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Health Care Students' Attitudes and Self-Assessment of Knowledge Regarding Seasonal Influenza Vaccination

Metropolia
University of Applied Sciences

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As of 1st of March 2018, all health care providers in Finland working with high risk patients became legally bound to get vaccinated against influenza to improve patient safety. Influenza is highly contagious disease and poses a significant risk for people in risk groups. Previously conducted studies indicate that the seasonal influenza vaccination compliance rates and the intention to get vaccinated among health care students are generally low. Decision-making is more influenced by personal experiences and beliefs, rather than evidence-based knowledge.

The aim of this thesis is to outline HC students' attitudes towards seasonal influenza vaccine, what are the factors influencing the attitudes, and how HC students self-evaluate their knowledge regarding the seasonal influenza vaccine. A representative cross-sectional quantitative study was conducted at Metropolia University of Applied Sciences, in Helsinki, Finland. A questionnaire was sent to 1802 health care students. 13% (n=229) of HCS' responses were analyzed. The acquired data were analyzed using SPSS and inductive content analysis.

60% of the respondents (n=137) felt positively or very positively towards seasonal influenza vaccination. Attitudes were influenced by work environment and education, rather than social media or family members' opinions. Half of the respondents assessed their level of knowledge regarding both benefits and adverse effects to be at least good. Some variables (self-assessment and attitudes) differed between HC implementations. HCS' vaccination coverage was 80%.

Mandatory vaccination can increase vaccination coverage; however, it may exacerbate attitudes towards the vaccination among HC students. Reasons for why implementations differ in rating their own knowledge, and if some implementations would benefit from further education need further investigation.

Keywords	Seasonal influenza, seasonal influenza vaccination, health care students, attitudes, self-assessment, Communicable Diseases Act §48.

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Maaliskuun 1. 2018 alkaen kaikki terveydenhuoltoalan ammattilaiset, jotka työskentelevät riskiryhmiin kuuluvien potilaiden kanssa, ovat Suomessa lain mukaan velvoitettuja ottamaan rokote kausi-influenssaa vastaan potilasturvallisuuden edistämiseksi. Influenssa on herkästi tarttuva tauti, joka aiheuttaa huomattavaa vaaraa riskiryhmään kuuluville henkilöille. Aiemmin tehdyt tutkimukset osoittavat, että terveydenhuoltoalan opiskelijoiden rokotuskattavuus ja aikomus ottaa rokote ovat yleisesti alhaisia. Päätöksentekoon vaikuttaa enemmän henkilökohtaiset kokemukset ja uskomukset, kuin näyttöön perustuva tieto.

Tämän opinnäytetyön tarkoituksena on kuvata terveydenhuoltoalan opiskelijoiden suhtautumista kausi-influenssarokotetta kohtaan, selvittää mitkä tekijät vaikuttavat suhtautumiseen ja millaiseksi he itsearvioivat omat tietonsa kausi-influenssa rokotteesta. Kuvaileva määrällinen poikittaistutkimus tehtiin Metropolia- ammattikorkeakoulussa Helsingissä. Kyselylomake lähetettiin 1802 terveydenhuoltoalan opiskelijalle. Kyselyn vastausprosentti oli 13% (n=229). Kerätty aineisto analysoitiin SPSS-ohjelmalla ja induktiivisella sisällönanalyysilla.

Vastanneista 60% (n=137) suhtautui positiivisesti tai erittäin positiivisesti kausi-influenssarokotteeseen. Asenteisiin vaikuttivat työympäristö ja koulutus enemmän kuin media tai perheenjäsenten mielipiteet. Puolet vastaajista arvioivat tietämyksensä rokotteiden hyödyistä ja haittavaikutuksista olevan vähintäänkin hyvät. Osassa muuttujista (itsearvio ja asenteet) esiintyy eroavaisuuksia terveydenhuoltoalan toteutuksien välillä. Terveydenhuoltoalan opiskelijoiden influenssarokotuskattavuus oli 80%.

Rokotusten pakollistaminen voi lisätä rokotuskattavuutta, mutta mahdollisesti pakottaminen voi myös heikentää terveydenhuoltoalan opiskelijoiden suhtautumista kausi-influenssa rokotetta kohtaan. Syitä miksi toteutuksien välillä oli eroja omien tietojen itsearvioinnissa ja hyötyisivätkö jotkut toteutukset lisäopetuksesta rokotuksiin liittyen tarvitsee vielä lisää tutkimista.

Avainsanat	Kausi-influenssa, kausi-influenssa rokote, terveydenhoito alan opiskelijat, suhtautuminen, itsearviointi ja tartuntatauti laki §48.

Contents

1 Introduction

Over the past years, the seasonal influenza has been responsible for 20-30 yearly deaths in Finland alone. (Korpi 2011). The infection poses a significant danger to those of old or very young age or with weakened immune system. The influenza vaccine was first developed in 1933 and it is nowadays recommended for all those at higher risk for severe complications and for those working in health care services. (Hannoun 2014).

On 1.3.2017, the Finnish parliament passed an additional section to the Communicable Diseases Act (later referred to as section § 48), which aims to improve patient safety. As of March 2018, all health care providers working regularly in close contact with high risk patients are legally bound to follow occupational vaccine recommendations. If a worker refuses to receive required vaccines without a valid reason, the employer can perceive the employee to be unqualified and thus has the right to suspend the worker from their position and reassign them to new duties. (Finnish Governments Decree on Communicable Diseases, 1227/2016 section §48).

The aim of this thesis is to gain insight into attitudes towards seasonal influenza vaccine by conducting a survey within health care students in of one University of Applied Science located in Helsinki, Finland. The topic is relevant as the section §48 will impact majority of health care providers.

Additionally, previous studies will be explored, and new gathered data will be analysed. The study conducted will collect data about the students' attitudes, factors influencing attitudes and perception of their own knowledge in form of a questionnaire.

2 Background

2.1 Seasonal influenza virus and vaccination

Sudden upper airways infection caused by influenza virus is referred as influenza. Influenza is the most common virus that is considered to be life-threatening. It appears seasonally, most commonly during the winter period. Approximately 5-15% of adults and 20-30% of children fall ill during the influenza epidemic. There are three main type of influenza viruses, A, B and C, where A and B usually cause the yearly influenza epidemic. Common symptoms caused by influenza virus are fever, dry cough, and soreness of throat area, pain in the muscles of body, runny nose, headaches and fatigue. Gastrointestinal issues may occur in children. Influenza symptoms usually last from 2 days, up to 2 weeks and in some cases even longer. Symptoms are similar to ones experienced with common cold, but with influenza, they are more intense, and they can result in person being hospitalized. Especially within risk groups, like long-term ill patients, cancer patients or elderly with poor immune system. (National Institute for Health and Welfare 2018a).

Influenza is a highly contagious disease, and a person contaminated by the virus can spread it before any symptoms appear. The disease spreads easily in confined spaces, like in public transportation, at school or work or other public facilities. The virus spreads as infected person coughs and sends droplets via air and surfaces that other people inhale and touch. For example, touching a contaminated door handle allows the virus to move around, and a person touching their eyes, nose, and mouth allows the virus to enter their body. (National Institute for Health and Welfare 2018a).

Vaccinating against influenza reduces the prevalence of influenza, moreover it alleviates the symptoms, and reduces death-toll and hospitalization caused by influenza. Majority of those who are vaccinated avoid getting sick with influenza. If a person gets infected even when vaccinated, the symptoms are milder, and the time spent being ill is shorter than without the vaccine. (National Institute for Health and Welfare 2018b).

Influenza vaccine has been used in healthcare since 1940 and has been developed and studied ever since (Huovinen - Ziegler 2011: 126-127). Influenza vaccine consists of cleaned and inactivated influenza viruses. In modern day, cleaned surface antigenic vaccines are being favoured over others, and these vaccines are made of virus' surface

proteins, so there are no living viruses in vaccines anymore. These influenza vaccines include in total of 3 different viruses: 2 viruses of A-type and 1 virus of B-type. These viruses are being chosen carefully by studying what type of virus does the next seasonal influenza wave have. (Leino 2007: 31-32).

Most common side effects from vaccination against influenza are local. Redness of the injection area, pain of the injection area or swelling of the injection area are the most common side-effects. (National Institute for Health and Welfare 2017). Some people might experience influenza-like symptoms. Extremely rare side-effects are muscle and/or joint pain, and neurological problems. (Leino 2007: 31-32).

2.2 Communicable Diseases Act section §48

According to Finnish Parliament, the aim of the Communicable Diseases Act is to prevent and control the spread of communicable diseases. The act was reformed in April 2017 and came into effect 1.3.2018. New section § 48 mandates that health care workers who work regularly in close contact with high risk patients will be expected to receive all occupational vaccination listings (including seasonal influenza vaccine annually). (Hakala 2014).

