

Nursing students' stress factors within the study period at university

LITERATURE REVIEW

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<p>Abstract</p> <p>Stress is a life fact that every human deal in their lifetime that can be variable levels according the situation. Most of the nursing students are experiencing significantly more stress during the study period of the university. Health field is being more professional day by day in all over the world and the nursing education programs are designed consisting of many essential subjects to cover up all theoretical and clinical knowledge to produce a quality output that make heavy workload for nursing students. Stress is quite common among the nursing students and identifying the risk factors are important for the coping this situation.</p> <p>The study was implemented as a literature review. The data were collected using two databases: CINAHL and PubMed, resulting in the selection of 9 articles that were analyzed using content analysis method. Hawker & Payne assessment score system was used by two research partners to assess the quality of the articles.</p> <p>As a conclusion, major three risk factors were identified along with each specific factor entitled subcategories. Study in university and students' adaptation phase; stress during clinical practice placement; other personal and sociodemographic factors were recognized as leading aspects for source of stress generation among student nurses.</p>		
Keywords/tags (subjects) nursing student, undergraduate nursing student, stress factors, risk factors, stressor		
Miscellaneous		

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1 Introduction

Nurses are an essential part of healthcare and constitute the greatest number of health profession globally. Nurses' role is increasing in meeting societal demands which are being required more and more for safe, evidence-informed and quality care. Furthermore, many evidences are showed that patient outcomes are affected significantly by the nurse's level of education. (Morin 2014, 136-141.) By that reason, future nursing students in bachelor level are found out stressors under the numerous challenges of academic life (Devkota & Shrestha 2018).

Stress presents an individuals' response to any change which is corelated to physical, psychological and emotional response and it requires an adjustment. Concerning of stress is displayed to negative consequences on students' health and well-being, specially to nursing student who has been reported experiencing high level of stress compared to other students in healthcare field. High level of stress is a result of negative unexpecting events which are connected between student's experiences with patients at clinical enviroment, assignments and procedures during studying. (Essays 2018.)

Nursing students' stress level is increased in clinical practice places as well (Chen & Hung 2014). The higher level of stress relates with the depression and sometimes it is brought suicide feelings to the students (Yamashita. et al., 2012). This affects to academic performances and development of personal wellbeing of them (Sheu. et al. 2002).

During study time, student can develop the identifying of the risk factors of the stress and the planning possible strategies. The solution of coping with these difficult situations would be helpful to train future nursing student in different ways to deal with expecting stressors (Aedh, Elfaki & Mohamed 2015). The aim of this study is finding out the factors that cause stress among undergraduate nursing students at university. The results of the study can be used to identify stress factors and cope the level of stress properly for future nursing students.

2 Nursing education and stress of nursing students

According to WHO (2009), the main points of principle requirements for the training of general nurses consists theoretical and clinical training. For the training of general nurses, the period of studying as required is at least three years or 4600 hours including academic and practical training. The institution shall ensure that theoretical part performs at least one-third the length of training duration while clinical part is at least one half of period. Theoretical nursing teaching is given by teachers who have competent professional degree in nursing schools or in other programs by healthcare institution. Nursing students implement clinical trainings in hospital and other public or private health care clinics. In this learning process, student is considered as a part of team and have direct contact with sick customers who need nursing care. By this reason, nursing students have chances to present as a nurse and learn how to work in a team, practice and develop the knowledge and skills what they have acquired.

2.1 Definition of stress

“Stress” scientifically has been explained by the Hans Selye for the first time through the stress theory. Alarming stage, resistant stage and exhausted stage are the main divided phrases of the stress theory according to the level of stress. (Fish & Matthew 2018.)

Stress is a stimulant reaction that changes physical or psychological equilibrium in the body (Mcnealus & Kristin 2018, 16). Adrenaline and cortisol levels are increased in the alarming stage for fight and flight responses. Cortisol hormone production is elevated to ‘adapt or normalise’ the stress in the resistance stage as a coping mechanism. Exhausted stage is the phrase which decreases or resistance the cortisol hormone in the body. The level of exhaustion cannot be controlled at this

phrase and it affects to the health negative way by showing the symptoms of the stress. (Bellingham & Kay 2014.)

Stress is defined as the experience of having intrinsic or extrinsic demands that outstrips an each person's resources for responding to those demands (Morgan & Tromborg 2007). Generally human psychological responses are divided into acute stress reactions and stress disorders. Stress reaction is a respond type to hard traumatic situation while the stress disorder is the situation which needs medical care because there is the post-traumatic stress situation for longer time. (Ponteva 2020.)

