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# The association between the prevalence and attitude regarding physical restraint use in a Dutch acute hospital

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## ENGLISH ABSTRACT

**Title:** The association between the prevalence and attitude regarding physical restraint use in a Dutch acute hospital.

**Background:** Factors that influence physical restraint use need to be identified to reduce this questionable practice. However, due to limitations of previous studies, it is unknown whether an association exists between the prevalence and attitude regarding restraint use.

**Aim and research questions:** To explore the association between the prevalence of physical restraint use and attitude of physicians and nurses towards restraint use in a Dutch acute hospital. The research questions were: what is the prevalence of restraint use, what is the attitude of physicians and nurses towards restraint use, and is there an association between the prevalence and attitude regarding restraint use?

**Method:** A cross-sectional, correlational study was conducted. Unannounced, one researcher observed patients on 17 units on restraint use to determine the prevalence. Then, physicians and nurses working in these units were asked to complete the Maastricht Attitude Questionnaire (MAQ) to determine their attitude towards restraint use. Subsequently, the Spearman's rank correlation coefficient was used to explore the association between the prevalence rates and mean MAQ scores at the unit level. Units with a response lower than 40% and/or a prevalence based on less than five patients were excluded from this analysis to increase the usability of the results.

**Results:** A moderate to strong positive significant association ( $r_s=0.608$ ,  $p=0.027$ ) was found, indicating that units with a positive attitude tended to use more restraint than units with a negative attitude. Physicians and nurses had a relatively neutral to slightly positive attitude regarding restraint use, but they considered the use of restraint as appropriate clinical practice. Physicians and nurses considered the mostly used restraint measure (bilateral bedrails) as moderately restrictive.

**Conclusion:** Attitude may be an influencing factor of physical restraint use.

**Recommendations:** Information programs for units with positive attitudes and high prevalence rates should be aimed at changing attitudes against restraint use in order to reduce the use of restraint.

**Keywords:** Physical restraint use, prevalence, attitude, association, acute hospital

## DUTCH SUMMARY

**Titel:** De associatie tussen de prevalentie van en attitude ten aanzien van het gebruik van vrijheidsbeperking in een Nederlands ziekenhuis.

**Inleiding:** Determinanten van het gebruik van vrijheidsbeperking zijn nodig om deze discutabele praktijk te verminderen. Door beperkingen van eerdere onderzoeken is het onbekend of er een associatie bestaat tussen de prevalentie van en attitude ten aanzien van het gebruik van vrijheidsbeperking.

**Doel en onderzoeksvragen:** Het verkennen van de associatie tussen de prevalentie van en attitude van artsen en verpleegkundigen ten aanzien van het gebruik van vrijheidsbeperking in een Nederlands ziekenhuis. De onderzoeksvragen: wat is de prevalentie van het gebruik van vrijheidsbeperking, wat is de attitude van artsen en verpleegkundigen ten aanzien van het gebruik van vrijheidsbeperking, en is er een associatie tussen de prevalentie van en attitude van artsen en verpleegkundigen ten aanzien van het gebruik van vrijheidsbeperking?

**Methode:** Een cross-sectioneel, correlationeel onderzoek werd uitgevoerd. Onaangekondigd observeerde een onderzoeker patiënten van 17 afdelingen op het gebruik van vrijheidsbeperking om de prevalentie te bepalen. Hierna werden artsen en verpleegkundigen van deze afdelingen gevraagd de Maastricht Attitude Questionnaire (MAQ) in te vullen om hun attitude ten aanzien van het gebruik van vrijheidsbeperking te bepalen. Vervolgens werd Spearman's  $r_s$  gebruikt om de associatie te verkennen tussen de prevalenties en gemiddelde MAQ scores op afdelingsniveau. Alleen afdelingen met een prevalentie gebaseerd op minimaal vijf patiënten en een respons van 40% werden in deze analyse geïnccludeerd.

**Resultaten:** Een gemiddelde tot sterke positieve significante associatie ( $r_s=0.608$ ,  $p=0.027$ ) werd gevonden tussen attitude en gebruik van vrijheidsbeperking. Artsen en verpleegkundigen hadden een relatief neutrale tot licht positieve attitude ten aanzien van het gebruik van vrijheidsbeperking, maar ze vonden vrijheidsbeperking geschikt voor in de praktijk. Artsen en verpleegkundigen vonden de meest gebruikte vrijheidsbeperkende maatregel (bilaterale bedrails) matig beperkend.

**Conclusie:** Attitude is mogelijk een determinant van het gebruik van vrijheidsbeperking.

**Aanbevelingen:** Om veelvuldig gebruik van vrijheidsbeperking te verminderen moet de positieve attitude van artsen en verpleegkundigen worden veranderd door het geven van informatie over het gebruik van vrijheidsbeperking.

**Trefwoorden:** Vrijheidsbeperkende maatregelen, prevalentie, attitude, associatie, acuut ziekenhuis

## BACKGROUND

Physical restraint is defined as any measures that limit an individual's freedom of movement, including the use of movement alarm systems, belts, locked doors and bedrails.<sup>1</sup> Depending on the definition, methods and study population, the prevalence of physical restraint use in acute hospitals ranges between 9% and 66% internationally.<sup>2-4</sup> In acute hospitals, physical restraint is frequently used to enable treatment, control behaviours like aggression and prevent falls.<sup>5,6</sup> However, restraint reduction does not lead to an increase in therapy disruptions and falls.<sup>7-9</sup> In addition, using these measures can result in many adverse events including incontinence, fractures, apathy, abrasions, pneumonia, isolation, nerve damage, thrombosis, discomfort, bleeding and death by asphyxiation.<sup>10,11</sup> Furthermore, physical restraint use constitutes an infringement of ethical values such as respect for the patient's privacy, dignity and autonomy.<sup>12</sup> The ineffectiveness, adverse events and ethical implications of physical restraint use indicate the need to reduce this questionable practice in acute hospitals.

Therefore, countries such as Denmark and Scotland introduced restrictive legislation that reduced restraint use considerably.<sup>13</sup> Furthermore, several acute hospitals in countries like The Netherlands, Austria and New Zealand perform annual prevalence measurements of physical restraint use to facilitate comparison and policy development.<sup>14</sup> Researchers also published results of restraint reduction programs that included one or more interventions such as education, feedback, policy change and consultation.<sup>7-9</sup> In one study a restraint reduction program was implemented on a number of units of two acute hospitals.<sup>7</sup> This program consisted of administrative support, education, consultation and feedback. The results show that restraint use reduced in some units but increased in others.<sup>7</sup> This suggests the need to develop unit or culturally tailored programs and implementations that are based on associated factors of physical restraint use.