If a health care professional refuses without a valid reason, the employer has the responsibility to reassess whether the refused employee is qualified to continue in their position. Only those with a valid reason to not get vaccinated are allowed to continue to practice their profession with an insufficient immunization. The law as well extends to students in practical training. (Finnish Governments Decree on Communicable Diseases, 1227/2016 section § 48). The purpose of the new section is to improve patient safety as health care professionals are a highly potential source of transmission. (Hakala 2014).

3   Previous Studies

For determining current beliefs, intentions, attitudes and uptake rates towards influenza vaccination within healthcare students, a review of the literature was done. Searches were done in Cinahl, PubMed and Medic databases. Terms that were used for searches included: nurse, student, healthcare, influenza, vaccine, attitudes. Search results were limited with a timeline from 2012 to 2018 and with language being either English or Finnish. Timeline was added as a criterion, so the researched information would be up to date and reliable. For theoretical research we have chosen articles that are focused in healthcare students and influenza vaccination and were available for us after setting criteria. For an overview of all studies used in this thesis, see appendix 1.

3.1   Vaccination compliance

According to previous studies conducted, the influenza vaccination compliance rate among health care students is generally low. A study published by University of Florence (2015) examined beliefs and opinions related to influenza vaccination among both students and health care professionals in central Italy, together with the vaccination compliance rate of the responders. The study revealed that 80% out of students had not received the vaccine during the three influenza vaccination campaigns from 2007-2010 which the survey targeted. From the grand total of 2576 subjects 23% were students from the fields of medicine, nursing, health care assistance, and techniques of prevention in the environment and in the workplace- implementation. (Bonaccorsi et al 2015: 138, 149). (See appendix 1 (4), row 2).

Nurses, healthcare assistants, and students were all most likely to have never received the vaccine during the three influenza seasons. 71% out of nurses answered that they were "never vaccinated", whereas students scored 80% on the same scale. In comparison, highest compliance rate was among physicians, 35% of whom had received the vaccine in all three influenza vaccination campaigns. In total, out of all 2576 participants, 317 respondents had always received the vaccine, and 1921 had never received it. (Bonaccorsi et al 2015: 140).

Even though influenza was perceived to be a harmful disease by most of the subjects, the influenza vaccination compliance rate remained low. According to the study, those who received the vaccine more than once during the study period were more likely to

consider influenza as a serious illness. 71% of all the subjects believed in the effective-ness of the vaccination, however, those who had not been vaccinated were more likely to agree that the vaccine itself could cause influenza, or that it could have severe adverse reactions. As the study did not specifically target students, results on attitudes do not show if and how students' responses differed from other subject groups (professionals). The study result revealed that there was a connection between high vaccination compli-ance and higher educational background. Those who had a longer educational history were more likely to answer that they were "always vaccinated". (Bonaccorsi et al 2015: 140, 142-143).

3.2   Factors that influence vaccination compliance

A study by Whalen et al (2014), conducted in United States, "Flu vaccine experiences and beliefs influence vaccination decision making more than knowledge", (see appendix 1(6), row 3) suggested that the decision on whether to get vaccinated or not was more influenced by personal experiences and beliefs. Factual knowledge about the disease or the vaccine did not affect decision-making as much among nurses and nursing students (Whalen et al 2014). (See appendix 1 (4), row 3).

The study results revealed that "many of the decisions to vaccinate are not based on evidence-based science". If a respondent perceived that their decision was influenced by a positive experience, they were 4.5 times more likely to have received the vaccina-tion. 197 students (52% of the sample) completed the questionnaire. (Whalen et al 2014: 4, 6).

Another study conducted in Ireland by Cornally et al (2013) examined nursing students' reasons behind opposing attitudes. A total of 131 final-year students filled the question-naire, and 79% of them, similarly to the research conducted in Florence (Bonacorssi et al 2015), had not received the vaccination (Cornally et al 2013: 1207, 1209).

According to the research results, the most given reason against getting vaccinated was "I don't need is as I rarely get ill" 42% (answered by 104 respondents, 42%). Other rea-sons included concerns about adverse effects (n=22) or vaccine contents (n=17). In con-trast, those who received and had positive attitudes towards the vaccine reasoned that the vaccine was taken in order, to protect oneself or patients, or family members. (Cor-nally et al 2013: 1209). As the respondents scored 3.5 (on a scale of 1 to 7) on subjective

norm- variable, it was clear that subjects did not feel pressurised by their peers to get the vaccine. Perceived behavioural control scored the highest mean of 5.5, which meant that respondents felt like they had the control over the decision to get vaccinated or not. Attitude towards receiving the vaccine was moderate (4.4, attitude- variable). (Cornally et al 2013: 1209). (See appendix 1 (4), row 1).

A study by Lehmann et al (2015) examined factors that would affect medical students' attitudes towards the influenza vaccine and their intention of being vaccinated. Participants of the survey were asked to pick from a set of 8 major factors that would best apply to them, considering vaccinating against influenza: vaccination is safe, self-protection, vaccination is available for free, patient safety, to set a positive example for someone, protection of family or friends, advice from a medical expert, ethic to not spread infection.

Participants of the study, who had not taken influenza vaccinations or were negative towards taking it, were asked exclusively to select from 9 inhibiting factors that best reasoned their decision to not get vaccinated. These 9 factors were; fear of needles, no specific risk, medical contraindication, influenza is not a serious disease, not possible to get vaccinated, fear of side-effects, vaccination could cause flu, vaccinating provides insufficient protection and vaccination was never offered for me. It was possible for attendants to select multiple answers that applied to them. (Lehmann et al 2015). (See appendix 1 (4), row 5).

The sample 2012, which consisted of 264 medical students, were all at pre-clinical part of their studies. Out of these medical students, 13% were already vaccinated against influenza. The 2013 years sample consisted of 279 medical students. In year 2012, 22% of the medical students reported a high intention to be vaccinated, 37% reported that they had not decided about the vaccination and 41% reported having no intention to be vaccinated. In 2013, the responses had not changed much: 23% or respondents had high intention, while 36% were undecided and 41% had no intention. The inhibiting and facilitating factors that medical students of the 2012-year part were asked to pick from as reasons behind rejecting or accepting the influenza vaccination. Within the given choices, the protection of family and friends, patient protection and self-protection were the most commonly chosen reasons, favouring the influenza vaccination by both immunizers and non-immunizers. (Lehmann et al 2013).

Within the factors that influenced the decision of not getting vaccinated, "not being at a specific risk" was the most popular choice for non-immunizers (50%), second highest choice was "influenza is not a serious disease" (22%). Other quite common reasons that were selected was "fear of side effects" (20%), "vaccination provides insufficient protection" (19%), "influenza vaccination has never been offered" (17%). Less common reasons were; "vaccination could cause flu" (6%), "haven't had possibility to get vaccinated" (3%), "medical contraindication" (2%) and "fear of needles" (1%). (Lehmann et al 2013).

3.3   Students' intention to get the influenza vaccine

In addition to studying reasons for vaccination non-compliance (as described above, in 3.2), Cornally et al (2013) also studied students' future intention to be vaccinated. All participants were asked if they intended to get vaccinated in the future. Subjects were asked to rank their intention to get vaccinated (on a scale from 1 to 7), scoring 2.9, which suggested that they were unlikely to go get vaccinated. Their attitude score of 4.4 (on a scale from 1 to 7) showed a moderate-to-strong intention to be vaccinated. Their subjective norm mean score of 3.5 tells that perceived social pressure to get vaccinated in the future was neutral. The highest mean score among the TPB (theory of planned behaviour) categories was "perceived behavioural control" (5.5), which suggests that students had confidence and the ability to get vaccinated if they so wanted. Student nurses do have a positive attitude towards the vaccine and getting vaccinated. But because of the social pressure to get vaccinated, they might not feel comfortable to seek it out and as a result, perhaps they even might have lower intentions to receive it in the future. (Cornally et al 2013: 1209).

The research shows that student nurses at their final-year have poor intentions to go get vaccinated against influenza after they have graduated from school. Vaccination history is a predictor of behaviour in future, so it would be important to educate student nurses about the importance of influenza vaccine and encourage them to be vaccinated during their years of studying, before graduating. If they get vaccinated once while studying, they would most likely repeat the process after they have graduated from school and are in professionals in a work environment. (Cornally et al 2013: 1210).

3.4   Knowledge regarding influenza among nursing students

A survey conducted by Bojar et al (2017), in University of Warsow, assessed 120 nursing students' level of knowledge regarding influenza and the vaccine. When asked to self-evaluate their knowledge regarding the influenza, most of the students assessed them to be either "quite good" (3.5) or "good" (4).