2.2 Nursing students stress during the study at university.

Learning environment is relating to the study setting and also clinical setting. It is a combination of physical settings, backgrounds, and cultures that form the nature of students' interactions and behaviors, and how teachers organize the educational setting to facilitate learning process. (Hala & Heba 2017.) Stress is most common psychological issue among the young adult university students; specially nursing students who have many academic challenges as well as challenge with joining workforce. Higher workload with education and inability to balance with personal issues are intertwined the life of nursing students. This leads to depression, anxiety and stress among them. (Walailak et al. 2018.)

Study work load, responsibility, seeking acceptance from peer view ,clinical practice and clinical environment are major stressful factors for the nursing students. Moderate stress is highlighted among majority while less percentage of students has severe stress during nursing study period. There is evidence that first year and final year students have much stress level comparing to other years. (Mahadeo & Prabhuswami 2014, 231-236.)

Various role such as role transition, role demand and role ambiguity in academic and clinical setting are developed tension for them. These may indirectly or directly

impede their performance and learning. (Devkota & Shrestha 2018.) During academic lives of nursing students, many circumstances are considered to be stress exposure. Clearly, students' stress exists in both study field and practice places of the study programme. (Rusnani & Mohd 2019.) Many records mentions that during the first practical training, students are aware of this professional job which is bouding with many stresses. Nursing profession is one of social services which are considered one of the most stress-inducing jobs. The first reason is deep emotional involvement in contact with patients but followed by responsibility of human health and life. In addition, nurse also has to trunggle with concerns of the patients and their families. (Iwona et al. 2018.)

As below figure 1 reflects, Hala & Heba (2017) proved there are three levels of stress accessed. The low level of stress ranged lower than 1.33 and the moderate level ranges between 1.34 – 2.66 while the high level are between 2.67-4-00. Every types of stressors in clinical practice were mentioned belong to moderate level and high. The final average of perceived stress was 2.87 which belong to high level of stress. This result showed that stressors in cilinical placement should be alarming and need to pay more attention to nursing students during practical training.

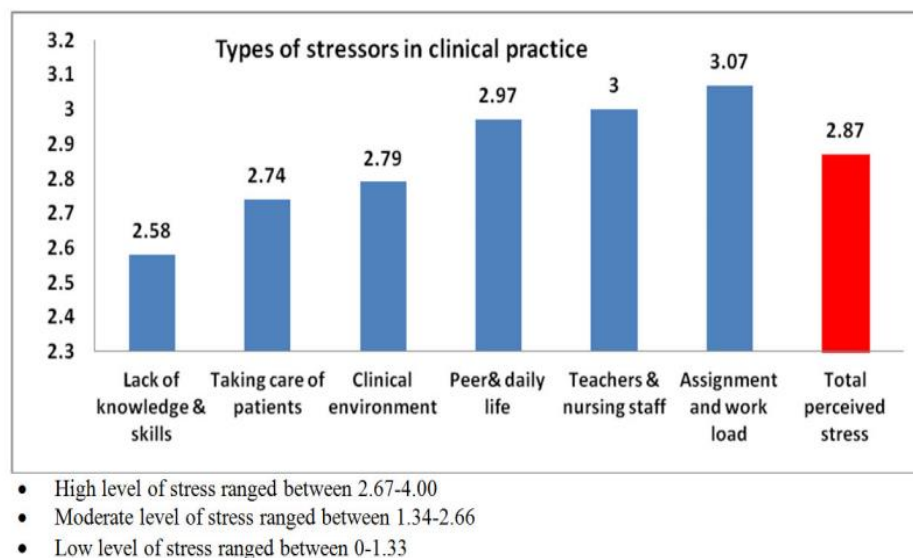


Figure 1. Types of stressors in clinical practice perceived by participant senior nursing (adapted from Hala & Heba 2017)

2.3 Stress response of student nurse

According to Labrague (2013), the physiopsychosocial health of student may be affected by the level of stress in nursing education. Nursing students identify stress responses are important key to plan effective interventions and strategies which aim to decrease and prevent stress in nursing school. All those are facilitating their learning both their learning both in the academe and clinical setting.

As table 1 indicated, Sheu and collaugues (2002) developed Physiopsychosocial Response Scale (PPSRS) to evaluate responses to stress. Physiopsychosocial health of students also is also measured during clinical practice. There are three subscatagories namely “emotional symptoms”, “social behavioral symptoms” and “physical symptoms”. Subscale scores and total scores are compute. In addition, the scorers are directly proportional to the reported symptoms and the presented poor physiopsychosocial health status. (Labrague 2013.)