Patient characteristics such as cognitive impairment, cerebro vascular accident and high care dependency are associated factors of physical restraint use.<sup>2,4,15</sup> According to the theory of reasoned action attitude and behaviour are sequentially related.<sup>16</sup> Therefore, a positive attitude towards physical restraint use may result in higher restraint use. Helmuth explored this association with a study sample of 52 nurses and Myers *et al.* with 201 nurses.<sup>17,18</sup> However, in both studies nurses were asked to complete a questionnaire to determine their physical restraint use.<sup>17,18</sup> Helmuth found that the incidence of physical restraint use was 3.5%. However, this rate was much lower than the previously reported rates of restraint use.<sup>17</sup> This may have been the result of underreporting due to social desirable answers. Myers *et al.* asked nurses about their restraint use in the last 12 months, which may have led

to memory bias.<sup>18</sup> These limitations may have resulted in lower than actual rates of restraint use and subsequent failure to find an association between attitude and physical restraint use.<sup>17,18</sup>

## **PROBLEM STATEMENT, AIM AND RESEARCH QUESTIONS**

Due to methodological limitations of previous studies, it is unclear whether an association exists between prevalence and attitude regarding physical restraint use in acute hospitals. In case an association is found, staff of units with a positive attitude and high prevalence can be informed regarding physical restraint use in order to reduce this questionable practice. Therefore, the aim of this study was to explore the association between the prevalence of physical restraint use and the attitude towards physical restraint use of physicians and nurses in a Dutch acute hospital. This aim was translated in the following three research questions:

1. What is the prevalence of physical restraint use in a Dutch acute hospital?
2. What is the attitude of physicians and nurses towards physical restraint use in a Dutch acute hospital?
3. Is there an association between the prevalence of physical restraint use and the attitude of physicians and nurses towards physical restraint use in a Dutch acute hospital?

## **METHODS**

### **Design and sample**

A cross-sectional, correlational study was conducted in a Dutch acute hospital during the period of February through June of 2013. This study was cross-sectional as it involved single quantitative measurements of the prevalence and attitude regarding physical restraint use during a fixed period in time.<sup>19</sup> This study was correlational because a Spearman's rank correlation coefficient ( $r_s$ ) with a corresponding p-value was used to explore and describe the association between the prevalence and attitude.<sup>19</sup> A cross-sectional, correlational study was chosen because such studies are appropriate for exploring and describing the association between single measurements of the prevalence and attitude regarding restraint use during a fixed period in time.<sup>19,20</sup> The study sample consisted of patients residing in 17 units of the acute hospital and the physicians and nurses working in these units. The pediatric unit was excluded because of ethical considerations.

## Data collection

### Prevalence of physical restraint use

Physical restraint use on patients was measured through observations. Observations were chosen over self report of restraint use because Ajzen and Fishbein recommend more objective measurements to study the relation between attitude and behaviour.<sup>21</sup> The observations took place between 10 AM and 1 PM during three consecutive days. In this period patients were observed once. The observations were unannounced in order to reduce change in common behaviour towards restraint use. Patients and caregivers were informed on the purpose of the observations when asked. All observations were carried out by one researcher. This researcher recorded prevalence and measure of physical restraint use during observations using an existing observation tool.<sup>22</sup> Although developed for nursing home studies, this tool was also appropriate for recording restraint use in an acute hospital setting. Prevalence was defined as the proportion of restrained patients in the observation period. Any limitation to an individual's freedom of movement was regarded as a physical restraint.<sup>1</sup>

### Attitude towards physical restraint use

The attitude of physicians and nurses towards physical restraint use was determined through the Maastricht Attitude Questionnaire (MAQ).<sup>23</sup> This took place after the restraint observation period to maintain common behaviour towards restraint use. Table 1 shows characteristics of the MAQ. The first part of the MAQ contains demographic questions. The second part is a scale consisting of 22 items from 3 subscales regarding restraint use: reasons (8 items), consequences for the patient (10 items) and appropriateness of restraint use (4 items). The third part contains 16 items regarding the restrictiveness of restraint use for patients and 16 items regarding the extent of discomfort that caregivers experience when using restraint. The MAQ adequately measures attitude considering that, according to the theory of reasoned action, attitude should be operationalized as opinions regarding the reasons and effects of restraint use.<sup>16</sup> The MAQ takes between five and ten minutes to complete. After completion, the questionnaire could be deposited in a sealed box to maintain respondent's confidentiality. This box was located in the nurses' station of all units. Physicians and nurses that did not complete the MAQ received a maximum of two reminders and replacement questionnaires in their mailbox. Furthermore, poster reminders were hung up in the nurses' stations. Respondents that did not complete the MAQ were asked to answer unanswered questions. Non respondents and respondents were identified and traced via a code on the MAQ. This code replaced the name of individual physicians and nurses.

(Table 1)

## **Analysis**

Data were analyzed using Statistical Package for the Social Sciences version 19.<sup>24</sup> Analyses were conducted at the unit and hospital level. Prevalence of at least one physical restraint use, response, job position and gender were described using frequencies and means. Age and experience in years were described using means and standard deviations. Scores on the MAQ were described using means, standard deviations and ranges. Only complete parts of the MAQ were analyzed. Spearman's  $r_s$  was used to calculate the association between the units' overall prevalence rates of physical restraint use and the mean scores on the second part of the MAQ. This correlation coefficient was chosen because data of the MAQ is ordinal.<sup>25</sup> Units with a response lower than 40% and/or a prevalence based on less than five observed patients were excluded from the correlation analysis to achieve more precision in the results.<sup>26</sup> Widely accepted criteria regarding the strength of a correlation are lacking.<sup>19</sup> Therefore, the following classification was used as a general guideline: A  $\pm r_s$  ranging from 0.00 to 0.25 was considered as little or no association, 0.25 to 0.50 a fair association, 0.50 to 0.75 as moderate to good association, and above 0.75 a good to excellent association.<sup>19</sup> A  $p < 0.05$  was considered as statistically significant.

## **Ethical considerations and informed consent**

The Dutch acute hospital provided consent to conduct the study under the condition that specialized physicians were not approached for participation. Permission from a Medical Ethics Research Committee was not required because the study was noninvasive and therefore not subject to the WMO.<sup>27</sup> Patients were not asked for consent considering that no personal data was collected. Physicians and nurses received an information letter that informed on the purpose of the study, stated that data was handled confidentially and that participation was voluntary. Codes were used as a substitute to names to protect the respondents' identity. The key to the code was safeguarded by the researcher. A returned MAQ was considered as consent to participate in the study.



## RESULTS

### Sample

Table 2 shows that a total of 230 patients of 17 units were observed on restraint use. No other data about the patients was collected. Table 3 shows the response rates and demographic characteristics of the responding physicians and nurses. A total of 207 out of 367 (response=56.4%) physicians and nurses returned the MAQ. The response was 56.2% (187/333) for nurses, 73.3% (11/15) for nurse managers (which are registered nurses) and 47.4% (9/19) for physicians. Most respondents were nurse (90.3%) and woman (81.6%). The mean age for nurses was 39.5 years (SD=11.38), for nurse managers 41.6 years (SD=11.66) and for attending physicians 26.7 years (SD=2.00). The mean work experience in years for nurses was 18.6 years (SD=11.69), for nurse managers 23.2 years (SD=11.43) and for attending physicians 1.7 years (SD=1.08). The units with a response lower than 40% were dialysis (18.8%), short stay (23.8%) and obstetrics/maternity (8.7%). One part of one MAQ was not completed by a nurse working in the unit urology/gynecology/obstetrics. With that exception, there were no missing values.

