միայն մեկ պատասխան)

1. Ձեզ երբևիցե ախտորոշել են <u>սրտի կաթված</u>?
1. Այո, 0. Ոչ, 90. Չգիտեմ 99. Մերժում *(եթե "Ոչ"դադարեցնել հարցագրույցը)*

2. Դուք հիշում էք, որ ձեր բժիշկը հրահանգներ կամ ինստրուկցիաներ տա ֆիզիկական ակտիվության վերաբերյալ?
1. Այո, 0. Ոչ, 90. Չգիտեմ, 99. Մերժում

> **3.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "քայլելու" վերաբերյալ?**
> 1. այո, 0. ոչ, 90. չգիտեմ, 99. մերժում
> **3.2 Մասնավորապես ինչ է Ձեզ ասել բժիշկը քայլելու վերաբերյալ?**

…………………………………..

3.3 Ինչպես եք հետևում քայլելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ, 99.□մերժում,

3.4 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ քայլել ոչ ավել քան 5 կմ?

1.□այո, 0.□ոչ, 90.□չգիտեմ, 99.□մերժում *(Եթե "այո", ապա անցնել 3.6 -րդ հարցին)*

3.5 Մասնավորապես քանի կմ է ասել Ձեր բժիշկը, որ պետք է քայլեք?

....

3.6 Ինչպես եք հետևում ոչ ավելի քան 5 կմ քայլելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ, 99.□մերժում,

4.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "վազելու" վերաբերյալ?

1. այո, 0. ոչ, 90. չգիտեմ 99. մերժում

4.2 Մասնավորապես ինչ է Ձեզ ասել բժիշկը վազելու վերաբերյալ?

…………………………..

4.3 Ինչպես եք հետևում վազելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 99.□մերժում, 90.□Չգիտեմ

5.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "ծանրություն բարձրացնելու" վերաբերյալ?

1. այո, 0. ոչ, 90. չգիտեմ 99. մերժում

5.2 Մասնավորապես ինչ է Ձեզ ասել բժիշկը ծանրություն բարձրացնելու վերաբերյալ?

…………………………..

5.3 Ինչպես եք հետևում ծանրություն բարձրացնելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

5.4 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "ոչ ավել քան 5 կգ. ծանրություն բարձրացնելու" վերաբերյալ?

1. այո, 0. ոչ, 90. չգիտեմ, 99. մերժում *(Եթե "այո", ապա անցնել 5.6 -րդ հարցին)*

5.5 Մասնավորապես քանի կգ է ասել Ձեր բժիշկը, որ պետք է բարձրացնել?

....

5.6 Ինչպես եք հետևում ոչ ավել քան 5 կգ․ ձանրություն բարձրացնելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

6.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "լողով զբաղվելու" վերաբերյալ?

1. այո, 0. ոչ, 90. չգիտեմ 99. մերժում

6.2 Մասնավորապես ինչ է Ձեզ ասել բժիշկը լողով զբաղվելու վերաբերյալ?

……………………………..

6.3 Ինչպես եք հետևում լողով զբաղվելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

7.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "ձեր աշխատանքի" վերաբերյալ?

1. այո, 0. ոչ, 90. չգիտեմ 99. մերժում

7.2 Մասնավորապես ինչ է Ձեզ ասել բժիշկը ձեր աշխատանքի վերաբերյալ?

……………………………..

7.3 Ինչպես եք հետևում ձեր աշխատանքի վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

8.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "հողամասում աշխատելու" վերաբերյալ?

1. այո, 0. ոչ, 90. չգիտեմ, 99. մերժում

8.2 Մասնավորապես ինչ է Ձեզ ասել բժիշկը հողամասում աշխատելու վերաբերյալ?

……………………………..

8.2.1 Դուք ունեք հողամասային տարածք ?

1. այո, 0. ոչ, 99. մերժում *(Եթե "Ոչ", ապա անցնել 9-րդ հարցին)*

8.3 Ինչպես եք հետևում հողամասում աշխատելու վերաբերյալ բժիշկի հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

Նշում: եթե տրվել է "ոչ" պատասխանը յուրաքանչյուր x.1 հարցերին, ապա դադարեցրեք հարցազրույցը:

9.1 Այլ ի՞նչ հրահանգներ է տվել Ձեր բժիշկը, որին պետք է հետևեք?

....

9.2 Ինչպես եք հետևում բժիշկի այլ հրահանգներին?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

10.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "ամիսը մեկ անգամ այցելելու իրեն" ?

1. այո, 0. ոչ, 90. չգիտեմ, 99. մերժում

10.2 Մասնավորապես ի՞նչ է Ձեզ ասել բժիշկը իրեն այցելելու վերաբերյալ?

....

10.3 Ինչպես եք հետևում բժիշկի հրահանգներին ամիսը X անգամ այցելելու իրեն?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

11.1 Ձեր բժիշկը երբևիցե տվել է ձեզ հրահանգներ "ձեր աշխատանքի բեռնվածության վերաբերյալ" ?