Table 1. Physio-Psychosocial Scale (adapted from Sheu & colleagues 2002)

Indicators	MEAN	SD
I. Emotional symptoms		
I tend to be worried and nervous	2.59	0.92
I tend to be nervous and anxious lately	2.51	0.89
I often feel depressed and miserable	1.93	1.01
I feel afraid without any reason	1.37	1.00
I feel I am going to have a nervous breakdown	1.26	1.18
I feel more anxious lately	1.93	1.09
I cannot calm down	1.11	0.96
II. Social behavioral symptoms		
I am not optimistic about my future	1.33	1.09
My life is not very colorful	1.24	1.02
I cannot work as usual	1.26	0.85
I have difficulty in making decisions	1.7	0.86
I do not feel needed or valued	1.34	1.01
I cannot think as clearly as before	1.67	1.04
III. Physical symptoms		
I often feel giddy	1.57	0.99
I experience nausea and vomiting	0.95	1.05
I often have vertigo and feel dizzy	1.16	1.11
I feel pressure in the chest	1.54	1.1
My fingers and toes feel numb or painful	1.09	1.1
I have stomach-ache and diarrhea	1.02	1
I have difficulties in breathing for no reason	1.16	1.11
I catch cold more often	1.59	1.2
GRAND MEAN	1.50	0.48

Legend:

2.67 – 4.00 Poor Health Status

1.34 – 2.66 Good Health Status

0 – 1.33 Best Health Status

3 The aim, purpose and research question

The aim of this study is finding out the factors that cause stress among undergraduate nursing students at university. The results of the study can be used to identify stress factors and cope the level of stress properly for future nursing students.

The research question is: What are the risk factors which caused stress among undergraduate nursing students at university ?

4 Methodology

4.1 Literature Review

The study was based on literature review as this is the way to identify, analyze, evaluate published ideas and information critically from author's point of view. It provides extensive overview of the knowledge which relates to the interest research topic. (Baker 2016, 265.) The data is critically analyzed by evaluation to demonstrate consisting stage of the knowledge (Cory 2017). Literature review is displayed state of the science. Many viewpoints are reflected for the idea or interest topic through the proper literature survey. Much information can be collected through that in order to make accurate decision. Literature review is avoided unnecessary studies as well as developed new theories based on published data. (Whittemore et al. 2005.) However, in the current study, the final achievement was narrowed down essential data to describe stress factors of nursing students within study period by searching the possible risk factors using adequate amount literature (Hart 1998, 13).

Presenting a literature review should be arranged by explaining the relevant information in such understandable manner that the reader can evaluate each phase's execution and dependability. Defining the aim and the research question, searching for and selecting literature, appraising literature, analyzing and synthesizing literature

and reporting results are the main criteria of the literature review. (Niela-Vilén & Hamari 2016, 23.) So, the steps were followed methodically in present literature review is to give the research process transparency and execution manner.

Results are demonstrated by table that summarizes the main findings along with the descriptive information (Rew 2010, 68). Limitations as well as the necessity of the further studies are highlighted in discussion part (Kowalczyk & Truluck 2013). This literature review is significant as it brings awareness to nursing students, staff and health sector.

4.2 Literature Search

Research data was selected from electronic data bases which provides by the JAMK University of Applied Science. The data was searched by CINAHL (Ebsco) and PubMed as these are highly recognized evidence base data bases for nursing students and nursing professionals to obtain reliable information (Moule, Aveyard & Goodman, 2017, 46). Wide range of bibliographic information amassed in the PubMed by the U.S. National Library of Medicine while CINAHL contains journal articles which are more focused on nursing and other allied health professions. However, phenomenon can be described more comprehensive manner by accessing multiple data bases (Cory 2017.) Definition of the keywords and the research topic related variable also provided (Baker 2016).

Furthermore, the trustworthiness on the data of these databases were recommended by an information specialist at JAMK, University of Applied Science Library as well. Separate search was done using above data bases to collect and synthesize data for the study.

PICOS conceptualizing model was used as search strategy for the study. The aim was found out the risk factors for stress among nursing students within the study period. Table 2 is illustrated about this approach clearly. The restriction of selection to the study was articles from 2009 to 2020. This is confirmed that recent evidence-based

information was used for the study (Liberati et al. 2009). The data searching was based on the keywords connecting terms of Boolean operators, "nursing students" OR "undergraduate nursing students" "OR" "Student nurses" AND "risk factors" OR "contributing factors" OR "predisposing factors" OR causes" AND "stress" OR "depression" "OR" "anxiety".

Table 2. PICOS

Population (P)	undergraduate nursing students
Phenomena of interest(I)	risk factors
Context (CO)	stress
Study(S)	English, literature review, from 2009 to 2020

An inclusion and exclusion criteria were selected for the research by the authors to assess and evaluate the proper articles to the study. Scientific articles which were not achieved for the standard level were excluded.