The study results, however, indicated that subjects overestimated their level of knowledge, as half of the nineteen theory questions provided were answered incorrectly by most participants. Theory test consisted of pathological and general questions about influenza. As many as 54% of respondents did not know the modes of transmission for influenza. Moreover, most subjects did know what drugs are most effective against influenza viruses A and B (77 %). (Bojar et al 2017: 614, 164). (See appendix 1 (4), row 4).

When answering the question about the influenza's annual death-toll, students were more likely to choose the options with least numbers out of the fixed answer choices. Also, questions regarding the number of people infected annually by the influenza in Poland and what is the most harmful influenza type were answered incorrectly (exact numbers are not available or deductible from the source of reference). (Bojar et al 2017:614).

Even though most of the respondents had not received influenza vaccination in past 5 years before the study was conducted, the results showed that students knew that the vaccination was the most effective method to prevent contraction. Additionally, 61% of all respondents agreed with the statement that influenza vaccine could cause influenza. (Bojar et al 2017: 614, 616).

4   Purpose and aims of the thesis

The aim of this thesis was to get an insight into attitudes regarding seasonal influenza vaccination among health care students of Metropolia University of Applied Sciences in Helsinki, Finland (later referred to in this thesis as HC students). As previously conducted studies have shown, studies focusing on students' attitudes towards seasonal influenza vaccination exist.

Due to recent changes in the Finnish law, the occupational vaccination protocols are changing. Therefore, it is relevant to study the attitudes and opinions of future professionals about a vaccine that must be taken on a yearly basis.

The research questions to be answered are:

1. What are HC students' attitudes towards seasonal influenza vaccine?
2. Which factors influence HC students' attitude towards the influenza vaccine?
3. How do HC students self-assess their knowledge regarding the benefits and adverse reactions of the seasonal influenza vaccine?

5   Implementation

5.1   Method

When selecting the research method, the opinion of the team was that a quantitative method was suitable for the research problem and for the analyzation of the data to be received from the questionnaires. Quantitative research method measures numbers and can be used to show correlation between different factors. A representative cross study was conducted, where the data is collected once (contrary to a longitude study, where the data is collected over a set time period to show changes in attitudes etc.) (Kankkunen - Vehviläinen-Julkkunen 2009: 41-42).

In addition to quantitative questions, the survey utilised aspects of qualitative research methods by providing respondents with open questions (to gain a more in-depth understanding of thoughts related to the fixed quantitative questions) which gave them a chance to answer more comprehensively, if they wished to do so. Answers to the open questions were analysed inductively, using protocols of qualitative content analysis methods. (Tuomi – Sarajärvi 2018:122-127).

5.2   Data collection

Sample, the group of people invited to partake in the study (Kankkunen - Vehviläinen-Julkkunen 2009: 42), was be based on who is willing to participate. The total population of healthcare students in the Metropolia University of Applied Science was 1894 students (number received via email from student office in February 2018). Out of the 1894 students, 92 have reported being absent from the semester Spring 2018, leaving the population (P=1802) for this study. The Population (P=1802) division per implementation is visible in table 2.

Table 1.   Population vs. sample size for survey.

Implementa-tion	Nurse (Finnish)	Degree Programme Nursing	Public health nurse	Paramedic	Midwife	Total
Enrolled se-mester 2018 spring	868	86	269	291	288	1802
Responded	111	5	41	41	31	229

260 answers were received between 4th of April - 9th of April 2018. Out of the 260, 31 chose "other" when asked for their degree, which were excluded from the table above, and from all results discussed and analysis as they fall outside the selected scope.

Permission was requested from the Metropolia University of Applied Science to conduct the survey for the students. The survey received authorization from Director of Clinical and Paramedic Services Päivi Rimpiaho, and Director of Health Promotion Services Päivi Haarala. The Permission process was done following the guidelines of good scientific conduct (Gurney 2017).

Data were collected 4th-19th of April 2018 by sending a link to the questionnaire via email to the population. The questionnaire form was created using a web-based tool "E-lomake" and it was accessible to all students from nursing, public health nurse, paramedic and midwifery students. The decision was to use only the web questionnaire, as the risk of a paper questionnaire was that the response rate could be low. If a questionnaire is regarding a topic of interest to the person answering, this usually yields a higher response rate (Vilkka 2005: 73-75). As the seasonal-influenza vaccination is a topic that was being discussed a lot amongst health care professionals and students, belief of the group was that the amount of answers received will be enough for a reliable study. The aim of receiving minimum of 100 observation units was completed and translates to a reliable and representative sample (Vilkka 2007: 57). Out of possible 1802 subjects, 229

replies were received that fall in the scope of the study, therefore the survey had 13% response rate, and 87% did not reply.

5.3 Questionnaire

It was important that the questionnaire form measured what the research plan indicated, and therefore the responses to the form will answer the research questions to ensure validity of the study and to be able to answer the research problem. (Vilkka 2007: 63).

The questionnaire form was approved with the instructing faculty member prior distribution. A pilot for the form was done with five volunteering nursing students where duration of filling in the questionnaire was measured, and the results of the pilot were used for making tests for statistical analysis in SPSS (Vilkka 2007: 78). After the pilot test, no changes were made to the questionnaire as no issues arose during the testing. The questionnaire was available both in English and Finnish. (See appendix 2).

The questionnaire's cover letter explained the aim and purpose of the study and informed the responder who was conducting the survey and how to reach them in case they any questions arouse. The responders were as well informed and assured anonymity. The cover letter as well explained the respondents how the gathered material was stored during the process and where the results of the survey could be seen (Vilkka 2007: 88). For background information, the form asked for the respondents' gender, from which implementation the respondent is (Nurse, Midwife, Paramedic, Public health nurse, or other), the year of studies and age. The questionnaire had both open and closed questions. Majority of the questions were mandatory and answered using an attitude scale.

5.4 Data analysis

The data was processed by using programs SPSS and Microsoft Excel. For quantitative study, it is important that the gathered data is in a numeral form (Jokivuori - Hietala 2007: 13). All observations were first checked visually to see if there are discrepancies and/or reasons to disregards any replies. After the initial check, the data in numeral form from the survey was processed by running descriptive statistics and crosstabulations in SPSS. Crosstabulation can be used to show dependence between different variables and if the

finding is statistically significant. (Vilkka 2007: 129.) For example, using the crosstabulation function, it is possible to determine if there is statistical significance with the implementations when comparing attitudes towards the seasonal influence vaccination.

The crosstabulation does not offer reasons for a phenomenon but can show correlation between variables. The validation tests used for the crosstabulations were exact or a basic chi-square test and the given P-values are shown in the results (Table 2-7). A p-value lower than 0.05 means that there is statistical significance with the chosen variables. (Kankkunen - Julkkunen 2009: 105-106).

The open question was analysed by the means of inductive data analysis. Inductive data analysis relies on inductive, interpretative reasoning, where a new theory or an explanation to a phenomenon will be built (from the collected primary data) upon interpretations and conclusions given by the researcher. (Thomas 2006: 238, Tuomi – Sarajärvi 2018: 127).

Inductive data analysis process consists of reduction of the respondents' answers (going through the answers repeatedly and then summarizing them, keeping only words or expressions relevant to the respondent's point), finding common themes from the reduced answers, and clustering them under named categories. Once themes are clustered under appropriately descriptive categories, more conceptual and general upper categories can be formed. The process is led by research questions and careful interpretation of raw data. (Thomas 2006: 241, Tuomi – Sarajärvi 2018: 127).

Qualitative data were first transferred from the questionnaire platform to a Microsoft Excel-file, thereafter transcribed and reorganized onto a Microsoft Word document to make text more decipherable and manageable. Physical form of the document was printed, and contents were read numerous times to become familiar with the comments the respondents had produced. Similarities were observed, and once connecting themes started to emerge from the comments, similar expressions were grouped together, creating and naming categories. Lower categories were connected to upper ones until no more categories could be formed.

6   Results

6.1   HC Students' Attitudes towards Seasonal Influenza Vaccine

Majority of the students (60%, n=137) responded to the questionnaire felt positively or very positively about the seasonal influenza vaccine. 21% (n=48) felt neutrally when asked to evaluate their attitude towards the influenza vaccine and 19% of respondents felt negatively or very negatively (n=44). (Table 2).

Out of all the implementations, public health nurses (81%, n=33) had the highest rate of feeling positively or very positively. Nursing (in Finnish) (n=62) and paramedics (n=23) students 56% of respondents felt positively or very positively towards the vaccine. Mid-wife students had similar responses to each other with around 55% replied positively or very positively (n=17). Degree programme in Nursing (official name of the English imple-mentation, referred to as DPN) had the lowest rate of feeling positively or very positively (40%, n=2). (Table 2).

