The influence of personal values and patient intoxication on nurses concerns about opioids: results of a prospective cross-sectional multi-centre study

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Abstract

Background: Nurses are the main administrators of opioids in hospitals and enjoy some autonomy when using them to manage pain. Nevertheless evidence suggests they exercise this freedom restrictively with the reasons for this self-limitation remaining unclear. Nurses are influenced by personal and professional values and by patients' attributes. Intoxicated patients pose a particular challenge. This study therefore investigated whether cautious attitudes towards opioids were aggravated in intoxicated patients and influenced by personal values.

Methods: A two-version questionnaire was developed. Each presented a case vignette describing a patient in acute pain who was either intoxicated or not intoxicated. Questionnaires contained identical case statements inquiring about concerns regarding opioids, preferred analgesics and statements about opioids and personal values. They were distributed prospectively in a cross-sectional, multi-centre design. Equal distribution of both questionnaires was achieved through randomization of wards. Regression analysis was employed to determine predictors for responses to the case statements.

Results: In total, n = 374 (26%) nurses returned questionnaires, 85% were female, 39% worked in surgery and 64% had >10 years experience. A total of 78% were concerned using opioids in the intoxicated patient and 70% preferred non-opioids instead. Most nurses agreed familiarity with an opioid gives them more confidence and they were more concerned in patients with a history of drug abuse. They neither associated opioids with helping patients to die nor with drug abuse. The majority endorsed value statements representing 'universalism', 'hedonism' and 'benevolence' while disagreeing with 'power' and 'stimulation'. Nurses concerns were predicted by values indicating 'conformity' and 'achievement'.

Conclusion: Nurses were concerned giving opioids to intoxicated patients and preferred non-opioids instead. These concerns were predicted by personal values representing 'Conservation' ('conformity') and 'Self-Enhancement' ('achievement'). Therefore, stigmatizing mental models likely contribute to nurses' reluctance to use opioids. Interestingly, personal ambition might protect nurses from discriminatory thoughts and practice.

Keywords

Acute pain, alcohol intoxication, opioids, nurses, decision making

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Introduction

Opioids are the backbone of management of both acute and chronic pain.[1,2] They are prescribed by physicians ideally as part of an individualized treatment strategy. The prescriber not only determines the type of opioid deemed most appropriate but also its dose, dosing interval and route of administration. The prescriber further decides whether the opioid should be given 'by the clock' on a regular basis, on demand, for example, to treat breakthrough pain, or both. Yet, in hospitals the implementation of the treatment plan is left to the ward nurses. They therefore are the main administrators of opioids for hospitalized patients. Moreover, nurses compared to doctors spend considerably more time with patients, complete regular pain assessments, and respond to patient calls for additional analgesics. Nurses, hence, hold the most complete set of information regarding a patient.[3–6] This information together with the permission to give opioids on demand endows them with a certain leverage to decide which patient at what time and doses could have further drug administrations. Evidence suggests nurses do exercise this autonomy, but often do not exhaust their therapeutic options.[7] Therefore, nurses might find decision-making regarding opioid administration occasionally demanding and consequently prefer a more cautious treatment approach.[7,8] The unease related to opioids could be further aggravated when a situation or patient is considered challenging, such as pain management in acutely intoxicated patients.[9] Yet, whether an acute intoxication indeed impacts opioid administration by nurses remains to be determined.

Decision-making in medicine depends on various factors such as theoretical knowledge, pattern recognition and intuition.[10] Nevertheless, even highly trained professionals in their working environment remain part of their societal context and cultural upbringing. Consequently, their decisions are likely also influenced by personal values.[11] Personal values can be defined as 'basic convictions of what individuals or social groups consider right, good or desirable'.[12] As such they 'motivate social and professional behaviour'.[11] However, to date, little work has been completed to investigate how personal values might influence nurses' mental models and subsequently their decisions regarding opioid administration in daily practice. The present prospective, cross-sectional, multi-centre study therefore aimed to elucidate (a) whether the presentation of an acutely intoxicated patient and personal values affected nurses' concerns about opioids and (b) to examine nurses' general attitudes towards opioids.

Methods

This prospective cross-sectional questionnaire-based study was conducted at three teaching hospitals (Evangelisches Krankenhaus Oldenburg, Klinikum Oldenburg and Pius Hospital Oldenburg) in northern Germany. After approval by the ethics committee of Carl von Ossietzky University Oldenburg (013/2015), all nurses involved in the care of adult patients were approached between 15 February and 1 April 2016.

Questionnaire development

To test the hypothesis that personal values and patient characteristics influence nurses' decisions to administer opioids to acutely injured patients, a two-version questionnaire consisting of five sections was developed (Supplemental material). The two versions were identical except for the case scenarios (vignettes) they presented.

The first section was concerned with the characteristics of participants ('demographics') such as 'age', 'gender', 'specialty', 'qualifications' and 'experience'. The second section contained one of two possible case scenarios. These vignettes aimed to stimulate participants' clinical thinking. The responses to the questionnaire items were thus expected to better reflect the cognitive and emotional processes nurses experience in similar situations during their daily routine.

The third section of the questionnaire presented two 'case statements' (items C1 and C2; Supplemental material) that were directly related to the case scenarios while the fourth and fifth sections showed statements about opioids (items A1–A7) and personal values (items V1–V10), respectively.

Case scenarios and case statements

Two case scenarios were developed by two researchers. They were designed to test the inclination of nurses to apply opioids to acutely injured non-intoxicated (scenario 1) and intoxicated (scenario 2) patients. The other five members of the research group independently checked the vignettes for content and face validity as well as language. Disagreements were solved through discussions within the group so that the final scenarios were as follows:

Case scenario 1 (non-intoxicated patient):

'In the early morning hours a 19-year-old man came off an icy road and crashed into a tree. Bystanders witnessed the accident and called an ambulance. At arrival the man was found drowsy. In the accident and emergency department he is arousable and answers to questions. He complains about pain in his right chest during breathing and about pain in his upper abdomen'.

