

# Some Characteristics of Employees as Risk Factors for Presenteeism

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## ABSTRACT

**Presenteeism, or the act of attending work while sick or despite feeling unwell, is a relatively new concept in the sphere of work. It is a phenomenon that has begun to be monitored more intensively around the world in the last decade. Presenteeism can affect an employee's work in various ways and its consequences mean that it is already a problem in itself. Employers devote too little attention to it or are frequently not even aware of it. The majority of employers are in fact too often focused on the growing problem of absence from work because of sickness (absenteeism) and on eliminating the negative consequences of absenteeism, and do not (yet) see presenteeism as a problem. The research presented in this article deals with the question of the impact of employee characteristics on the phenomenon of presenteeism. The characteristics considered included ambition, financial worries, job security, sick leave and the physical and mental health of employees.**

*Key words: presenteeism, presence in the workplace, employee health, reduced productivity, risk factors*

*JEL: D23, I19*

## 1 Introduction

Presenteeism – attending work while sick or despite feeling unwell – is a relatively new and little researched concept. It manifests itself as reduced productivity of the employee at work, which means that the employee works less and/or less productively than he/she could or is expected to. The occurrence of presenteeism in the past has been characterised in particular by interventions by employers attempting to reduce excessive absence from work because of sickness (absenteeism). Today presenteeism occurs for

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a variety of reasons including excessive workloads, inadequate organisation of work, fear of loss of employment, employees' financial difficulties, health problems occurring as a result of work, etc.

The reasons for presenteeism in the working environment differ greatly. The most common among them include a culture within an organisation that supports such behaviour by employees, working conditions and a type of work that do not allow employees to take sick leave in the case of sickness, employee characteristics (e.g. psychological characteristics of the individual) and influences of the environment (e.g. the economic situation and political decisions). In general terms the occurrence of presenteeism is linked to three categories of factors: organisational, personal and social. In view of the breadth of the topic, we shall limit ourselves in this article to a single category, that of personal factors.

The purpose of the article is to illustrate and explore the importance of personal factors (the impact of the most important personal circumstances or employee characteristics) on the incidence of presenteeism in the working environment. Through this article we aim to establish (objective of the article) whether employee characteristics significantly affect the phenomenon of presenteeism in the working environment. We have tested our hypothesis on the basis of six partial hypotheses.

The article presents the phenomenon of presenteeism, the factors that influence presenteeism (with a particular focus on personal risk factors) and the consequences of presenteeism. Research was carried out with the help of a questionnaire developed on the basis of theoretical findings and the results of research by other authors. Various statistical methods were used to process the results, including bivariate analysis, the chi-square test ( $X^2$ ) and contingency table analysis. Coefficients of contingency and association were also calculated. Findings were also presented on the basis of wider research into the phenomenon of presenteeism and risk factors in the Slovenian working environment (INODEL project; Mlakar, 2013).

## 2 Presenteeism

### 2.1 Definition of the problem

Presenteeism, or the act of attending work while sick or despite feeling unwell, is a relatively new concept in the sphere of work, and one that has begun to be monitored around the world with increasing intensity in the last decade. During this period, numerous (mainly foreign) authors (e.g. Aronsson & Gustafsson, Bergstroem et al., Burton et al., Chaterrji & Tilley, Goetzel et al., Hemp, Hansen & Andersen, etc.) have published the results of studies that define the extent of the phenomenon and related negative consequences for the organisation, work processes and the health of the employee (workforce) or society in general. Given the scale of the problem and its

consequences, presenteeism is already an issue to which employers devote too little attention, or of which they are frequently not even aware. According to calculations made in the USA (American College of Occupational and Environmental Medicine, 2006), only 14% of American companies measure presenteeism in their working environments. Given that the Americans were among the first to begin studying presenteeism, it is reasonable to conclude that the percentage in other parts of the world is lower still, something which points to the fact that employers and organisations are still not sufficiently aware of the negative effects of the phenomenon. The majority of employers are in fact too often focused on the growing problem of absence from work because of sickness (absenteeism) and on eliminating the negative consequences of absenteeism. Some organisations even pay »attendance bonuses« to employees who are never absent for health reasons (Huver et al., 2012, p. 1), in order to reduce the phenomenon of absenteeism and its negative consequences on work processes.

Particular attention needs to be drawn not only to the employer's responsibility to provide suitable and healthy working conditions, the necessity of an effective health care system, and the society-wide promotion of health and a healthy lifestyle, but also to the employee's responsibility to look after his/her own health and take responsibility for it. The International Association for Worksite Health Promotion (2009) defines the promotion of health in the workplace as a corporate set of strategic and tactical actions that seek to optimise worker health and business performance through the collective efforts of employees, families, employers, communities and society at large. Employee health and the ability to perform a specific job in a working environment is therefore a complex area for which care and responsibility lie not only with the employer and the employee, but also with the general social climate or system, which must realise that the health of the individual and care for health is one of the most important values of that system. A healthy society is of key importance for successful business and a healthy economy. Only a healthy workforce can be fully efficient and effective.

The problems caused to employers by presenteeism are by their nature hidden, since presenteeism is an invisible phenomenon for employers and its (negative) effects and consequences are frequently more difficult to perceive and manage than the consequences of absenteeism. The invisibility or lack of perception of the phenomenon is a result of the fact that an employer is often unable to assess, in the case of employees who are at work (i.e. present in the workplace), whether they are sick, how sick they are, and if as a result of their mental or physical condition they are unable to perform their work and duties as effectively as they would otherwise. It can often happen that even employees themselves are unable to assess their own state of health – in other words whether they are actually sick or merely feeling unwell, where this feeling will pass. The problems of presenteeism are therefore not only in the recognition of the phenomenon on the part of the employer and the

employee, but also in the issue of measuring its effects on working processes – to what extent, in other words, is the effectiveness (productivity) of the employee reduced as a result of the physical or mental health issues the employee is facing. Reduced productivity is particularly difficult to measure in service activities.