(Table 3)

### Prevalence of physical restraint use

Table 2 shows the prevalence of at least one physical restraint use. A total of 48 out of 230 (20.9%) patients were observed restrained in the acute hospital. Bedrails were mostly used (n=44), in particular bilateral bedrails (n=35). The other restraint measures used were special sheet (n=3), chair with a table (n=2) and bumpers (n=1). Physical restraint was mostly used ( $\geq 50\%$ ) on the units recovery (100%), intensive care unit (87.5%) and neurology (50%). Restraint was less used ( $\leq 10\%$ ) on units such as cardiology (7.7%), urology/gynecology/obstetrics (7.1%) and surgery (3.8%). No restraint was used on the units psychiatry (closed and open unit), obstetrics/maternity and in the emergency room. The prevalence on the unit obstetrics/maternity and in the emergency room was based on less than five observed patients.

(Table 2)

## **Attitude of physicians and nurses towards physical restraint use**

Table 4 shows mean scores on the total scale and subscales representing the attitude towards physical restraint use of physicians and nurses. The mean score of the acute hospital on the total scale (3.21, SD=0.40, range=1.77-4.36) and the subscales 'reasons' (3.04, SD=0.56, range=1.25-4.38) and 'consequences' (2.97, SD=0.49, range=1.40-4.20) indicate that the physicians and nurses had a relatively neutral or slightly positive attitude towards physical restraint use, the reasons for using restraint and the consequences of restraint use. However, the mean score of the acute hospital on the 'appropriateness' subscale (4.16, SD=0.48, range=2.25-5.00) indicates a positive attitude demonstrating that physicians and nurses considered restraint use as adequate measures in their clinical practice. Table 4 also shows that the mean score on the total scale was highest on the units neurology, (3.63, SD=0.33, range=3.05-4.32), internal medicine (3.38, SD=0.29, range=2.77-3.77), intensive care (3.33, SD=0.30, range=2.95-4.09), emergency room (3.32, SD=0.40, range=2.45-4.18) and recovery (3.27, SD=0.34, range=2.64-3.82), and lowest on the units dialysis (2.95, SD=0.38, range=2.36-3.36), psychiatry (2.97, SD=0.40, range=1.77-3.50) and short stay (2.98, SD=0.28, range=2.64-3.27). Scores on the subscales 'reasons' and 'consequences' demonstrate somewhat similar findings. This indicates that units with the highest scores had a slightly more positive attitude towards restraint use than units with the lowest scores. However, all units had a positive attitude on the 'appropriateness' subscale indicating that physicians and nurses working in these units considered restraint use as appropriate clinical practice.

(Table 4)

## **Opinions of physicians and nurses towards physical restraint use**

Table 5 and 6 shows mean scores on the 'restrictiveness' and 'discomfort' scale representing the opinions of physicians and nurses towards the effects of physical restraint use.

Physicians and nurses of the acute hospital rated restraint measures as moderately restrictive, but they felt less discomfort using them. Physicians and nurses rated wrist and ankle restraint, belt and vest as most restrictive measures and they felt most discomfort using them. Physicians and nurses rated sensor alarm, unilateral bedrails and infrared barrier alarm system as least restrictive measures and they did not feel discomfort using them. Physicians and nurses of the acute hospital rated bilateral bedrails as moderately restrictive, but they felt little discomfort using the measure. Units scored higher on the 'restrictiveness' scale than on the 'discomfort' scale indicating that units considered restraint measures as more restrictive than uncomfortable using them. Although scores between units

differed, all units rated wrist and ankle restraint as most restrictive and sensor alarm as least restrictive measure. With the exception of the cardiology unit, all units rated wrist and ankle restraint as most discomforting using the measure. On unit level too, physicians and nurses rated bilateral bedrails as moderately restrictive, but they felt less discomfort using the measure.

(Table 5)

(Table 6)

### **Association between the prevalence and attitude regarding physical restraint use**

Table 7 shows Spearman's rank correlation coefficient and the corresponding p-value. The units short stay, dialysis, obstetrics/maternity and emergency room were excluded from analysis because their response rate was lower than 40% and/or had a prevalence based on less than five patients. A total of 13 units were included in the analysis and this resulted in a moderate to strong statistically significant positive association ( $r_s=0.608$ ,  $p=0.027$ ) between the prevalence and attitude of physicians and nurses regarding restraint use. This indicates that units with a positive attitude tended to use more restraint than units with a negative attitude.

(Table 7)

## **DISCUSSION**

The prevalence of at least one physical restraint use was 20.9%. Bilateral bedrails were the mostly used restraint measure. With a mean score of 3.21 on the MAQ total scale, the attitude of physicians and nurses was relatively neutral to slightly positive. However, with a mean score of 4.16 on the 'appropriateness' subscale, physicians and nurses considered restraint use as adequate clinical practice. Restraint measures were rated as moderately restrictive, but physicians and nurses felt less discomfort using them. Physicians and nurses considered bilateral bedrails as moderately restrictive and they did not feel discomfort using the measure. With an  $r_s$  of 0.608 and a p-value of 0.027, the association between the prevalence and attitude regarding restraint use was moderate to strong and significant.

This study holds limitations. First, the principal researcher conducted the observations which may have resulted in less reliable measurements of restraint use due to observer bias.<sup>19</sup> However, to reduce observer bias, the researcher used an observation tool and took sufficient time to conduct adequate observations.<sup>20</sup> Second, time and day may be an

influencing factor of restraint use.<sup>28</sup> Considering that patients were observed once and not at the same time of the same day, this may have resulted in a misrepresentation of actual restraint use. Third, only patient data regarding restraint use was collected. Therefore, it was impossible to explore whether factors such as age and gender were associated with restraint use. Fourth, not all physicians and nurses filled in the MAQ, which may have led to a misrepresentation of their attitude. However, the overall response rate was adequate to good.<sup>26</sup> In addition, although developed for nursing home studies, the MAQ adequately measures attitude and holds good psychometric properties.<sup>23</sup> Fifth, permission was not obtained to approach specialized physicians for participation. Therefore, the attitude of these physicians remains unknown. However, the acute hospital did provide consent to approach attending physicians for participation, which resulted in a first impression of their attitude. Sixth, the study was conducted in one acute hospital. This limits the generalizability and usability of the findings.<sup>19</sup> Finally, the prevalence and attitude was measured once during a fixed period in time in a rather uncontrolled environment. Although a positive association was found, this limitation makes it impossible to state that positive attitude causes high restraint use.<sup>20</sup> However, the existence of a sequential association between attitude and prevalence is supported by the theory of reasoned action.<sup>16</sup>