Case scenario 2 (intoxicated patient):

'In the early morning hours a 19-year-old man came off an icy road and crashed into a tree. Bystanders witnessed the accident

and called an ambulance. At arrival the man was found drowsy and smelling of alcohol. In the accident and emergency department he is arousable but responds aggressively to questions. He complains about pain in his right chest during breathing and about pain in his upper abdomen. On examination several open blister packs were found in his pockets'.

One researcher developed the two case statements C1 and C2 (Supplemental material) that are directly related to the case scenarios. Content and face validity were again discussed and consented within the group. Case statement 1 ('I would be concerned about giving opioids') aimed to test the general concerns of nurses to administer opioids whereas case statement 2 ('To treat pain, I would prefer a non-opioid over an opioid') asked more specifically about treatment options for the cases presented.

Opioid and personal value statements

The general statements about opioids were selected from a previously validated questionnaire employing a Delphi process.[8,13] In brief, n = 10 nurses experienced in the use of administering opioids and involved in the care of adult patients were randomly approached. They were asked to rank the 14 items of the original questionnaire according to their perceived relevance for their clinical practice. The seven statements rated most important were then included into the questionnaire of this study.

Statements testing basic personal values were selected from the validated 21-item 'Portraits Value Questionnaire' (PVQ).[14] The PVQ operates within the model framework of values introduced by Schwartz[15] in 1992. Its 21 statements represent 10 basic values that are organized into four categories as follows. The values 'power' and 'achievement' that Schwartz suggested to serve the self-interest of an individual are subsumed under the heading 'Self-Enhancement'. 'Universalism' and 'benevolence' supposedly helping collective interests are listed under 'Self-Transcendence'. 'Hedonism', 'self-direction', and 'stimulation' likely representing independent thought and flexibility are arranged under 'Openness to Change'. Finally, the values 'security', 'conformity', and 'tradition' representing self-restriction and resistance to change are subsumed under 'Conservation'.[12]

A second Delphi process was employed to reduce the number of statements from two (three) per value in the original PVQ to one per value here. Briefly, all scientists participating in the study independently ranked the items of each value according to the likely relevance for this study. Only those items that received the highest ranks were included into the final questionnaire. Disagreements between scientists over the importance of an item were resolved through discussions. The final

questionnaire, therefore, contained 10 items representing the 10 basic values and four categories identified by Schwartz.[15] Scientists involved in this Delphi process were either academic nurse educators or clinicians. As they were experienced in nursing, educational and pain research they were able to ensure content validity and relevance of the statements.

Final questionnaire and questionnaire distribution

Responses to the case, including opioid and value statements were recorded using 5-point Likert-type-scales ranging from 'strongly disagree' (numerical value: 0) to strongly agree (numerical value: 5).

Equal numbers of nurses in each hospital and specialty were exposed to the two versions of the questionnaire, respectively. This was achieved by randomizing each specialty in each hospital to one version of the questionnaire. This resulted in participants working on the same ward at the same hospital continuously receiving the same questionnaire.

In response to feedback of a pilot study, where participants expressed anxiety about being identifiable when working in small units, the different specialties were grouped into three main clusters: 'Medicine', 'Surgery' and 'Critical Care', respectively. Critical care comprised of all nurses working in intensive care unit (ICU) and high dependency unit (HDU) settings, theatres, recovery and accident and emergency departments.

Questionnaires were distributed in paper form and returned anonymously in an envelope to ensure participants were not identifiable to the researchers. Returning a questionnaire was considered consent to participate in the study.

The primary outcome of this study was to elucidate whether the responses to the two case statements were predictable by the responses of nurses to the value and opioid statements provided. The secondary outcome was nurses' responses to the value and opioid statements in general.

Statistical analysis

Returned questionnaires were collected and responses entered into a database (SPSS 23, IBM, Ehningen, Germany) with no imputations for missing values.

Data were first analysed descriptively. To allow easier comparability of responses between participants exposed to the two different case scenarios, data obtained with Likert-type-scales were combined for each item as follows: 'strongly agree' and 'agree' were joined into an 'agree' group and 'strongly disagree' and 'disagree' into a 'disagree' group, respectively.

Table 1. Characteristics of participants.

	Total	Evangelisches Krankenhaus	Klinikum Oldenburg	Pius Hospital
Nurses approached, n	1416	452	664	300
Forms returned, n (%)	374 (26)	110 (24)	151 (23)	113 (38)
Age in years: mean (SD; range)	39 (12; 18–62)	41 (13; 20–62)	39 (12; 18–61)	38 (12; 20–60)
Gender[a]				
Female, n (%)	316 (85)	88 (80)	125 (83)	103 (91)
Male, n (%)	50 (13)	20 (18)	21 (14)	9 (8)
Missing, n (%)	8 (2)	2 (2)	5 (3)	1 (1)
Specialty[a]				
Medicine, n (%)	114 (30)	25 (23)	59 (39)	30 (26)
Surgery, n (%)	146 (39)	40 (36)	50 (33)	56 (50)
Critical care,[b] n (%)	97 (26)	38 (35)	39 (26)	20 (18)
Missing, n (%)	17 (5)	7 (6)	3 (2)	7 (6)
Qualifications[a]				
Diploma in nursing, n (%)	200 (53)	63 (57)	72 (48)	65 (57)
Specialist qualification, n (%)	124 (33)	36 (33)	54 (36)	34 (30)
Academic degree, n (%)	37 (10)	8 (7)	19 (12)	10 (9)
Missing, n (%)	13 (4)	3 (23)	6 (4)	4 (4)
Experience[a]				
<2 years, n (%)	49 (13)	18 (16)	20 (13)	11 (10)
2–5 years, n (%)	45 (12)	12 (11)	17 (11)	16 (14)
6–10 years, n (%)	38 (10)	5 (5)	18 (12)	15 (13)
>10 years, n (%)	240 (64)	75 (68)	95 (63)	70 (62)
Missing, n (%)	2 (0.5)	0 (0)	1 (1)	1 (1)

SD: standard deviation.
[a]Percentages are calculated for the respective total number of returned questionnaires.
[b]Nurses working in ICU/HDU settings, theatres, recovery and accident and emergency (A&E) departments.