## 2.2 (Personal) risk factors

In addition to health problems which the employee brings to the workplace »from home« (e.g. allergies, arthritis, asthma, diabetes, etc.), the factors that lead to presenteeism in working environments can be also be of an internal nature, connected with work or occurring as a consequence of work or working conditions (e.g. burnout, depression, fatigue, chronic neck/back pain, etc.) in connection with poor working conditions, ineffective management and poor work-life balance (from Lalić & Hromin, 2012, p. 112).

Presenteeism is to a large extent dependent on mental issues, unlike absenteeism, which is generally found in individuals with somatic symptoms (from Goetzl et al., 2004, p. 406). Presenteeism is influenced above all by health problems, both chronic and episodic, where the subject of (international) studies conducted to date in connection with the phenomenon of presenteeism has most frequently been allergies, depression, stress, various forms of headache, etc.

Krohne and Magnussen (2011, p. 6) point out that the policy of the organisation and the position in which the employee is employed play an important role in the employee's decision, in the case of sickness or feeling unwell, whether to go to work or take sick leave and stay at home. In their opinion, moreover, an employee is encouraged to come to work when sick or otherwise incapacitated by the belief that coming to work will not have negative effects.

Closely connected with the phenomenon of presenteeism are personal risk factors that increase the possibility of »voluntary presenteeism« (resulting from an individual's decision) (from Caverley et al., 2007). These are factors that are connected with the individual's own personal circumstances and relate above all to the views and personality characteristics of the individual. Personal risk factors include:

- **denial of sickness and refusal to have health checked;** Denial of sickness is the phenomenon where an employee denies feeling ill or being sick because he believes that despite feeling ill or being sick he is equally productive in his job. Some employees are proud of never having had even a single day of sick leave, and in some working environments are even rewarded for this by employers with so-called attendance bonuses,
- **financial situation;** Sick leave is generally (in the majority of legal systems) worse paid than regular work. In the case of employees with

financial difficulties who have trouble getting to the end of the month on their income, such an arrangement can lead to presenteeism or to behaviour where instead of sick leave they take regular leave, which is paid in full. By increasing their presence at work, employees correct their income, above all in those working environments where wage structure is also dependent on performance, overtime, etc.

- **family life and attitude to the family;** Where working environments are stimulating and interesting, it can often happen that for some individuals work becomes home and home becomes work, so that even when they are ill it seems more taxing to them to stay at home and look after themselves and their family obligations. In the opinion of some authors (Aronsson & Gustafsson, Goetzel et al., Hemp, Bergstrom et al., Hansen & Andersen, etc.) presenteeism is more prevalent among people who are more ambitious and more committed to work, who see their career as very important, and among those who are dissatisfied with their family life (from Johns, 2011. p. 487). According to some studies presenteeism is more prevalent among employees with a larger number of children, since by going to work despite feeling ill they »save« themselves from the obligation of looking after them (from Hansen & Andersen, 2008, p. 957).
- **workaholicism;** People who are workaholics by nature more often come to work sick. In the opinion of Hansen and Andersen (2008), this is due above all to conservative attitudes towards absence from work. Such individuals believe themselves to be indispensable and irreplaceable at work, while at the same time they believe that their absence would be unfair on their co-workers, who are additionally burdened by the work tasks of the absent employee (loyalty). Such employees are very responsible and committed to work, their conscientious and reliable, and therefore employers exploit these characteristics, which in itself further increases the occurrence of presenteeism in the workplace.
- **performance-based self-esteem;** Performance-based self-esteem is often related to the employee's need for recognition. Employees who are unable to say »no« to the needs and wishes of other people have, because of this characteristic, a greater propensity for presenteeism than those who are able to set the boundaries of their own productivity (from Brečko, 2012, p. 34).
- **psychological characteristics;** Psychological characteristics affect the different perception of the effects of work on the employee's health. Introverted individuals are more inclined to absenteeism since they have a more negative consideration of the effect of work on health. On the other hand extraverts who have a more positive attitude to work are more inclined to presenteeism. Conscientious employees or employees with a high work ethic are more reliable and more responsible, traits

which motivate them to be present at work even in the face of physical discomfort (from Johns, 2011, p. 485).

- **lifestyle**; Lifestyle is an individual's typical way of life, defined by a set of distinct behaviours in a specific timeframe and formed under the influence of experiences and living conditions from childhood. Elements of lifestyle such as diet, physical activity, vices (alcohol, tobacco, etc.) and stress management strongly influence an employee's state of health. An unhealthy lifestyle can cause numerous illnesses and strengthen symptoms, which in working environments causes increasing costs as a result of absence from work (absenteeism) and also reduce productivity in the workplace as a consequence of presenteeism. Interest among employees in the promotion of health at work has therefore increased in recent times, since health care costs have reached levels that they can no longer afford. Figures show (Pronk et al., 2004, p. 19), that up to seven per cent of health care costs in the EU are linked to obesity, while for large companies in the USA at least a quarter of their total annual health care costs per employee are connected to an unhealthy lifestyle. It is worth pointing out here that direct health care costs incurred as a result of an unhealthy lifestyle only represent a quarter of all costs arising from the consequences of an unhealthy society. The biggest costs arise when employees who, because of health problems, are not fully productive come to work (from Škerjanec, 2011).
- **neuroticism (emotional instability)**; Neuroticism reflects personal differences in experiencing the world as threatening, problematic and stressful (Caspi et al., 2005, quoted in: Rančigaj, 2009, p. 13). Individuals with pronounced neuroticism are frequently vulnerable and tend to experience guilt, they lack self-confidence and are frequently bad-tempered, angry and easily frustrated. The expression of all these negative emotions over a longer period leads to various illnesses which, in the long term, cause costs in working environments because of reduced productivity as a result of presenteeism and absenteeism (from Aronsson & Gustafsson, 2005, p. 960).