1. այո, 0. ոչ, 90. չգիտեմ 99. մերժում

11.2 Մասնավորապես ի՞նչ է Ձեզ ասել բժիշկը ձեր աշխատանքի բեռնվածության վերաբերյալ?

....

11.3 Ինչպես եք հետևում բժիշկի հրահանգներին ձեր աշխատանքի բեռնվածության վերաբերյալ?

1.□վատ, 2.□միջին, 3.□Լավ, 90.□Չգիտեմ 99.□մերժում,

Բ. Դեմոգրաֆիկ և սոցիալ-դեմոգրաֆիկ հարցեր

12. Դուք քանի՞ տարեկան եք? ....

99. մերժում

13. Ո՞րն է Ձեր կրթության մակարդակը?
1. թերի միջնակարգ (10 տարուց պակաս)
2. միջնակարգ (10 տարի)
3. միջնակարգ մասնագիտական (2 տարի)
4. ինստիտուտ/ համալսարան (5-6 տարի)
5. հետդիպլոմային (գիտ. Թեկնածու)

6. այլ (խնդրում եմ, որ նշեք) ---------
90. Չգիտեմ
99. մերժում

14. Դո՞ւք այժմ աշխատում եք?

1. այո
0. ոչ (եթե ոչ, ապա անցնել 18–րդ հարցին)
99. մերժում

15. Ձեր աշխատանքը ֆիզիկական է?
1. այո, *(եթե այո, ապա անցնել 16–րդ հարցին)*
0. ոչ
99. մերժում

16. Ձեր աշխատանքը ավելի պասիվ գրասենյակային է?
1. այո
0. ոչ
99. մերժում

17. Ի՞նչ եք դուք աշխատում?
....

18. Նշեք ձեր ամուսնական կարգավիճակը?
1. ամուրի
2. ամուսնացած
3. ամուսնալուծված
4. այրի
99. մերժում

19. Ձեր հետ միասին քանի մարդ է ապրում ձեր ընտանիքում?

....

99. մերժում

20. Ձեր սեռը? *(հարցնել միայն չհայտնաբերելու դեպքում)*
0. արական
1. իգական

Գ. Հարցեր կանխատեսելի գործոնների վերաբերյալ

Կարող եք ասել՝

21. Ձեր միջին քաշը?

....

90. չգիտեմ
99. մերժում

22. Ձեր միջին հասակը?

....

90. չգիտեմ
99. մերժում

23. Դուք ծխում եք այժմ?

1. այո
0. ոչ *(եթե ոչ ապա անցնել 25 –րդ հարցին)*
99. մերժում

24. Օրական միջին հաշվով քանի սիգարետ եք ծխում?

....

25. Հետևյալ տարբերակներից, որն է լավագույնը բնութագրում Ձեր առողջական վիճակը այսօր?

1. շատ լավ
2. լավ
3. բավարար
4. վատ
90. չգիտեմ
99. մերժում

26. Դուք երբևիցե վախեցել եք, որ ֆիզիկական ակտիվությամբ զբաղվելը կարող է սրտի կաթվածք առաջացնել?

1. այո
0. ոչ
90. չգիտեմ
99. մերժում

27. Իսկ Դուք այժմ վախենում եք, որ ֆիզիկական ակտիվությամբ զբաղվելը կարող է սրտի կաթվածք առաջացնել?

1. այո
0. ոչ
90. չգիտեմ
99. մերժում

28. "Ֆիզիկական ակտիվությունը կանխարգելում և երկարաձգում է ժամանակահատվածը մինչև երկրորդ սրտի կաթվածքը": Համաձայն եք այս ձևակերպման հետ:

1. լիովին համաձայն եմ
2. համաձայն եմ
3. դժվարանում եմ պատասխանել
4. համաձայն չեմ
5. լիովին համաձայն չեմ
90. չգիտեմ

99.   մերժում

29. Կա որևէ մեկը, որ Ձեզ օգնի հետևել բժիշկների տված հրահանգներին ֆիզիկական ակտիվության վերաբերյալ?

....

90.   չգիտեմ
99.   մերժում

30. Միջին հաշվով ամսեկան որքան գումար է ծախսում Ձեր ընտանիքը?

1.   ոչ ավելի քան 25 000 դրամ
2.   25 001 - 50 000 դրամ
3.   50 001 - 200 000 դրամ
4.   ավելի քան 200 001 դրամ
90.   չգիտեմ
99.   մերժում

Սա հարցաշրույցի վերջն է:
Շնորհակալություն Ձեր մասնակցության համար և Հաջողություն:

APPENDIX 3. CONSENT FORM (ENGLISH AND ARMENIAN)

CONSENT FORM TEMPLATE

Title of Research Project: A study of adherence and factors associated with adherence to physicians' instructions for physical activity among patients with first-time acute Myocardial Infarction.