DPN had the highest rate of feeling negatively or very negatively regarding the seasonal influenza vaccine with 40% (n=2). Paramedics 27% (n=11), Midwife students 26% (n=8), and Nurse (Finnish) 16% (n=18) out of respondents feel negatively or very negatively. Public health nurse implementation felt the least negatively (12%, n=5). All respondents replied to the question from given options from Very positively to Very negatively, and no respondent chose not to reply to the question. (Table 2).

Table 2. HC students' attitudes towards seasonal influenza vaccine per implementation.

Exact Chi-square P-Value 0,058 (*)		Nurse (Finnish)	DPN (English)	Public health nurse	Paramedic	Midwife	Total
Very positively or positively	Fr	62	2	33	23	17	137
	%	55,90 %	40,00 %	80,50 %	56,10 %	54,80 %	59,80 %
Not positively or negatively	Fr	31	1	3	7	6	48
	%	27,90 %	20,00 %	7,30 %	17,10 %	19,40 %	21,00 %
Negatively or very negatively	Fr	18	2	5	11	8	44
	%	16,20 %	40,00 %	12,20 %	26,80 %	25,80 %	19,20 %
Total	Fr	111	5	41	41	31	229
	%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

(*) P-value higher than 0.05, no statistical significance

Vaccination coverage

Out of all survey respondents, 80% (n=184) had taken the vaccination over the influenza seasons 2017-2018. (Table 3). The greatest vaccine compliance was among midwifes where 87% (n=27) had received the vaccination. Public health nurses had 83% (n=34) coverage of immunisation. Nursing students (English) had an 80% (n=4) coverage and nursing (Finnish) students had a coverage of 79% (n=88). Paramedic students had the weakest compliance rate with 76% (n=31) being vaccinated. (Table 3).

Table 3. HC students' vaccination coverage per implementation for 2017-2018.

Exact Chi-Square P-Value 0,807		Nurse (Finnish)	DPN (English)	Public health nurse	Paramedic	Midwife	Total
Yes	Fr	88	4	34	31	27	184
	%	79,30 %	80,00 %	82,90 %	75,60 %	87,10 %	80,30 %
No	FR	23	1	7	10	4	45
	%	20,70 %	20,00 %	17,10 %	24,40 %	12,90 %	19,70 %
Total	Fr	111	5	41	41	31	229
	%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

Vaccination coverage per year of study

First year students were less likely to have taken the vaccine compared to respondents in the later stage of studies. Fourth-year-students had the greatest compliance rates, with 88 % vaccinated (n=30). Third-year students had second highest compliance with 86% (n=59). Second-year students' coverage was 83% (n=49) and first-year-students 69% (n=46) had received the vaccination. (Table 4).

Table 4. HC students' vaccination coverage per year of study for 2017-2018.

Exact Chi-Square P-Value 0,035		1st year student	2nd year student	3rd year student	4th year student (or above)	Total
Yes	Fr	46	49	59	30	184
	%	68,70 %	83,10 %	85,50 %	88,20 %	80,30 %
No	Fr	21	10	10	4	45
	%	31,30 %	16,90 %	14,50 %	11,80 %	19,70 %
Total	Fr	67	59	69	34	229
	%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

There is a statistical significance for the year of studies and vaccination coverage with students in regards the seasonal influenza for period 2017-2018, since the P-value is lower than 0.05. With the statistical significance, generalisation could be made that first year HC students are more likely to not be vaccinated than fourth year students when compared the total group in one sample (vs. comparing samples per implementation).

6.2   Factors influencing HC students' attitudes towards the influenza vaccine

The HC students felt that the most influencing factor towards their attitude towards the seasonal influenza vaccine from given options in survey was work environment (49%, n=112). Second most influencing factor amongst the respondents was education received at school (48%, n=109). 25% of all respondents felt that family members opinions (n=58) or social media (n=57) had impact on their attitudes towards the vaccine. There was little variation between the implementations and the factors selected in the questionnaire. (Table 5).

Table 5. Factors influencing HC students' attitudes towards seasonal influenza vaccine.

Exact Chi-Square test P-Value higher than 0,05			Nurse (Finnish)	DPN (English)	Public health nurse	Para-medic	Midwife	Total
Family members' opinions	Not impacting	Fr	82	5	32	29	23	171
		%	73,90 %	100,00 %	78,00 %	70,70 %	74,20%	74,70 %
	Impacting	Fr	29	0	9	12	8	58
		%	26,10 %	0,00 %	22,00 %	29,30 %	25,80%	25,30 %
Total		Fr	111	5	41	41	31	229
		%	100,00 %	100,00 %	100,00 %	100,00 %	100,00%	100,00 %
Work environment	Not impacting	Fr	53	2	26	19	17	117
		%	47,70 %	40,00 %	63,40 %	46,30 %	54,80 %	51,10 %
	Impacting	Fr	58	3	15	22	14	112
		%	52,30 %	60,00 %	36,60 %	53,70 %	45,20 %	48,90 %
Total		Fr	111	5	41	41	31	229
		%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %
Social media	Not impacting	Fr	81	3	33	31	24	172
		%	73,00 %	60,00 %	80,50 %	75,60 %	77,40 %	75,10 %
	Impacting	Fr	30	2	8	10	7	57
		%	27,00 %	40,00 %	19,50 %	24,40 %	22,60 %	24,90 %
Total		Fr	111	5	41	41	31	229
		%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %
Education at school	Not impacting	Fr	54	4	21	22	19	120
		%	48,60 %	80,00 %	51,20 %	53,70 %	61,30 %	52,40 %
	Impacting	Fr	57	1	20	19	12	109
		%	51,40 %	20,00 %	48,80 %	46,30 %	38,70 %	47,60 %
Total		Fr	111	5	41	41	31	229
		%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

Other factors influencing attitudes towards influenza vaccine

The responders were as well given the option to answer freely which factors influenced their attitudes (n=114). Other reasons included evidence-based knowledge, §48 Communicable Diseases Act, personal deductions and previous experiences, distrust in the

vaccine, occupational ethics and will to protect oneself or family. In figures 2-6, grey cells represent reduced versions of original comments (reductions). The reductions are linked to common themes shown in white, and clustered into upper categories shown in orange. Figure 1 depicts an overview of all categories.
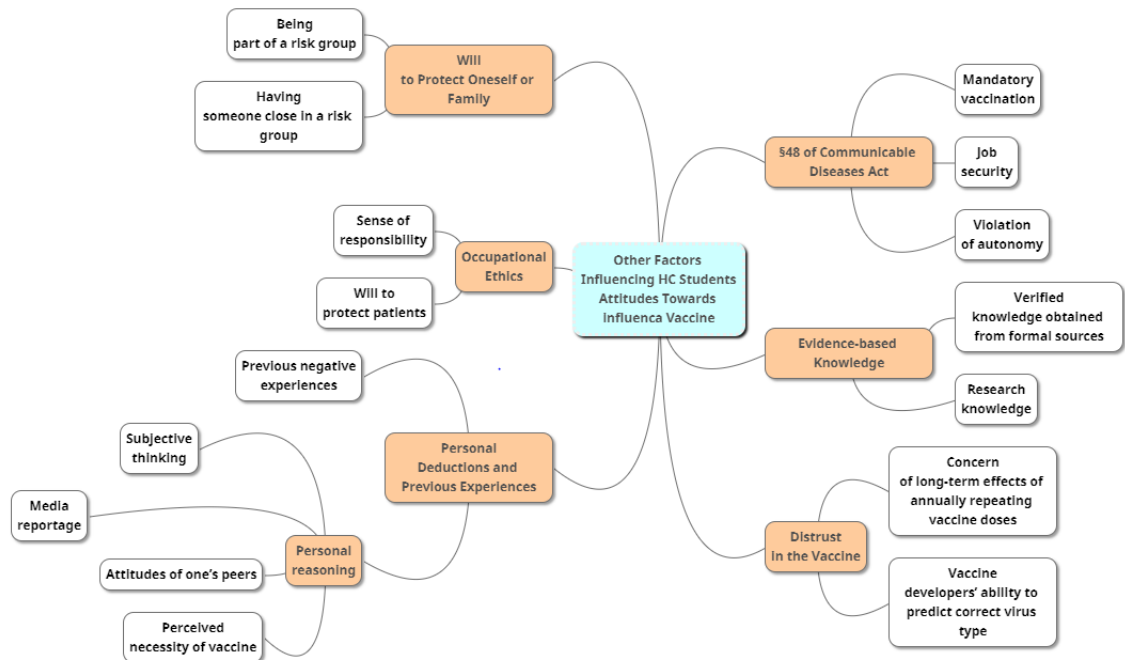

Figure 1. Overview of other factors that influence HCS attitudes towards influenza vaccine.