We found a moderate to strong positive significant association between the prevalence and attitude regarding physical restraint use. This indicates that units with a negative attitude tended to use less restraint than units with a positive attitude. Possible explanation for finding the association is that we used objective methods to measure actual physical restraint use.<sup>21</sup> Additionally, we used the MAQ that adequately measures attitude towards restraint use.<sup>16</sup> In the study of Helmuth and the study of Myers et al. the association between the prevalence and attitude regarding physical restraint use was not found.<sup>17,18</sup> This may have been the result of using subjective methods to measure the use of restraint subsequently leading to reporting lower than actual rates of restraint use.<sup>17,18,21</sup>

In this study the attitude of physicians and nurses towards physical restraint use differed between units. However, physicians and nurses of all units considered restraint use as appropriate clinical practice. Overall, physicians and nurses had a relatively neutral to slightly positive attitude towards using restraint. In a number of studies the attitude of nurses was also relatively positive.<sup>17,18,29</sup> However, two other studies found that the attitude of nurses or student nurses towards restraint use was relatively negative.<sup>30,31</sup> We found that physicians and nurses considered the mostly used restraint (bilateral bedrails) as moderately restrictive and they did not feel uncomfortable using the measure.

We found that physical restraint use was higher on the unit neurology than on the other general units. This is confirmed by other studies.<sup>5,15</sup> Perhaps the number of patients with a cerebrovascular accident residing in the unit neurology is higher than in other units. Cerebrovascular accident is a known influencing factor of physical restraint use.<sup>15,28</sup> In our study restraint use was high in the intensive care unit. This was also found in other studies.<sup>3,32</sup> However, some studies found that no restraint was used in the intensive care unit.<sup>33,34</sup> May be due to cultural differences. To illustrate, in Norway using physical restraint to maintain treatment is untraditional.<sup>33</sup> We found that bilateral bedrails were the mostly used restraint measure. Other studies confirm this finding.<sup>4,35,36</sup> However, some studies did not report bedrail use.<sup>3,34</sup> Possibly, bedrail use was not measured in these studies. In our study no restraint was used on the unit psychiatry. This is confirmed by another Dutch study.<sup>37</sup> This was unexpected considering that cognitive impairments are an influencing factor of physical restraint use.<sup>4,15</sup> Perhaps this is the result of restrictive legislation. In the unit psychiatry the law Bijzondere Opnemingen in Psychiatrische Ziekenhuizen applies.<sup>38</sup> This law strictly regulates the practice and documentation of physical restraint use. This law may have increased unit staff's awareness regarding the subject restraint use resulting in a negative attitude and subsequent lower use of restraint.

## **CONCLUSION**

We found a moderate to strong positive significant association between the prevalence and attitude regarding physical restraint use. This provides evidence that attitude may be an influencing factor of restraint use. Physicians and nurses had a relatively neutral to slightly positive attitude regarding restraint use, but they considered the use of restraint as appropriate clinical practice. Bilateral bedrails were the mostly used restraint measure. Physicians and nurses considered bilateral bedrails as moderately restrictive and they did not feel discomfort using the measure. These findings should be used to inform physicians and nurses on physical restraint use in order to change their attitude against restraint use and reduce the use of restraint. Recognizing that there are differences between units regarding prevalence rate and attitude will make the information more useful.

## **RECOMMENDATIONS**

### **Future research**

Although we found that attitude may be an influencing factor of physical restraint use, comparable studies are indicated to confirm or refute this finding. These studies should be multicentered and include large and various populations of patients, physicians and nurses. Specialized physicians should be part of these populations to also determine their attitude towards restraint use. The study definition should include bedrails. By including the definition in the research report, the magnitude of bedrail use and other restraint use becomes clear. The generalization, comparability and usability of the results further increases by using a uniform study methodology. Independent observation is preferable over self report to facilitate empirical representations of physical restraint use. The MAQ should be used to adequately determine attitude towards restraint use. However, the psychometric properties of this questionnaire should be tested in the acute hospital setting. More studies regarding factors other than attitude that influence restraint use are also indicated. Results from such studies provide the basis for the development and implementation of tailored restraint reduction programs.

### **Relevance for clinical practice**

Information programs for units with positive attitudes and high prevalence rates should be aimed at changing attitudes against restraint use in order to reduce the use of restraint.

## **CONTRIBUTIONS**

Study design: JK, MB; data collection and analysis: JK; and manuscript preparations: JK, MB, TH, JH.

## **CONFLICT OF INTEREST**

None declared.

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**Table 1** Characteristics of the Maastricht Attitude Questionnaire<sup>23</sup>

Part	Content	Cronbach's alpha	Scoring	Interpretation
1	Demographic questions	Not applicable	Complete questions	Differs by demographic
2	22 items scale from 3 subscales regarding restraint use: reasons (8 items), consequences for the patient (10 items) and appropriateness (4 items)	Total Scale = 0.83 to 0.86 Subscales: Reasons = 0.81 Consequences = 0.73 Appropriateness = 0.65	1= strongly disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5= strongly agree	Higher scores indicate favorable opinions regarding restraint use
3	16 items regarding the restrictiveness of restraint use for patients 16 items regarding the extent of discomfort that caregivers experience when using restraint	Not applicable  Not applicable	1 = not restrictive 2 = moderately restrictive 3 = very restrictive  1 = not discomforting 2 = moderately discomforting 3 = very discomforting	Higher scores indicate negative opinions regarding the effects of restraint use

**Table 2** Prevalence of at least one physical restraint use

Unit	At least one restraint used/Observed n/N (%)	Measure <sup>3</sup>																	
		Sensor alarm n	(Wheel)/(geri)chair with a (locked) table n	Belt n	Bilateral bedrails n	Unilateral bedrails n	Leg level bedrails n	Leg level and left or right head bedrails n	Bumpers n	(Geri)chair preventing rising n	Chair on a board n	Camera surveillance n	Special sheet n	Sleep suit n	Tight sheet n	Infrared barrier alarm system n	Vest restraint n	Bedroom door locked n	Wrist/ankle restraint n
Dialysis <sup>1</sup>	2/15 (13.3)	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Cardiology	1/13 (7.7)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Coronary care unit and First heart aid <sup>1</sup>	3/12 (25.0)	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Orthopedics	6/28 (21.4)	-	-	-	4	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Oncology	2/16 (12.5)	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Neurology	5/10 (50.0) <sup>4</sup>	-	1	-	4	-	-	-	1	-	-	1	-	-	-	-	-	-	-
Surgery	1/26 (3.8)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urology/Gynecology/Obstetrics	1/14 (7.1)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulmonology	2/14 (14.3)	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal medicine	4/25 (16.0)	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Acute admission unit	2/9 (22.2)	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minor surgery/Anesthesia/Examination <sup>2</sup>	2/6 (33.3)	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Examination/Intravenous therapy <sup>2</sup>	2/7 (28.6)	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intensive care unit <sup>1</sup>	7/8 (87.5)	-	-	-	6	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Recovery <sup>1</sup>	8/8 (100)	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table 2 (Continued)**

Unit	At least one restraint used/Observed n/N (%)	Measure <sup>3</sup>																	
		Sensor alarm n	(Wheel)/(geri)chair with a (locked) table n	Belt n	Bilateral bedrails n	Unilateral bedrails n	Leg level bedrails n	Leg level and left or right head bedrails n	Bumpers n	(Geri)chair preventing rising n	Chair on a board n	Camera surveillance n	Special sheet n	Sleep suit n	Tight sheet n	Infrared barrier alarm system n	Vest restraint n	Bedroom door locked n	Wrist/ankle restraint n
Emergency room <sup>1</sup>	0/3 (0-0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Obstetrics <sup>1</sup> /Maternity	0/1 (0-0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Closed psychiatric unit <sup>1,2</sup>	0/6 (0-0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open psychiatric unit <sup>2</sup>	0/9 (0-0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	48/230 (20.9) <sup>4</sup>	-	2	-	35	4	4	1	1	-	-	-	3	-	-	-	-	-	-

<sup>1</sup> The doors of these units were locked.