### 2.3 Consequences of presenteeism in the workplace

The consequences of presenteeism which employers and employees perceive in the workplace and away from the workplace are above all negative in nature and generally affect working processes in two directions. First, as a result of the consequences of presenteeism, the individual employee's effectiveness in the workplace can suffer, since such an employee takes more time and invests more effort to achieve the same effect as a healthy employee. Secondly, collective working effectiveness and efficiency can also suffer, since healthy employees take on the tasks of sick co-workers or help them in their work tasks, which reduces their effectiveness, and because a sick employee can infect co-workers and customers (from Demerouti et al., 2009, p. 51–52).

On the one hand, then, presenteeism reduces the effectiveness and efficiency of employees in the performance of their work tasks and duties (which consequently reduces the effectiveness of the organisation as a whole), while on the other it can, in the long term, worsen and place at risk their health and the state of health of the workforce (or society) in general.

The negative consequences of presenteeism can be separated into two groups of consequences: the costs of the reduced productivity of the worker in the workplace, and the effect on the health of employees.

Worker productivity is of key importance when measuring the overall productivity of an organisation. In connection with presenteeism, it is the case that an employee's productivity can be directly affected by sickness or feeling ill, and this is the cause of potential interventions by the employer connected to the health of the employee in the workplace. Worker productivity is generally divided into two components, both of which have a key influence on the productivity of the organisation as a whole: absenteeism and presenteeism (from Escorpizo et al., 2007, p. 1373). Research shows that the risk of loss (worsening) of effectiveness is greater in the case of sick employees than in the case of a healthy workforce (from Davis et al., 2005, p. 3). Reduced effectiveness in the workplace can be caused by various factors tied to the nature (type) of sickness, quality of life and characteristics of the work.

A study carried out in the USA (cited in Levy, 2003) calculated an average annual loss per worker of 115 productive hours due to presenteeism, which amounts to more than \$2,000 per worker per year or a total cost of \$250 billion. Goetzel et al. (2004) estimate in their study that the presence in the workplace of an employee with a headache reduces that worker's productivity by up to 89% and that the annual costs of various types of headache/migraine among employees in the USA are \$2.1 million. In the same study it is estimated that the total costs of presenteeism tied to reduced productivity represent at least 61% of all employee health costs. It is also found that the highest financial burden on employers as a consequence of presenteeism is represented by hypertension, heart disease, depression and other mental illness and joint disorders.

An Irish study (Chatterji & Tilley, 2002) has shown that presenteeism costs the Irish one billion euros a year, or 3% of Ireland's GDP. A British study, *Mental Health at Work: Developing the business case* (The Sainsbury Centre for Mental Health), has found that the annual costs of presenteeism in the form of reduced productivity at work are £15.1 billion, which is almost 1.8 times more than the costs of absenteeism (the costs of reduced productivity attributable to mental health problems alone costs UK employers an average of £605 per employee per year). Similarly, a study carried out in an Australian call centre (Tilse & Sanderson, 2005) defines costs relating to reduced productivity as 1.9 times higher in the case of presenteeism than in the case of absenteeism. The situation is also similar in the USA, since on average 25% of Americans

suffer from mental illness (Centers for Disease Control and Prevention, 2011). According to a study by the Integrated Benefits Institute (2009), depression is on average associated with 2.2 days of absence (absenteeism) and 7.5 days of reduced productivity as a result of presenteeism per employee per year. This means that an organisation with 1,000 employees and an average salary of \$50,000 per year (meaning that the average employee earns approximately \$192 per day), loses almost \$1,500 per employee per year because of presenteeism due to depression (from Klachefsky, 2012, p. 1).

The effect of presenteeism on employee health is as a rule a much bigger cost than the eventual cost of temporary absence from work. Bergström et al. (2009), for example, analyse and compare the impact of presenteeism on the future general health of workers employed in the public and private sectors in Sweden. The authors of the research find that in the public sector presenteeism is a risk factor with an impact on future general health above all in the case of those employees whose health status is typically good. Among employees in the private sector, exactly the opposite results are produced by the research, with presenteeism shown to have a greater impact on employees whose health status is poor and to further worsen their health picture. The authors substantiate the results obtained by comparing the consequences of presenteeism against various working conditions and types of work in the two sectors.

A similar positive correlation between presenteeism and its impact on the future health status of employees is defined by Hansen and Andersen (2008) in their study of the Danish workforce. They find that for employees who were present at work despite sickness or feeling ill for more than six days in the past year, there is a 53% greater chance that in the next year and a half (or three years) they will be absent more frequently for a longer total period (at least 14 days in a row) as a result of sickness. These results are supported by the fact that over a period of year and a half (or three years), the »presentees« group give a lower assessment to their own health than the group not characterised by frequent presenteeism. The authors also predict a worsening of health status in the future for those employees who do not recover fully after sickness and more frequently return to work too soon.

According to Pickett (2010), a deterioration of health because of the consequences of presenteeism can also be seen in those employees who never take a holiday and who do a lot of overtime. Stress and depression are more common in these employees and, according to some American studies, these two phenomena increase the possibility of presenteeism.

### **3 Impact of Employee Characteristics on Presenteeism in The Slovenian Working Environment**

Owing to the complexity of the field, measuring presenteeism represents a major challenge to modern organisations, above all because of the nature



of data collection. In this article we present part of our own research, through which we aimed to establish the prevalence of presenteeism among employees in the Slovenian working environment, and the factors believed to have caused presenteeism among employees in this environment.

The collection of data took place in July and August 2012. As part of the *Improving the Working Environment through Innovative Solutions* (INODEL) project, which is part-financed by the European Social Fund, we prepared an electronic questionnaire for employees in Slovenia. The questionnaire was sent out as an online invitation addressed to the human resources departments of companies included in the panel of the Chamber of Commerce and Industry of Slovenia. A total of 267 questionnaires were returned. Of these, 79 were excluded from the research either because they had not been completed or because the respondents had answered fewer than 20% of the questions.