Evidence-based knowledge

HC students indicated that their attitudes were shaped by evidence-based knowledge. Themes that emerged formed subcategories of *verified knowledge obtained from formal sources* and *research knowledge* formed the umbrella term of *evidence-based knowledge.* (Figure 2.) Some respondents reflected trust in *verified knowledge obtained from formal sources*. Information that was gained from formal, authoritative sources such as lectures led by professionals or information published by the Finnish National Institute for Health and Welfare were perceived reliable, and attitude-impacting factors. Additionally, *Research knowledge,* either in form of research articles or studies found online, were said to influence attitudes. Scientific evidence, reading trustworthy research articles and studies about benefits and adverse reactions were remarked.
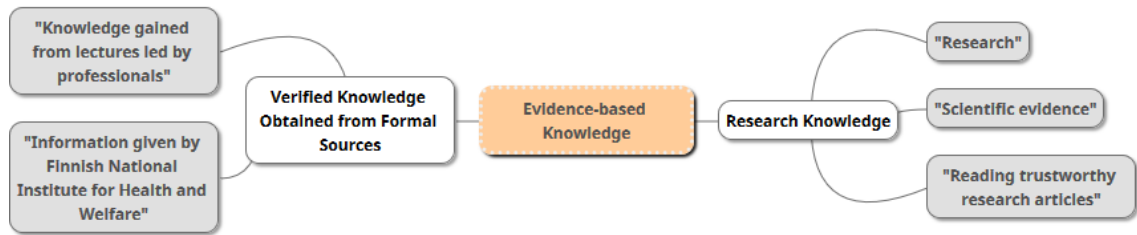
Figure 2. Overview of reduced comments clustered into themes, under category of "Evidence-based Knowledge".

§48 of Communicable Diseases Act

Students also indicated that the section §48 of the Communicable Diseases Act influences their attitudes towards the influenza vaccination. Upper category of §48 Communicable Diseases Act consists of categories; *mandatory vaccination, job security* and *violation of autonomy*. Mandatory vaccination was formed from comments such as "forceful means", and "vaccine compulsion". Job security included comments that expressed worry relating to job security, such as "I want to keep my job". Violation of autonomy consisted of comments such as "nurses right to autonomy is violated" and "everyone should have the right to decide on their own bodies", which meant that perceptions emerged that the right to self-determination was violated, which consequently impacted attitudes towards the vaccine itself. (Figure 3.)
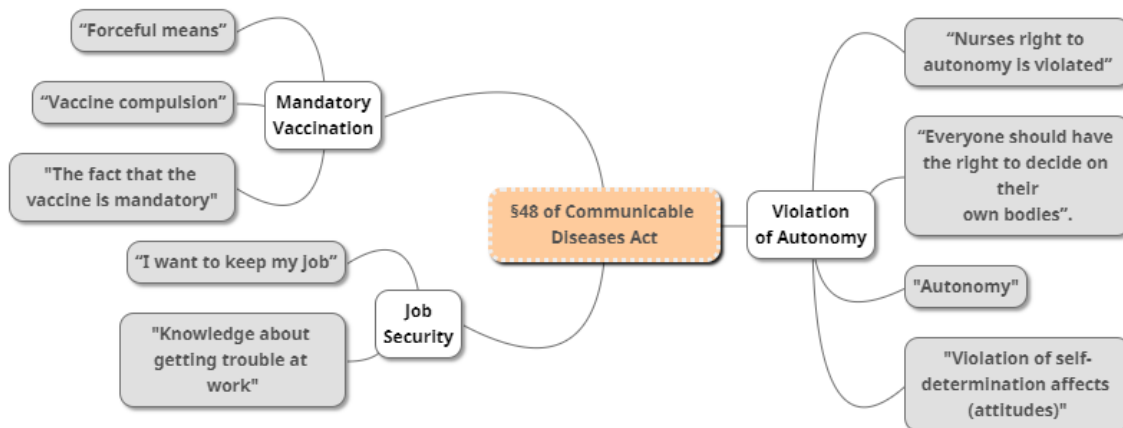
Figure 3. Overview of reduced comments clustered into themes, under category of §48 Communicable Diseases Act.

Personal deductions and previous experiences

Subjects reported that personal deductions and previous experiences impacted their attitude towards seasonal influenza vaccine. *Previous negative experiences* included comments such as "I got fever every time I received the vaccination" or "the fact I got adverse reactions from the H1N1 ("swine flu") vaccination". Subjects wrote about previous negative experiences, such as getting sick with influenza despite having received the vaccination. As a result, the vaccine was not seen potent. Family member's negative experiences were said to impact one's attitude as well.

Personal reasoning consists of categories *subjective thinking, media reportage, attitudes of one's peers* and *perceived necessity of vaccine. Subjective thinking* was formed from comments such as "own personal opinion" and "own values", as many respondents stated that their attitudes were impacted by their own opinions, without elaborating further. *Media reportage* included comments such as "news headlines regarding the effectiveness of the vaccines". *Attitudes of one's peers* included comments "co-workers' attitudes" or "friends and family's attitudes". *Perceived necessity of the vaccine* formed from comments that indicated need for the vaccine such as "the vaccine is necessary" and from opinions that hinted that a healthy person does not benefit from the vaccine: "I don't need it as I'm healthy". (Figure 4.)
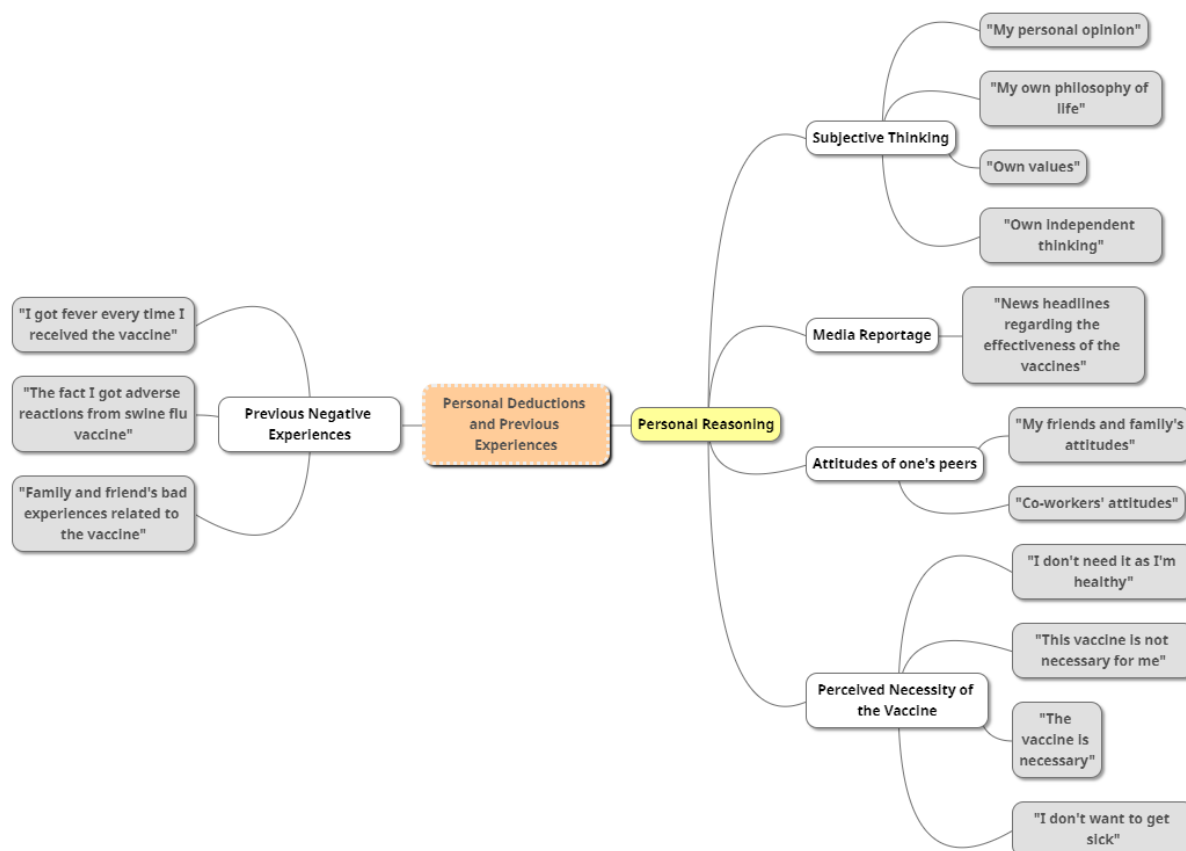
Figure 4. Overview of reduced comments clustered into themes, under category of Personal deductions and previous experiences.