<sup>2</sup> The units Minor surgery/Anesthesia/Examination and Examination/Intravenous therapy constitute Short Stay. The closed and open psychiatric unit constitute Psychiatry. Prevalence rates of the subunits of Short stay and Psychiatry units were presented separately to demonstrate different patient populations. The combined prevalence rate for Short stay was 4/13 (30.8%) and for psychiatry 0/15 (0.0%).

<sup>3</sup> Sensor alarm (include in-bed sensor mats, floor sensor mats and optiseats), belt (all materials attached or adjacent to the waist, a bedrail consists of a head and leg level part, bilateral bedrails (bilaterally raised head and leg part), unilateral bedrails (unilaterally raised head and leg part), leg level bedrails (bilaterally raised leg part), leg level and left or right head bedrails (bilaterally raised leg part and unilaterally raised left or right head part, (geri)chair preventing rising (deep or overturned/reclined chair), chair on a board (a chair whose legs are fixed to a board), special sheet (a fitted sheet including a coat enclosing the mattress), sleep suit (clothing that deters a person from self undressing, tight sheet (a sheet over belly and upper legs that is tightened firmly under the mattress at both sides of the bed), bumpers are plastic covers that are fixed between head and leg level bedrail parts.

<sup>4</sup> On one patient three different restraint measures were used. Therefore, the number of measures used on Neurology was seven and the prevalence rate for Neurology was 5/10 (50%).

**Table 3** Response rates and demographic characteristics of the respondents (n=207)

Unit	Respondent/Staff n/N (%)	Position Respondent/Staff			Female/Respondent n/N (%)	Age Mean (SD)	Experience in years Mean (SD)
		Nurse n/N (%)	Nurse manager n/N (%)	Attending physician n/N (%)			
Dialysis	6/32 (18.8)	5/30 (16.7)	1/2 (50.0)	0/0 (0)	4/6 (66.7)	42.8 (9.02)	23.0 (10.00)
Cardiology <sup>1</sup>	9/16 (56.3)	7/14 (50.0)	1/1 (100)	1/1 (100)	8/9 (88.9)	36.2 (10.62)	12.9 (8.09)
Coronary care unit and First heart aid <sup>1</sup>	19/22 (86.4)	17/20 (85.0)	1/1 (100)	1/1 (100)	12/19 (63.2)	44.1 (10.34)	23.1 (11.49)
Orthopedics	18/21 (85.7)	16/19 (84.2)	1/1 (100)	1/1 (100)	17/18 (94.4)	34.7 (12.76)	14.8 (12.98)
Oncology	7/16 (43.8)	7/16 (43.8)	0/0 (0)	0/0 (0)	5/7 (71.4)	42.3 (8.98)	18.1 (11.39)
Neurology	13/19 (68.4)	13/19 (68.4)	0/0 (0)	0/0 (0)	13/13 (100)	37.5 (10.58)	17.7 (11.57)
Surgery	16/25 (64.0)	14/23 (60.9)	1/1 (100)	1/1 (100)	14/16 (87.5)	33.6 (10.92)	13.3 (11.98)
Urology/Gynecology/Obstetrics	7/14 (50.0)	6/13 (46.2)	1/1 (100)	0/0 (0)	7/7 (100)	39.9 (11.96)	20.9 (12.42)
Pulmonology	12/15 (80.0)	11/14 (78.6)	1/1 (100)	0/0 (0)	11/12 (91.7)	42.0 (12.81)	17.9 (12.06)
Internal medicine	16/28 (57.1)	16/25 (64.0)	0/0 (0)	0/3 (0)	15/16 (93.8)	36.8 (12.74)	14.7 (12.83)
Acute admission unit <sup>1,2</sup>	12/15 (80.0)	11/14 (78.6)	1/1 (100)	0/0 (0)	10/12 (83.3)	39.1 (12.07)	17.9 (12.26)
Short Stay <sup>1,2</sup>	5/21 (23.8)	4/20 (20.0)	1/1 (100)	0/0 (0)	5/5 (100)	43.4 (9.07)	25.2 (8.29)
Intensive care unit	14/28 (50.0)	14/27 (51.9)	0/1 (0)	0/0 (0)	9/14 (64.3)	37.1 (8.51)	17.8 (8.62)
Recovery	12/12 (100)	12/12 (100)	0/0 (0)	0/0 (0)	11/12 (91.7)	45.0 (10.71)	24.1 (10.80)
Emergency room	21/36 (58.3)	16/24 (66.7)	1/1 (100)	4/11 (36.4)	13/21 (61.9)	39.0 (13.36)	18.1 (15.29)
Obstetrics/Maternity	2/23 (8.7)	2/22 (9.1)	0/1 (0)	0 (0)	2/2 (100)	40.0 (1.41)	23.0 (1.41)
Psychiatry <sup>1</sup>	18/24 (75.0)	16/22 (72.7)	1/2 (50.0)	1/1 (100)	13/18 (72.2)	38.8 (11.39)	17.5 (11.90)
Total <sup>1</sup>	207/367 (56.4)	187/333 (56.2)	11/15 (73.3)	9/19 (47.4)	169/207 (81.6)	39.0 (11.44)	18.1 (11.96)
Total Age Mean (SD)		39.5 (11.38)	41.6 (11.66)	26.7 (2.00)			
Total Experience in years Mean (SD)		18.6 (11.69)	23.2 (11.43)	1.7 (1.08)			

<sup>1</sup> Nurse manager and attending physician of Cardiology also worked on Coronary care unit and First heart aid. Nurse manager of Acute admission unit also worked on Short stay. Because the MAQ of these respondents were used twice, the response rate was 207/367 (56.4%) and not 204/364 (56.0%).

<sup>2</sup> Short stay consists of the units Minor surgery/Anesthesia/Examination and Examination/Intravenous therapy. Psychiatry consists of a closed and an open unit. The units were combined because staff worked in both units.