Where appropriate, chi-square tests were employed to examine whether depending on the case scenario shown (a) the responses to the two case statements were different and (b) the proportion of missing responses to the general statements about opioids and the value statements differed.

Finally, to identify predictors for the responses to each case statement (dependent variables) two multinomial logistic regression models were employed as follows:

In model A ('opioids') 'age', 'gender', 'specialty', 'qualifications', 'experience' and 'case scenario' were independent variables alongside the seven general statements about opioids. Model B ('personal values') was identical to model A except that here instead of the opioid statements the 10-value statements were included in the analysis.

The values of p were not corrected for multiple comparisons throughout the study. However, p-values < 0.05 were taken as indication for a possible significant effect.

Results

Out of the 1416 originally distributed questionnaires, 374 (26%) were returned and analysed (Table 1).

Characteristics of participants were similar between hospitals. Most were female (n = 316; 85%), worked on surgical wards (n = 146; 39%) and had more than 10 years experience (n = 240; 64%). Interestingly, n = 37 (10%) had an academic degree, which was an unusually high rate for nurses working in German hospitals.[16]

Distribution of responses

The reliability of the questionnaire was assessed with Cronbach's α. This was 0.69 for the overall questionnaire, 0.65 for the statements concerning opioids (items A1–A7) and 0.71 for the statements about personal values (items V1–V10).

A correlation analysis (Kendall's τ) between the two case statements C1 and C2 revealed a moderate but significant association ($\tau = 0.41$; $p < 0.0001$) indicating both were testing different latent variables.

The response patterns to case statements 1 and 2 (items C1 and C2) were both dependent on the case the nurses were presented with (Figure 1). Statistically more participants agreed (78%) with the statement that they would be concerned about giving opioids (statement C1) in the intoxicated compared to the non-intoxicated patient (49% agreement; $p < 0.0001$).
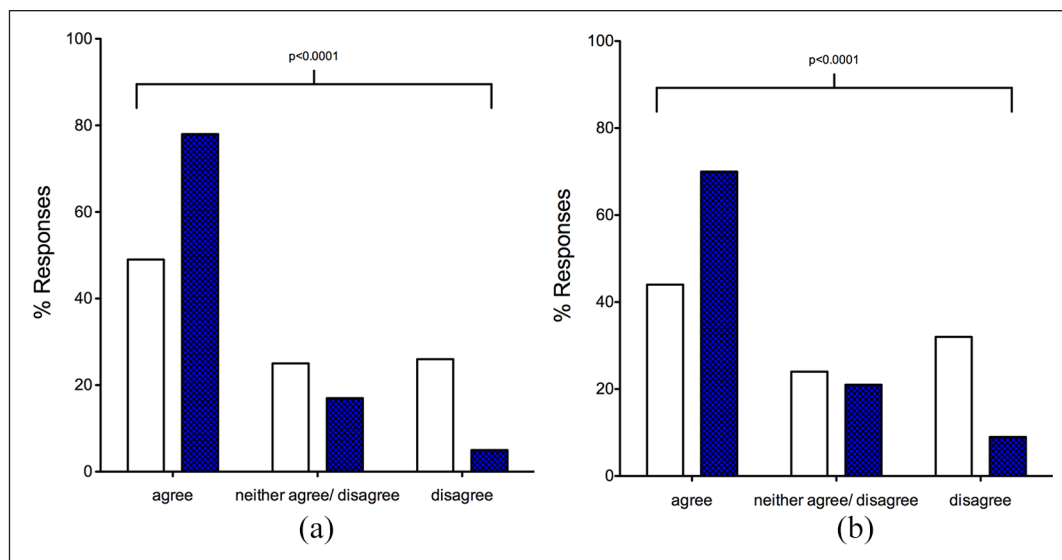
Figure 1. Nurses' response patterns to case statements 1 and 2. The figure depicts the frequency distributions for nurses' responses to case statements 1 ('I would be concerned about giving opioids'; panel a) and 2 ('To treat pain, I would prefer a non-opioid over an opioid'; panel b) depending on the case scenario they were presented with.
Nurses' response patterns for the non-intoxicated patients were significantly different for both case statements compared to the intoxicated patient (chi-square test).
White bars: non-intoxicated patients; blue hatched bars: intoxicated patients.

Also, in the intoxicated patient 70% nurses would prefer giving a non-opioid over an opioid compared to 44% in the non-intoxicated patient ($p < 0.0001$).

Table 2 shows the frequency distribution of responses to the general statements about opioids (items A1–A7) and the statements about personal values (items V1–V10) for the two case scenarios, respectively. Significantly ($p < 0.0001$; chi-square test) more data were missing for the value statements in the questionnaires containing case scenario 2 (intoxicated patient, 6.4% missing) compared to scenario 1 (2.1% missing). For the opioid statements, the proportion of missing data was similar between vignettes (scenario 1: 1.9% missing data; scenario 2: 2.5%; $p = 0.319$).

Independent of the case scenario shown, Table 2 further indicates that the majority of nurses agreed familiarity with an opioid gives them more confidence when administering it (86% overall; item A2) and that they are more concerned about patients with a history of drug abuse (74% overall; item A5). However, most participants disagreed that they associate giving opioids with helping patients to die (89% overall; item A6) and that they associate opioids with drug abuse (82% overall; item A7).

Finally, Table 2 also shows general trends regarding nurses' personal values that were independent of the case scenario presented. For instance, most nurses (68% and 90% overall, respectively) disagreed with the values statements V1 ('It is important to me to be rich. I want to have a lot of money and

expensive things') and V8 ('I look for adventures and like to take risks. I want to have an exciting life'). However, a majority agreed with items V2 ('I think it is important that every person in the world should be treated equally. I believe everyone should have equal opportunities in life'; 83% overall agreement), V4 ('Having a good time is important to me. I like to 'spoil' myself'; 62% overall agreement) and V6 ('It's very important to me to help the people around me. I want to care for their well-being'; 78% overall agreement).