Explanation of Research Project:

Hi, I am Mikhayil Melikov, a student of Public Health Department of the American University of Armenia. As a part of my course requirements The American University of Armenia is conducting a study concerning adherence to physicians' instructions for Physical activity among Myocardial infarction patients at the Institute of Cardiology in Yerevan. You are chosen to participate in this study since you were registered in the Institute of Cardiology within the period 2007-2008. You were selected randomly from the list of all Myocardial Infarction patients treating in the Institute of Cardiology. I would be very grateful to you if you answer some questions about your adherence to physicians' instructions for physical activity that I am going to ask. The interview will take from you approximately 15 minutes. Any information that you provide will be coded, held anonymous and will not be linked to your phone number. There is no risk to you. You will not receive any financial or other benefits for participation in this study. Your participation is very important and valuable for the investigation and hopefully it will help to promote physical activity as a cardiac rehabilitation program among Myocardial Infarction patients of the Yerevan. Your participation is voluntary. You can refuse to participate as well as you can refuse to answer any question you do not want to answer. Also you can interrupt the conversation whenever you want and there will be no negative consequences for you and it will not jeopardize future medical care. If you feel that you have been treated unfairly during this study you should contact Yelena Amirkhanyan, chair of Departmental IRB at (010)512592. For more information you can contact Varduhi Petrosyan, Associate Dean, Colleage of Health Sciences: (010) 512564, e-mail: vpetrosi@aua.am or Mikhayil Melikov, studies' student investigator: (094) 077739; (010)563312, e-mail: mikhayil_melikov@edu.aua.am.

Thank you in advance. Do you have any questions?

So, would you like to participate?

Բանավոր տեղակացման ձև

Ուսումնասիրության անվանումը: Հայտնաբերել սրտի կաթվածով անձանց
քանակը, որոնք հետևում են բժիկների հրահանգներին ֆիզիկական ակտիվության
վերաբերյալ և վերջինի հետ պայամանվորված գործոնները:

_____

Ուսումնասիրության ընդհանուր բնութագիրը

Բարև-ձեզ, Ես Միխայիլ Մելիքովնեմ, Ես սովորում եմ Հայաստանի Ամերիկյան
Համալսարանի Հանրային առոջապահության ֆակուլտետում: Իմ ուսումնական
պահինջների համաձայն Հայաստանի Ամերիկյան Համալասարանը
իրականացնում է ուսումնասիրություն Երևանի Կարդիոլոգիայի Ինստիտոտւում
սրտի կաթվածով տառապող անձանց հետևելը բժիկների հրահանգներին
ֆիզիկական ակտիվության վերաբերյալ: Ձեզ ընտրել են պատահական սկզբունքով
2007-2008թթ. ԵրևանիԿարդիոլոգիայի Ինստիտոտւում գրանցված սրտի
կաթվածով ախտորոշված անձանց ցուցակից: Ես շատ շնորհակալ կլինեի, եթե
դուք կարողանայք պատասխանել մի քանի հարցի, կապված Ձեր ֆիզիկական
ակտիվության վերաբերյալ բժիշկների հրահանգներին հետևելուն պես:
Հարցագրույցը Ձեզանից կպահանջի մոտավորապես տասնրհինգ րոպե:
Ցանկացած տեղեկատվություն, որը դուք կտրամադրեք կծածկագրվի,
կպահպանվի նրա անանունությունը և կապ չի ունենա Ձեր հեռախոսահամարի
հետ, Ձեր մասնակցությունը հարցմանը ռիսկ չի կրելու Ձեր համար: Հարցմանը
մասնակցելու համար դուք որևէ ֆինանսական կամ այլ շահ չեք ստանալու: Ձեր
մասնակցությունը շատ կարևոր և արժեքավոր է, այն թույլ կտա ուսումնասիրել և
նպաստել սրտի կաթված ունեցող մարդկանց մոտ ֆիզիկական ակտիվության
միջոցներով սրտային վերականգնմանը: Ձեր մասնակցությունը կամավոր է, և
դուք կարող եք մերժել հարցմանը մասնակցել ընդհանրապես, ինչպես նաև
չպատասխանել ցանկացած հարցի, որին դուք հարմար չեք գտնում
պատասխանել: Դուք կարող եք դադարեցնել հարցագրույցը ցանկացած պահին`
առանց Ձեզ համար որևէ բացասական հետևանքների և Ձեր հետագա բուժումը ոչ
մի ձնով չի տուժի դրանից: Եթե ուսումնասիրության շրջանակներում դուք զգացել
եք, որ Ձեր նկատմամբ վարվել են ոչ արդարացի կերպով, ապա դիմեք
Գիտահետազոտական Էթիկայի Հանձնաժողովի վարիչ` Էլենա Ամիրխանյանին,
հետևալ հասցեյով (010)512592.   Նախորոք շնորհակալուլություն եմ հայտնում:
Ավելի մանրամասն տեղեկություննների համար կարող եք դիմել Առողջապահական
գիտությունների քոլեջի փոխղեկվան` Վարդուհի Պետրոսյանին, (010) 512564, e-
mail: vpetrosi@aua.am կամ   ուսումնասիրության ուսանող-փորձագետ` Միխայիլ
Մելիքովին (ինձ), (094) 077739, e-mail: mikhayil_melikov@edu.aua.am.

Արդյոք ունեք որևէ պարզաբանման կարիք/հարցեր?: Արդյոք դուք կուզենայք
մասնակցել այս հարցմանը?: