

ASSESSMENT OF PRACTICES AND KNOWLEDGE ABOUT ANALGIN  
AND OTHER PAIN MEDICATION USE AMONG ARMENIAN  
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## **Abstract**

Pain is one of the most widespread symptoms and one of the most frequent reasons for medical care. Therefore, not surprisingly, pain medication accounts for one of the most utilized drug categories. However, in many cases pain-killing medicines are assigned inappropriately. Among widely used and often misused medicines in Armenia special attention should be paid to Analgin and its combinations with other active substances. These drugs are widely available in Armenian drug stores and are sold without prescription.

Nevertheless, the adverse effects of Analgin, such as agranulocytosis and anaphylactic shock, were discovered in 1960s. Based on the number of research, Analgin gradually was withdrawn in many countries, including Sweden, Great Britain, Norway, USA, Saudi Arabia, Israel, Denmark, Pakistan, and many other countries.

This cross-sectional study was conducted to find out the level of knowledge and practices of Armenian population towards Analgin and other pain medicines, as well as recognizing possible associations between consumption of Analgin and knowledge and practices of the population. The study was conducted in five drug stores of Yerevan during August, 2003. According to the results of the study, 77% of participants mentioned Analgin as their known pain medication. It was found that these people tend to buy Analgin. The majority of the respondents considered Analgin as effective pain medication, and nobody knew its exact side effects. It was also found that older people tended to buy more Analgin. Likewise, 74% of the sample population either did not know of did not assume that Analgin was withdrawn in many countries. Based on these findings, it is important to educate both population and health care professionals, including pharmacists and doctors. At the same time important steps should be taken by the Ministry of Health and Drug and Medical Technology Agency (DMTA) in preventing getting Analgin to the drug stores or supply it by the prescription

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## **Introduction**

Pain is one of the most widespread symptoms and one of the most frequent reasons for medical care (1). Therefore, not surprisingly, pain-killing (analgesic) drugs represent one of the most utilized drug categories (2). Internal analgesics are “products taken as pain-relievers, fever reducers, and anti-inflammatory agents” (3). Non-narcotic non-steroid analgesics are widely used in daily medical practice. Because they usually not only relieve pain, but also reduce the temperature, they are often called analgesics-antipyretics (4). In 1981, about 9% of all prescriptions in the USA were dedicated to pain-killing drugs (5). In 1989 pain-killing drugs made up 20% of all over-the-counter (OTC) medicines in England (5). Moreover, market for pain medication continues to increase from year to year.

Pain is not only just a feeling. This is a complex psychophysiological reaction of the organism to irritation of sensitive nervous endings in the organs and tissues. As pain includes mental component, it can define behavioral characteristics and actions of persons, just like hunger and thirst (6). Pain is described as an acute and a chronic. The difference is in the duration of pain. Chronic pain is usually defined as pain, which lasts longer than expected normal time of the recovery (5). In case of acute pain, the end of pain is predictable (5). Although acute pain is often reduced by relatively simple methods, to deal with chronic pain is far more difficult and multidisciplinary approach should be used. This involves wide range of curative and supportive methods. Chronic pain is one of the most expensive problems of modern health care in industrialized countries. It affects 25-30% of population of these countries (5). In the USA, for example, pain requires expenses for almost 9 billion dollars annually (7).

The best way to deal with pain is to remove its reason. Pain-killing medicines should be given only when the reason of pain cannot be removed (8). The argument is that analgesic drugs do not remove the reason of pain but only reduce reaction to pain. However, pain can

be reduced not only with pain-killing drugs. Cold water, for example, reduces pain due to burn; warm and massage remove muscular pain. It is important to mention Henry K. Beecher's research in 1955, which discovered that 35% of people who have different types of pain experienced relief after taking placebo (9). So, it can be considered that in many cases pain-killing medicines are assigned inappropriately.

In 1986 report of *Health Actions International* revealed that in 1985 on the markets of Africa, Indonesia, India, Middle East, and Caribbean countries three fourth of analgesics contained either potentially dangerous components, or were not effective and not rational combinations, or were expensive compared to equally effective alternative medicines (10).

The research of German drugs, which were available in the pharmaceutical markets in 1988 in seven regions of the world (Africa, Brazil, Central America, Columbia, India, Mexico, and Philippines), revealed that 77% of 81 analgesics were inappropriate (11).

It should be mentioned that drugs are classified as inappropriate according to the following criteria: 1) if the combination is not rational; 2) if there are no data about effectiveness of the drug; 3) if there are safer alternative medicines; 4) if unsuitable drug forms are used; and 5) if active component is not enough in its dosage (5).

Among the most frequently used and misused drugs in Armenia, special attention should be paid to Dypirone or Metamizole sodium, commonly known in Armenian population as Analgin. In addition, Analgin is also widely used in combinations with other different active components, such as Coffein, Phenobarbital, Codein, etc. Well known in Armenia, as well as in the countries of former Soviet Union combined (complex) drugs of Analgin include such drugs as Andipal, Anapyrin, Benalgin, Tempalgin, Baralgin, Spasmalgon, and Pentalgin.

Chemically Dypirone represents group of pyrazolones. Other representatives of this group are Antipyrin and Amidopyrin (4). First pyrazolones appeared at the end of 19<sup>th</sup>

century. Most of them have already disappeared due to their ability to cause agranulocytosis, which is life-threatening condition when the amount of white blood cells decreases and people become vulnerable to many diseases (5).

Dypirone and its combinations with other medicines were used without any limitations until 1980s. In 1987 in Netherlands a young woman almost died after taking Baralgin (12). During period from July 1981 to July 1986 in Germany, where center Hoechst is located, 94 people died after taking drugs containing Dypirone. In 46 cases the reason of dying was agranulocytosis and in 39 cases the reason was anaphylactic shock (13). These cases initiated the German Agency of Drug Reglamentation to put all products of Dypirone in the group of medicines given by prescription only. All combined medicines containing Dypirone were withdrawn from the German market (5).

However, in many developing countries, including Armenia, Dypirone still remains popular and profitable pain-killing drug. It can be explained by the fact that many pharmaceutical firms produce pain-killing drugs that contain Dypirone or other pyrazolones. As shown in Table 1, in 1990 almost one pain-killing drug out of five on the pharmaceutical market in Africa, Caribbean countries, Pakistan, and Middle East contained Dypirone or other pyrazolone (5).

Table 1. *The number and percentage of analgesics containing Dypirone*

County/Region	# of analgesics	# of drugs containing Dypirone	% of drugs containing Dypirone	# of drugs containing other pyrazolones	% of drugs containing other pyrazolones
Africa	115	18	16	9	8
Caribbean countries	66	12	18	6	9
Middle East	141	21	15	10	7
Pakistan	186	21	11	2	1
<b>Total</b>	<b>508</b>	<b>72</b>	<b>14</b>	<b>27</b>	<b>5</b>

Sources: Africa: *MIMS Africa July 1990*; Caribbean: *MIMS Caribbean July 1990*; Middle East: *MIMS Middle East June 1990*; Pakistan: *QIMP 1990*

In 1989 Dypirone was the most widely used analgesic in Bulgaria (14). In 1990 it was the second utilized drug in Yugoslavia (5). It is difficult to explain continuous popularity of Dypirone in these countries. In 1980 in the annual publication of *Side Effects of Drugs Annual* the conclusion was made that “as effective and less dangerous alternative drugs exist, there is no reason for further implementation of Dypirone” (15). Even in 1973 in the publication of *American Medical Association* was written that the consumption of Dypirone as pain-killing drug, as a mean against arthritis, or standard anti-inflammatory drug could not be justified (16). However, many firms insist that Dypirone is safe and effective product.

In intensions to clarify debates about cases of agranulocytoses caused by Dypirone, the Department of Pharmaceutical Epidemiology of Boston University conducted international research of agranulocytoses and aplastic anemias in 1978. The goal of this research was to collect all data about patients with agranulocytosis and aplastic anemias who were admitted to the hospital with such conditions or who developed them during staying at the hospital in eight places: Israel, Barcelona, Ulm (Germany), Western Berlin, Milan, Budapest, Sophia, and Stockholm – with total population of 22.3 million. From all these places only five - Israel, Barcelona, Ulm, Western Berlin, and Budapest – were used for calculations of agranulocytoses caused by Dypirone. The results of the research surprised and provoked even more debates. In 3 places – Ulm, Western Berlin, and Barcelona – the risk of agranulocytosis caused by Dypirone was 23.7 times higher than without using this drug. However, in Israel and Budapest relative risk was not more than one. Researchers could not explain this deviation (5).



Despite controversial results with respect to risk caused by Dypirone, the research was useful because it found that Dypirone can cause agranulocytosis; that in these countries Dypirone was the reason of one fourth of all cases of agranulocytoses; and that in some geographical areas patients who received Dypirone a week prior to the research were 20-30 times at higher risk of developing agranulocytosis than patient who did not use it (5). Moreover, the article in *Lancet* in 1986 stated that the results of Boston research strengthen the argument to withdrawing Dypirone from the market and use Paracetamol or Aspirin instead (17).

From 1986 Hoechst and many other pharmaceutical companies convinced doctors and pharmacists, as well as Agencies of Drug Regulation, especially in developing countries, that Dypirone is “safe” medicine. At the same time Hoechst distributed reports about Boston research, where the attention was given to favorable to the company results of this study.

It was estimated that mortality due to adverse effects of Dypirone used intramuscularly was 1 : 5,000 and used per os (through mouth as pills) was 1 : 50,000. It is also known that 2,000 people die in the world annually as a consequence of Dypirone’s adverse effects (5).

In many countries excessive advertisement of medicines containing Dypirone had great impact on people’s consumption of this drug. In many developing countries, including Armenia, Dypirone still remains a popular pain-killing medicine.

However, pharmacologists are concerned that medicines that are being withdrawn from the Western markets are still sold in Armenia. Among them is not only Analgin but also Streptocit and Laevomitacin (18).

In November 2002 in *Bulletin of Drug and Medical Technology Agency of Ministry of Health, Republic of Armenia* the article “Analgin and Analgin containing drugs are

withdrawn in many countries” appeared. This article stated that Analgin containing drugs were used without any control only in CIS and some other developing countries. In 1999 Analgin was withdrawn from Sweden market, in Great Britain in 1965, in Norway in 1976, in the USA in 1977, in Saudi Arabia in 1980, in UAE in 1981, in Israel in 1985, in Denmark in 1979. These drugs were withdrawn also in Malaysia in 1987, in Pakistan, Ghana, Netherlands, Bahrain, Ireland, Singapore, Venezuela, Nepal, German, etc. (19).

Despite other countries, Armenia is among countries where Analgin and Analgin containing pain-killing drugs are widely consumed and are sold without prescription.

This information motivates to conduct the research to find out the preferences of Armenian population regarding pain-killing drugs, their practices and knowledge, and the reasons for their choice.

Several attempts have been initiated by Drug and Medical Technology Agency (DMTA) in Armenia to stop the entrance of Dypirone into our republic. However, the fact is that Analgin is still being sold in pharmacies and the population still prefers this medicine. The problems that arise with withdrawal of Analgin in Armenian market are huge income of pharmaceutical companies, low price and great accessibility of Analgin to population, as well as unwillingness of Armenian population to change traditionally used drugs and lack of information about hazardous side effects of this drug.

The following list reflects all available non-narcotic non-steroid pain medication that is sold in Armenian drug stores without prescription:

- Acidum acetylsalicylicum (Aspirin)
- Ibuprofen (Protopen)
- Indometacin (Metindol)
- Paracetamol (Efferalgan, Tylenol, Caffetin, Calpol, Solpadein)
- Ascophen-P (Citramon)
- Voltaren (Reumophen, Diclophenac, Vurdon, Naclophen, Olphen, Diclonat P, Dicloran)

- Analgin (Sedalgin, Nevralgin)/Tempalgin/Pentalgin/Trigan-D/ Spasmalgon
- Ketonal
- Nimesil
- Pyroxicam (Ksephocam, Movalis)

In contrast, WHO basic drugs' list includes only 4 non-narcotic anti-inflammatory drugs, namely: Acidum acetylsalicylicum (Aspirin), Ibuprofen (Motrin, Lamidon), Indometacin (Metindol, Dolovin), and Paracetamol (Efferalgan, Tylenol). As it is seen Analgin is not included in this list.

The purpose of this paper is to discover the usage of pain-killing medicines by the Armenian population and the level of knowledge about them.

The research questions addressed by the study are the following: what is the knowledge of population about pain-killing medicines and what are the reasons that Analgin is still consumed in Armenia; what are the practices of Armenian population regarding pain medication; and is there an association between Analgin consumption and the level of knowledge and practices.

## **Methods**

### *Study Design*

To assess the practice and knowledge of Armenian population about pain medication a cross-sectional (point prevalence) study design was implemented.

The sample size was calculated according to the following formula (20):

$$n = (z^2 * p * q) / d^2$$

Considering confidence interval (CI) 95%, which means that z is equal to 1.96, p = 0.5, q = 1-p = 0.5 and the precision (d) = 0.1, sample size is equal to 96.

$$n = (1.96^2 * 0.5 * 0.5) / 0.1^2 = 96.04$$

This number was rounded to 100. The additional index for the non-response was not considered because the instrument (questionnaire) was not self-administered and there would not be an opportunity to miss some questions.

### Study Population

The *target population* for this study was people who use any of the non-narcotic non-steroid pain-killing drugs that were currently registered in Armenia. The *study population* was people who visited a particular drug store (included in the study) and who bought any non-narcotic pain-killing medicine.

Cluster sampling was used to approach people in the pharmacies. In this case, clusters corresponded to districts where drug stores were located. People in the each cluster represented randomly selected part of the sample.

People, both males and females, from age 20, who visited a particular pharmacy (included in the study) and who bought a non-narcotic non-steroid pain-killing drug were included in the study. Age 20 was selected with the assumption that this age corresponded to the fourth and the fifth grades of the higher education, when the students had enough knowledge to answer the questions.

People who did not achieve age 20 and who bought other than non-narcotic pain-killing drugs were excluded from the study. Also, people who bought “no-spa” were not included in the study, although people (and even some pharmacists) believed that this drug belonged to pain-killing group. However, this drug belongs to spasmolytic medicines and should not be considered in the group of pain-killing medicines despite its pain-relieving effect. In addition, foreign citizens were also excluded from the study.

### Location of the Study

Five drug stores were selected according to their location: i.e. the drug store should be located in the crowded street near the hospital, or the market, or the bus stop where many people passed and entered the drug store. This allowed saving time. Two to three days were enough to interview 20 people in the each drug store. The drug stores were located in five large and at the same time different districts in Yerevan, so the overlapping was avoided.

### Survey Methods

Study participants were interviewed in the pharmacy; they were face-to-face interviews conducted by the student investigator. It took approximately 5-10 minutes to answer the questions. Interviewer was in the pharmacy and asked those people who bought any pain medication to answer the questions. The list of available in the pharmacies pain-killing medicines was previously obtained from the pharmacy. Likewise, the oral consent was obtained from each participant.

Interviews were held from August 8 to August 28. Drug stores were coded from 01 to 05 in the order they were visited. Table 2 provides details on location of the drug stores as well as on day and time of interviews.

Table 2. *Code, location, days, and time of interviews in five drugs stores in Yerevan.*

<b>Code</b>	<b>Name of the Drug Store</b>	<b>Address</b>	<b>Days</b>	<b>Time</b>
01	“Valson” ltd	Margarian,15	08.08.2003 08.11.2003	10.00 – 16.00 10.00 - 16.30
02	Drug store # 4	Abovian, 39	08.12.2003 08.13.2003	16.00 – 19.00 12.00 – 18.00
03	“Green”	Mashtots, 5	08.15.2003 08.16.2003	15.00 – 18.00 18.00 – 21.00
04	“Cito” ltd	Bagratuniats, 11 <sup>a</sup>	08.17.2003 08.20.2003	12.00 – 18.00 12.00 – 16.00
05	“Shtap ognutiun # 7”	Gayi avenue, 17	08.22.2003 08.25.2003 08.28.2003	12.00 – 16.00 15.00 – 18.00 17.00 – 20.00

### Study Variables

The dependent variable of the study (outcome) is people who either bought Analgin in the drug store or people who usually use Analgin as pain reliever vs. those people who bought other pain-killing medicine or people who usually use other pain-killing medicine. Including both these cases into the outcome would increase the representativeness of the outcome.

Independent variables of the study include variables on demographic characteristics of the sample population, such as gender, age, employment status, and educational level, as well as variables on knowledge and practice (Table 3).

Table 3. *Dependent and independent variables of the study*

<i>Dependent variable (outcome)</i>	Analgin bought in the drug store and/or usually consumed vs. other pain medication bought or usually consumed
<i>Independent variables</i> <ul style="list-style-type: none"><li>▪ Demographic characteristics</li><li>▪ Knowledge</li><li>▪ Practice</li></ul>	Gender (nominal scale) Age (numerical scale) Employment status (nominal scale) Educational level (ordinal scale)  Known pain medication (nominal scale) Knowledge about side effects of pain medication (nominal) Knowledge about withdrawing Analgin (nominal)  Person recommended pain medication (nominal)

### Data Collection, Instrument

The questionnaire for the consumer survey was used to elicit knowledge and practices of Armenian population regarding non-narcotic pain-killing drugs (See Appendix 1). The questionnaire was developed by the student investigator. It was translated forward into Armenian and then backward into English by two independent translators in order to ensure

the reliability of the instrument. The research proposal was reviewed and approved by the Institutional Review Board (IRB) committee within the College of Health Sciences at the American University of Armenia (AUA).

The pre-test of the questionnaire was done by interviewing ten consumers of pain medication in the drug store. Appropriate changes were made after it.

The questionnaire consists of 24 questions, including questions on demographic characteristics of the participants, such as gender, age, current employment status, educational level, and monthly family income, and questions about practices and knowledge of the participants.

Practice questions include questions on type of pain (acute vs. chronic); frequency of pain-killing drugs consumption; persons who recommended pain-killing medicine; type of pain-killing medicine usually consumed by the respondent; and type of pain medicine (if any) given to the children under age 16.

Knowledge questions were designed the way to find out what pain medication the participants knew; what were the reasons for using this or that medicine; whether the participants knew that pain medicines can have side effects and whether they knew that Analgin is withdrawn in many countries; as well as whether they wanted to be informed about correct usage of pain medication.

The starting and finishing time of the each interview was also recorded.

#### *Analytic Methods*

Data entry was performed using SPSS software. Analysis was done by SPSS and included descriptive statistics and logistic regression analysis to test the association of the dependent variable with independent variables.

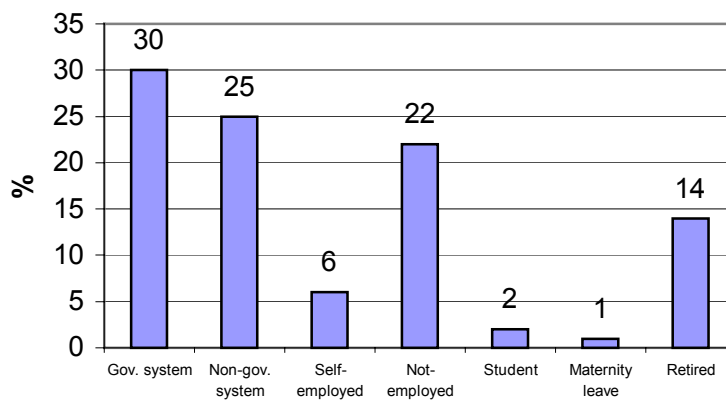
Resources that were needed included human resources (pharmacists), financial resources, time and statistical data.

## Results

### Demographic characteristics

The mean age of sample population was 44.57 years (SD  $\pm$  16.06 years) with the range from 21 to 82 years old. Females accounted for 74 % of the total sample. Distribution by the employment status was the following: 38 % of sample population was unemployed, 62 % was employed with the majority employed in the governmental system (30 %) (Figure 1).

Figure 1. *Participants Distribution by Employment Status*



54 % of the participants had higher education, 31 % had technical education, and the remaining 15 % graduated from the schools without further education (Figure 2).

Figure 2. *Participants Distribution by Educational Level*

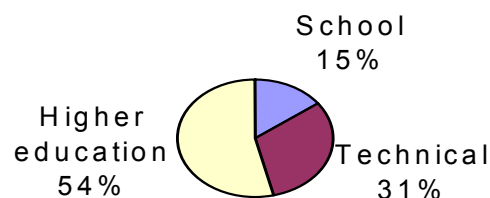
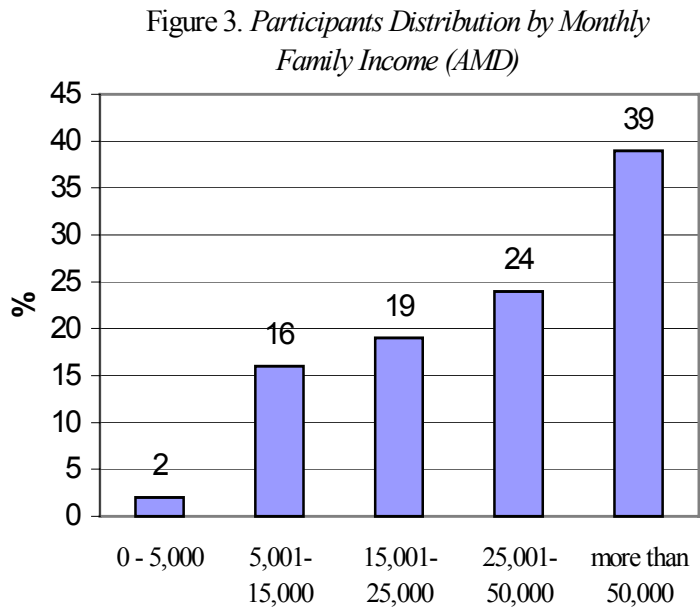




Figure 3 displays distribution of the participants by monthly family income with the majority (39%) having monthly income more than 50,000 drams (about 100 dollars).



*Descriptive Statistics*

*Knowledge*

When reporting about known pain medication, 77 % of participants mentioned either Analgin with other pain medicine(s) or Analgin only, and 23 % mentioned other than Analgin pain-killing medicines. 74 % of participants agreed that pain medication could have side effects on human body, and 26 % did not think that pain-killing drugs could have any side effects.

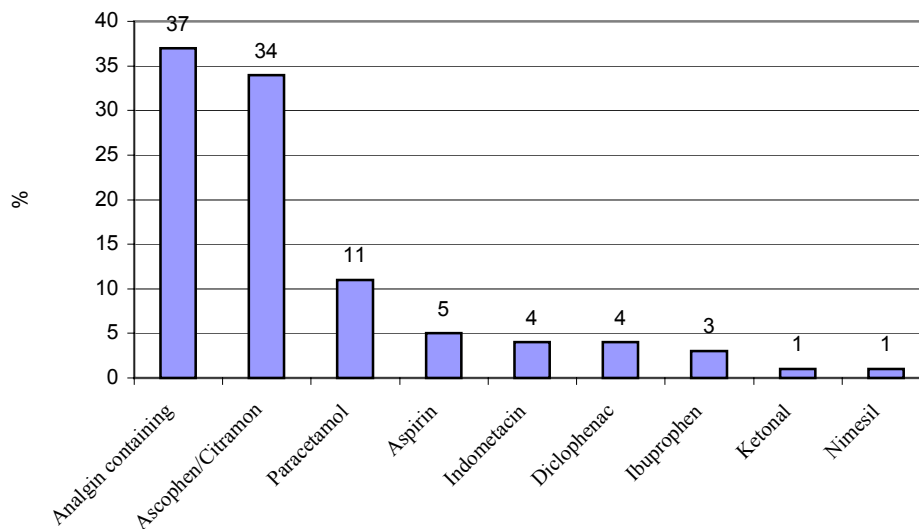
26 % of sample population knew that production and consumption of Analgin was prohibited in many countries, 8 % of participants even did not assume that Analgin was prohibited in other countries, and 66 % knew nothing about it (most of the participants were surprised by such a question). So, only about a quarter of participants have heard about withdrawing of Analgin in other countries.

Regarding getting more information about correct usage of pain medication, 82 % of the participants expressed agreement, and the remaining 12 % thought that their knowledge was enough and they did not need to be more informed about it. Of this 82 %, the majority (36 %) expressed the desire to be informed about correct usage of pain medication by the pharmacist in the drug store, 28 % through television or radio, 21 % through special journals and brochures, and 15 % preferred doctors as a source of getting information on correct usage of pain-killing medicines.

### *Practice*

Out of all bought in the five drug stores pain medicines, 37 % was attributed to Analgin containing medicines and 63 % was dedicated to other pain-killing medicines. What is interesting, Ascophen made up 29 % in the latest group (Figure 4).

Figure 4. *Pain medication bought in the drug stores*



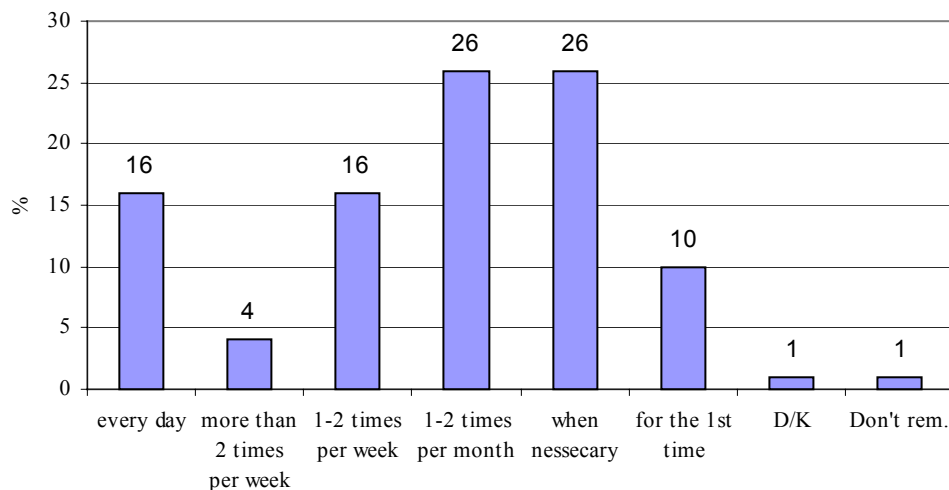
Pain medication for relieving acute pain was bought in 61.8 % of cases, for relieving chronic pain it was bought in 36.8 %, and the remaining 1.4 % of respondents did not know

the type of pain. The majority of the respondents bought pain-killing medicines to relieve headache (42.6 %), relieving toothache occurred in 13.2 % of cases. It should be mentioned that 19.2 % of sample population used these medicines for reduction of temperature.

Only in 38 % of cases the pain-killing medicine bought in the drug stores was advised by a professional (either a pharmacist or a doctor), and 62 % of participants did not get qualified advise in choosing a pain medication. Moreover, 46 % of sample population decided themselves the type of pain medicine.

The frequency distribution of pain medication consumption is presented in Figure 5. As it is seen, one peak of consumption of pain medicines lies in 1 to 2 times per month (26%), and the second peak (second 26 %) is defined as “when necessary”, when respondents could not define the exact frequency of consumption. It is also important to notice that 16 % of sample population consumed pain-killing drugs every day.

Figure 5. *The Frequency of Pain Medication Consumption*



35 % of participants preferred not to use pain medication at all when they had pain. Another 25% used Analgin containing medicines, and 40 % used other pain-killing medicines. Of those 65 % of respondents who used medicines, 78.5 % mentioned the

effectiveness as a main reason, 7.7 % mentioned safety, and 6.2 % mentioned availability of the drug. Only 3.1% took into account the low price of the medicine. However, it was observed that the mean price of pain medication bought in the drug stores during the survey made up 819 AMD. Moreover, excluding two extreme values (expensive drugs) the mean price would decrease to 353 AMD. In contrast, the mean price of the remaining pain medicines that were not bought during the survey accounted for 1,265 AMD (See Appendices 2 and 3).

Among those who used Analgin in the last year, 64.2 % considered it effective, 22.6% considered it available, and 11.3 % gave other explanations of its consumption, such as used to or traditionally. Those who did not use Analgin in the last year (24 people) more than a half (54.2 % - 13 people) mentioned unwanted side effects of Analgin (though nobody knew exactly which side effects were they and believed that Analgin was harmful to the heart), 37.5 % considered Analgin as not effective, and 8.3 % said that they just did not like this drug (Table 4).

Table 4. *Reasons for using or not using Analgin.*

<b>Those who used Analgin</b>	<b>%</b>	<b>Those who did not use Analgin</b>	<b>%</b>
Effective	64.2	Unwanted side effects	54.2
Available	22.6	Not effective	37.5
Likes/Traditionally	11.3	Don't like	8.3
Cheap	1.9		

46 % of participants have children under age 16. Among them 53 % preferred to give no medication to their children when they had pain, 26 % gave Paracetamol, and only 7 % of participants gave Analgin or Analgin containing medicines to their children.

Results of the Logistic Regression

Table 5 summarizes the results of the logistic regression analysis of the outcome variable and each of the independent variables. It should be mentioned that outcome variable was originally labeled as 1 for Analgin and 2 for other; SPSS converted and changed values: 0 for Analgin and 1 for other, so it should be considered that numbers refer to log odds of buying other pain medication (not Analgin).

Table 5. *The Results of the Logistic Regression Analysis*

<b>Independent Variables</b>	<b>Odds Ratio (OR)</b>	<b>P – value</b>	<b>Confidence Interval (CI)</b>
Gender	1.3288	0.6024	0.46 - 3.87
Age*	1.0331	0.0435	1.001 – 1.07
Employment status	1.3167	0.5931	0.48– 3.61
Educational level			
School (ref. popn)			
Higher (1)	0.29	0.0982	0.07 – 1.26
Technical (2) *	0.17	0.0019	0.05 – 0.52
Known pain medication*	0.18	0.0053	0.05 – 0.6
Knowledge about side effects	0.58	0.35	0.19 – 1.8
Knowledge about withdrawing			
Don't know (ref)			
No (1)	0.29	0.21	0.04 – 1.99
Yes (2)	0.83	0.75	0.26 – 2.06
Person recommended pain medication	0.53	0.21	0.2 – 1.44

\* -  $p < 0.05$

As it is seen, independent variables age, knowledge of different types of pain-killing medicines, and technical educational level are statistically significant with respect to the outcome. Consumption of other pain medicines slightly increases with the age (OR=1.04) controlling for all other variables, although statistical significance is close to marginal ( $p = 0.04$ ). This means that consumption of Analgin slightly decreased with age. People who mentioned other pain-killing medicine as their known pain medication tended to use less

Analgin ( $p=0.053$ ,  $OR=0.18$ ). Also, according to the results, people with technical education tended to buy less other pain medication ( $OR=0.17$ ) and more Analgin. In order to create the best model, **Forward: LR** method was used in Logistic Regression in SPSS (21). The goodness of fit for this model was 97.5 % and the model included age, educational level, and known pain medication variables (for more detail see Appendix 4).

### **Discussion and Recommendations**

The results of the study indicated that the great majority of study participants preferred to use Analgin. The possible explanation of this may be the lack of information about adverse and dangerous effects of Analgin. Nobody of the respondents knew exactly what abnormalities Analgin can cause. Most of them considered it as effective and the only remedy for relieving their pain. 74 % of the participants either did not know or did not think that Analgin was withdrawn in many countries. Bringing this information to the public would motivate to buy less dangerous and equally effective pain-killing medicines. Knowing that Analgin can become a source of allergic reaction with different levels of severity, including death, would have mental impact on public's consumption of this drug. Therefore, it is very important to educate the population, especially when 82 % of the respondents expressed the desire to be more informed about correct medication use. According to the study results, the most preferable way and place of public education is a pharmacist and a drug store. For this, special attention should be paid to on education of the pharmacists, as well as education of the doctors. It is necessary to keep them aware about withdrawn and newly introduced medicines in the markets of different countries. It is also important to inform the doctors about changes in the pharmaceutical market. Many doctors remain fixed to particular medicines and do not know about substitutes for this drug or synonyms of the same drug. At the same time, people who were advised by the doctor to buy the particular medicine do not

admit and do not trust the pharmacists who recommend the synonymous drug. So, both pharmacists and doctors should periodically receive new information via special medical and pharmaceutical journals or special programs by TV and/or radio.

Drug stores can be provided with some warning posters; the pharmacists should not recommend consumers to buy Analgin when they ask for advice on pain medication. 28 % of the sample population preferred TV/radio as a source of getting information. So, instead of advertising Pentalgin by TV, it is better to warn public through short video film or special program and inform that there are more appropriate substitutes for Analgin. It is suggested to use Paracetamol or Aspirin instead of Analgin. It is permitted to use Analgin in limited amounts and under the supervision of health care professional only in exceptional situations. For example, it can be used in rheumatoid fever if the person does not bear salicylates (22).

Despite the great consumption of Analgin by adults, children are given Analgin only in 7% of cases. It seems that parents are more careful about their children's health than their own.

In the answers on known pain medication, Analgin made up 77 % (either alone or with other pain-killing drug). Naturally, people who mentioned it as their known pain medication tend to use this medicine (what was shown in the results of the study).

Results show that consumption of Analgin decreases with the age: elder people tend to buy less Analgin. This can be explained by more knowledge and experience gained during the lifetime. Likewise, people with technical education consume more Analgin possibly as a result of having less overall knowledge compared to people with higher education.

Attention should be paid to the fact that people do not visit doctors, and often decide themselves which medicine to buy. This is the possible reason for the inadequate consumption of pain medication. It could lead to worsening the health of the patient. It should

not be forgotten that pain-killing medicines, like any other chemical substance, have side and sometimes dangerous effects.