Table 3. Inclusion and exclusion criteria

Inclusion	Exclusion
Articles with the key words: nursing student, stressor or stress factor, risk factor, with its synonyms	
Published between 2009-2019, full text access, relevance based on titles, relevance based on abstracts.	Duplicated articles
The relevance of articles after full-reading and do answer the research question.	Articles which do not answer the research question

4.3 Content analysis

This study was investigated by utilizing the knowledge of content analysis. According to Cole (1988), content analysis is created by analyzing the communication which including written, verbal, and visual messages. In past, content analysis was used for newspapers and magazine articles, advertisements, political and hymn but nowadays, it is expanded to business, psychology, journalism, and sociology (Elo & Kynga 2007). Through analyzing, evaluation and categorization are implemented as key themes without losing the ideas but confirming its prominent role to the audience. Framework and theme are mainly characterized while the comparison is assessed. (Graneheim & Lundman 2004.) The using this method is deducing the implication from document along observed realistic paradigm (Hsieh & Shannon 2005).

According to Hall (2017) and Burns & Grove (2005), the process of content analysis involves the collecting of general information to a more focus by exclusion and inclusion criteria. Besides, researcher narrows the conducted previous studies' scope down into a more specific insight but no change the intended meaning. This study starts finding the common articles bases on theoretical research after conducting process with the main key word in searching term. The following process is searching articles based on searching options as the year, language, titles, full-text reading, geographic subset, peer review and abstract reading. The final chosen articles are decided by relevant articles that answer the intended research question.

The selected articles were critically appraised separately to select articles by using Hawker's checklist. The review briefly displays the effective outcome which is selected by relevant evidenced based articles to research study. The selected articles were evaluated in the following areas: title and abstract, introduction and aims, method and data, sampling, data analysis, ethics and bias, results, transferability and implications, and implications and usefulness. Each criteria section assigns the answers into a numerical score from 1 to 4 points: Very poor=1, Poor=2, Fair=3,

Good=4. (Hawker & Payne 2002.) The theoretical scale of points of each article vary from 9 to 36 and the minimum score of chosen articles is decided to be 18. All results were compared together, and 9 articles were selected for further analysis. In the overall quality grades, there are 8 high quality articles with high number from 30-36 points. One articles with 29 points was considered with medium quality which ranges from 24-29 points. There were no low-quality articles under 24 points. Points from evaluation Hawker's checklist will be updated in appendix.

The total articles (N=9) used in this investigation were published in 2018 (N=1), 2017 (N=3), 2016 (N=3), 2014 (N=1) and 2012 (N=1). The articles are published in different locations are: Australia (N=1), Brazil (N=3), USA (N=1), Sweden (N=1), Singapore (N=1), Japan (N=1) and Jamaica (N=1). The appraised articles used quantitative study (N=1), analytical study (N=1), analytic and quantitative (N=1) and qualitative-quantitative method (N=6). Data were analyzed by descriptive correlational survey (N=1), online survey (N=1) and statistical analysis (N=2).