Distrust in the vaccine

Some comments expressed worry and lack of faith in the vaccine itself. Distrust in the vaccine consists of categories; *concern of long-term effects of annually repeating vaccine doses* and *vaccine developers' ability to predict correct virus type.* Concern of long-term effects included comments such as "due to vaccine's seasonal nature, long-term effects cannot be studied properly". Taking vaccinations annually did not seem safe, and the question of how the body will respond to annual doses in long-term was expressed in the answers.

Additionally, respondents showed distrust in vaccine-developers' ability to predict seasonally occurring virus type. *Ability to predict correct* virus type included comments such as "there is no way to certainly tell if the vaccine will protect against the right virus type", and "they just decide which virus type will be the worst every year". (Figure 5.)
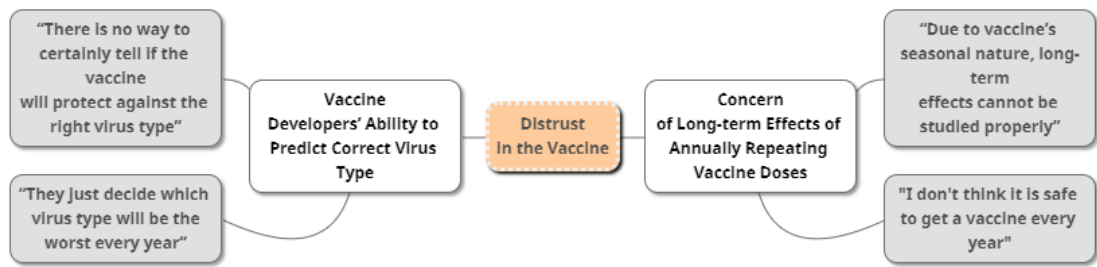
Figure 5. Overview of reduced comments clustered into themes, under category of "Distrust in the vaccine.

Occupational ethics

Sense of responsibility with occupational ethics affects attitudes. Occupational ethics contains subcategories *sense of responsibility* and *will to protect patients*. Sense of responsibility emerged from comments such as "I want to be a good nurse" and "ethics of nursing". Will to protect patients developed from comments such as "concern about the patients" and "(increase) in patient safety". (Figure 6.)
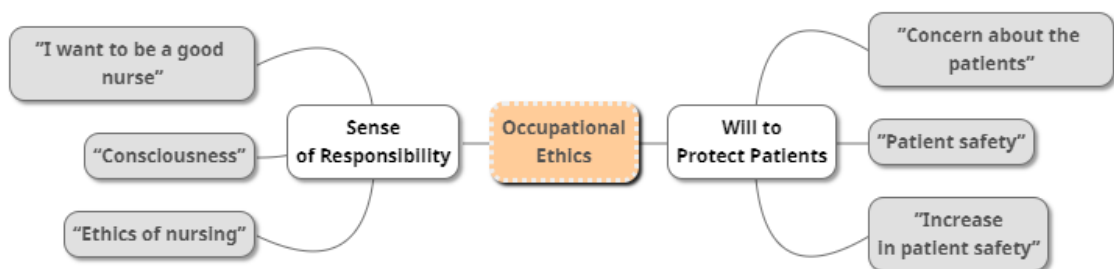

Figure 6. Overview of reduced comments clustered into themes, under category of "Occupational ethics.

Will to protect oneself or family

Being part of or having someone close in the risk group was also said to be an attitude-impacting factor. Will to protect oneself of family included *categories being part of a risk group* or *having someone close in a risk group*. Comments such as "I have a family member in the risk group" or "I am in the risk group" arouse. (Figure 7.)
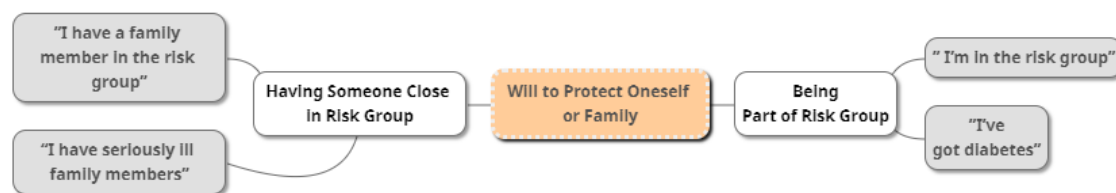
Figure 7. Overview of reduced comments clustered into themes, under category of Will to protect
   oneself of family.

6.3   HC student's self-evaluation regarding their knowledge of the vaccine

Majority of the health care students who responded to the questionnaire (73%, n=163)
consider their knowledge of the benefits of the influenza vaccine to be good or very good.
17% (n=39) feel that their knowledge is neither sufficient nor insufficient and 10% (n=22)
considered their knowledge to be insufficient or very insufficient. Total of 224 respond-
ents replied to the question from given options from very sufficient to very insufficient,
and five respondents chose not to reply to the question. (Table 6).

Out of all the implementations, public health nurses (81%, n=33) had the highest rate of
evaluating their knowledge to be sufficient or very sufficient. Midwifes (79%, n=23) and
nursing students from Finnish program (76%, n=82) majority consider their knowledge
to be sufficient or very sufficient. For Paramedics, the self-evaluation was second lowest
with 56% (n=23) and degree program in Nursing had the lowest rate of self-evaluation
with 40% (n=2). (Table 6).

Degree programme in Nursing (English implementation) had the highest rate of evaluat-
ing their knowledge on benefits of the vaccine to be insufficient or very insufficient with
40% (n=2). Paramedics had a rate of 20% (n=8). Midwife students 10% (n=3) evaluated
their knowledge to be insufficient or very insufficient. Nurses from Finnish degree pro-
gram had 8% rate (n=9) of replies indicating their knowledge to be insufficient or very
insufficient. No-one from Public health nurse implementation considered their knowledge
to be insufficient or very insufficient. (Table 6.)

Table 6. HCS Self-evaluation of knowledge regarding benefits of seasonal influenza vaccine.

Exact Chi-square P-Value 0,024		Nurse (Finnish)	DPN (English)	Public health nurse	Paramedic	Midwife	Total
Very good or good	Fr	82	2	33	23	23	163
	%	75,90 %	40,00 %	80,50 %	56,10 %	79,30 %	72,80 %
Not good or insufficient	Fr	17	1	8	10	3	39
	%	15,70 %	20,00 %	19,50 %	24,40 %	10,30 %	17,40 %
Insufficient or very in-sufficient	Fr	9	2	0	8	3	22
	%	8,30 %	40,00 %	0,00 %	19,50 %	10,30 %	9,80 %
Total	Fr	108	5	41	41	29	224
	%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

There is a statistical significance in regard to the implementation and how respondents evaluated their knowledge on the benefits of the seasonal influenza vaccine. Most nursing students (from Finnish implementation), public health nurses and midwifery students rated their knowledge to be good or very good. Paramedic students and Nursing students from the English implementation had evaluated their knowledge the most of all respondents to be insufficient or very insufficient.

HCS self-evaluation regarding adverse effects of seasonal influenza vaccine

More than half of the HC students who responded to the questionnaire (53%, n=116) consider their knowledge of the adverse reactions of the influenza vaccine to be good or very good. 31% (n=68) feel that their knowledge is neither sufficient nor insufficient and 16% (n=35) considered their knowledge to be insufficient or very insufficient. Total of 219 respondents replied to the question from given options from very sufficient to very insufficient, and ten respondents chose not to reply to the question. (Table 7.)

Out of all the implementations, Public health nurses (73%, n=30) had the highest rate of evaluating their knowledge to be sufficient or very sufficient. Majority of midwife students (61%, n=17) and half of nursing students from Finnish program (50%, n=52) consider their knowledge to be sufficient or very sufficient. Paramedic students' self-evaluation was second lowest with 43% (n=17) and degree program in Nursing had the 0% rate of self-evaluation of knowledge of adverse reaction of influenza vaccine.

Degree programme in Nursing (English implementation) had the highest rate of evaluating their knowledge on adverse reactions of the vaccine to be insufficient or very insufficient with 80% (n=4). Paramedics had a rate of 23% (n=9). Nurses from Finnish degree program had 15% rate (n=16) of replies indicating their knowledge to be insufficient or very insufficient. Public health nurse implementation 10% (n=4) considered their knowledge to be insufficient or very insufficient. Midwife students 7% (n=2) evaluated their knowledge to be insufficient or very insufficient.

Table 7. Self-evaluation of HCS' knowledge regarding adverse reactions of seasonal influenza vaccine.