At the same time, steps should also be taken by the Ministry of Health and ADMT in preventing getting Analgin to the pharmacies or it should be sold by prescription only in emergency situations.

### **Limitations of the Study**

The study has certain limitations connected with study design, sample size, and sampling methodology.

The design of the study is cross-sectional, which does not allow detecting changes in people's practices and knowledge. Instead, only estimation of prevalence can be obtained.

Larger sample size would contribute to larger power of the study. Likewise, only people who visited drug stores had chance to be included in the study. So, the study excluded those people who due to different reasons could not visit a pharmacy.



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## Consumer Survey Questionnaire

**ID:**\_\_ \_\_ \_\_ \_\_

**Date of interview (dd/mm/yy):**\_\_\_\_\_

**Time Begin:**\_\_ \_\_

I would like to start by asking you some background questions before asking you questions on pain-killing medicines. This information is confidential and will only be used for research purposes.

### Background information

1. Gender: 1. Male                      2. Female
2. Date of birth (dd/mm/yy): \_\_\_\_\_
3. Current employment status:
  - a. employed in governmental system
  - b. employed in non-governmental system
  - c. self-employed
  - d. not employed
  - e. student
  - f. maternity leave
  - g.. retired
  - h. other \_\_\_\_\_
4. Educational level:
  - a. school (< 8 grade)
  - b. school (8-10 grade)
  - c. college
  - d. higher education/incomplete higher education
  - e. technical
  - f. other \_\_\_\_\_
5. What is the monthly income of your family?
  - a. 0-5,000 drams
  - b. 5,001-15,000 drams
  - c. 15,001-25,000 drams
  - d. 25,001-50,000 drams
  - e. more than 50,000 drams

## Questions about bought medicine

6. Type/name of bought pain-killing medicine: \_\_\_\_\_
7. For whom do you buy this pain-killing medicine?
- yourself (go to question 9)
  - parent
  - child
  - sister/brother
  - grandparent
  - neighbor
  - relative
  - spouse
  - other \_\_\_\_\_
8. How old is he/she? \_\_\_\_\_
9. Do you buy this medicine for treatment (relieving pain) or for prevention?
- treatment
  - prevention (go to q.12)
  - don't know (go to q. 12)
10. Is it an acute or a chronic pain?
- Acute
  - Chronic
  - Don't know
11. Where pain is located?
- |                   |                          |
|-------------------|--------------------------|
| a. head           | g. menstrual cycle       |
| b. heart          | h. eye/ear               |
| c. kidney/kidneys | i. muscular pain         |
| d. stomach        | j. tooth/teeth           |
| e. intestines     | k. joint pain            |
| f. throat         | l. other (specify) _____ |
12. How often do/does you or a person for whom you buy this medicine use/s it?
- every day
  - once or twice a week
  - more than twice a week
  - once or twice a month
  - more than twice a month
  - for the first time
  - when necessary
  - don't know
  - don't remember
13. Who advised you or that person to use this particular medicine?
- I myself
  - Family member

- c. Doctor/nurse
- d. Pharmacist
- e. Neighbor
- f. Friend
- g. From book/journal
- h. Other \_\_\_\_\_

**Questions about usage of pain-killing drugs**

14. What pain-killing medicines do you know (check all that apply)?

- 1. Analgin/tempalgin/pentalgin
- 2. Ascophen
- 3. Aspirin
- 4. Paracetamol/tylenol
- 5. other \_\_\_\_\_

15. What pain-killing medicines do you usually use to relieve your pain?

- 1. don't use (go to question 17)
- 2. Analgin/tempalgin/pentalgin (answer q. 16 and go to q.19)
- 3. Ascophen
- 4. Aspirin
- 5. Paracetamol/tylenol
- 6. other \_\_\_\_\_

16. Why?

- 1. cheap
- 2. effective
- 3. easy to use
- 4. available
- 5. safe
- 6. other \_\_\_\_\_

17. Have you or your family member used Analgin as pain-killing medicine this year?

- 1. yes
- 0. No

18. Why or why not?

*Yes*

- 1. cheap
- 2. effective
- 3. easy to use
- 4. available
- 5. safe
- 6. other \_\_\_\_\_

*No*

- 1. expensive
- 2. not effective
- 3. difficult to use
- 4. has unwanted side effects
- 5. other \_\_\_\_\_

19. Do you think that pain-killing medicines can have adverse effects on organism?

- 1. Yes
- 0. No



# Հարցաշար բնակչությանը

Հարցվող \_\_\_\_\_

Հարցազրույցի ժամանակը (օր, ամիս, տարի) \_\_\_\_\_

Սկսման ժամանակը \_\_\_\_\_

Մինչև ցավազրկող դեղամիջոցների մասին հարցերին անցնելը, ես կուզենայի գրանցել որոշ անձնական տվյալներ: Այս տվյալները գաղտնի են և կօգտագործվեն միայն հետազոտական նպատակներով:

## Անձնական տվյալներ

1. Սեռ                      1. Արական                      2. Իգական
2. Ծննդյան ամսաթիվը (օր, ամիս, տարի) \_\_\_\_\_
3. Ներկա աշխատանքային կարգավիճակը`
  - ա. պետական համակարգի աշխատող
  - բ. ոչ պետական համակարգի աշխատող
  - գ. անհատ ձեռներեց
  - դ. չի աշխատում
  - ե. ուսանող
  - զ. ֆիզարձակուրդ
  - թ. թոշակառու
  - ր. այլ \_\_\_\_\_
4. Կրթության մակարդակը:
  - ա. դպրոց (8 տարի)
  - բ. դպրոց (8-10 տարի)
  - գ. քոլեջ
  - դ. բարձրագույն կրթություն/անավարտ բարձրագույն կրթություն
  - ե. միջնակարգ մասնագիտական
  - զ. այլ \_\_\_\_\_
5. Ձեր ընտանիքի ամսական եկամուտը:
  - ա. 0 -5,000 դրամ
  - բ. 5,001 – 15,000 դրամ
  - գ. 15,001 – 25,000 դրամ
  - դ. 25,001 – 50,000 դրամ
  - ե. 50,000 ավել

## Նարգեր գնվաց դեղամիջոցի մասին

6. Գնված դեղամիջոցի անվանումը՝ \_\_\_\_\_

7. Ու՞մ համար եք գնել այս դեղամիջոցը:

1. ինձ համար (անցնեք հարց 9)
2. ծնողի
3. երեխայի
4. քրոջ/եղբոր
5. տատիկի/պապիկի
6. հարևանի
7. բարեկամի
8. կնոջ/ամուսնու
9. այլ \_\_\_\_\_

8. Քանի՞ տարեկան է նա: \_\_\_\_\_

9. Դուք գնում եք այս դեղամիջոցը բուժման (ցավազրկման) թե՞ կանխարգելման համար:

1. բուժման
2. կանխարգելման (անցնեք h.12)
3. չգիտեմ (անցնեք h.12)

10. Դա սուր ցավ է թե՞ քրոնիկական:

1. սուր
2. քրոնիկական
3. չգիտեմ

11. Ի՞նչն է ցավում:

- |               |                    |
|---------------|--------------------|
| 1. գլուխը     | 7. դաշտանային ցավ  |
| 2. սիրտը      | 8. աչքը/ականջը     |
| 3. երիկամները | 9. մկանային ցավ    |
| 4. ստամոքսը   | 10. ատամը/ատամները |
| 5. աղիները    | 11. հոդային ցավ    |
| 6. կոկորդը    | 12. այլ _____      |

12. Ի՞նչ հաճախականությամբ եք դուք կամ անձը, որի համար գնել եք դեղը, օգտագործում այն:

1. ամեն օր
2. շաբաթական 1-2 անգամ
3. շաբաթական 2 անգամից ավել
4. ամիսը 1-2 անգամ
5. ամիսը 2 անգամից ավել
6. առաջին անգամ
7. անհրաժեշտության դեպքում
8. չգիտեմ
9. չեմ հիշում



13. Ո՞վ է խորհուրդ տվել ձեզ կամ այդ անձին օգտագործել այս դեղամիջոցը:

- |                    |                                 |
|--------------------|---------------------------------|
| 1. ես ինքս         | 5. հարևան                       |
| 2. ընտանիքի անդամ  | 6. ընկեր                        |
| 3. բժիշկ/բուժքույր | 7. կարդացել եմ գրքում/ամսագրում |
| 4. դեղագետ         | 8. այլ _____                    |

**Նարցեր ցավազրկող դեղերի օգտագործման մասին**

14. Ի՞նչ ցավազրկող գեղամիջոցներ դուք գիտեք (նշեք բոլոր հնարավոր պատասխանները):

1. անալգին/տեմպալգին/պենտալգին
2. ասկոֆեն
3. ասպիրին
4. պարացետամոլ/թայլենոլ
5. այլ \_\_\_\_\_

15. Սովորաբար ի՞նչ ցավազրկող դեղամիջոցներ եք դուք օգտագործում ցավի ժամանակ:

1. չեմ օգտագործում (անցեք հ. 17)
2. անալգին/տեմպալգին/պենտալգին (պատասխանեք հ.16 և անցեք հ.19)
3. ասկոֆեն
4. ասպիրին
5. պարացետամոլ/թայլենոլ
6. այլ \_\_\_\_\_

16. Ինչո՞ւ:

1. էժան է
2. ազդեցիկ է (էֆֆեկտիվ)
3. հեշտ է օգտագործել
4. մատչելի է
5. անվտանգ է
6. այլ \_\_\_\_\_

17. Դուք կամ ձեր ընտանիքի անդամները այս տարվա մեջ օգտագործե՞լ եմ անալգին ցավազրկման համար:

1. այո                      0. ոչ

18. Ինչո՞ւ:

*այո*

1. էժան է
2. ազդեցիկ է (էֆֆեկտիվ)
3. հեշտ է օգտագործել
4. մատչելի է
5. անվտանգ է
6. այլ \_\_\_\_\_

*ոչ*

1. թանկ է
2. էֆֆեկտիվ չէ
3. դժվար է օգտագործել
4. ունի անցանկալի կողմնակի ազդեցություն
5. այլ \_\_\_\_\_

19. Կարծո՞ւմ եք արդյոք, որ ցավազրկող դեղերը կարող են կողմնակի ազդեցություն ունենալ օրգանիզմի վրա:

1. այո 0. ոչ

20. Դուք ունե՞ք մինչև 16 տարեկան երեխա:

1. այո 0. ոչ (անցնեք հարց 22)

21. Ի՞նչ դեղամիջոց եք տալիս երեխային երբ նա ցավ է ունենում:

1. ոչինչ չեմ տալիս
2. անալգին/տեմպալգին/պենտալգին
3. ասկոֆեն
4. ասպիրին
5. պարացետամոլ/թայլենոլ
6. այլ \_\_\_\_\_

22. Անալգինի արտադրությունը և վաճառքը արգելվա՞ծ են շատ զարգացած երկրներում:

0. ոչ 1. այո 2. չգիտեմ

23. Կուզենայի՞ք արդյոք տեղեկացված լինելիք ցավազրկող դեղամիջոցների ճիշտ օգտագործման մասին:

1. այո 0. ոչ (այստեղ կանգնեք)

24. Կուզենայի՞ք որ ո՞վ տեղեկացներ ձեզ այդ մասին:

1. հեռուստա/ռադիո հաղորդում
2. բժիշկը
3. դեղագետը/դեղագործը
4. հատուկ ամսագրեր/բրոշուրներ
5. այլ \_\_\_\_\_

Հարցազրույցի ավարտը՝ \_\_\_\_

## Appendix 2

*Non-narcotic non-steroidal pain-killing drugs that were bought in Armenian drug stores during survey.*

<b>Name of pain-killing medicine</b>	<b>Form of release</b>	<b>Manufacturer</b>	<b>Price (AMD)</b>
Analgin	Tablets, N10	ICN, Russia	50
	Tablets, N10	Bulgaria	100
Aspirin	Tablets, N10	Belarus	30
		ISN, Russia	30
		Bayer	550
Ascophen	Tablets, N10	ICN, Russia	75
Caffetin	Tablets, N10	Russia	520
Citramon	Tablets, N10	ICN, Russia	50
	Tablets, N6	Ukraine	40
Diclophenac	Tablets, N20	Yugoslavia	440
Efferalgan	“Sparkling”Tablets, N10	UPSA, France	500
Ibuprophen	Tablets, N10	Belarus	60
Indometacin	Tablets, N25	Bulgaria	150
Ketonal	Capsules, N25	Slovenia	1600
Nimesil	Powder, N30	Germany	5800
Paracetamol	Tablets, N10	ICN, Russia	50
Pentalgin	Caplets, N12	ICN, Russia	1300
Spasmalgon	Tablets, N20	Bulgaria	440
Tempalgin	Tablets, N10	Bulgaria	220
Voltaren	Tablets, N20	Swedes	4700
Vurdon	Tablets, N20	Greece	500
Mean price including two extreme values (5800 and 4700 AMD)			819
Mean price excluding two extreme values			353

### Appendix 3

*Non-narcotic non-steroidal pain-killing drugs that were not bought in Armenian drug stores  
during survey*

<b>Name of pain-killing medicine</b>	<b>Price (AMD)</b>	<b>Name of pain-killing medicine</b>	<b>Price (AMD)</b>
Calpol	960	Sedalgin	270
Reumophen	3100	Nevralgin	200
Naclophen	650	Trigan-D	180
Diclonat	1000	Donalgin	1850
Dicloran	840	Pyroxicam	750
Olphen	2800	Solpadein	1750

