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**Assessment of awareness and attitude towards breast cancer and
mammography**

Doctoral (PhD) thesis booklet

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INTRODUCTION

In 2020, breast cancer was the leading malignant cancer in terms of incidence and prevalence in the overall population, both in the world and in Europe. Regarding mortality, breast cancer ranked 5th in the world and 3rd in Europe. In Hungary, it ranks 3rd in incidence, 1st in prevalence and 4th in mortality following lung, colorectal and pancreatic cancer. For the female population, it is ranked 1st in incidence, prevalence and mortality in the world, in Europe and in Hungary, too. Hungary is far below the EU average in terms of standardised mortality rates for breast cancer.

This cancer is a multifactorial disease with complex pathomechanisms. The development of breast cancer is a slow process taking many years, therefore a possible approach to reduce mortality was to introduce a screening programme. Hungary introduced mammogram screening in 2001. The target group for screening are asymptomatic women aged 45-65 years who are invited to the screening via letters once every two years. The 2015 results for Hungary show that the coverage of invitation coverage 78.5%, but participation in screening was only 45%. Digital mammography accounted for 60% of cases. These quality indicators are far below the European Union average.

Reports on awareness and attitudes towards breast cancer are rare, and to the best of our knowledge, no such comprehensive study has been conducted in Hungary. As lack of knowledge about this disease or possible misconceptions may contribute to low participation rates in mammography screening, we considered it important to investigate the awareness and attitudes of the target groups.

Objective

The aim of our research is to explore the awareness of 25–65-year-olds in Baranya County about breast cancer and its screening, and to identify the factors that significantly influence participation in screening.

Hypotheses

The awareness of female respondents surveyed at their general physician's (GP) office is well below the knowledge of mammography participants regarding this group of questions.

The mammography group will be almost fully aware of the recommended age and frequency for breast cancer screening.

The least well informed group in terms of awareness will be the group of men.

The awareness and attitude of each group will be significantly influenced by the survey respondents' level of education.

RESEARCH MATERIAL AND METHOD

Research method: quantitative, cross-sectional

Sample

Sampling location: Baranya county

Sampling period: March 2017 – June 2017

Planned subject number: 1100

Inclusion criterion: Age between 25 and 65 years.

Exclusion criterion: history of neoplastic disease

Sampling method: non-random, quota sampling

Description of sampling: The Department of Radiology of the Faculty of General Medicine of the University of Pécs and 12 primary care districts participated in the study on a voluntary basis.

Method

Research tool: self-constructed, anonymous, self-administered questionnaire. Questionnaire question categories: sociodemographic characteristics, health status and health-related issues, breast cancer awareness and its source, attitudes towards and factors influencing mammography screening.

Analysis

The data were analyzed using descriptive statistics (mean, median, relative rate), odds ratios, Spearman's rank correlation, Mann–Whitney U test with a 95% confidence interval. Regarding the question on symptoms, respondents who correctly marked at least five of the eight options were considered „well informed“ and all other respondents were considered „not well informed“. For the question on risk factors, respondents who correctly marked at least seven of the twenty-one options and no more than one incorrectly were considered „well informed“, all other respondents were considered „not well informed“.

RESULTS

The average age was 47.9 years for men, 47.22 years for women surveyed at their GP, and 53.33 years for mammography participants.

| Place of residence | Men | Women surveyed at their GP | Mammography participants |
|--------------------|-------|----------------------------|--------------------------|
| County seat | 53.2% | 51.5% | 28.9% |
| Other city | 26.4% | 24.7% | 36.8% |
| Village/town/farm | 20.4% | 23.8% | 34.3% |

Women surveyed at their GP who live in the county seat have significantly more trust in doctors and the health care system than their counterparts who live in villages, towns and farms, and screening participants living in the county seat have more trust in doctors and the health care system than those living in other cities.

| Level of education | Men | Women surveyed at their GP | Mammography participants |
|--------------------------|-------|----------------------------|--------------------------|
| Less than 8 grades | 0% | 0.9% | 0.5% |
| 8 grades | 6.5% | 10.6% | 9% |
| Vocational school | 26.9% | 23.3% | 21.4% |
| Secondary/high school | 32.3% | 22% | 40.3% |
| Vocational qualification | 8% | 11% | 6.5% |
| College/University | 26.4% | 32.2% | 22.4% |

In the group of women surveyed at their GP, those with lower levels of education were less likely to have visited their GP in the previous 6 months.

A lack of health-conscious behaviour was revealed during questions about GP check-ups and screenings in our survey. Although 24.9% of men and 44.9% of women surveyed at their GP believe that they should have a check-up before symptoms develop, in fact only a very small percentage of both groups (8.5% and 9.3%, respectively) see their doctor for a regular check-

up. A slightly better result was seen in the group of mammography participants (50.2%, actual medical check-up: 21.9%). Similar results were obtained in a *Maltese study* by Marmarà *et al.* where 88.6% of respondents only visit their doctor if they have a problem/illness, so similar to our study, only a small percentage considered regular medical check-ups important. Those who answered correctly about screening (that it should take place before symptoms develop) were more likely to have a higher level of education in all three groups, more likely to have a medical qualification in both female groups, and in the group of men, younger age and medical qualification of spouse/partner were also positive influences.

55.5% of women surveyed at their GP attended a breast cancer screening in the past two years, which is similar to *the rate of attendance in the UAE (58%) based on a survey by Elobaid et al.* This was much higher in both *Canada (72%) and the UK in 2008 (80%)*. In our survey, people who have an acquaintance/friend with a history of breast cancer were more likely to have participated in breast cancer screening.

58.7% of male respondents reported not having enough information about women's breast cancer screening and these respondents were significantly older. 70.9% of women surveyed at their GP indicated that they had sufficient information about mammography screening, these respondents were significantly older and more likely to have a healthcare degree. Although 86.1% of mammography participants responded that they had sufficient information about breast cancer screening, the results did not reflect this, as even men were found to be more informed about the screening frequency. These respondents were significantly older.

| Correct response rate regarding the screening protocol | | |
|--|-------------------|-----------------------|
| | Recommended start | Recommended frequency |
| Men | 27.4% | 21.9% |
| Women surveyed at their GP | 35.2% | 33.9% |
| Mammography participants | 86.6% | 12.9% |

A survey by Donnelly et al. found that 26.4% of Qatari women surveyed were aware of national screening guidelines for mammography screening, a percentage most similar to the group of men in our research. Our results even fall behind the survey conducted by Kanaga et al. in Malaysia where 47.2% of respondents answered correctly to questions about mammography screening. In a study by Wegwarth et al., all 5 EU Member States included in the study were

uninformed about mammography screenings. Similar to our work, *Carrasco-Carrido et al. concluded in Spain that women are more informed about mammography screening than men (98.07% vs. 91.85%)*. In this study, awareness of mammography screening among women was very high, as shown by the fact that 50–69-year-olds had a screening coverage of >80%. Regarding the question about the interval between breast cancer screenings, men were more informed than mammography participants, therefore **our second hypothesis** that the mammography group would be almost completely aware of the screening age and frequency was not fully supported. In the context of these results, **our third hypothesis** of men being the least informed should also be highlighted: they had approximately similar rates of correct responses and, for the screening frequency, an even better response rate than the mammography participants. For men, the older group was significantly more informed on screening age, while for women, the younger group was significantly more informed on screening interval.

90.3% of women surveyed at their GP and 94% of women in the mammography group stated that they know how to perform a breast self-examination. For women surveyed at their GP, these respondents were significantly older and 8.2 times more likely to have a healthcare degree. Our study found that 84.7% of women surveyed at their GP and 91.5% of mammography participants had already performed a breast self-examination, a result well above *both the findings of Trupe et al. in South Africa (33.3%) and of Erbil et al. among Turkish women (55.8%)*. 41.9% of women surveyed at their GP and 51.7% of mammography participants regularly perform self-examinations. It is similar to *the study by Olajide et al. in Nigeria, where 56% of respondents have performed a self-examination at least once and 45% regularly perform self-examinations*. Our results are far better than the *findings of Donnelly's survey of Arab women in Qatar, where the proportion of women who regularly perform breast self-examination was 13.9%*. 38.8% of women surveyed at their GP and 51.2% of mammography participants knew the recommended age at which self-examination should be started. For both groups, higher level of education and, for women surveyed at their GP, younger age and a healthcare degree positively influenced this awareness.

84.1% of men, 92.5% of women surveyed at their GP and 96.5% of mammography participants believe that breast cancer is a curable disease if detected early. In the work of *Trupe et al., far more people considered it a curable disease: only 2.9% believed that breast cancer cannot be cured*. In our study, higher level of education had a positive effect on this awareness in the mammography group.

69.2% of men, 80.6% of women surveyed at their GP and 78.1% of mammography participants knew that breast cancer can be asymptomatic at an early stage. Correct respondents in both female groups had higher levels of education and were more likely to have some kind of health-related degree.

| Source of information | | | |
|---------------------------------------|-------|----------------------------|--------------------------|
| | Men | Women surveyed at their GP | Mammography participants |
| TV | 50.7% | 41.9% | 37.8% |
| Internet | 43.3% | 41% | 37.3% |
| Newspapers/pamphlets | 35.3% | 35.7% | 31.8% |
| Friend/acquaintance/colleague | 29.4% | 37.9% | 42.8% |
| Family member | 24.4% | 23.3% | 25.9% |
| General practitioner/other specialist | 21.9% | 38.3% | 44.3% |
| Healthcare worker | 17.4% | 33.9% | 35.8% |
| Has not heard of it | 6% | 1.3% | 0.5% |

In a study by *Olajide et al. in Nigeria*, patients who knew about breast cancer screening were mostly informed from the media, mainly radio and television programmes and newspapers, with fewer identifying a doctor or other healthcare worker as a source of information. *In a survey by Erbil et al. in Turkey*, significantly more people (65.5%) identified their doctor as a source of information than in our survey. In Brazil, 86.5% of respondents of a survey by *Batiston et al.* received some information about breast cancer, and 28.8% obtained information through mass media. Thus, our **fifth hypothesis** that the Internet is the most common source of information was not supported. While it is the second most common source of information among women surveyed at their GP, it only ranks fourth for mammography participants.

In all three of our survey groups, inherited predisposition was the most commonly answered risk factor – it is similar to *Marmarà's study*, where respondents also identified inherited predisposition as the primary risk factor. In our survey, only a very small percentage of respondents considered themselves well informed about risk factors: 2.49% of men, 7.05% of women surveyed at their GP and 5.97% of the mammography group. This percentage is well below the results of *Tazhibi et al.* who found that 32% of respondents demonstrated increased

awareness in this regard. The study by *Trupe et al.* also showed better results, with 31.3% of respondents correctly classifying 6 of the 12 risk factors listed. Female respondents from EU Member States in a study by *Wegwarth et al.* also showed low levels of awareness on this issue, but in a study by *Dreier in Germany*, most women correctly identified the risk factors. In the mammography group, higher level of education had a positive effect on awareness, similar to *the study of Batiston et al.* Moreover, in our survey, those in the mammography group who were considered well informed were more likely to have a healthcare degree.

According to 52.2% of men, 68.7% of women surveyed at their GP and 76.6% of mammography participants, breast cancer is a common cause of cancer death in Hungary. Regarding this question, even men were more informed than those surveyed by *Elobaid et al.*, only 43% of whom thought it was the most common cancer type among women. For both groups surveyed at their GP, having friends/acquaintances with a history of breast cancer was a positive influence, and for female respondents, education was also a positive influence and they were more likely to have a healthcare degree. Thus, although higher level of education was not an influential factor among men, a significant association was found for a number of awareness-related topics and the two female groups, supporting our **fourth hypothesis**.

All three of our surveyed groups responded that the most common symptom of breast cancer was a palpable lump in the breast, reported by more than 90% of respondents in each group. A high percentage, which was well below our survey (76.8%), of respondents surveyed by *Kanaga et al. in Malaysia* also indicated that a palpable lump in the breast could be a sign of breast cancer. In the study by *Trupe et al.*, an even smaller proportion of respondents, merely 53.1% considered a palpable lump in the breast a symptom. In our study, 11.94% of men, 16.74% of women surveyed at their GP and 28.85% of the mammography group were considered well informed about symptoms. Our study showed a similar (or, in case of the two groups surveyed at their GP, a lower) level of awareness to the survey conducted by *Tazhibi et al.*, as they reported that 71.3% of the respondents had a low level of awareness. In all three groups, healthcare degree and in case of the two female groups, level of education had a positive effect on symptom awareness. Thus, our **first hypothesis**, that the breast cancer awareness of female respondents surveyed at their GP is much lower than that of the mammography group in this group of question, is not fully supported. Although better results were obtained for recommended age for self-examination, Hungarian breast cancer mortality and breast cancer symptoms, this was not true for the other questions. The two groups showed an almost equal percentage distribution in terms of recommended time for self-examination, breast cancer

curability, asymptomatic stage and risk factors. Moreover, regarding the interval between breast cancer screenings, women surveyed at their GP gave significantly more correct answers.

55.2% of male respondents knew that they could develop breast cancer, a fact that significantly more respondents *in the study by Elobaid et al.* was aware of, although their work only surveyed women. In our survey, respondents who answered correctly were more likely to have a spouse/partner with a healthcare degree.

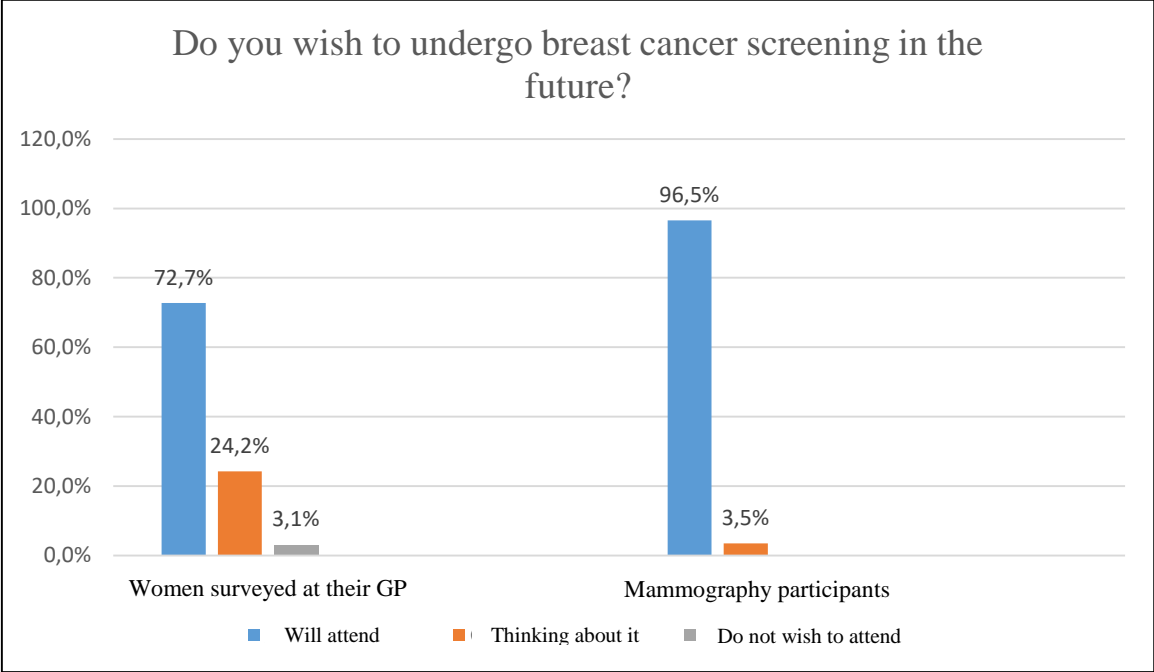
69.2% of men would like to be aware if their wife or partner has breast cancer, while 6.5% would not. For the same question, 89.9% of women surveyed at their GP responded that they would like to know if they have breast cancer – these respondents had a significantly higher level of education.

Of the statements measured on the Likert scale, among women surveyed at their GP, „attending breast cancer screening gives a sense of security and helps individuals keep their health under control" was largely agreed by respondents, and those living in a county seat agreed more than those living in other cities. These respondents were practically aware of the fact that mammography is necessary for early detection of breast cancer, as were 71.6% of respondents *in the study by Olajide et al.* The second statement, „A healthy lifestyle, such as a low-fat and low-calorie diet and regular exercise, reduces the risk of developing breast cancer“ was partially agreed by women, and women living in the county seat and in villages/towns/farms were more likely to agree with this statement than women living in other cities. For the last statement, we examined the extent to which women consider mammography screening to be an intimate method of examination. Women did not really consider breast cancer screening to be an intimate method of testing, but a weak negative correlation between age and this statement was found. Women agreeing with this last statement were significantly more likely to indicate at the end of the questionnaire that they did not wish to undergo future breast cancer screening. For the mammography group, the first statement („attending breast cancer screening gives a sense of security and thus allows the individual to keep their health under control“) was almost universally agreed by respondents and a weak positive correlation between this agreeing to this statement and age was confirmed. Regarding the second statement („a healthy lifestyle, such as a healthy diet and regular exercise, reduces the risk of developing breast cancer“), it was largely agreed by respondents, and respondents without any friends/acquaintances with a history of breast cancer were more likely to agree with this statement. This statement was partially agreed by respondents in all three groups, which is supported by recent expert estimates that successful

lifestyle changes can prevent 25–30% of breast cancer cases. For the third statement, we looked at whether respondents in the mammography group were afraid that the screening would detect any lesions. Respondents were more afraid of developing the disease, but there was evidence of a negative correlation of medium strength between this statement and level of education.

Respondents to our survey with a family history of breast cancer or a history of breast cancer among friends/acquaintances reported feeling significantly more likely to have breast cancer in their lifetime. Those living in a village/town/farm reported feeling significantly more likely to develop the disease than their counterparts living in the county seat. In our survey, the majority thought they had the same chance of developing breast cancer as all other women, but the discrepancy of *findings by Trupe et al.* with our results is very striking, since respondents overestimated their personal risk of breast cancer with 47.7% feeling likely to develop breast cancer in their lifetime.

52.2% of male respondents, 63.4% of women surveyed at their GP and 67.7% of mammography participants would like more information about breast cancer screening. Those in among women surveyed at their GP who would like more information are significantly younger and more likely to have some healthcare degree. Those in the mammography group who wanted more information about mammography screening had significantly lower levels of education.



Women surveyed at their GP who indicated that they will attend future screenings were significantly older. Those in the mammography group who are considering attending future breast cancer screenings have significantly higher levels of education. *A study by Donnelly in*

Qatar and another by Carrasco-Garrido in Spain both showed that awareness was associated with higher levels of education.

DISCUSSION

Overall, it should be highlighted that the awareness of respondents is not adequate. Respondents' lack of awareness is already evident in their responses to questions related to mammography screening. Although Hungary has similar results to foreign studies in terms of awareness about mammography screening guidelines, breast self-examination and the curability of breast cancer, the results are far below expectations. There are huge knowledge gaps regarding the ages when self-examinations and mammography screenings are recommended. Better results were noted for curability, asymptomatic stage and incidence, and breast cancer incidence was estimated more accurately in this survey than in studies abroad. In terms of information on breast cancer symptoms and especially risk factors, the results are disappointing. Although respondents in foreign studies were more knowledgeable about risk factors, in our survey more people were aware of the fact that a lump in the breast can be a symptom of breast cancer. It is precisely because of this low level of awareness that it would be most important to emphasise the symptoms of breast cancer through the various information channels. Compared to our results, in a study abroad, more people mentioned their doctor as a source of information regarding mammography screening. It would also be important that health professionals teach adolescent girls the timing and steps of self-examination, even in the context of an educational class. It was a surprising fact that the awareness of men was not as different as we would have thought at first. As for the attitudinal questions, even more than half of male respondents would like to receive more information about screening, although of course this result was significantly better in the other two groups surveyed. Regarding the question whether they would like to participate in future breast cancer screenings, a very high percentage of respondents would like to participate or is thinking about it.