Bivariate analysis was used to verify the partial hypotheses H1, H2, H3 and H4. The correlation between the variables »ambition«, »financial problems«, »concern about job security« and »number of days of sick leave« with the phenomenon of presenteeism was verified by means of a chi-square test ( $\chi^2$ ) or through analysis of contingency tables. For each variable we formulated a null hypothesis H0, which states that the rows and columns of the contingency table are independent variables, i.e. that there is no correlation between the two studied variables (an alternative hypothesis states that a connection exists). In the next phase we confronted both hypotheses with the data (representation and analysis of the contingency table), taking into account the fact that for sufficiently large samples it is most common to use a chi-square test (rather than calculating the test statistics, we prefer to report on the »*p*-value«; where this was lower than the pre-selected risk rate  $\alpha=0.05$ , we rejected H0 and confirmed H1). For each of the first four partial hypotheses we also calculated coefficients of contingency and association (*mutatis mutandis*, since this is only specialised for 2x2 tables), which show the level of correlation of the individual variables studied. Partial hypotheses relating to physical (H5) and mental (H6) health were verified by means of a classification method using the Orange software suite.

Through the research we verified the following hypothesis: that the phenomenon of presenteeism in working environments is influenced by the characteristics of employees. In doing so we formulated six partial hypotheses:

- H1: Presenteeism occurs more frequently among more ambitious employees.
- H2: Employees who do not have financial difficulties are more rarely inclined to presenteeism.
- H3: Employees who are worried about job security are more frequently inclined to presenteeism.
- H4: For employees who took on average fewer than 5 days' sick leave in the last 12 months, a higher rate of presenteeism is typical.

- H5: The physical health of the employee has an impact on presenteeism.
- H6: The mental health of the employee has an impact on presenteeism.

The hypothesis will be confirmed if we confirm at least three partial hypotheses.

### **3.1 The impact of ambition on presenteeism**

On the basis of a definition of the concept of ambition, we identified individual elements of ambition in the working environment and grouped them into nine statements which we used to verify the level of ambition of respondents.

The results of the research showed that the majority of respondents wish to succeed in their field, that the majority of respondents wish to progress in their own skills in the workplace, and that at work they follow their own goals, which are important elements of ambition. The level of ambition does not differ significantly between the genders but greater differences among respondents are evident if we compare the level of ambition by education structure, where we find that those respondents with higher education qualifications are, as may be expected, more ambitious. A comparison of the level of ambition among respondents by type of employment shows that employees with fixed-term contracts and employees with student work contracts are more ambitious than employees with contracts of indefinite duration. These results are not surprising, since fixed-term employees and student employees typically draw on their ambition out of a desire to prove themselves to their employer, and probably also because employees of this type are on average younger than those employed for an indefinite period, which probably gives them an additional motivation to work, additional energy and a desire to prove themselves, all of which are fundamental elements of ambition. Analysis of the results of our sample in fact showed that of all respondents employed on fixed-term contracts, 54.17% are younger than 35. On the basis of the results of the research conducted, we can estimate that the respondents are highly ambitious.

We defined the correlation of the level of ambition to the incidence of presenteeism (partial hypothesis 1) in the working environment on the basis of the average value of the total set of questions in the questionnaire relating to ambition. Ambitious employees are thus represented in our case by those respondents who replied to this set of questions with an average score of at least 3.41, which was the overall average score for this set of questions. We defined the incidence of presenteeism by calculating the median of the question, which determined the average number of days of presenteeism in the last 12 months on the basis of a division of the studied sample of units into two equal parts. We chose the median because we found that if we take the arithmetic mean as the threshold value (i.e. 10.10 days), the standard deviation is too great, or the data deviate extremely from the arithmetic mean,

and that the units of the sample are very unevenly distributed and therefore have too great an impact on its value.

Presenteeism thus occurs more frequently if it has occurred in the case of an individual employee for more than 7.5 days in the last 12 months. Each respondent was thus assigned two labels: ambitious/unambitious and presenteeism rarer/presenteeism more frequent. With regard to the assumptions defined above, it can be seen from Table 1 that our sample contains 30 units that fall into the category of ambitious employees where the value of the presenteeism variable is »more frequent« and 57 units that fall into the category of ambitious employees where presenteeism is rarer.

**Table 1: Contingency table of partial hypothesis 1**

| Partial hypothesis 1                |     | Presenteeism rarer<br>(No. of units) | Presenteeism more frequent<br>(No. of units) | Total |
|-------------------------------------|-----|--------------------------------------|--|-------|
| Employee ambition<br>(No. of units) | NO  | 51                                   | 39   | 90    |
|                                     | YES | 57                                   | 30   | 87    |
| Total                               |     | 108                                  | 69   | 177   |

Source: own research

In our case the chi-square test returns a  $p$ -value of 0.23, which means that we retain  $H_0$  and do not confirm our partial hypothesis, since with a risk rate of 5% we maintain that there is no significant correlation between the variable »ambition of employee« and the rarity/frequency of presenteeism. In this concrete case the coefficient of contingency is equal to 0.090 and the coefficient of association to  $-0.185$ . The former indicates that there is no correlation between the two variables, while the latter indicates a weak (negative) correlation. The results of the research showed that a greater level of ambition in an employee is evidently not a reason for the more frequent incidence of presenteeism in the working environment. The desire for success, progress within the organisation and in terms of one's own skills, and the desire to achieve set goals (personal goals and those of the organisation) are apparently not reasons that would increase the incidence of presenteeism in the working environment.

### 3.2 Impact of financial difficulties on presenteeism

We verified the financial situation of respondents through analysis of (potential) difficulties connected to the payment of food bills, household bills and rent in the last 12 months. The results of the research showed that more than a third (69.36%) of respondents did not have problems paying with food bills, household bills and rent in the last 12 months, while on the other hand 6.36% of respondents had problems every month, which is by no means a negligible figure. The results of the research do, however, show a relatively stable financial situation among respondents, which at a time of economic and financial crisis is surprising.

Employees who do not have financial difficulties represented, in our case, those respondents who answered »never« to the question »Have you had problems paying food bills, household bills or rent in the last 12 months?« We established the incidence of presenteeism in the same way as with the partial hypothesis above. Each respondent was assigned two labels: presence/absence of financial difficulties and presenteeism rarer/presenteeism more frequent. With regard to the assumptions defined above, it follows from Table 2 that our sample contains 81 units that fall into the category of respondents who have had no financial problems in the last 12 months and where the value of the presenteeism variable is »rarer«, and 38 units in the category of respondents who have had no financial problems in the last 12 months where presenteeism is more frequent.

**Table 2: Contingency table of partial hypothesis 2**

| Partial hypothesis 2                 |     | Presenteeism rarer<br>(No. of units) | Presenteeism more frequent<br>(No. of units) | Total |
|--------------------------------------|-----|--------------------------------------|--|-------|
| Financial problems<br>(No. of units) | NO  | 81                                   | 38   | 119   |
|                                      | YES | 23                                   | 30   | 53    |
| Total                                |     | 104                                  | 68   | 172   |

Source: own research

The chi-square test returns a  $p$ -value of 0.002, so with a risk rate of 5% we reject the hypothesis that the variables »no financial problems« and »presenteeism rarer/more frequent« are independent. We therefore state that a significant correlation exists between them. Using the coefficient of contingency (0.227) we can estimate that there is a weak correlation between the two variables, while the coefficient of association (-0.471) indicates that the correlation is moderate and negative. A correlation between the variables »financial difficulties« and »frequency of presenteeism« has already been established by some authors (e.g. Aronsson & Gustafsson, 2005; Ashby & Mahdon, 2010) who have previously studied the phenomenon. Employees whose monthly income is partly dependent on their presence at work are more frequently inclined to go to work despite being sick or feeling ill. In view of the correlation between the studied variables, we find that financial difficulties can be a cause of presenteeism in the working environment. This is indicated by the results of the research, since those respondents who do not have financial difficulties more rarely come to work when feeling unwell.

### 3.3 Impact of security of employment on presenteeism

We verified the element of security of employment by establishing the level of worry among respondents with regard to the security of their own job. The results of the research showed that 35.84% of respondents are worried about the security of their employment, while 33.94% of respondents are not afraid of losing their job. Interestingly, almost a third of all respondents

(31.21%) did not give a definite answer to the question of security of their employment, which points to the fact that the conditions in which they work do not (apparently) encourage them to think about this issue. The fact that 35.84 percent on all respondents are worried about their jobs is worrying, since it is probably the consequence of current economic conditions, which are highly unpredictable (presumably) even in working environments that were stable before this period.

It is interesting to compare the attitude of men and women towards this issue, where the results of the research shows that women are more sensitive with regard to this issue, since on average they indicate a higher level of worry about job security (41.6% are worried) than men (27.6%). This figure is not surprising in that women, by their nature, more frequently express concern about life events. We also reached the expected findings when we compared worry about job security between respondents with regard to the type of employment, where we found that the highest level of worry is present among fixed-term employees (66.67% of respondents employed on fixed-term contracts are worried about their job security).

A slightly lower percentage (62.50%) was found among those respondents with student work contracts while those least worried about job security were those respondents with contracts of indefinite duration (29.29%). Despite the fact that the results of the research were expected, we are slightly surprised by the high percentage of employees with contracts of indefinite duration who are worried about the security of their employment, since a contract of indefinite duration ought to represent some basic security for employees. Given the current economic situation, the fear or worry of respondents with employment contracts of indefinite duration is perhaps expected, since current economic conditions in the labour market do not allow anyone to be free from worry. If we compare worry about job security among employees by sectors, we found that there is least fear among employees in the mining industry (71.43% of employees in this sector are not worried about job security), while those were most worried our employees in the other activities category (64.29%). As already indicated above, almost a third of respondents did not have a definite answer to this question. Of these respondents, the largest number are employed in the education sector (57.14%) and the financial and insurance sectors (54.55%).

Those worried about job security in our case are those respondents who responded to the statement »I am not worried about the security of my employment« with »strongly disagree« and »disagree«. We identified the frequency of presenteeism in the same way as in the partial hypotheses above. Each respondent was assigned two labels: worried/not worried about job security and presenteeism rarer/more frequent. With regard to the above assumptions, it may be seen from Table 3 that our sample contains 28 units belonging to the category of respondents who are worried about job security where the value of the presenteeism variable is »more frequent«, and 33 units

in the category of respondents who are worried about job security among whom presenteeism occurs more rarely.

**Table 3: Contingency table of partial hypothesis 3**

| Partial hypothesis 3                       |     | Presenteeism rarer<br>(No. of units) | Presenteeism more frequent<br>(No. of units) | Total |
|--|-----|--------------------------------------|--|-------|
| Worry about job security<br>(No. of units) | NO  | 71                                   | 40   | 111   |
|  | YES | 33                                   | 28   | 61    |
| Total                                      |     | 104                                  | 68   | 172   |

Source: own research

In our case the chi-square test returns a  $p$ -value of 0.21, which means that we retain  $H_0$  and do not confirm our partial hypothesis, since with a risk rate of 5% we maintain that there is no significant correlation between the variable »worry about job security« and the rarity/frequency of presenteeism. In this concrete case the coefficient of contingency is 0.096 and the coefficient of association is 0.202. The former indicates that there is no correlation between the two variables, while the latter indicates a weak (negative) correlation. According to the findings of some authors (e.g. Prater & Smith, 2011), fear of loss of employment, in connection with the current economic and financial situation, has increased the possibility of presenteeism in the working environment, since it appears that in unpredictable working conditions employees are more likely to come to work even when they are sick or feeling unwell. When the working environment is unstable, the employee feels that taking sick leave could also be grounds for dismissal. In terms of the results of the research in the Slovenian working environment, we are unable to confirm these findings, since employees who are worried about job security are not present at work more frequently when they are feel unwell. The reasons for the above findings also need to be sought in the fact that almost a third of respondents did not give a definite answer to the question regarding security of employment (from Mlakar, 2013).

### 3.4 Impact of sick leave on presenteeism

Fewer than five days' sick leave is the condition that was tied to the question about the number of days of sick leave in the last 12 months. All respondents who answered this question with a number less than 5 were studied from the point of view of frequency of presenteeism, which we established using the same method as in the above partial hypotheses. Each respondent was assigned two labels: number of sick days smaller/greater than 5 and presenteeism rarer/more frequent. With regard to the above assumptions, it may be seen from Table 4 for that our sample contains 55 units belonging to the category of respondents who had fewer than 5 days' sick leave in the last 12 months where the value of the presenteeism variable is »more frequent«,

and 67 units in the category of respondents who had fewer than 5 days' sick leave in the last 12 months among whom presenteeism occurs more rarely.

**Table 4: Contingency table of partial hypothesis 4**

| Partial hypothesis 4                      |     | Presenteeism rarer<br>(No. of units) | Presenteeism more frequent<br>(No. of units) | Total |
|---|-----|--------------------------------------|--|-------|
| No. days sick leave < 5<br>(No. of units) | NO  | 6                                    | 18   | 23    |
|   | YES | 67                                   | 55   | 122   |
| Total                                     |     | 73                                   | 73   | 146   |

Source: own research

The chi-square test returns a p-value of 0.01, so with a risk rate of 5% we reject the hypothesis that the variables »number of sick days« and »presenteeism rarer/more frequent« are independent. We therefore state that a significant correlation exists between them. Using the coefficient of contingency (0.217) we can estimate that there is a weak correlation between the two variables, while the coefficient of association (-0.570) indicates that the correlation is moderate and negative. That a small number of sick days can also be one of the reasons for an increased incidence of presenteeism has been found by some authors (including Brečko, 2011; Weaver, 2010; Yang & Chen, 2009) in their own research. The reasons for a small number of days of sick leave need to be sought either in the good state of health of the employee or in an increased number of days of presence at work despite being sick or feeling unwell. Both assumptions can be confirmed on the basis of the results of the research, since respondents generally assessed their health status as good, while at the same time we can also confirm the hypothesis that those employees who took fewer than five days' sick leave in the last 12 months more frequently come to work when sick or when feeling unwell.

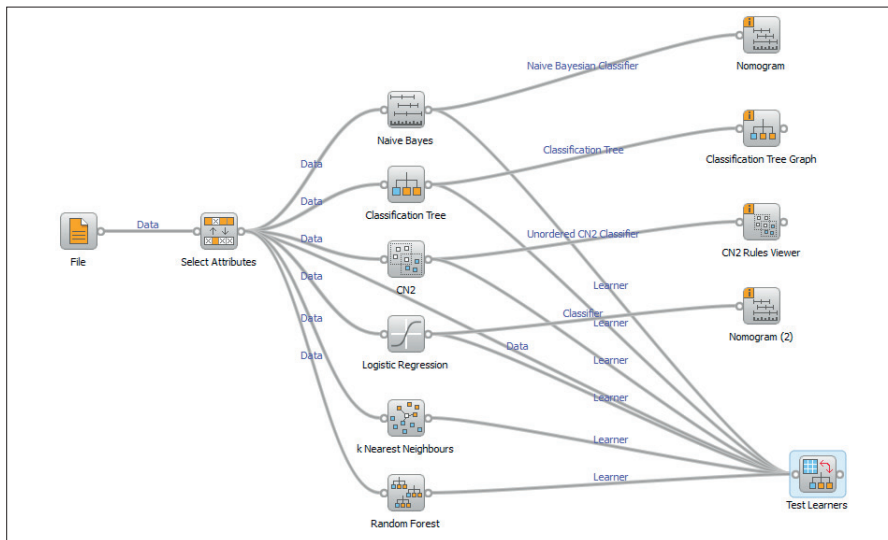
### **3.5 Impact of physical and mental health on presenteeism**

To analyse the correlation of physical and mental health to presenteeism, we used a classification method based on 10-fold cross-validation, which means that we divided the sample randomly into 10 parts, nine of which we used to set parameters and the tenth for testing. We then repeated the process, so that each part of the sample was used once the testing and the final score gave the average of all 10 tests. Classification into groups was carried out using the open-source Orange software suite, which is designed above all for machine learning and bioinformatic analysis. As well its true programming capability (it is used as a Python module), Orange has visual programming functionality. Figure 1 shows an example of classification into groups in the Orange software suite.

The icon on the left represents the file widget into which we loaded the data. In »Select Attributes« we selected the variables we were working with. A double click on the icon shows us that in order to test our partial hypothesis

5 we selected, from among all the measured variables, questions relating to the physical health of respondents as independent variables, and a question relating to the incidence of presenteeism as a dependent variable. We then sent the selected subset of variables for analysis to six statistical classification models, namely a naïve Bayesian classifier, classification trees, classification rules (CN2), logistic regression, nearest neighbours and random forests. As we can see, all models were tested, since they are linked by the »Test Learners« widget. This shows us that we used 10-fold cross-validation for testing and how well the individual methods performed in the test. From the analysis we can see that in terms of classification accuracy the best method was the random forests method (which, however, does not exceed the percentage of presentees, which is 78.2%, and is therefore not usable); in terms of the AUC measure, only the naïve Bayesian classifier exceeds the 0.75 threshold.

**Figure 1: Classification into groups in the Orange software suite**

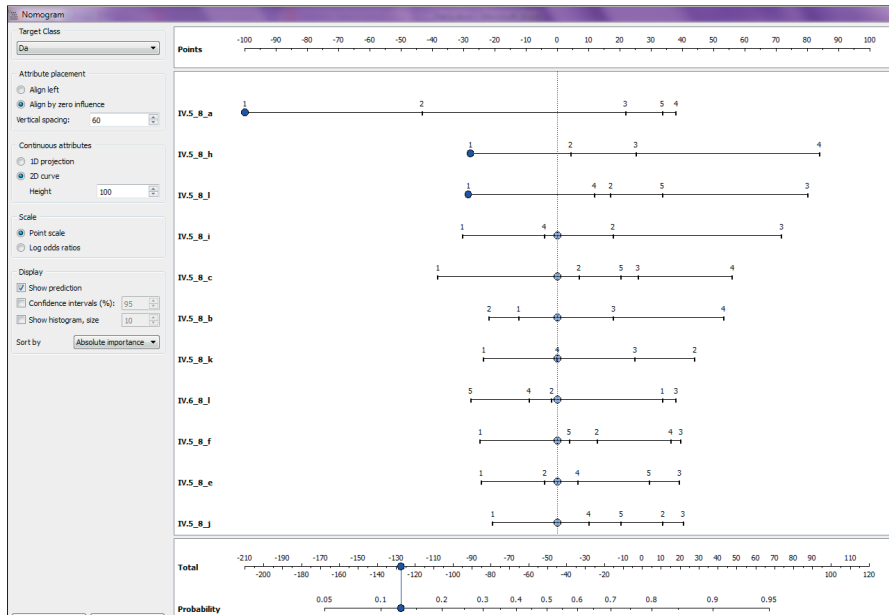


Source: own (Orange software suite)