**Table 4** Attitudes of physicians and nurses towards physical restraint use

Unit	MAQ Mean (SD)	Subscales		
		Reasons Mean (SD)	Consequences Mean (SD)	Appropriateness Mean (SD)
Dialysis	2.95 (0.38)	2.85 (0.58)	2.63 (0.39)	3.92 (0.49)
Cardiology	3.22 (0.32)	3.00 (0.54)	3.11 (0.34)	3.92 (0.47)
Coronary care unit and First heart aid	3.18 (0.48)	3.01 (0.57)	2.98 (0.55)	4.03 (0.63)
Orthopedics	3.05 (0.42)	2.94 (0.64)	2.77 (0.48)	3.94 (0.43)
Oncology	3.23 (0.15)	2.80 (0.19)	3.09 (0.25)	4.46 (0.64)
Neurology	3.63 (0.33)	3.47 (0.51)	3.44 (0.37)	4.42 (0.30)
Surgery	3.15 (0.39)	2.87 (0.70)	2.98 (0.47)	4.14 (0.39)
Urology/Gynecology/Obstetrics	3.10 (0.23)	2.89 (0.32)	2.83 (0.37)	4.21 (0.47)
Pulmonology	3.20 (0.60)	2.97 (0.73)	2.82 (0.82)	4.60 (0.38)
Internal medicine	3.38 (0.29)	3.24 (0.56)	3.15 (0.48)	4.25 (0.27)
Acute admission unit	3.20 (0.30)	3.05 (0.34)	2.97 (0.41)	4.06 (0.40)
Short Stay	2.98 (0.28)	2.88 (0.25)	2.64 (0.44)	4.05 (0.41)
Intensive care unit	3.33 (0.30)	3.26 (0.47)	3.13 (0.36)	3.98 (0.42)
Recovery	3.27 (0.34)	3.31 (0.37)	2.78 (0.56)	4.42 (0.49)
Emergency room	3.32 (0.40)	3.21 (0.50)	3.03 (0.41)	4.26 (0.42)
Obstetrics/Maternity	3.20 (0.03)	3.25 (0.18)	3.05 (0.07)	3.50 (0.00)
Psychiatry	2.97 (0.40)	2.63 (0.49)	2.79 (0.44)	4.08 (0.56)
Total	3.21 (0.40)	3.04 (0.56)	2.97 (0.49)	4.16 (0.48)

**Table 5** Opinions of physicians and nurses towards the degree of restrictiveness of physical restraint

Unit	Measure																Total Mean (SD)
	Sensor alarm	(Wheel)/(geri)chair with a locked table	Belt	Bilateral bedrails	Unilateral bedrails	(Ger)chair preventing rising	Chair on a board	Camera surveillance	Special sheet	Sleep suit	Tight sheet	Infrared barrier alarm system	Vest restraint	Bedroom door locked	Unit door locked	Wrist and ankle restraint	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Dialysis	1.33 (0.52)	1.83 (0.75)	2.83 (0.41)	2.17 (0.75)	1.67 (0.52)	2.17 (0.75)	1.83 (0.41)	2.00 (0.89)	2.67 (0.82)	2.33 (0.52)	2.67 (0.52)	1.67 (0.82)	2.83 (0.41)	2.33 (0.52)	1.83 (0.75)	3.00 (0.00)	2.20 (0.32)
Cardiology	1.44 (0.53)	2.33 (0.71)	2.67 (0.50)	1.78 (0.44)	1.33 (0.50)	1.78 (0.67)	1.89 (0.78)	1.89 (0.78)	2.44 (0.53)	2.78 (0.44)	2.78 (0.44)	1.56 (0.73)	2.67 (0.50)	2.00 (1.00)	1.67 (0.71)	3.00 (0.00)	2.13 (0.27)
Coronary care unit and First heart aid	1.11 (0.32)	2.05 (0.62)	2.79 (0.42)	1.79 (0.42)	1.26 (0.45)	1.74 (0.45)	1.37 (0.60)	1.58 (0.84)	2.47 (0.61)	2.37 (0.68)	2.79 (0.42)	1.42 (0.61)	2.79 (0.42)	2.21 (0.79)	1.74 (0.81)	3.00 (0.00)	2.03 (0.24)
Orthopedics	1.22 (0.43)	2.28 (0.67)	2.94 (0.24)	2.06 (0.42)	1.50 (0.51)	1.94 (0.54)	1.61 (0.61)	1.50 (0.62)	2.61 (0.50)	2.28 (0.67)	2.50 (0.62)	1.28 (0.46)	2.72 (0.46)	2.28 (0.58)	1.78 (0.65)	3.00 (0.00)	2.09 (0.26)
Oncology	1.14 (0.38)	2.14 (0.69)	2.86 (0.38)	1.71 (0.49)	1.29 (0.49)	1.71 (0.49)	1.86 (0.69)	1.43 (0.54)	2.57 (0.54)	2.29 (0.49)	2.86 (0.38)	1.29 (0.49)	2.86 (0.38)	2.29 (0.76)	1.57 (0.54)	3.00 (0.00)	2.05 (0.23)
Neurology	1.15 (0.38)	2.31 (0.63)	2.69 (0.63)	1.62 (0.65)	1.31 (0.48)	1.54 (0.52)	2.00 (0.58)	1.31 (0.48)	2.38 (0.77)	2.23 (0.73)	2.77 (0.44)	1.23 (0.60)	2.62 (0.65)	2.38 (0.65)	1.77 (0.73)	3.00 (0.25)	2.02 (0.27)
Surgery	1.13 (0.34)	1.75 (0.68)	2.62 (0.50)	1.94 (0.44)	1.38 (0.50)	1.75 (0.58)	1.88 (0.72)	1.75 (0.93)	2.50 (0.52)	2.31 (0.79)	2.50 (0.52)	1.44 (0.73)	2.63 (0.50)	2.19 (0.54)	1.75 (0.78)	2.94 (0.25)	2.03 (0.34)
Urology/Gynecology/Obstetrics	1.43 (0.54)	1.71 (0.76)	3.00 (0.00)	2.43 (0.54)	1.57 (0.54)	1.86 (0.69)	2.14 (0.69)	1.86 (0.90)	2.86 (0.38)	2.29 (0.76)	3.00 (0.00)	1.43 (0.54)	2.86 (0.38)	2.86 (0.38)	2.43 (0.54)	3.00 (0.00)	2.29 (0.17)
Pulmonology	1.08 (0.29)	2.08 (0.52)	2.92 (0.29)	2.17 (0.39)	1.33 (0.49)	1.92 (0.52)	2.00 (0.74)	1.75 (0.75)	2.75 (0.45)	2.50 (0.67)	2.33 (0.49)	1.42 (0.67)	2.83 (0.39)	2.33 (0.78)	1.75 (0.62)	3.00 (0.00)	2.14 (0.19)
Internal medicine	1.19 (0.40)	2.00 (0.63)	2.69 (0.48)	1.94 (0.57)	1.31 (0.48)	1.94 (0.77)	2.31 (0.60)	1.50 (0.82)	2.75 (0.45)	2.38 (0.72)	2.69 (0.60)	1.44 (0.73)	2.75 (0.45)	2.13 (0.81)	1.69 (0.70)	2.94 (0.25)	2.10 (0.27)