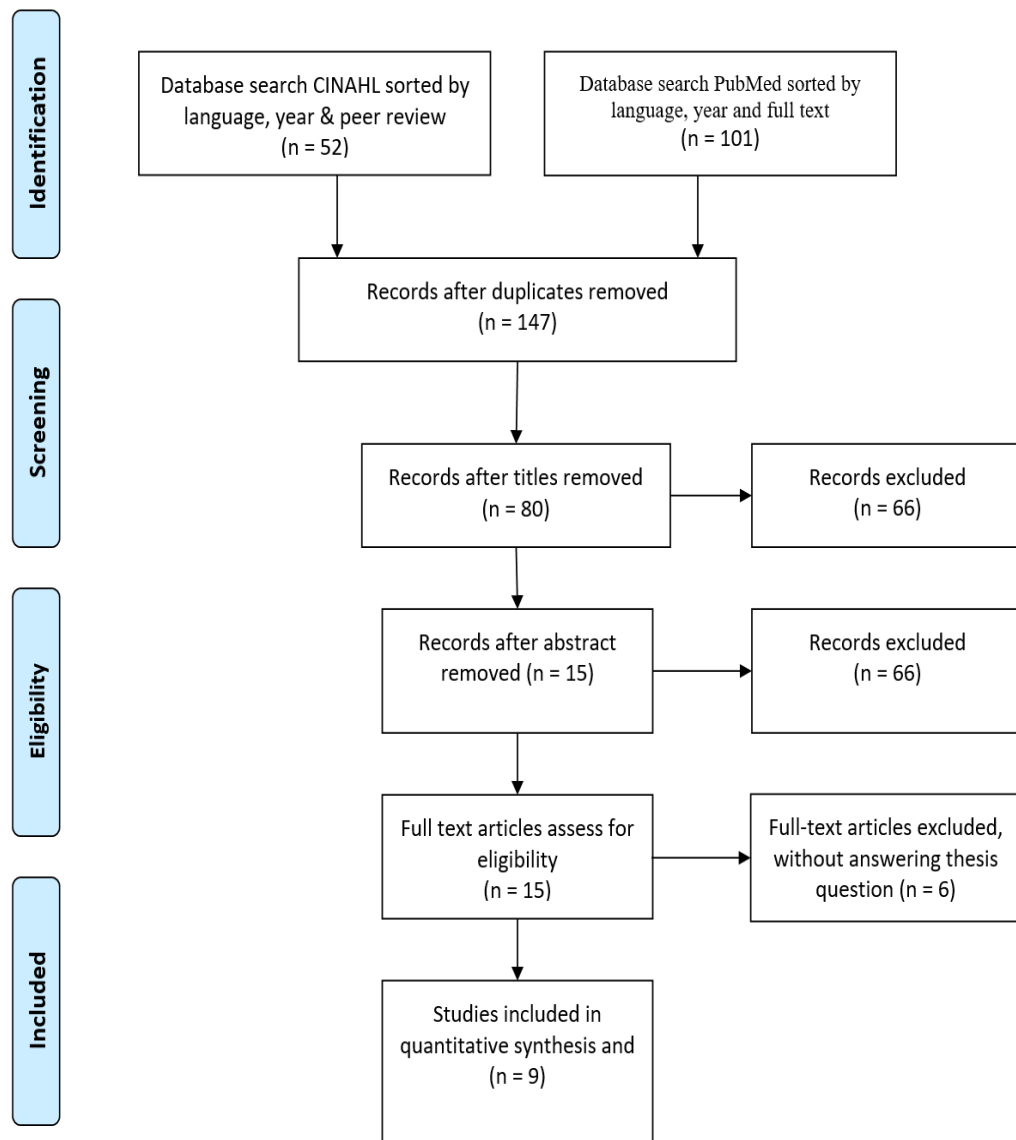


Figure 2. A chart indicating articles selection process

5 Results

Three main categories were made by synthesized the 9 selected articles. All information relates to research question was collected from chosen articles and categorized into each main category. Again, the information was evaluated together to find relating ideas and merged into subcategories. Lastly, resulting table was created with final main categories and subcategories as table 4 below. (Duriiau, Reger & Pfarrer 2007.)

Table 4. Summary of main categories and subcategories identified from the appraised articles

Research question	Main categories	Subcategories
What are the stress risk factors among nursing students at university ?	Stress development during adaptation phase and studying in the school.	<ol style="list-style-type: none"> 1. Adaptation phase difficulties 2. Curriculum complications 3. Factors arise with conflict situation and balancing
	Factors of stress affecting undergraduate nursing student at clinical placements.	<ol style="list-style-type: none"> 1. Inadequate theoretical and clinical knowledge in clinics 2. The fears in practical placement 3. The relationship between clinical staff and practical student 4. The clinical setting expectation and student's expectation
	Personal and sociodemographic factors influencing on nursing students' stress excluding academic issues.	<ol style="list-style-type: none"> 1. Personal issues 2. Stress under sociodemographic

5.1 Stress development during adaptation phase and studying in the school.

Fundamentally the stress factors of student nurses which originates within the university studies can be summarized under three subcategories according the finding. These are adaptive phase difficulties; Curriculum complications and factors arise from the conflict situation. Mostly nursing students are young and the adaptation of the new learning environment from their usual lifestyle is difficult task for them. Especially fresh young students with lack of knowledge about the degree experience

the stress because of the adaptive phase incapability (Bosso, Silva & Costa 2017, 137). Higher responsibilities and independent work are contributed much stress during the first semester. Increasing demand, accomplishment and competency in each academic year also relates with the nursing students' inability to cope stress. Final year students encounter the maximum stress level, and the stress level is increased gradually in each academic year from the beginning of the course. (Cestari et al. 2017, 192- 195.)

Furthermore, curriculum can be considered as one of stress causing factor which manifests the inadequacy of maintain satisfactory psychological health. Full time degree, expeditiousness of the course, higher demanding from academic staff, work capacity, dissatisfaction and anger on own accomplishment, insistency on attainment of the graduation timely are prioritized among them. (Tomaschewski-Barlem et al. 2014, 935 & 938.) Continuation of university study during the clinical practice is also become a burden factor for their mentality (Graham et al. 2016, 13). The curriculum is consisted of full of exams, tight schedules, writing assignments, case studies, projects and clinical practices. This compact system is perceived more intensely stressful for the nursing students. (Suen et al. 2016, 2.) Time management is one of difficulty that highlights during nursing study. Balancing personal life with mandatary extracurricular work and enormous in class work is generated the students' stress. Moreover, inadequate content exploration of the university and intractable schedule system are also interlinked factors for the stress. (Bosso, Silva & Costa 2017, 132 & 135; Llapa-Rodrigues et al. 2016, 219.)

Some nursing students work during the studies and they demonstrate incapability of the balancing situation with less productive study comparing the non-work students. It has revealed that working students have more factors of burnout syndrome than non-working students. (Tomaschewski-Barlem et al. 2014, 937.) Interpersonal correlation with companions and the academic staff is constructed conflict situation for student nurses (Bosso, Silva & Costa 2017, 132).

5.2 Factors of stress affecting undergraduate nursing student at clinical placements.

Studies showed that inadequate theoretical and clinical knowledge are the most common stress factors in clinical practice. Nursing students do not have sufficient nursing skills and knowledge about disease and treatment. In addition, nursing skills are performed in classroom practices differently than clinical practice. (Kaneko & Momino 2020.) According to Suen and colleagues (2016), the stress level rises over the nursing programme so in the clinical, nursing students' confidence and level of stress are significantly different between third year student and first year. Likewise, Bosso, Silva, & Costa (2017, 131) stated that the senior students have greater stress than junior students through professional communication, environment, trainings, and practical activities at clinic. In comparison between practices in hospital department and community/primary care, nursing students in hospital departments is believed to have higher level of stress because of having greater the number of patients needs caring, workload and facing more often multi diseased and dying patients. Moreover, the clinical sources also were implemented such as not acquainting with medical term and history, being in unknow situations or making mistakes with patients and not manipulating technical instruments. (Blomberg et al. 2013, 5.)

In practical placement, many mentors gave the evaluation of student's fear during practices. Most of the fear is to be infected by patients who have infectious diseases. In the other hands, among the students practiced, the relationship between the inability of relate theory to practice and the fear of harming the patient are significant sources of stress. Besides, many students reported that the rigors of hospital environment and the ability in dealing with dying patients are uneasy to cope and overcome. Another fear was conducted is unfamiliarity with the unit, terminology and medical techniques which cause difficulty identification when needed. (Graham et al. 2016.)

Studies conducted among nursing students in practical placement, the relationship between clinical staffs and practical students are moderately high resources of

stress. This factor affects significantly to the learning experiences of students during clinical practices. From student's view side, poor interpersonal relationship is identified by various feeling such unhelpful and disrespectful to staffs and alienated from the team. The reason of those feeling might come from beholding negative attitudes and inattention of healthcare staffs and inadequate support from clinical staffs for coping with difficult circumstances. In addition, nursing students reported that they had fears of getting criticism from teachers in front of peers, other clinical staffs, and patients. (Graham et al. 2016.) According to Suen and colleagues (2016), in the health care systems, nursing students were of lower rank and identified by student's uniform in clinical environment. By this reason, it made a barrier in building confidence of nursing students and effective communication between trainees and health care professionals. From clinical staffs' view side, the relationship between students and clinical staffs are affected by heavy workload and high expectation of nursing students. Both students and nursing staff had pressure finishing job on time while clinical staffs had to work, teach, and guide the nursing trainee at the same time. These factors are challenging the communication among nursing students and teaching staffs in clinical environment. (Graham et al. 2016; Suen et al. 2016; Tomaschewski-Barlem et al. 2014.)

The conflict between clinical setting expectations and students' expectation are one of stress factors among nursing students in clinical placement. It is said that nurses in hospital generally have higher expectations on nursing students, specially third year students because they have better ability of learning and practice in understaffed and overcrowded environments. On the other hand, the nursing students did not satisfy with what they expect about clinical placement. The aspects of individualization, teaching innovation and learning strategies, orientation might be missing without supervision during practical training. Practical students preferred a supportive environment with better autonomy which give the feeling of teamwork than follow and observe their supervisor' doing. (Suen et al. 2016.)

5.3 Personal and sociodemographic factors influencing on nursing students' stress excluding academic issues.

Not only the concerns of academic setting and clinical practice, but also there are evidence that some other factors like personal issues and sociodemographic vulnerabilities also have been interlinked to cause stress among nursing students.

