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## **Structure of risk factors developing of diabetes and cardiovascular diseases depending of the type of tobacco smoking**

Smoking is a factor in increasing the risk of endothelial dysfunction and increase the risk of developing diabetes and cardiovascular diseases. The influence of active and passive smoking on the risk of developing diabetes and cardiovascular disease among population of industrial cities of Central Kazakhstan is analyzed. Smokers surveyed 766 people (609 women and 157 men) in Karaganda, Saran, Karaganda region. It is established that a high risk of developing diabetes was observed in 31 % persons with passive type of smoking with prevalence of women 92 % in comparison with 63 % active type of smoking. Physical work predominated, higher in the group with active type of Smoking — 71 % comparatively with 65 % in the group of passive smoking. A high cardiovascular risk among almost 80 % of persons with active type of smoking and high risk of diabetes in group with passive smoking.

*Key words:* active, passive smoking, the risk of diabetes, screening, Findrisk, Score.

### *Actuality*

Among of the leading behavioral and physiological risk factors related to mortality, the second after high blood pressure (13 % mortality) followed factor of tobacco smoking (9 %) [1, 2]. Development of Endothelial dysfunction and cardiovascular diseases are a important factors in their development and in combination with diabetes mellitus, tobacco use exacerbates the development and further progression of diabetic macroangiopathy in the form of lesions of the coronary vessels of the brain. Combination of smoking and one of other risk factors such as hypercholesterolemia and blood hypertension result risk increasing exponentially in compared with persons without risk factors. Prevalence of tobacco use to date is an important prognostic indicator of the future burden of active smoking-related diseases, including important role in the risk of developing diabetes. The prevalence of active smoking among adults globally, according to WHO prevails among men: 36 % comparatively with 8 % in women. Recently, there is evidence held by the research on the effect of passive smoking on the risk of developing of lung disease and of diabetes. This type of smoking the most pre-dominant among females [3, 4, 7].

According to the WHO the number of people with registered diabetes had increased from 108 million in 1980 to 422 million in the year 2014. The global prevalence of diabetic patients among people older than 18 years increased from 4.7 % in 1980 to 8.5 % in 2014. WHO estimates that in 2012 year 1.5 million deaths were directly caused by diabetes and a 2.2 million deaths were due to the high level of blood glucose concentration. Almost half of all deaths caused by high concentration of glucose in the blood occurs before the age of 70 years. Mortality in European region accounted for 238 person and a maximum mortality rate — in the African region, South-East Asia: 322 and 382 person per 100000 population respectively [1]. According to the Ministry of health of Kazakhstan in 2013, the number of incidence of diabetes is 170 persons per 100 thousands of population and mortality from late complications of diabetes as a diabetic macroangiopathy (strokes, heart attacks) accounted for 141 to 100000 of the adult population with a tendency to increase compared with the year 2012 [6].

The aim of investigation: to evaluate the prevalence of active and passive tobacco smoking while carrying out a screening survey of the population of downtown Saran, Land Karaganda and to study their possible influence on the risk of developing diabetes.

### *Materials and methods*

A cross-sectional investigation as form of screening among residents of the city of Saran was carried out. Human 766 patients aged 18 to 65 years have been examined: 609 women (79.5 %) and 157 men (20.5 %). Questionnaires included questions of active and passive smoking, duration of smoking, social and demographic indicators, history of chronic disease. Active smoking was assessed by the smoker index (IR): IR of more than 10 — high risk, passive smoking by means of a questionnaire, data on smoking spouse, partner. The risk of developing diabetes was estimated using of scale Findrisk, the criteria for a low risk:

<7–11 points, high risk of development of diabetes from 12 to 20 points and measuring of blood glucose concentration was used to determine the glucose level of capillary blood. Cardiovascular risk was estimated by the SCORE scale (Fig. 1, 2.)

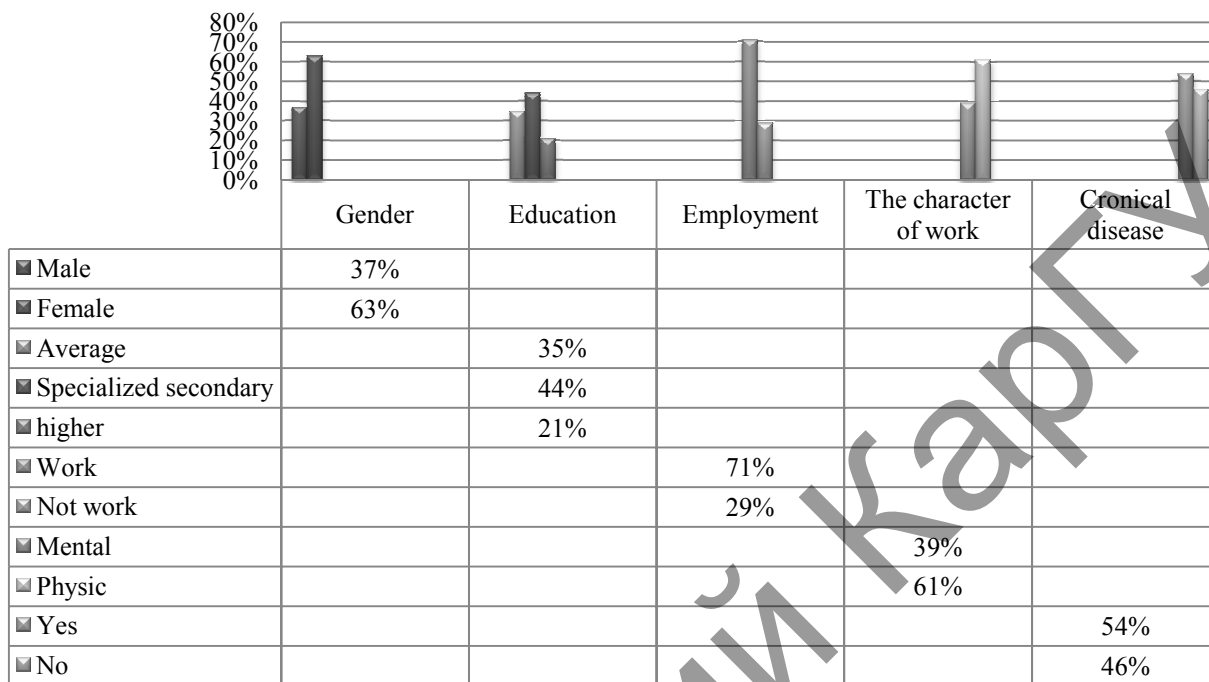


Figure 1. General characteristics of subjects in the contingent of active smoking group

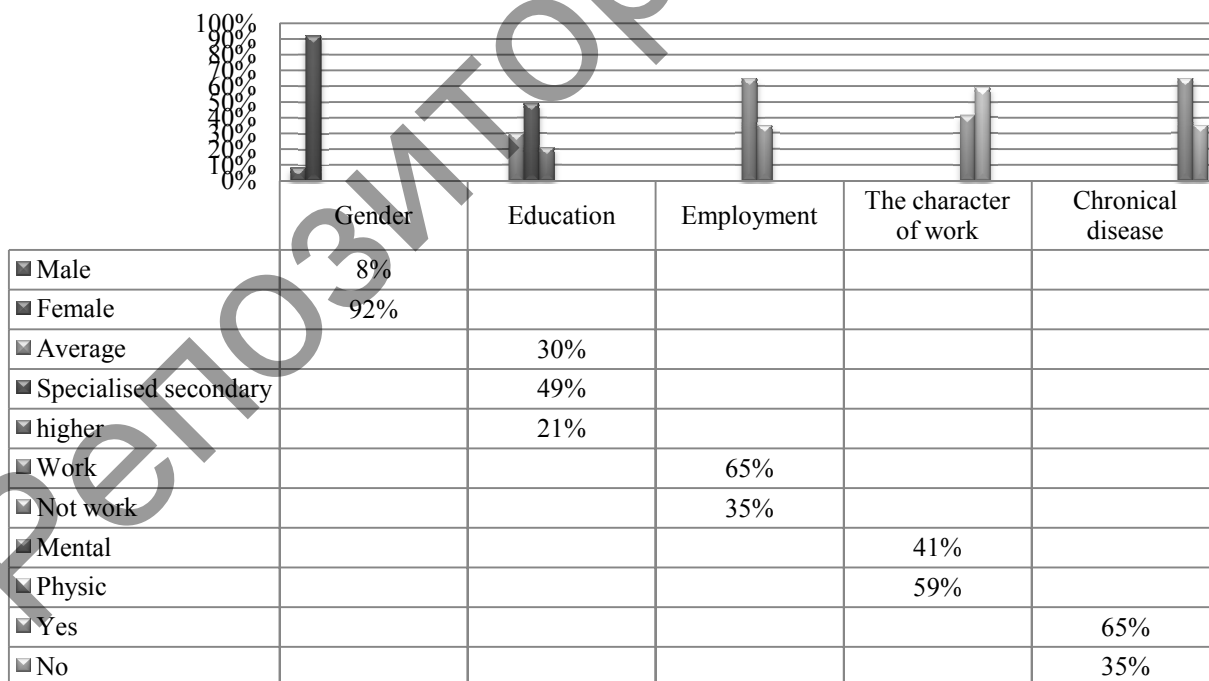


Figure 2. General characteristics of contingent subjects in the passive smoking group

*Results*

Results of comparative investigation of the characteristics in terms of social and demographic indicators showed the presence of prevalence among women in groups with active and passive smoking: 92 % and

63 % respectively regardless of the level of education of women (secondary education (average), specialized secondary education and highest education) — 35 %, 44 % and 21 % in group 1 comparatively with 30 %, 49 % and 21 % in group 2 (Fig.1,2). 71 % and 65 % of women have job and 29 % and 35 % without job respectively. Regarding type of work we showed prevalence of more active smoking in groups 1 and 2 of women-workers of physical work: in group 1 of active smoking — 61 % and 59 % in women of passive smoking group 2 in compared with 39 % and 41 % respectively in women of not physical work. Prevalence of chronic diseases were showed in a group with passive smoking type of chronic disease in 65 % of respondents comparatively with 54 % in group of active smoking (Fig. 1, 2).

Analysis of clinical investigation identified a groups of active and passive smoking as 25 % and 43 % respectively. In the Group of active smokers in compared with the Group passive smokers noted the predominance of high cardiovascular risk in 77 (41 %) respondents. In a group of passive smoking we have showed the prevalence of risk of developing diabetes comparatively with group of active smoking has reached 102 (31 %) and also high rates of cardiovascular risk was revealed in a group of passive smoking, which were increased until 124 (38 %) respondents.

### Conclusions

1. A high risk of developing diabetes was associated with passive smoking and reached 102 (31 %).
2. High risk developing of cardiovascular diseases associated with active smoking and reached 77 (41 %) respondents.

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## **Шылым шегу түріне байланысты қант диабеті және жүрек-қантамыр ауруларының тәуекел факторларының құрылымы**

Шылым шегу салдарынан қант диабеті және жүрек-қантамырлары ауруларының дамуы және эндотелий дисфункциясының артуы дәлелденген қауіпті фактор болып табылады. Диабет және жүрек-қантамырлары ауруларының даму қауіпі бойынша белсенді және пассивті темекі шегудің әсері зерттелген. Қарағанды қаласы және Қарағанды облысының Саран қаласының шылым шегетін 766 адам (609 әйелдер мен 157 ерлер) зерттеуге қатысқаны анықталды. Нәтижесінде қант диабеті ауруының жоғары деңгейде қауіпті дамуы пассивті темекі шеккен тұлғаларда 102 (31 %) байқалды. Топта белсенді және пассивті темекі шегетін әйелдер саны жоғары болды, оның ішінде белсенді шылым шегу 63 %-бен салыстырғанда, пассивті шегетін (92 %) әйелдер басым түсті. Жұмыс түрінің сипатын ескере отырып, дене шынықтырумен айналысатын пассивті темекі тобында — 65 %, белсенді темекі шегу 71 % құрады. Созылмалы ауруларды зерттеу барысында, ол аурулардың негізгі түрі пассивті темекі шегудің тобындағы науқастардың 65 %-да табылған. Пассивті темекі шегетіндер тобымен салыстырғанда белсенді темекі шегетін топтарында 77 (41 %) респонденттердің кардиоваскулярлы қауіпі басым екені анықталды. Белсенді темекі шегудің тобымен салыстырғанда пассивті темекі шегу тобында қант диабетінің даму қауіпі 102 адамды (31 %) құрайтыны, сонымен қатар пассивті темекі шегу тобында жүрек-қантамырлар ауруларының даму қауіпінің жоғарғы көрсеткіші 124 (38 %) науқастарда байқалды.

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## **Структура факторов риска развития диабета и сердечно-сосудистых заболеваний в зависимости от типа курения**

Курение является доказанным фактором в увеличении риска дисфункции эндотелия, и как следствие — повышение риска развития диабета и сердечно-сосудистых заболеваний. Изучено влияние активного и пассивного курения на риск развития диабета и сосудистых заболеваний. Обследованы 766 курящих человек (609 женщин и 157 мужчин) г. Караганды и г. Сарани Карагандинской области. Установлено, что высокий риск развития сахарного диабета наблюдался у 102 (31 %) лиц, подвергавшихся пассивному курению. Одинаково часто в группе с активным и пассивным типом курения преобладали женщины: в группе с пассивным типом курения — 92 %, среди активно курящих — 63 %. Занятые физическим трудом преобладали больше в группе с активным типом курения — 71 %, в группе пассивного курения — 65 %. При изучении хронических заболеваний их наличие выявлено в основном в группе с пассивным типом курения — у 65 % обследованных. В группе активно курящих в сравнении с группой пассивно курящих отмечено преобладание высокого кардиоваскулярного риска у 77 (41 %) респондентов. В группе пассивного курения установлено преобладание риска развития сахарного диабета в сравнении с группой активного курения — 102 человека (31 %). Также отмечены высокие показатели риска развития сосудистых заболеваний в группе пассивного курения — у 124 (38%) обследованных.