**Table 5 (Continued)**

Unit	Measure																Total Mean (SD)
	Sensor alarm Mean (SD)	(Wheel)/(geri)chair with a locked table Mean (SD)	Belt Mean (SD)	Bilateral bedrails Mean (SD)	Unilateral bedrails Mean (SD)	(Geri)chair preventing rising Mean (SD)	Chair on a board Mean (SD)	Camera surveillance Mean (SD)	Special sheet Mean (SD)	Sleep suit Mean (SD)	Tight sheet Mean (SD)	Infrared barrier alarm system Mean (SD)	Vest restraint Mean (SD)	Bedroom door locked Mean (SD)	Unit door locked Mean (SD)	Wrist and ankle restraint Mean (SD)	
Acute admission unit	1.17 (0.39)	1.67 (0.78)	2.75 (0.45)	1.58 (0.52)	1.42 (0.52)	1.58 (0.52)	1.50 (0.67)	1.42 (0.52)	2.33 (0.65)	2.00 (0.74)	2.58 (0.52)	1.50 (0.67)	2.83 (0.39)	2.25 (0.75)	1.75 (0.75)	3.00 (0.00)	1.96 (0.29)
Short stay	1.20 (0.45)	1.60 (0.55)	2.80 (0.45)	2.00 (0.00)	1.00 (0.00)	1.80 (0.45)	1.60 (0.55)	1.20 (0.45)	2.40 (0.55)	1.60 (0.89)	3.00 (0.00)	1.20 (0.45)	2.60 (0.55)	2.20 (0.84)	1.40 (0.89)	3.00 (0.00)	1.91 (0.13)
Intensive care unit	1.00 (0.00)	1.93 (0.48)	2.57 (0.51)	2.00 (0.56)	1.50 (0.52)	1.79 (0.43)	1.43 (0.65)	1.36 (0.63)	2.29 (0.61)	2.29 (0.73)	2.57 (0.51)	1.29 (0.61)	2.57 (0.51)	2.14 (0.77)	1.64 (0.63)	3.00 (0.00)	1.96 (0.24)
Recovery	1.08 (0.29)	2.25 (0.75)	2.83 (0.39)	2.00 (0.43)	1.08 (0.29)	2.08 (0.52)	1.92 (0.67)	1.08 (0.29)	2.50 (0.67)	2.42 (0.67)	2.83 (0.39)	1.08 (0.29)	2.83 (0.39)	2.42 (0.67)	1.92 (0.52)	3.00 (0.00)	2.08 (0.16)
Emergency room	1.14 (0.36)	1.90 (0.63)	2.81 (0.40)	1.81 (0.60)	1.24 (0.44)	1.81 (0.68)	1.67 (0.66)	1.24 (0.44)	2.24 (0.70)	2.00 (0.78)	2.52 (0.51)	1.33 (0.58)	2.76 (0.44)	2.10 (0.70)	1.62 (0.67)	2.90 (0.30)	1.94 (0.30)
Obstetrics/Maternity	1.50 (0.71)	1.50 (0.71)	2.50 (0.71)	1.50 (0.71)	1.50 (0.71)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.50 (0.71)	2.00 (0.00)	2.50 (0.71)	1.00 (0.00)	3.00 (0.00)	2.50 (0.71)	2.00 (0.00)	3.00 (0.00)	1.81 (0.09)
Psychiatry	1.44 (0.51)	2.61 (0.61)	2.94 (0.24)	2.39 (0.61)	1.56 (0.51)	2.33 (0.49)	1.94 (0.80)	1.78 (0.73)	2.44 (0.51)	2.44 (0.62)	2.50 (0.71)	1.67 (0.59)	2.67 (0.49)	2.67 (0.49)	2.17 (0.62)	3.00 (0.00)	2.28 (0.31)
Total	1.19 (0.40)	2.06 (0.68)	2.79 (0.42)	1.95 (0.55)	1.36 (0.48)	1.86 (0.59)	1.78 (0.69)	1.52 (0.70)	2.48 (0.60)	2.29 (0.70)	2.64 (0.52)	1.39 (0.60)	2.73 (0.45)	2.29 (0.70)	1.78 (0.69)	2.98 (0.14)	2.07 (0.28)

**Table 6** Opinions of physicians and nurses towards the degree of discomfort to use physical restraint

Unit	Measure																Total Mean (SD)
	Sensor alarm	(Wheel)/(geri)chair with a locked table	Belt	Bilateral bedrails	Unilateral bedrails	(Geri)chair preventing rising	Chair on a board	Camera surveillance	Special sheet	Sleep suit	Tight sheet	Infrared barrier alarm system	Vest restraint	Bedroom door locked	Unit door locked	Wrist and ankle restraint	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Dialysis	1.00 (0.00)	1.50 (0.55)	2.83 (0.41)	1.83 (0.75)	1.50 (0.55)	1.67 (0.52)	1.83 (0.75)	1.50 (0.55)	2.33 (1.03)	2.33 (0.52)	2.67 (0.52)	1.33 (0.52)	2.50 (0.55)	2.00 (0.89)	1.33 (0.82)	3.00 (0.00)	1.95 (0.37)
Cardiology	1.22 (0.44)	1.44 (0.73)	2.44 (0.53)	1.44 (0.53)	1.22 (0.44)	1.56 (0.88)	1.56 (0.88)	1.78 (0.67)	2.22 (0.67)	2.89 (0.33)	2.56 (0.53)	1.33 (0.50)	2.33 (0.87)	1.67 (0.87)	1.44 (0.73)	2.78 (0.44)	1.87 (0.27)
Coronary care unit and First heart aid	1.00 (0.00)	1.32 (0.48)	2.47 (0.70)	1.26 (0.45)	1.11 (0.32)	1.32 (0.48)	1.42 (0.51)	1.32 (0.48)	2.21 (0.63)	2.32 (0.67)	2.63 (0.60)	1.26 (0.45)	2.47 (0.70)	2.00 (0.82)	1.42 (0.77)	2.89 (0.32)	1.78 (0.24)
Orthopedics	1.17 (0.38)	1.83 (0.79)	2.94 (0.24)	1.61 (0.61)	1.28 (0.58)	1.72 (0.67)	1.67 (0.69)	1.50 (0.62)	2.44 (0.62)	2.17 (0.79)	2.33 (0.69)	1.39 (0.50)	2.72 (0.46)	2.28 (0.67)	1.56 (0.71)	3.00 (0.00)	1.98 (0.31)
Oncology	1.00 (0.00)	1.43 (0.54)	2.71 (0.49)	1.29 (0.49)	1.00 (0.00)	1.29 (0.49)	1.86 (0.90)	1.71 (0.76)	2.43 (0.79)	2.43 (0.79)	2.71 (0.76)	1.43 (0.79)	2.71 (0.49)	2.43 (0.79)	1.86 (0.69)	3.00 (0.00)	1.96 (0.26)
Neurology	1.00 (0.00)	1.54 (0.66)	2.69 (0.48)	1.31 (0.48)	1.00 (0.00)	1.23 (0.44)	2.08 (0.76)	1.38 (0.51)	1.69 (0.48)	1.85 (0.80)	2.85 (0.38)	1.23 (0.60)	2.69 (0.63)	2.31 (0.63)	1.46 (0.66)	3.00 (0.00)	1.83 (0.23)
Surgery	1.13 (0.50)	1.25 (0.45)	2.38 (0.62)	1.44 (0.51)	1.13 (0.34)	1.56 (0.51)	1.44 (0.63)	1.50 (0.73)	2.38 (0.62)	2.19 (0.75)	2.50 (0.52)	1.25 (0.58)	2.50 (0.52)	2.00 (0.73)	1.69 (0.79)	2.87 (0.34)	1.82 (0.31)
Urology/Gynecology/Obstetrics <sup>1</sup>	1.17 (0.41)	1.33 (0.52)	2.83 (0.41)	1.83 (0.75)	1.33 (0.52)	1.67 (0.82)	2.00 (0.63)	2.17 (0.75)	2.67 (0.82)	2.83 (0.41)	2.67 (0.52)	1.33 (0.52)	2.83 (0.41)	2.50 (0.55)	1.83 (0.75)	3.00 (0.00)	2.13 (0.22)
Pulmonology	1.08 (0.29)	1.50 (0.52)	2.67 (0.65)	1.33 (0.49)	1.08 (0.29)	1.58 (0.67)	1.67 (0.78)	1.75 (0.75)	2.42 (0.67)	2.42 (0.67)	2.33 (0.65)	1.50 (0.67)	2.67 (0.49)	2.25 (0.87)	1.33 (0.49)	3.00 (0.00)	1.91 (0.30)
Internal medicine	1.00 (0.00)	1.38 (0.62)	2.50 (0.63)	1.25 (0.45)	1.00 (0.00)	1.38 (0.62)	1.75 (0.68)	1.44 (0.73)	2.19 (0.66)	2.13 (0.72)	2.56 (0.73)	1.25 (0.58)	2.62 (0.62)	2.13 (0.89)	1.56 (0.63)	2.94 (0.25)	1.82 (0.32)