Regression models

The two regression models generated for case statements 1 and 2, respectively, explained a considerable amount of variability of responses. For case statement 1 (concerns about opioids) model A ('opioids') explained 37% variability whereas model B ('values') explained 30%. Similar results were obtained for statement 2 (preference to use a non-opioid). Here, model A explained 33% variability and model B 29%, respectively.

Interestingly, the case scenarios when included into model A did not predict responses to either case statement 1 or 2 (Tables 3 and 4). However, this was different when the scenarios were included into the value model (model B). Here, the vignettes significantly explained answers to both case statements. Furthermore, responses to case statement 1 could not be explained

Table 2. Frequency distribution of nurses' responses to opioid and values statements.

(A) General statements about opioids	Case 1: non-intoxicated patient (n = 185)				Case 2: intoxicated patient (n = 189)			
	Agree n (%)	Neither agree/disagree n (%)	Disagree n (%)	Missing n (%)	Agree n (%)	Neither agree/disagree n (%)	Disagree n (%)	Missing n (%)
A1. More knowledge about opioids (e.g. morphine) compared to other medications (e.g. blood pressure medications or insulin) is required in order to give them safely.	90 (48)	38 (21)	55 (30)	2 (1)	121 (64)	40 (21)	22 (12)	6 (3)
A2. Familiarity with an opioid (e.g. morphine) gives me more confidence when administering this opioid.	167 (90)	10 (5)	5 (3)	3 (2)	154 (81)	25 (13)	5 (3)	5 (3)
A3. When giving opioids (e.g. morphine) I need to monitor patients more closely in comparison to giving other medications (e.g. blood pressure medications or insulin).	70 (38)	63 (34)	48 (26)	4 (2)	88 (47)	64 (34)	33 (17)	4 (2)
A4. When giving opioids (e.g. morphine) I am constantly aware of side effects.	93 (50)	44 (24)	44 (24)	4 (2)	107 (57)	50 (26)	30 (16)	2 (1)
A5. When administering opioids (e.g. morphine) I am more concerned about patients with a history of drug abuse (IVDU).	131 (70)	24 (13)	27 (15)	3 (2)	147 (78)	27 (14)	11 (6)	4 (2)
A6. I associate giving opioids (e.g. morphine) with helping patients to die.	0 (0)	6 (3)	175 (95)	4 (2)	6 (3)	20 (11)	159 (84)	4 (2)
A7. I associate opioids (e.g. morphine) with drug abuse.	4 (2)	16 (9)	161 (87)	4 (2)	12 (6)	25 (13)	144 (76)	8 (4)

(B) Statements about personal values	Agree n (%)	Neither agree/disagree n (%)	Disagree n (%)	Missing n (%)	Agree n (%)	Neither agree/disagree n (%)	Disagree n (%)	Missing n (%)
Self-Enhancement								
V1. It is important to me to be rich. I want to have a lot of money and expensive things (*power*)	21 (11)	24 (13)	134 (73)	6 (3)	13 (7)	37 (19)	121 (64)	18 (10)
V7. Being very successful is important to me. I hope people will recognize my achievements (*achievement*)	84 (45)	67 (36)	31 (17)	3 (2)	74 (39)	71 (38)	31 (16)	13 (7)
Self-Transcendence								
V2. I think it is important that every person in the world should be treated equally. I believe everyone should have equal opportunities in life (*universalism*)	158 (85)	20 (11)	4 (2)	3 (2)	152 (80)	21 (11)	3 (2)	13 (7)
V6. It's very important to me to help the people around me. I want to care for their well-being (*benevolence*)	147 (79)	32 (17)	3 (2)	3 (2)	146 (77)	32 (17)	1 (1)	10 (5)
Conservation								
V3. It is important to me to live in secure surroundings. I avoid anything that might endanger my safety (*security*)	94 (51)	68 (37)	19 (10)	4 (2)	111 (59)	55 (29)	13 (7)	10 (5)
V9. It is important to me always to behave properly. I want to avoid doing anything people would say is wrong (*conformity*)	74 (40)	66 (36)	42 (22)	3 (2)	75 (40)	63 (33)	36 (19)	15 (8)
V10. Tradition is important to me. I try to follow the customs handed down by my religion or my family (*tradition*)	70 (38)	56 (30)	54 (29)	5 (3)	56 (30)	76 (40)	40 (21)	17 (9)
Openness to Change								
V4. Having a good time is important to me. I like to 'spoil' myself (*hedonism*)	129 (70)	40 (22)	10 (5)	6 (3)	104 (55)	61 (32)	9 (5)	15 (8)
V5. It is important to me to make my own decisions about what I do. I like to be free and not depend on others (*self-direction*)	156 (84)	23 (12)	5 (3)	1 (1)	150 (79)	32 (17)	1 (1)	6 (3)
V8. I look for adventures and like to take risks. I want to have an exciting life (*stimulation*)	0 (0)	6 (3)	175 (95)	4 (2)	6 (3)	20 (11)	159 (84)	4 (2)

IVDU: intravenous drug user.
Responses to general statements about opioids (A), and basic personal values (B) in the two cohorts exposed to either case scenario 1 (non-intoxicated patient) or case scenario 2 (intoxicated patient). Statements testing basic values are ordered according to overreaching themes as suggested by Schwartz.[15] Basic values are given in brackets behind the statement testing it.

Table 3. Results of two logistic regression models for nurses' responses to case statement 1 ('I would be concerned about giving opioids').

Model A: 'opioids'	Neither agree/disagree			Agree		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	0.99	0.94–1.04	0.687	1.00	0.95–1.06	0.901
Gender (male)	1.07	0.33–3.49	0.915	0.52	0.18–1.50	0.228
Speciality (surgery)						
Critical care	0.59	0.19–1.83	0.363	0.52	0.18–1.50	0.224
Medicine	0.91	0.31–2.73	0.871	1.14	0.42–3.13	0.797
Qualifications (specialist qualification)						
Academic degree	0.48	0.12–1.91	0.300	0.49	0.14–1.69	0.256
Diploma	1.48	0.49–4.47	0.483	0.72	0.26–1.99	0.520
Experience	1.34	0.73–2.45	0.340	1.20	0.69–2.08	0.516
Case scenario (intoxicated patient)	25.0	0.3–2196	0.159	0.934	0.01–84.4	0.976
Statements						
1. More knowledge about opioids (e.g. morphine) compared to other medications (e.g. blood pressure medications or insulin) is required in order to give them safely.	4.01	1.21–13.0	**0.020**	5.27	1.68–16.6	**0.004**
2. Familiarity with an opioid (e.g. morphine) gives me more confidence when administering this opioid.	1.83	0.62–5.38	0.274	1.67	0.59–4.75	0.334
3. When giving opioids (e.g. morphine) I need to monitor patients more closely in comparison to giving other medications (e.g. blood pressure medications or insulin).	0.82	0.54–1.24	0.342	0.83	0.57–1.21	0.343
4. When giving opioids (e.g. morphine) I am constantly aware of side effects.	1.37	0.93–2.03	0.113	1.25	0.87–1.78	0.222
5. When administering opioids (e.g. morphine) I am more concerned about patients with a history of drug Abuse (IVDU).	0.90	0.61–1.33	0.601	1.64	1.12–2.40	**0.011**
6. I associate giving opioids (e.g. morphine) with helping patients to die.	2.98	0.86–10.4	0.086	2.36	0.70–8.03	0.168
7. I associate opioids (e.g. morphine) with drug abuse.	1.36	0.60–3.06	0.460	1.33	0.61–2.89	0.741
Case scenario (intoxicated patient) × statement A1	0.30	0.09–1.02	0.053	0.20	0.06–0.65	**0.007**
Case scenario (intoxicated patient) × statement A2	0.41	0.12–1.42	0.159	1.07	0.31–3.68	0.917

Model B: 'personal values'	Neither agree/disagree			Agree		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	0.99	0.93–1.05	0.649	0.98	0.92–1.04	0.448
Gender (male)	1.72	0.51–5.78	0.377	0.85	0.30–2.38	0.757
Speciality (surgery)						
Critical care	0.93	0.32–2.71	0.893	0.68	0.25–1.82	0.437
Medicine	1.50	0.50–4.53	0.470	1.98	0.725–5.48	0.187
Qualifications (specialist qualification)						
Academic degree	0.35	0.07–1.63	0.180	0.41	0.11–1.56	0.191
Diploma	1.20	0.39–3.67	0.752	0.78	0.28–2.19	0.633
Experience	1.24	0.65–2.38	0.517	1.14	0.62–2.08	0.676
Case scenario (intoxicated patient)	0.82	0.12–5.57	0.838	0.09	0.02–0.53	**0.007**
Statements						
Self-Enhancement						
V1. *Power*: It is important to me to be rich. I want to have a lot of money and expensive things.	1.00	0.62–1.60	0.982	1.16	0.76–1.77	0.503
V7. *Achievement*: Being very successful is important to me. I hope people will recognize my achievements.	0.68	0.38–1.24	0.206	0.55	0.32–0.96	**0.036**

(Continued)

Table 3. (Continued)

Model B: 'personal values'	Neither agree/disagree			Agree		
	OR	95% CI	p-value	OR	95% CI	p-value
Self-Transcendence						
V2. *Universalism*: I think it is important that every person in the world should be treated equally. I believe everyone should have equal opportunities in life.	0.88	0.52–1.49	0.625	1.05	0.64–1.72	0.849
V6. *Benevolence*: It's very important to me to help the people around me. I want to care for their well-being.	1.13	0.61–2.09	0.690	0.91	0.52–1.60	0.752
Conservation						
V3. *Security*: It is important to me to live in secure surroundings. I avoid anything that might endanger my safety.	1.00	0.60–1.65	0.995	1.07	0.67–1.71	0.766
V9. *Conformity*: It is important to me always to behave properly. I want to avoid doing anything people would say is wrong.	1.24	0.78–1.97	0.355	1.57	1.02–2.42	**0.040**
V10. *Tradition*: Tradition is important to me. I try to follow the customs handed down by my religion or my family.	1.22	0.78–1.92	0.390	1.21	0.80–1.83	0.364
Openness to Change						
V4. *Hedonism*: Having a good time is important to me. I like to 'spoil' myself.	1.27	0.69–2.34	0.444	1.00	0.57–1.73	0.984
V5. *Self-direction*: It is important to me to make my own decisions about what I do. I like to be free and not depend on others.	1.32	0.68–2.54	0.414	0.87	0.48–1.55	0.625
V8. *Stimulation*: I look for adventures and like to take risks. I want to have an exciting life.	3.56	0.88–14.4	0.075	2.25	0.59–8.56	0.233
Case scenario (intoxicated patient) × value statement 8	0.26	0.06–1.14	0.074	0.63	0.15–2.57	0.518

OR: odds ratio; CI: confidence interval; IVDU: intravenous drug user.
Regression model A included participants' demographical data and responses to seven opioid-related statements. Model B was identical to model A except that the opioid statements were replaced with ten value statements. For analysis the original 5-point Likert-type-scale responses were first pooled into a 3-point scale with the initial 'strongly disagree' and 'disagree' responses combined into one 'disagree' category and the 'strongly agree' and 'agree' responses into one 'agree' category. The pooled 'disagree' responses then served as references in the regression analysis. For those demographical items that comprised sub-variables and for the case scenario the reference sub-variable is shown in brackets where appropriate. To allow easier orientation, p-values < 0.05 are shown in bold. The values of p were not corrected for multiple comparisons.
The value statements are ordered according to overreaching themes as suggested by Schwartz.[15]

by participant demographics regardless of the model employed (Table 3). Yet, the demographical variable 'specialty' predicted answers to statement 2 (preference to use a non-opioid) in both models (Table 4). This possibly indicates fewer nurse concerns with regards to opioid administration when they are frequently using them.

Tables 3 and 4 further show responses to both case statements were significantly predicted by the opioid-related items A1 ('More knowledge about opioids (e.g. morphine) compared to other medications (e.g. blood pressure medications or insulin) is required in order to give them safely') and A5 ('when administering opioids I am more concerned about patients with a history of drug abuse'). The finding of item A1 having predictive value was not surprising as more

participants agreed with this statement in the intoxicated (64%) compared to the non-intoxicated (48%) patient (Table 2). It is also supported by the identification of the interaction term 'case scenario × statement A1' as predictor for responses to both case statements (Tables 3 and 4).

While no further opioid-related item predicted responses to case statement 1 (concerns about opioids), item A6 ('I associate giving opioids with helping patients to die') was found to be predictive for case statement 2 (preference to use a non-opioid; Table 4).

Personal values were only identified as predictors for responses to case statement 1 (concerns about opioids) but not for case statement 2 (preference to use a non-opioid). Item V7 representing 'achievement' and item V9 representing 'conformity' significantly explained

Table 4. Results of two logistic regression models for nurses' responses to case statement 2 ('To treat pain, I would prefer a non-opioid over an opioid').

Model A: 'opioids'	Neither agree/disagree			Agree		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	1.00	0.95–1.05	0.943	0.99	0.95–1.04	0.699
Gender (male)	1.11	0.43–2.90	0.825	1.62	0.64–4.12	0.308
Speciality (surgery)						
Critical care	0.30	0.11–0.82	**0.019**	0.48	0.19–1.25	0.132
Medicine	0.72	0.27–1.91	0.509	1.42	0.57–3.52	0.451
Qualifications (specialist qualification)						
Academic degree	0.38	0.11–1.36	0.137	0.43	0.13–1.38	0.156
Diploma	0.79	0.30–2.04	0.620	1.07	0.45–2.56	0.886
Experience	0.90	0.52–1.55	0.707	1.22	0.73–2.02	0.449
Case scenario (intoxicated patient)	1.64	0.29–9.24	0.578	2.42	0.49–11.9	0.279
Statements						
1. More knowledge about opioids (e.g. morphine) compared to other medications (e.g. blood pressure medications or insulin) is required in order to give them safely.	2.28	1.13–4.59	**0.022**	2.97	1.52–5.79	**0.001**
2. Familiarity with an opioid (e.g. morphine) gives me more confidence when administering this opioid.	0.91	0.54–1.53	0.715	0.84	0.52–1.37	0.492
3. When giving opioids (e.g. morphine) I need to monitor patients more closely in comparison to giving other medications (e.g. blood pressure medications or insulin).	1.19	0.82–1.72	0.354	1.08	0.77–1.51	0.668
4. When giving opioids (e.g. morphine) I am constantly aware of side effects.	1.00	0.70–1.42	0.983	1.08	0.78–1.50	0.640
5. When administering opioids (e.g. morphine) I am more concerned about patients with a history of drug abuse (IVDU).	1.03	0.73–1.47	0.851	1.53	1.09–2.15	**0.014**
6. I associate giving opioids (e.g. morphine) with helping patients to die.	3.93	1.37–11.3	**0.011**	2.89	1.05–7.97	**0.041**
7. I associate opioids (e.g. morphine) with drug abuse.	0.78	0.40–1.55	0.481	0.91	0.49–1.70	0.775
Case scenario (intoxicated patient) × statement A1	0.47	0.22–1.02	0.055	0.32	0.15–0.66	**0.002**

Model B: 'personal values'	Neither agree/disagree			Agree		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	1.01	0.95–1.07	0.767	0.98	0.93–1.03	0.412
Gender (male)	1.05	0.40–2.81	0.918	1.58	0.62–4.02	0.335
Speciality (surgery)						
Critical care	0.35	0.13–0.96	**0.04**	0.39	0.15–1.01	0.051
Medicine	0.60	0.21–1.71	0.335	1.08	0.41–2.80	0.878
Qualifications (specialist qualification)						
Academic degree	0.29	0.07–1.23	0.094	0.53	0.16–1.71	0.286
Diploma	0.92	0.33–2.54	0.865	1.96	0.77–4.99	0.158
Experience	0.74	0.40–1.38	0.347	1.18	0.67–2.08	0.575
Case scenario (intoxicated patient)	0.23	0.09–0.60	**0.003**	0.17	0.07–0.41	**0.000**
Statements						
Self-Enhancement						
V1. *Power*: It is important to me to be rich. I want to have a lot of money and expensive things.	1.05	0.69–1.61	0.806	1.03	0.70–1.53	0.870
V7. *Achievement*: Being very successful is important to me. I hope people will recognize my achievements.	1.06	0.61–1.83	0.837	0.83	0.51–1.36	0.462

(Continued)

Table 4. (Continued)

Model B: 'personal values'	Neither agree/disagree			Agree		
	OR	95% CI	p-value	OR	95% CI	p-value
Self-Transcendence						
V2. *Universalism*: I think it is important that every person in the world should be treated equally. I believe everyone should have equal opportunities in life.	0.90	0.54–1.50	0.687	0.83	0.52–1.33	0.436
V6. *Benevolence*: It's very important to me to help the people around me. I want to care for their well-being.	1.66	0.92–2.99	0.092	1.47	0.88–2.48	0.145
Conservation						
V3. *Security*: It is important to me to live in secure surroundings. I avoid anything that might endanger my safety.	0.93	0.58–1.50	0.768	1.15	0.74–1.78	0.534
V9. *Conformity*: It is important to me always to behave properly. I want to avoid doing anything people would say is wrong.	0.89	0.57–1.39	0.606	1.12	0.75–1.68	0.579
V10. *Tradition*: Tradition is important to me. I try to follow the customs handed down by my religion or my family.	1.11	0.72–1.72	0.643	0.85	0.57–1.26	0.414
Openness to Change						
V4. *Hedonism*: Having a good time is important to me. I like to 'spoil' myself.	0.92	0.52–1.64	0.775	0.73	0.43–1.25	0.255
V5. *Self-direction*: It is important to me to make my own decisions about what I do. I like to be free and not depend on others.	1.04	0.57–1.88	0.910	1.21	0.71–2.06	0.490
V8. *Stimulation*: I look for adventures and like to take risks. I want to have an exciting life.	0.88	0.54–1.46	0.630	0.79	0.50–1.25	0.316