Lack of satisfaction the course, working environment and personal interaction, interrelate subject matters, frustration feeling about nursing profession and their personal selection are triggered the nursing students stress level (Tomaschewski-Barlem et al. 2014, 935 & 939).

Personal emotion in the clinical practice is recognized as risk factors of stress. Fearfulness, exhausted feeling about the work capacity, anxiety, inferior feeling as a student, desperation can be pointed out as intrapersonal factors which correlates with the stress. (Graham et al. 2016, 16.) Lack of experience about patients' pain and suffers is prioritized for emotional based stress in clinical setting (Cestari et al. 2017, 194). Some students also feel stress while practicing in the congested wards (Blomberg et al. 2013).

Financial difficulty is conveyed in literature as a major source of stress among the nursing students (Graham et al. 2016, 16). The nursing students with financial struggling continue the studies doing part time jobs so that they are unable to manage time for studies effectively. The financial burden is affected severely the students who should pay expenses by them self without any other supporting source. (Cestari et al. 2017, 193; Suen et al. 2016, 5.)

Sleep quality is also directly associated with stress, anxiety, and depression among undergraduate nursing students according the conceptual model illustrated. Lack of quality in sleeping is interconnected with perception stress. (Zhang & Peters 2018, 5.) Nursing students' stress is developed about completing national clinical final examination in some countries (Blomberg et al.2013).

Considering sociodemographic vulnerabilities gender, age, marital status, occupation, academic year, expenses for study have been identified as stress factors. Female students are more tendency become stress comparing to male students. Emotional exhaustion is higher among the married women as a result of much workload combine at university and the home. This scenario is worsening with the students who have children with them according the evidence. The hormone like adrenaline and cortisol production is double in this situation in woman than men which makes emotional frustration, panic, depression, and anxiety. (Cestari et al. 2017, 191-195; Llapa-Rodriguez et al. 2016, 218; Suen et al. 2016, 7.)

6 Ethical considerations, validity and reliability

The responsible conduct a research accepting RCR guidelines is the key requirement in scientific writing of Finland. Ethics also one of the most important part of the research that fulfill ethical viewpoint and evaluation associate with research and science. Research integrity is essential fact that prioritizes to concern honesty and integrity in the research. So, the key element of the proceeding our thesis in responsible manner was continuing our research by securing the principles of honesty and integrity. The research integrity of the thesis can be accomplished by accurate conducting and careful evaluation, scientific and ethical feasible methods, reporting and analyzing according the scientific knowledge, scientific planning, respecting, and crediting the other researchers with proper citation. (Finnish Advisory Board on Research Integrity 2012.) Research integrity guidelines were followed accordingly by the researchers to be ethically responsible throughout our study.

This thesis writing has been instructed following JAMK's reporting instructions and ethical principles for JAMK university of applied sciences. All authors were aware of ethical conduct in studies and educated about research misconduct such as: falsification, fabrication, plagiarism, and misappropriation. This literature review will be sent to Urkund to prevent of plagiarism by analyzed what other sources have been used.

In addition, a completed thesis is public and confidential. It must be submitted in correct electronic format and stored permanently in Jamk's electronic archive and Theus database. (JAMK university of applied sciences 2019.)

In the article selection process, the research result might have been affected by researchers' writing languages which are not their mother language. By this reason, the reliability of research might be decreased. The validity of data was ensured in the inclusion and exclusion criteria steps which includes searching limitation, such as peer reviewed and published period from 2009-2020.

7 Limitation

In our study, there are several limitations. In selection article process, some articles were excluded because of limitation range of 10 years and written language in English only. Therefore, the useful information which could have been achieved in earlier periods and in other languages is limited. Some of articles were accessed only through payment or waiting process of asking permission. However, we got all needed assessment permissions.

Moreover, the perception of stress and the stress factors vary from different person, cultures, and countries so there are not completely adequate factors of stress. Nursing programs and the period of nursing study are different among universities and countries, so the last year nursing student might be understood as third year or fourth year student. The assessment of stress was implemented mostly by tools such as questionnaires and numerical rating scales which does not include stress tracker.

8 Discussion

In the healthcare system, student nurses are the next liners in patient care. Therefore, they are obliged to experience scenarios that they will encounter when they become registered nurses which are achieved through academic knowledge in university and clinical placements. In fact, the registered nurse nowadays is facing various stressors which can be reasons may affect consequentially to their health and well-being. By this reason, the stressors become barriers between nurse and patients in providing the possible caring at clinical place.