Mean price = 1265 AMD

## SPSS Output for Logistic Regression Analysis for Best Model

## Method: Forward:LR

Dependent Variable Encoding:

Original Value		Internal Value		Value	Freq	Parameter Coding (1)	(2)
1	Analgin	0					
2	Other pain medicines	1					
Q22							
	no		0	8		1.000	.000
	yes		1	26		.000	1.000
	don't know		2	66		.000	.000
Q4_1							
	higher/incomplete_higher		1	15		1.000	.000
	technical		2	31		.000	1.000
	school		3	54		.000	.000

Dependent Variable.. OUTCOME outcome  
 Beginning Block Number 0. Initial Log Likelihood Function  
 -2 Log Likelihood 138.62944  
 \* Constant is included in the model.  
 Estimation terminated at iteration number 1 because  
 parameter estimates changed by less than .001  
 Classification Table for OUTCOME  
 The Cut Value is .50

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
Constant	.0000	.2000	.0000	1	1.0000	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper

Beginning Block Number 1. Method: Forward Stepwise (LR)

----- Variables not in the Equation -----

-

Residual Chi Square 22.515 with 10 df Sig = .0127

Variable	Score	df	Sig	R
AGE	3.2827	1	.0700	.0962
Q1	.0000	1	1.0000	.0000
Q3_1	.6791	1	.4099	.0000
Q4_1	4.5314	2	.1038	.0619
Q4_1(1)	.0784	1	.7794	.0000
Q4_1(2)	3.7868	1	.0517	.1135
Q13_1	1.5280	1	.2164	.0000
Q14_1_1	6.8323	1	.0090	.1867
Q19	.8316	1	.3618	.0000
Q22	2.2145	2	.3305	.0000
Q22(1)	2.1739	1	.1404	.0354
Q22(2)	.2079	1	.6484	.0000

Variable(s) Entered on Step **Number 1**  
 Q14\_1\_1 known pain medicines

Estimation terminated at iteration number 3 because  
 Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 131.570  
 Goodness of Fit 100.000  
 Cox & Snell - R<sup>2</sup> .068  
 Nagelkerke - R<sup>2</sup> .091

	Chi-Square	df	Significance
Model	7.059	1	.0079
Block	7.059	1	.0079
Step	7.059	1	.0079

Classification Table for OUTCOME  
 The Cut Value is .50

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
Q14_1_1	-1.3291	.5278	6.3428	1	.0118	-.1770
Constant	1.6168	.6615	5.9736	1	.0145	

-

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
Q14_1_1	.2647	.0941	.7447

----- Model if Term Removed -----

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
Q14_1_1	-69.315	7.059	1	.0079

----- Variables not in the Equation -----

Residual Chi Square 16.549 with 9 df Sig = .0563

Variable	Score	df	Sig	R
AGE	4.0255	1	.0448	.1209
Q1	.0000	1	.9977	.0000
Q3_1	1.0486	1	.3058	.0000
Q4_1	6.5744	2	.0374	.1363
Q4_1(1)	.0001	1	.9912	.0000
Q4_1(2)	6.0727	1	.0137	.1714
Q13_1	1.1051	1	.2931	.0000
Q19_1	1.2078	1	.2718	.0000
Q22	1.2967	2	.5229	.0000
Q22(1)	1.1283	1	.2881	.0000
Q22(2)	.0692	1	.7925	.0000

Variable(s) Entered on Step **Number 2**

  Q4\_1            education

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood            124.868  
 Goodness of Fit              98.884  
 Cox & Snell - R^2            .129  
 Nagelkerke - R^2             .171

	Chi-Square	df	Significance
Model	13.761	3	.0032
Block	13.761	3	.0032
Step	6.702	2	.0350

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
Q4_1			6.3427	2	.0419	.1300
Q4_1(1)	-.4492	.6240	.5181	1	.4716	.0000
Q4_1(2)	-1.2466	.4950	6.3424	1	.0118	-.1770
Q14_1_1	-1.5794	.5537	8.1352	1	.0043	-.2104

Constant	2.3793	.7575	9.8664	1	.0017
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Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
Q4_1(1)	.6382	.1878	2.1682
Q4_1(2)	.2875	.1090	.7585
Q14_1_1	.2061	.0696	.6101

----- Model if Term Removed -----

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
Q4_1	-65.785	6.702	2	.0350
Q14_1_1	-67.025	9.181	1	.0024

-

----- Variables not in the Equation -----

-

Residual Chi Square      10.797 with      7 df      Sig = .1477

Variable	Score	df	Sig	R
AGE	6.2563	1	.0124	.1752
Q1	.0253	1	.8735	.0000
Q3_1	1.5885	1	.2075	.0000
Q13_1	1.9094	1	.1670	.0000
Q19	1.8615	1	.1725	.0000
Q22	2.0113	2	.3658	.0000
Q22(1)	1.3286	1	.2491	.0000
Q22(2)	.3673	1	.5445	.0000

Variable(s) Entered on Step **Number 3**

AGE

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood	118.428
Goodness of Fit	97.547
Cox & Snell - R <sup>2</sup>	.183
Nagelkerke - R <sup>2</sup>	.244

	Chi-Square	df	Significance
Model	20.202	4	.0005
Block	20.202	4	.0005



Step 6.441 1 .0112

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
AGE	.0365	.0150	5.9258	1	.0149	.1683
Q4_1			8.2339	2	.0163	.1748
Q4_1(1)	-.7806	.6537	1.4259	1	.2324	.0000
Q4_1(2)	-1.5186	.5315	8.1632	1	.0043	-.2109
Q14_1_1	-1.7283	.5750	9.0362	1	.0026	-.2253
Constant	1.0814	.9006	1.4416	1	.2299	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
AGE	1.0372	1.0071	1.0682
Q4_1(1)	.4582	.1272	1.6497
Q4_1(2)	.2190	.0773	.6207
Q14_1_1	.1776	.0575	.5480

----- Model if Term Removed -----

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
AGE	-62.434	6.441	1	.0112
Q4_1	-63.740	9.053	2	.0108
Q14_1_1	-64.410	10.392	1	.0013

----- Variables not in the Equation -----

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Residual Chi Square 4.881 with 6 df Sig = .5591

Variable	Score	df	Sig	R
Q1	.0015	1	.9688	.0000
Q3_1	.3955	1	.5294	.0000
Q13_1	2.3953	1	.1217	.0534
Q19	.7898	1	.3742	.0000
Q22	1.8737	2	.3919	.0000
Q22(1)	1.3534	1	.2447	.0000
Q22(2)	.2503	1	.6169	.0000

No more variables can be deleted or added.

### **List of appropriate Journals**

1. British Medical Journal
2. The Lancet
3. Journal of American Medical Association
4. American Journal of Public Health
5. National Public Health Institute: Thesis Collection Scientific Works and Reports (Armenia)