OR: odds ratio; CI: confidence interval; IVDU: intravenous drug user.
Regression model A included participants' demographical data and responses to seven opioid-related statements. Model B was identical to model A except that the opioid statements were replaced with 10-value statements. For analysis, the original 5-point Likert-type-scale responses were first pooled into a 3-point scale with the initial 'strongly disagree' and 'disagree' responses combined into one 'disagree' category and the 'strongly agree' and 'agree' responses into one 'agree' category. The pooled 'disagree' responses then served as references in the regression analysis. For those demographical items that comprised sub-variables and for the case scenario the reference sub-variable is shown in brackets where appropriate. To allow easier orientation, p-values < 0.05 are shown in bold. The values of p were not corrected for multiple comparisons.
The value statements are ordered according to overreaching themes as suggested by Schwartz.[15]

responses to case statement 1 whereas a trend was also seen for statement V8 representing 'stimulation' and the interaction term 'case scenario × statement V8' to predict this statement (Table 3). In addition, there was also a trend for item V6 ('benevolence') to predict case statement 2 (Table 4).

Discussion

This study provides evidence that patient attributes such as presenting intoxicated and personal values influence nurses' mental models about opioid administration. For instance, nurses were more hesitant to use opioids for the management of pain when a patient appeared intoxicated. This attitude was predicted by value statements reflecting Self-Enhancement and Conservation.

Case scenarios and patient attributes

There is some evidence to suggest acute drug or alcohol intoxications can impose barriers to patient care in general.[17] However, whether this also translates to clinical situations where opioids are additionally required to treat pain remains to be established. Ideally, field studies should be conducted to obtain the necessary information. However, these are difficult to perform due to a plethora of potentially confounding variables in the clinical environment. In addition, field studies are prone to bias. To overcome this obstacle studies involving the use of case vignettes have often been advocated instead. Although case vignettes are somewhat artificial they offer nevertheless the advantage of better control over the research context and are less time and resource consuming.[18]

Here, we constructed two cases presenting a young man in pain after a road traffic accident. They were identical except that in one scenario the victim was under the influence of alcohol and possibly illicit drugs (scenario 2). Our results showed nurses' mental models about their inclination to treat a patient with opioids depended on patient's attributes. Specifically, nurses were found to be more uncomfortable using opioids when the patient presented intoxicated.

Concerns about the co-administration of opioids and alcohol are based on the notion of harmful drug interactions potentially exposing patients to a greater risk for instance of respiratory depression. They are inferred from the side-effect profile of each compound which includes sedation and impairment of motor function. Articles hence caution readers about possible additive actions of both drugs.[19] However, studies investigating alcohol–opioid interactions are surprisingly scarce. Results of both animal and human studies nevertheless suggest mild-to-moderate alcohol intake does not increase the risk of opioid-induced respiratory depression.[20,21] Therefore, an overly cautious approach to pain management in acutely alcohol-intoxicated patients is likely not justified, especially not in clinical areas where frequent observations and monitoring of vital signs are possible.

What remains unclear, however, is whether nurses expressed their concerns about opioids in the intoxicated patient indeed because they were worried about the potential harmful interactions of alcohol and opioids or whether their concerns were in fact part of discriminatory behaviour towards intoxicated patients. The latter notion is based on findings from stigma research indicating healthcare professionals display negative attitudes towards drug users.[22] In addition, it has been shown that patients whose conditions were thought to be self-inflicted receive poorer care and less empathy from nurses.[23] Nevertheless, the precise reasons for nurses' hesitation to administer opioids to intoxicated patients need to be determined in future research.

Personal values

Each individual's behaviour and decisions relies on certain basic beliefs or values about what is good (moral) and desirable.[12,24] The development of these personal values is influenced by cultural upbringing, education and experience in life.[25] Personal values might hence be viewed as a private affair, which some might find hard to share. The idea of personal values as something intimate is supported here as significantly more nurses found it difficult to respond to the value statements when they were presented in the context of substance abuse. This is even more remarkable considering

responders remained completely anonymous to us. It might, therefore, indicate that nurses became acutely aware of a conflict between their personal and professional values which they were possibly unable to solve at that moment.[11] In addition, people from the same group or society might share some values. This was evident here as well. Regardless of which case scenario nurses were exposed to, a high proportion showed similar responses about value statements that represented 'Self-Transcendence' (universalism (V2) and benevolence (V6)) and 'Openness to Change' (self-direction (V5) and stimulation (V8)). Interestingly, while they agreed on equal opportunities (universalism), well-being of people (benevolence) and that they wanted to make their own decisions (self-direction), they were conservative in the way that they did not like to take risks (stimulation). Thus, the values of nurses in our cohort were very similar to those Moyo et al.[12] described in their recent review.

In this study, case scenarios became predictors only in those statistical models which employed value rather than opioid statements as independent variables. Results therefore suggest personal values influence nurses' attitudes towards opioids and more remarkably towards intoxicated patients. The latter is especially important as patients with drug dependence are generally viewed as challenging or even problematic.[23,26] The reluctance to engage with this group might therefore be based on deep seated mental models that might even resist professional education and codes of conduct.[11] At least partially these mental models might be labelled as 'stigmatizing'. Stigma is a social phenomenon that has been thought as process exercised by a majority to exclude smaller groups and to coerce conformity. Its aim is hence to protect and preserve existing social structures.[27] The likely presence of stigmatizing mental models in our cohort was supported by the finding of 'Conservation' (conformity (V9)) as predictor of concerns about the use of opioids in intoxicated patients. It is in agreement with results by Skinner et al.[24] showing that Conservation values are associated with negative emotions towards patients who abuse alcohol or heroin. Interestingly, however, those agreeing personal success was important to them ('Self-Enhancement' – achievement, V7) were less likely to be concerned about giving opioids to the intoxicated patient. Therefore, a certain degree of personal ambition might help protect nurses from discriminatory thoughts and behaviour.