We can see in Figure 1 that further connections run from the widgets for the Bayesian classifier, logistic regression, classification trees and classification rules. This enables us to view these models in a comprehensible manner. Since the best results were given by the naïve Bayesian classifier (see Table 5), a further visualisation is provided by a nomogram (Figure 2). Figure 2 shows that in the classification into groups, i.e. determination of the presence of presenteeism, the most important variable is »tiredness or lack of energy«, followed by »dry cough/dry throat«. All variables are arranged in descending order of importance but for the sake of clarity only the most important are shown.



**Figure 2: Nomogram visualisation of operation of naïve Bayesian classifier (partial hypothesis 5)**



Source: own (Orange software suite)

One of the advantages of using nomograms in Orange is the possibility of prediction for any range of values. Figure 2 shows that a unit for which tiredness or lack of energy=1, dry cough/dry throat=1 and digestive disorders=1 has a slightly higher than 10% probability (13% to be more exact) of being a presentee. If we compare this to the distribution across the entire sample, where the percentage relating to the value »presenteeism« is 78.2%, we see that low values for the variables »tiredness or lack of energy«, »dry cough/dry throat« and »digestive disorders« determine an absence of the phenomenon of presenteeism.

**Table 5: Results of individual techniques (partial hypothesis 5)**

| Method – statistical classification models | CA     | AUC    |
|--|--------|--------|
| Naïve Bayesian classifier                  | 0.7760 | 0.7621 |
| Classification trees                       | 0.7322 | 0.6294 |
| CN2 rules                                  | 0.7544 | 0.6673 |
| Logistic regression                        | 0.6544 | 0.5936 |
| Nearest neighbour                          | 0.7114 | 0.6802 |
| Random forests                             | 0.7819 | 0.7145 |

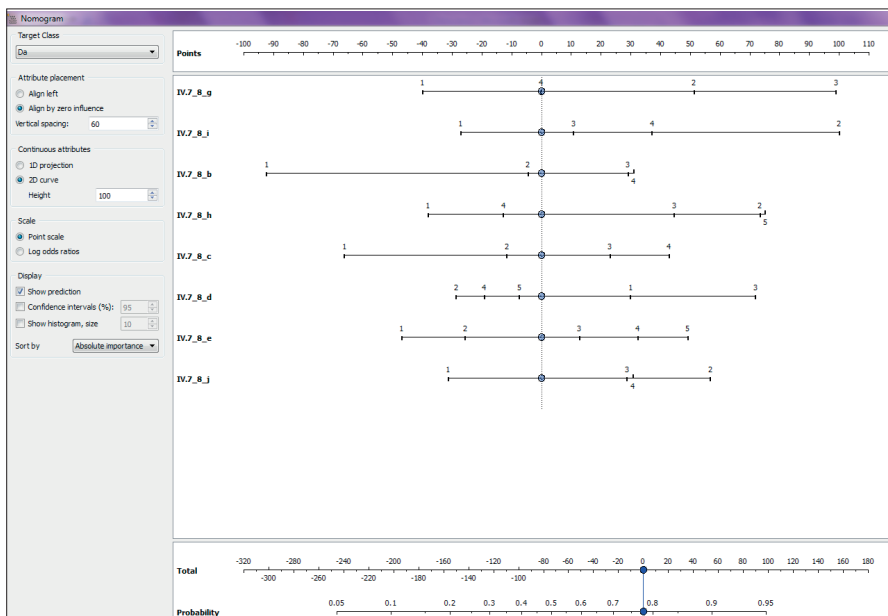
Source: own (Orange software suite)

Using the naïve Bayesian model, we are able to confirm partial hypothesis 5 (Physical health of the employee has an impact on presenteeism), since the AUC is greater than 0.75 (i.e. 0.76).

We obtained similar results in the analysis of partial hypothesis 6 (Mental health of the employee has an impact on presenteeism), where in order to test our hypothesis we selected variables relating to the mental well-being of respondents in the last 12 months. Just as with partial hypothesis 5, the best results in this hypothesis were given by the naïve Bayesian classifier. In this case too, the AUC is greater than the threshold value (i.e. 0.75), and therefore we can confirm our hypothesis.

Figure 3 shows that in the classification into groups, i.e. determination of the presence of presenteeism, the most important variable is »desperate« followed by the variables »so sad that nothing could cheer you up« and »nervous«. On the basis of the results we can state that negative mental states have a more intensive effect on the phenomenon of presenteeism than positive mental state (as shown in Figure 3, the variable »agreeable« is only in sixth place in terms of importance).

**Figure 3: Nomogram visualisation of operation of naïve Bayesian classifier (partial hypothesis 6)**



Source: own (Orange software suite)

In view of the results of our analysis of the individual partial hypothesis, we can state that we have confirmed four of the six partial hypothesis, and we can therefore confirm the main hypothesis, i.e. that employee

characteristics significantly affect the phenomenon of presenteeism in the working environment. The results of research with our sample show that the incidence of presenteeism is most affected by the variables »financial difficulties«, »number of days of sick leave« and »physical and mental health of respondents«, which is shown by the calculated p-values and coefficients of association, and the naïve Bayesian classifier model.