Basic Chi-square P- Value 0,001 *)		Nurse (Finnish)	DPN (English)	Public health nurse	Paramedic	Midwife	Total
Very good or good	Fr	52	0	30	17	17	116
	%	49,50 %	0,00 %	73,20 %	42,50 %	60,70 %	53,00 %
Not good or insufficient	Fr	37	1	7	14	9	68
	%	35,20 %	20,00 %	17,10 %	35,00 %	32,10 %	31,10 %
Insufficient or very in-suffcient	Fr	16	4	4	9	2	35
	%	15,20 %	80,00 %	9,80 %	22,50 %	7,10 %	16,00 %
Total	Fr	105	5	41	40	28	219
	%	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

*) SPSS was not able to run exact test, basic value used.

There is statistical significance in regards of the implementation and how respondents evaluated their knowledge on the adverse reactions of the seasonal influenza vaccine. More than half of the midwifery students and public health nurse students, who participated in the questionnaire ranked their knowledge of the adverse reactions to the vaccine to be very good or good. Paramedic students and Nursing students from the English side had the evaluated their knowledge the most of all responders to be insufficient or very insufficient.

7   Discussion

7.1   Discussion of the results

More than half of the healthcare students feel positively or very positively about the seasonal influenza vaccine. One in five students feel negatively or very negatively towards the vaccine. This result contradicts the study from Cornally et al (2013), which suggested that students are not likely to be vaccinated against seasonal influenza in the future, even though the disease itself is perceived dangerous. This behaviour can be interpreted as negative attitude towards the vaccine. When 19% of HC students feel negatively or very negatively regarding a mandatory vaccination that is needed in order to practise their profession, more emphasis on education could be given to increase the positive attitudes regarding the vaccine.

Public health nursing students felt most positive and less negative regarding the vaccine, when comparing different implementations. Nursing students (excl. DPN) rate their attitudes less positive than public health nurse students, but more than paramedics and midwife students. Paramedic students had highest percentage of feeling negatively or very negatively towards the vaccine. The results, however, show no statistical significance, therefore more study would be needed in order to make assumptions for the entire population.

Vaccination compliance can be interpreted to reflect attitudes towards influenza vaccine. Previous studies from around the world (Bonaccorsi et al 2015, Cornally et al 2013) conclude that HC students vaccination compliance is generally low, however majority of the HC students who replied to this survey have been vaccinated against the seasonal influenza (total percentage being 80% vaccinated). Similarly, to the study by Bonaccorsi et al 2015, a correlation between being vaccinated and level of studies was found. The more advanced a person was in their studies, the more likely they had received the influenza vaccine.

When it comes to factors influencing attitudes towards the season influenza vaccine, more weight was given work environment and to the education received school rather than family member's opinions or social media. Furthermore, HC students indicated additional factors which influence their attitudes. Those who had more negative-toned atti-

tude towards the vaccine were more likely to have given more elaborate and comprehensive comments than those who perceived their attitude as other than negative. Answers were categorized to evidence-based knowledge, personal deductions and previous experiences, distrust in the vaccine, occupational ethics and will to protect oneself or their family. Attitudes were affected as well by the new section §48 of Communicable Diseases Act. Whalen et al (2014) suggested that the decision to receive the vaccine can be influenced more by personal experiences and beliefs rather than evidence-based knowledge. There is little variation between different implementations and factors that influence their attitudes.

Over half of the HC students evaluate their knowledge regarding benefits of the influenza vaccine to be at least good. One in ten of the respondents evaluated their knowledge to be insufficient or very insufficient. On knowledge regarding adverse reactions, around half of the students would evaluate their knowledge to be good or higher and roughly one in six evaluated their knowledge to be insufficient or very insufficient.

Implementations had difference when evaluating their knowledge regarding influenza vaccine. Public health nurses rated their knowledge highest from all implementations and least insufficient. Midwifery students had the second highest self-evaluation, and paramedic students rated their knowledge most insufficient in both benefits and adverse reactions. All groups evaluated their knowledge to be better in benefits than in adverse reactions. No public health nurse students, for instance, rated their knowledge in the benefits to be insufficient, however in adverse reactions 10% felt their knowledge to be insufficient or very insufficient.

In the study by Bojar et al (2017) it was found that students estimated their knowledge regarding influenza and influenza vaccine good or quite good, however when tested, their performance was not as good as they had assessed. To accurately evaluate HC students' knowledge on influenza vaccine, self-assessment should be accompanied by a test that shows the understanding of the subject, as it is possible that students may not evaluate their own knowledge realistically. (Nikula 2011: 48). With some implementations, the amount of answers received was fewer than other implementations and conclusions should not be made for the entire population.

7.2 Validity and reliability

Validity and reliability of a study determines the credibility of results. For validity, it is important that the research conducted answers the chosen research questions, the method of gathering data is chosen based on it being applicable to study the chosen phenomenon, and that the questions asked in questionnaire answer the chosen research problem (Vilkka 2007: 152). To ensure the valid outcome for this project, the research questions decided for the thesis were specific and chosen carefully. The questionnaire was created first and then piloted with a group of volunteer HC students. No changes were made to the questionnaire as no issues arose during the testing. Aim of the questionnaire was to specifically answer the set research questions and the data received from the survey answers the research problems.

To evaluate the reliability of a quantitative study, it is important to assess how well the conclusions drawn from the results given by the sample could represent the entire population and how well the respondents were reached; if everyone from the sample had means to answer (Vilkka 2007: 152). Size of the sample should be more than 10% of the studied population. As this survey's answer percentage was 13%, the sample size can be considered as large enough to represent the population studied. Additionally, chance of errors (such as invalid answers) should be considered as well and measure them and react to them accordingly. With individual groups, with DPN students, not enough answers were received though to have a reliable look at the results for the entire DPN group.

This study utilised aspects of qualitative research methods (inductive data analysis) as well to analyse freely expressed answers. To assess trustworthiness and value of qualitatively analysed research results, it is important to judge how believable (degree of credibility) the results are. (Tuomi – Sarajärvi 2018). Ideally this is done by reviewing researchers' deductions with the sample group and asking them how well the findings represent their ideas. As this survey's answers were collected completely anonymously without a chance to reach the original respondents again reliably (and before publication), judging believability of the findings was left to the research group, the thesis' inspectors and fellow student colleagues at peer evaluation gatherings. To increase believability of the qualitative conclusions, a detailed description of the inductive process was given and explained.

For credibility of the study, it is important to see when examining the data, is there statistical significance with the results, and did the results answer the original research problem. (Kankkunen - Vehviläinen-Julkkunen 2009: 158). The frequency distribution of the variables has been described both in percentages and numeral form. Exact or basic chi-square test was used by SPSS to find statistical significance. The P-values are shown in tables accordingly. The significance level used in tests is 0.05, where lower than 0.05 values are considered statistically significant.

Comments received from the teacher guiding the thesis process, PhD Anne Nikula and colleagues during group guidance meetings promote credibility and help to notice and minimize mistakes in the process (Vilkka 2007: 153). Both quantitative and qualitative researches methods used were discussed with lecturers of each field several times during the project to ensure validity and reliability.

7.3   Ethical principles

Study must follow the ethical principles to be able to be valid. Avoiding bias is one value for research ethics (Yin 2014: 76). The study group did not take into consideration their own personal attitudes towards vaccinations and avoided leading questions towards the respondents. During inductive analysis, bias was avoided by having breaks between analysis sessions, revising and reassessing the work done.

The respondents' answers were treated anonymously (Kankkunen - Vehviläinen-Julkkunen 2009: 176). The study was based on voluntary participation and no-one was pressured to participate. The participants had the chance to ask questions regarding the study from work group in case it was needed, either by phone or via e-mail. No scientific mistakes or issues arose during the process, which would have been needed to be made known to the faculty member guiding the thesis. (Kankkunen - Vehviläinen-Julkkunen 2009: 158).

The study followed the principles of University of Applied Science scientific conduct rules, where the research is honest and precise in recording and presenting data gathered. Ethical practises were followed, and other publications and their authors were respected. Applicable permissions were applied and granted. No sponsor was involved, and no monetary compensation was received by anyone involved in the project, nor the authors nor the participants of the survey. The supervising faculty member has been presented

status of project throughout the process of the thesis to ensure ethical process and results (Gurney 2017).

7.4   Conclusions and further research possibilities

As influenza vaccine is important in preventing harm caused by influenza, it is important to ensure HC students are vaccinated against the illness, and in order to have high compliance, it is important that attitudes towards the vaccine are not negative. Results of this survey show a higher vaccination compliance than previous studies discussed. One difference in the studies is that influenza vaccine is mandatory for health care professionals and students during clinical practice. The reason for higher vaccination compliance therefore can be related to the change in Communicable Diseases Act section §48 addition.

It is possible that if the vaccination was not mandatory, the vaccination percentage of HC students would be lower. If further studies/surveys are done towards this topic, it could be an option to inquire the intention to be vaccinated if not mandatory. As University of Applied Science HC students are no longer having a practical placement during the first semester, this could affect the vaccination coverage for first semester students to decrease in future.