SUMMARY OF NEW RESULTS

The two groups surveyed at their GP (merged)

- Older people are significantly better informed, both in terms of the recommended age for breast cancer screening and the recommended interval between breast cancer screenings.
- Those with higher levels of education were better informed about the symptoms of breast cancer.

Men

- Men who had a history of breast cancer in their circle of friends/acquaintances were more likely to be well informed about the symptoms of breast cancer.
- Men who think breast cancer is a common cause of cancer death in Hungary were more likely to have friends or acquaintances with a history of breast cancer.
- Men who were considered to be well informed about breast cancer symptoms were found more likely to be have a spouse/partner with a healthcare degree
- Men who knew that they have a chance of developing breast cancer were more likely to be married to a partner with a healthcare degree.

Women surveyed at their GP

- Among women surveyed at their GP, older respondents were more informed about the recommended time between breast cancer screenings.
- Women surveyed at their GP who were aware of the age at which breast self-examination was recommended were significantly younger, more likely to have a higher level of education and more likely to have a healthcare degree.

- Women surveyed at their GP who knew that breast cancer could be asymptomatic at an early stage were more likely to have a higher level of education and more likely to have some kind of healthcare degree.
- Women surveyed at their GP who thought that breast cancer was a common cause of cancer death in Hungary were more likely to have a higher level of education, more likely to have a healthcare degree and more likely to have friends or acquaintances with breast cancer.
- Women surveyed at their GP who were classified as well informed about symptoms were significantly more likely to have a higher level of education and a healthcare degree.
- 89.9% of women surveyed at their GP want to know if they have breast cancer and these respondents had significantly higher levels of education.
- Women surveyed at their GP and living in the county seat agreed more with the „attending a breast cancer screening gives a sense of security and, in doing so, helps individuals to keep their health under control“ statement than women living in other cities.
- Women surveyed at their GP and living in either the county seat or in villages/towns/farms were more likely to agree with the „a healthy lifestyle, such as a low-fat, low-calorie diet and regular exercise, reduces the risk of developing breast cancer“ statement than women living in other cities.
- Regarding women surveyed at their GP, there was a weak negative correlation between age and finding mammography an intimate screening method, and women who agreed with this statement were significantly more likely to indicate at the end of the questionnaire that they did not wish to participate in future breast cancer screening.
- Women surveyed at their GP with a family history of breast cancer or a history of breast cancer among friends/acquaintances reported feeling significantly more likely to have breast cancer in their lifetime.
- Women surveyed at their GP who would like more information about breast cancer screening were younger and more likely to have some kind of healthcare degree.

- Women surveyed at their GP who indicated that they will attend a screening were significantly older.

Mammography participants

- Mammography participants who were aware of the age at which self-examination was recommended had a higher level of education.
- Respondents in the mammography group who believe that breast cancer is a curable disease if detected early have a higher level of education.
- Women in the mammography group who knew that breast cancer could be asymptomatic at an early stage were more likely to have a higher level of education and more likely to have some kind of healthcare degree.
- Those in the mammography group who were considered well-informed about risk factors were more likely to have higher levels of education and a higher chance of having a healthcare degree.
- Mammography participants who were classified as well informed about symptoms were significantly more likely to have a higher level of education and a healthcare degree.
- In the mammography group, there was a weak positive correlation between agreeing with the „attending a breast cancer screening gives you a sense of security and helps you keep your health under control“ statement and the respondents' age.
- Those in the mammography group who have not had breast cancer in their circle of friends/acquaintances were more likely to agree with the „a healthy lifestyle, such as a healthy diet and regular exercise, reduces the risk of developing breast cancer“, statement.
- In the mammography group, in case of respondents who are afraid that the screening test will show some lesion there was a moderate-strength negative correlation with level of education.

- In the mammography group, people living in a village/town/farm reported feeling significantly more likely to develop the disease than their counterparts living in the county seat.
- Those in the mammography group who wish to receive more information about breast cancer screening had lower levels of education.
- Those in the mammography group who indicated that they were thinking about participating in breast cancer screening in the future had significantly higher levels of education.

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