#### **4 Comparative Analysis of Findings with Foreign Studies**

A comparison of our research with the results of some previous studies shows that our research provides the most competitive definition to date of the causes of presenteeism in the working environment, since it covers the whole of the working population. Most earlier studies have, in fact, studied the phenomenon of presenteeism very selectively, either from the point of view of the state of health (specific illnesses/conditions) of employees, from the point of view of reduced productivity as a result of presenteeism, or from the point of view of a specific sector or organisation, etc.

Some authors (e.g. Aronsson et al., 2000; McKewitt et al., 1997) have found that employees whose working domain includes care for others (e.g. employees in education, health care and social care) are more often subject to presenteeism. The research we carried out in the Slovenian working environment does not allow us to confirm these findings, since the incidence of presenteeism identified among employees in the health care, social care and education sectors in Slovenia is lower than the average incidence of presenteeism.

In line with the findings of Burton et al. (2004) and Allen et al. (2005), we are also able to estimate for the Slovenian working environment that more than half of respondents have at least one of the listed physical health problems or chronic illnesses affect their capacity for work and their ability to perform their work tasks. The biggest problems in the Slovenian working environment, in comparative terms, are various kinds of pain (neck, back, feet, joints), headaches, tiredness and insomnia, which reduces productivity (difficulties with concentration, slow performance of work tasks, difficulties making decisions, postponement of work, etc.).

Reduced productivity in the form of quantitatively less work done is most frequently affected by headaches, but according to the findings of our research and according to the findings of Boyles (2009). In comparison to the findings of Collins et al. (2005) we find that chronic conditions are more rarely present among employees in the Slovenian working environment, since according to their findings almost two-thirds of the employees of a US chemical company have at least one chronic condition, while our research established that almost half of respondents have none of the chronic conditions surveyed. A similarity between the two studies, however, is that the largest number of respondents with one of the listed chronic conditions has a form of allergy.

The largest number of sufferers of chronic conditions among the respondents in our research was among employees in professional, scientific, technical and manufacturing activities, while the findings of Collins et al. (2005) show that the largest number of chronic health conditions was among skilled craft workers. Interestingly, the findings of the research in the Slovenian working environment also indicate that respondents with a poor state of health (both physical and mental) are not subject to greater work impairment, as is found by some other authors (Collins et al., 2005; Burton et al., 2004; and Allen et al., 2005).

Gurchiek (2009) found that 40% of employees go to work despite being sick or feeling ill because of their work ethic, dedication to work and the belief that the organisation needs them. We obtained similar results with our research, in which the most important reasons for coming to work despite feeling ill are likewise defined as reasons connected to dedication to work and work ethic (work commitments and meetings, deadlines, irreplaceableness).

In a study conducted in 2012, Lalić and Hromin find that the level of presenteeism is similar in all the groups of employees studied (irrespective of whether their work is sedentary or otherwise, the type of job and the status of the organisation by which they are employed, etc.). Our research of the Slovenian working environment led us to similar findings, which likewise show that presenteeism is a phenomenon that appears in all sectors and among the majority of employees, irrespective of the type of job they do.

From the comparison of the research we carried out in the Slovenian working environment with studies carried out previously, we are able to state that presenteeism is a problem to which more attention needs to be devoted. The comparison of findings regarding the circumstances or risk factors that more frequently have an impact on the phenomenon of presenteeism in an individual working environment is an interesting one. From the findings of our research, we can conclude that the personal circumstances of the individual are more closely connected to presenteeism than organisational circumstances, for which we are unable to claim that they represent a risk factor the presenteeism, as is claimed by some previous studies and the theoretical starting points we have defined.

## **5 Conclusion**

In modern working environments, presenteeism appears above all as the consequence of the challenges of the current economic climate and psychosocial risks or factors in the working environment which cause employees to experience excessive workloads and stress as a result of organisational and other conditions of work. Risk factors for the occurrence of presenteeism are connected to, among other things, the rationalisation of work processes, which is aimed at ensuring the maximum efficiency of

business activities, other words doing as much as possible with the least effort and in the shortest possible time.

The research carried out in the Slovenian working environment showed that personal factors or personal circumstances have an impact on the incidence of presenteeism in the working environment. In the light of the research results, the following personal risk factors may be said to have the biggest impact on the incidence of presenteeism in the Slovenian working environment: financial situation, number of days of sick leave, and physical and mental health of the employee. On the other hand ambition and level of job security do not apparently have a significant impact on the incidence of presenteeism.

The elimination of psychosocial risks represents a cost which many organisations can ill afford, particularly at a time of economic crisis. Investment in healthy working conditions and a suitable organisational climate can prevent greater costs and losses in the future. A pleasant and healthy working environment with good psychosocial relations, in which it is possible to work without feelings of overwork and stress, is the fruit of cooperation between employee and employer. This cooperation, however, is not something that can be taken for granted. Rather, it needs to be constantly evaluated, built on and improved. Cooperation must be based on preventive interventions, since the reduction of psychosocial risks in workplaces is only effective when the individual and organisational levels are combined. Job security, social security, a culture of cooperation, recognition and reward, a good work-life balance and adequate supervision and organisation of work lead to employee health and facilitate flexibility, motivation and dedication, as well as creativity and innovation. A working culture that includes the support of management and co-workers, and the development of social, health and vocational competences, must be one of the fundamental goals of modern employers if they wish to be able to face the economic challenges of modern society.

Presenteeism is thus a problem that causes damage both to the individual and to the business world, and is therefore a phenomenon that deserves to be treated with considerable care. Eliminating its negative effects (both in terms of reduced productivity and its impact on health) is therefore an essential step for modern society. The symptoms of presenteeism can be alleviated by both employee and employer. If the employer creates a positive working environment where there is open communication among employees, the employee will be physically and mentally less affected. Employers must treat employees as valuable goods and constantly be aware that only a healthy and rested employee can be fully effective and successful. It is the task of employees, on the other hand, to respect their own health and take care of it, which includes taking sick leave when they feel unwell.

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