When investigating the vaccination compliance within the different implementations, paramedic students' compliance rate is lower than other implementations, however there is no real significance to these findings and more study would require to further investigate if there is a reason for the lower coverage.

The self-assessment of students regarding their knowledge might not depict a correct view of the real level of knowledge, but nevertheless can provide an insight on how well students perceive their own knowledge on the matter. Paramedic students have the lowest coverage rate (excluding DPN students due to low amount of replies) and rate their knowledge to be lowest of all the groups. Further investigation could be done to see why implementations differ in rating their own knowledge, and perhaps if some implementations would benefit from further education on the topic to ensure better compliance in vaccination coverage.

In Finland, each health care implementations' curriculum covers two credits of the Basics of Vaccination Competence (which translates to 57 hours of vaccination competence studies) during fifth term (first semester of third year) of their studies. Additionally, public health nurses study one extra credit (27 hours which adds up to 81 hours of vaccination competence in total) of Advanced Vaccination Competence, and as results showed, public health nurses had the most positive attitude towards the seasonal influenza vaccine. This supports findings of other studies conducted that the level of education history correlates with positively to vaccination compliance, and thus attitudes towards the seasonal influenza.

What influences the attitudes towards the influenza vaccine is complex as it is not only one, but it can form from many reasons. Mandatory vaccination can increase vaccination coverage, however might not help to increase positive attitudes among HC students. For DPN programme, the answering percentage was too low to make assumptions for the whole group. DPN students' answers were included in the results to show the reader the answers as DPN was included in the scope of the thesis, however in discussion, the results are not considered.

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DATA COLLECTION MATRIX FROM PREVIOUS STUDIES

Publication / Year of publication / Writers.	Purpose of the study / Research questions.	Method / study sample.	Key results.	Other noticable outcomes.
British Journal of Nursing. 2013, Vol 22, No 21, page 1207-1211. Student nurses' intention to get the influenza vaccine. Cornally N., Deasy E.A., McCarthy G., Moran J. & Weathers E.	Study the influenza vaccination rate within student nurses, the vaccination behavior of the past and clarify the future behavior.	Quantative/descriptive/correlational study, 131 participants / student nurses. A researcher-developed questionnaire was distributed. (p.1208). A literature review was conducted alongside the study to outline previous attitudes, believes and intentions towards influenza vaccination and review vaccination compliancy rates. Theory of Planned Behavior.	The study concluded that low intention scores meaning that students would not be interested in getting vaccinated in the future either after graduating though feeling moderately towards the vaccine itself. Reason most commonly given for vaccination behavior was own previous experience of never getting ill. Other reasons were concerning adverse reactions and protection for family, patients and self.	Approx. 79% of subjects had never been vaccinated for seasonal influenza.

Published online 26.2.2015 University of Florence. Beliefs and opinions of health care workers and students regarding influenza vaccination in Tuscany, central Italy. Bonaccorsi G., Santomauro, F., Porchia B.R., Niccolai G., Pellegrino E., Bonanni P. & Lorini C.	Examine beliefs, opinions and knowledge of health care workers and students regarding influenza and the vaccine.	Quantitative study: three-parted questionnaire with closed questions was distributed. Subjects had to - agree or disagree with factual statements. - record their vaccination compliance in 2007-2008 and 2009-2010. - give reasons for receiving or not receiving the vaccine. - document sociodemographic information. 2576 participants (mostly HCWs and doctors), of whom 601 (23.3%) were students.	80% of health care students did not receive the seasonal influenza vaccine during years 2007-2010. Nurses, health care assistants and students were all most likely to never been vaccinated for seasonal influenza seasons studied. Influenza was perceived to be a serious illness. Influenza vaccine was perceived to be effective despite low compliance rates. However, 89,6% of subjects who had not received the vaccine at all agreed that "it is better to contract influenza than to get vaccinated" and were more likely to agree that vaccine could have significant side-effects.	Vaccination competence rate was linked with educational background.

31.10. 2014. Whalen D., Molnar D., Milne F., Schwal L. & Hackett, V.	Ascertain that personal beliefs and experiences weight more upon decision whether to get vaccinated or not. Do personal beliefs affect the decision making regarding getting the influenza vaccine or not.	A cross-sectional survey -an anonymous questionnaire, which was used to assess "knowledge, attitudes and beliefs regarding the influenza vaccination". Study sample (226) consisted of nursing community-, and faculty members, and nursing students attending the conference where the study was conducted. Additionally, members of the public were taken to the sample to compare the results of health care professionals.	Personal previous experiences and subjective opinions influenced decision-making more than evidence-based, objective knowledge.	197 students.
Polish Nursing. 2017; 66(4): 612-617. (6p). Knowledge regarding influenza among nursing students. Bojar K., Belowska J., Iwanow L., Panczyk M., Zarzeka A., Cieślak I., Kwiatkowska Z. & Gotlib J.	Aim of the study was to assess the knowledge regarding influenza within nursing students in their first- and second year of studies at Warsaw medical university, faculty of health sciences.	120 first and second year nursing students. Diagnostic survey by anonymous questionnaire. 35 closed-ended, single-choice questions.	Most of respondents assessed their knowledge of influenza good (4) or quite good (3.5). (Scale 1-5). Majority of students not vaccinated for influenza during 2015-2016 or in the past 5 years. Insufficient knowledge of influenza amongst the participating nursing students.	Need to increase students' knowledge regarding influenza and promote vaccination in order to increase vaccination compliance.

BMC Infectious Diseases (2015) 15:185. Medical students' attitude towards influenza vaccination. Lehmann B., Ruiter R., Wicker S., Chapman, G. & Kok, G.	The study aims to assist in the development of future educational programs for medical students and can provide advice to hospitals about how to include medical students into their annual health care professional vaccination programs. Research question was to Identify social cognitive variables that predict medical students' intention, as well as reasons for refusal and acceptance to get vaccinated against influenza.	Cross-sectional survey about the factors influencing the decision to get vaccinated against influenza (N = 264 in 2012, N = 279 in 2013). Pre-clinical medical students at the University Hospital Frankfurt attending an occupational health screening before their preliminary medical examination, at the end of their second year.	Only a small proportion of the medical students were motivated to get vaccinated against influenza in both samples (22% and 23% respectively) and that an even smaller proportion (12.9%) had been vaccinated in 2012. Most common reasons reported for getting vaccinated against influenza were self-protection, patient protection and the protection of family and friends. Reported reasons for not getting vaccinated were mostly associated with a low risk-perception, fear of side-effects, and the disbelief in the effectiveness of influenza vaccination.	A high intention to get vaccinated was most likely for participants who felt both positively already in regards to the vaccine and who also had high feelings of autonomy. Medical students feel free to choose whether to get vaccinated against influenza. If that feeling of freedom is paired with a positive feeling towards the vaccine, the autonomy is not a barrier for getting the vaccine.

Questionnaire form

Background information:

1. **Gender**
Male
Female
Other

2. **Age**
18-25
26-35
36->

3. **Degree program**

Nursing (in Finnish)
Degree Programme in Nursing (English)
Public health nurse
Paramedics
Midwifery
Other, what? _____ Free text

4. **Stage of studies**

1st year student
2nd year student
3rd year student
4th year < student

Vaccinated:

5. **Have you taken the seasonal influenza vaccine for the period 2017-2018?**

Yes
No, if so, why not?
(free text) _____

Self-assessement of vaccination knowledge:

On a scale from 1-5,

6. **How would you evaluate your knowledge regarding the benefits of seasonal influenza vaccine?**

Very good
Good
Not good or insufficient
Insufficient
Very insufficient
Cannot say

7. **How would you evaluate your knowledge regarding the adverse reactions of influenza vaccine?**

Very good
Good
Not good or insufficient

Insufficient
Very insufficient
Cannot say

On a scale from 1-5,

8. **How would you evaluate your understanding of how the change in Communicable Diseases Act (section §48) will affect you when working in health care sector?**

Very good
Good
Not good or insufficient
Insufficient
Very insufficient
Cannot say

Attitude towards vacciniation:

On a scale from 1-5:

9. **How do you feel about the seasonal influenza vaccine?**

Very positively
postitively
Not positively or negatively
Negatively
Very negatively
Cannot say

10. **How do you feel regarding the new section in Communicable Diseases Act section §48?**

Very positively
Postitively
Not positively or negatively
Negatively
Very negatively
Cannot say

Influential factors:

11. **Which factors influence your attitude towards seasonal influenza vaccine?**

Family members' opinions
Work environment
Social media
Education
Other, what?
        (Free text) _____

12. **What else would you like to say?**

(Free text) _____