**Table 6 (Continued)**

Unit	Measure																Total Mean (SD)
	Sensor alarm Mean (SD)	(Wheel)/(geri)chair with a locked table Mean (SD)	Belt Mean (SD)	Bilateral bedrails Mean (SD)	Unilateral bedrails Mean (SD)	(Geri)chair preventing rising Mean (SD)	Chair on a board Mean (SD)	Camera surveillance Mean (SD)	Special sheet Mean (SD)	Sleep suit Mean (SD)	Tight sheet Mean (SD)	Infrared barrier alarm system Mean (SD)	Vest restraint Mean (SD)	Bedroom door locked Mean (SD)	Unit door locked Mean (SD)	Wrist and ankle restraint Mean (SD)	
Acute Admission unit	1.08 (0.29)	1.25 (0.62)	2.67 (0.65)	1.17 (0.39)	1.00 (0.00)	1.50 (0.80)	1.67 (0.78)	1.58 (0.79)	2.25 (0.87)	2.08 (0.79)	2.67 (0.65)	1.50 (0.80)	2.83 (0.39)	2.50 (0.52)	1.75 (0.75)	2.92 (0.29)	1.90 (0.33)
Short stay	1.20 (0.45)	1.20 (0.45)	2.60 (0.55)	1.60 (0.55)	1.00 (0.00)	1.60 (0.89)	2.00 (0.00)	1.40 (0.55)	2.20 (0.84)	2.00 (1.00)	3.00 (0.00)	1.20 (0.45)	2.40 (0.55)	2.60 (0.55)	1.20 (0.45)	3.00 (0.00)	1.89 (0.22)
Intensive care unit	1.00 (0.00)	1.07 (0.27)	1.86 (0.54)	1.00 (0.00)	1.00 (0.00)	1.07 (0.27)	1.14 (0.36)	1.21 (0.58)	1.71 (0.61)	1.71 (0.47)	1.93 (0.73)	1.21 (0.58)	2.21 (0.70)	1.79 (0.89)	1.36 (0.63)	2.57 (0.76)	1.49 (0.31)
Recovery	1.00 (0.00)	1.50 (0.52)	2.42 (0.79)	1.25 (0.45)	1.08 (0.29)	1.42 (0.52)	1.92 (0.67)	1.33 (0.78)	2.00 (0.60)	2.42 (0.67)	2.58 (0.52)	1.08 (0.29)	2.75 (0.45)	2.17 (0.72)	1.75 (0.75)	2.83 (0.39)	1.84 (0.28)
Emergency room	1.10 (0.44)	1.43 (0.60)	2.33 (0.73)	1.29 (0.56)	1.14 (0.48)	1.33 (0.66)	1.62 (0.67)	1.24 (0.54)	2.05 (0.50)	1.81 (0.68)	2.24 (0.63)	1.24 (0.54)	2.57 (0.51)	1.86 (0.85)	1.48 (0.68)	2.86 (0.36)	1.72 (0.38)
Obstetrics/Maternity	1.00 (0.00)	1.00 (0.00)	1.50 (0.71)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.50 (0.71)	2.00 (0.00)	1.00 (0.00)	2.00 (0.00)	1.50 (0.71)	1.00 (0.00)	2.00 (0.00)	1.28 (0.13)
Psychiatry	1.00 (0.00)	1.67 (0.59)	2.56 (0.62)	1.83 (0.86)	1.22 (0.43)	1.67 (0.69)	1.94 (0.73)	1.67 (0.84)	1.94 (0.80)	1.94 (0.73)	2.44 (0.62)	1.39 (0.61)	2.67 (0.49)	2.28 (0.75)	1.44 (0.62)	2.83 (0.38)	1.91 (0.43)
Total	1.06 (0.28)	1.43 (0.59)	2.51 (0.64)	1.39 (0.57)	1.12 (0.36)	1.45 (0.62)	1.67 (0.70)	1.48 (0.68)	2.15 (0.70)	2.15 (0.73)	2.49 (0.63)	1.30 (0.56)	2.59 (0.57)	2.13 (0.78)	1.52 (0.68)	2.88 (0.35)	1.83 (0.33)

<sup>1</sup> Response was 6 (42,9%).

**Table 7** Association between the prevalence of physical restraint use and the attitude of physicians and nurses towards physical restraint use

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Units	Spearman's rank correlation coefficient	p-value
All except Dialysis, Obstetrics/Maternity, Short stay and Emergency room <sup>1</sup>	0.608	0.027

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<sup>1</sup> These units were excluded from analysis because the response rates were less than the cut-off point of 40% (Dialysis 18.8%, Short stay 23.8%, Obstetrics/Maternity 8.7%) and/or the prevalence rate of physical restraint use was based on less than the cut-off point of five observed patients (Obstetrics/Maternity one patient and Emergency room three patients).