Finally, as value statements only predicted responses to case statement 1 ('concerns about opioids') but not to the statement about therapeutic preferences (case statement 2) might either suggest mental models do not necessarily translate into practice or in a more practical sense an awareness of the lack of clinical alternatives to opioids. Nevertheless, the precise reasons for this

differential response needs to be addressed in future research.

Opioids

About three-quarters of participating nurses agreed they would be concerned about using opioids (case statement 1) in intoxicated patients and that they would rather prefer giving non-opioids (case statement 2). This highlights a cautious attitude and a certain unease of nurses with these medications. These findings are in agreement with previous research suggesting worries over safety often prevent sufficient opioid administration even in the non-intoxicated patient.[28] The reticence regarding opioid use however is not exclusive to nurses. It has been demonstrated for physicians in the community and for anaesthetists as well.[29,30]

The idea that nurses worry over patient safety and are hence reluctant to use opioids is further supported here by a high proportion of participants expressing concerns when administering opioids to patients with a history of drug abuse (opioid statement 5). In addition, those who were worried about giving opioids to these patients were also significantly more likely to express concerns about opioid use in our case scenarios (case statement 1) and would rather avoid them altogether (case statement 2).

However, the bias against opioids is now thought to be obsolete and even problematic. An overly cautious approach to pain management in the acutely intoxicated patient might not only expose those patients to unnecessary suffering it possibly also produces a disproportionately high opioid demand that subsequently puts patients at greater risk to experience adverse drug events.[31] Under-treatment of pain has further been suggested to trigger relapse of addiction or exacerbate it. The American Society for Pain Management Nursing hence recommends that the quality of assessment and treatment of patients with an addiction should be the same as for any other patient.[32] Yet, as only about half of our cohort agreed that when giving opioids they would need to monitor patients more closely (opioid statement 3) and that they would be constantly aware of drug-induced side effects (opioid statement 4) challenges the idea safety concerns are the sole reason for the observed reluctance in opioid use. Instead, it might highlight a lack of knowledge and training of nurses regarding opioids and the care for intoxicated patients. In accordance with previous research this notion is supported here by the majority of participants agreeing more knowledge is required in order to give opioids safely (opioid statement 1) and that familiarity with an opioid made them more confident when using it (opioid statement 2).[8] It is additionally supported by the results of the regression

analyses. Those participants that agreed with opioid statement 1 (more knowledge required) were 4 to 5 as well as 2 to 3 times more likely to agree with case statements 1 ('concerns about opioids') and 2 ('prefer non-opioids'), respectively. Furthermore, the interaction term 'case scenario × opioid statement 1' also suggests nurses' anxieties about opioids become more important when patients are intoxicated.

The lack of confidence of nurses when caring for patients with drug problems is in agreement with a recent study by Warren et al.[17] which indicated nurses needed more training to improve care in patients with alcohol intoxication.

In addition to the employment of biased mental models that are indicative of further educational needs of nurses regarding opioids and patients with drug problems, our data also suggest other factors might also influence nurses' decisions. This notion is based on the results of the regression analyses identifying personal values as predictors for responses to case statement 1 ('I would be concerned giving opioids') and showing that those who viewed opioids as means to help patients die (opioid statement A6) were 3–4 times more likely to prefer non-opioids over opioids in our case scenarios. Our findings are hence in agreement with McCaffery et al.[28] who showed that personal opinions played a critical role in pain assessment and treatment by nurses.

Study limitations

One considerable limitation of this study was the low response rate in all three hospitals. As this has been observed in other studies as well, ours is no exception.[26] Because trends in responses were nevertheless very clear, we do not believe more participation would have changed our results considerably. Moreover, as discussed, some nurses might have been deterred by the intimate nature of the value statements. This is supported by the three times higher proportion of missing responses to the value statements in case scenario 2 (intoxicated patient) and constitutes an interesting finding in its own right.

Furthermore, accurately representing the population in northern Germany, nurses were predominantly from a White Christian background.[33] Cohorts from different or more mixed backgrounds might have yielded different results and future research needs to address this. However, the purpose here was to evaluate if personal values might influence clinical practice in general which was achieved. A grading of values according to their impact on clinical practice was beyond the scope of this study.

Finally, the design of our vignettes could have been emotionally more challenging. We could have for instance included descriptions about patient's looks or

smells. This might have biased participants towards more polarized responses. However, it would have also introduced another variable (patient appearance) in addition to intoxication and might have complicated interpretation of our results. Nevertheless, mental models including bias, stigmata and values around patients with substance use or abuse in the context of pain management with opioids are complex. In the future, more studies are therefore needed to address this intricate relationship.

Conclusion

A considerable proportion of nurses in this study shared similar opinions regarding opioids and displayed common personal values. Nurses were also more concerned giving opioids to intoxicated patients and preferred to administer non-opioids in this patient group. Concerns about opioids were predicted by personal values representing 'Conservation' (conformity) and 'Self-Enhancement' (achievement). This indicates stigmatizing mental models might influence nurses' decision making in management of acute pain. Conversely, a high degree of personal ambition might help protect nurses from discriminatory thoughts and behaviour. However, more research is needed to investigate the complex interaction of different personal values on nurses' decisions and clinical practice.

Author contributions

A.H., V.P., C.J., F.W. and C.B. designed the study, analysed the data and wrote the manuscript. C.G. analysed the data and wrote the manuscript.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical approval

Ethical approval for this study was obtained from Ethics Committee (Medizinische Ethik-Kommission) of Carl von Ossietzky University Oldenburg (013/2015).

Guarantor

C.B. is the guarantor of this article.

Informed consent

Informed consent was not sought for this study because it would have breached anonymity of responders. Returning questionnaires was deemed as consent to participate in the study.

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Supplemental material

Supplemental material for this article is available online.

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