Stress is interlinked with the psychological issues like anxiety and depression so that it affects negatively healthy lifestyle. Based on the profile found, it is need of an hour that universities and other nursing teaching institutes be concerned much about the occurrence of stress among nursing students, since this influences the health, quality of learning, personal life balancing and performance of students. Furthermore, it is key issue to reinforce discussions on the health condition of nursing students in educational spaces with a perspective to generate actions of prevention, control, and reduction of the stress during the study period.

Some similar and different stress factors were identified in our earlier findings and the result part. In clinical environment, workload, pressured responsibilities, peer view are common stressful reasons among nursing students. It was agreed that the first year and last year student were impacted majorly by stress factors. (Mahadeo & Prabhuswami 2014, 231-236.) Deep emotion includes natural and personal fears of nursing student when they contact with patients and different diseases (Iwona et al. 2018). There was small difference mentioned in earlier study that learning environment is also a factor which impact to nursing student's interaction and behaviors. This learning environment could be made of educational setting, culture, background and teaching organization with arrangement of teacher. According to figure 1, assignment and workload is the highest stress factor, lack of knowledge and skills is smallest. (Hala & Heba 2017.) However, in the finding, hardly stress factors were mentioned as a biggest reason for nursing student, even all aspects were listed similarly.

Sociodemographic factors are common characteristics affects stress level of nursing student among countries. The background of a nursing student might decide how much challenges he/she must face during academic studying combining with studying factors. According to Iwona and colleagues (2018), nursing job made a nurse struggle by double concerning are patients and their families. The assessment of socio demographic characteristics will effectively support the psychological plans at school more specific to each student and risk groups considered such as female, married status and the number of children if have.

The finding of the literature review can be utilized to implement coping mechanism concerning the stress factors. Awareness of these risk factors is essential by the future nursing students, teaching staff of university, family members, staff of the practical placement, health sector, curriculum designers to maintain well-being of the student nurses while studying. Proper stress management during the study period can be produced best workforce for the future which serves to one of the most highly respectable and rewarding careers as a professional nurse.

9 Conclusion

Three major stress generating risk factors that affect undergraduate nursing students were identified through our literature review. They can be documented as stress factors during adaptation phase and university studies, stress developing factors in the clinical practice, personal and sociodemographic issues. Furthermore, various types of stress sources were clarified under each main category. In this perspective, it is key requirement that proper recognition and consideration the stress factors of the undergraduate nursing students specially by the teaching staff, family members, mentors along with other staffs in clinical practice placement, curriculum designers so that the students can maintain their psychological health positive manner. Further studies can be proposed the action focusing the coping strategies of the undergraduate nursing students stress level. This would support to minimize the stress and improve their well-being during the study period.

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Appendix: content analysis

No.	Author(s), Year, Country	Title	Aim(s) and Purpose	Participants, Sample size	Data collection and Analysis	Key results	Quality assessment
1	Tomaschewski-Barlem, J.G., Lunardi, V.L., Lunardi, G.L., Barlem, E.L.D., Silveira, R.S., & Vidal, D.A.S. 2014 Brazil.	Burnout syndrome among undergraduate nursing students at a public university	To investigate the burnout syndrome and its relationship with demographic and academic variables among undergraduate nursing students at a public university in Southern Brazil.	168 nursing Students	Quantitative study with 168 students, by applying an adaptation of the Maslach Burnout Inventory - Student Survey, validated for this study. Descriptive & Variance Analysis of the data.	Students do not have the burnout syndrome, manifesting high average scores in Emotional Exhaustion, High Professional effectiveness. Students who do leisure activities have high professional effectiveness. Combining work and studies negatively influenced only the Professional Effectiveness factor, while the intention of giving up influenced negatively Disbelief and Professional Effectiveness factors.	32
2	Graham, M.M.B., Lindo, J., Bryan, V.D. & Weaver, S. 2016. Jamaica.	Factors associated with stress among second year student nurses during clinical training in Jamaica	To determine the levels of stress among students in the Jamaican clinical setting and describe the perceived contributing factors to this stress.	106 second year nursing students	30- item self-administered questionnaire to gather data on levels of stress and contributing factors. Rate of levels of stress experienced have been asked from participants. (scale 0-5, where 5 was highest). Data were analyzed using SPSS® v 19 for Windows®.	Students enrolled at two nursing schools experienced moderately high levels of stress in the clinical Environment.	29

3	Kaneko, S., & Momino, K. 2020. Japan.	Stress Factors and Coping Behaviors in Nursing Students during Fundamental Clinical Training in Japan	To identify the structure of stress factors during fundamental clinical training and the relationships between stress factors and coping behaviors in nursing students	158 first-year undergraduate nursing Students.	A self-administered questionnaire study was conducted before and after fundamental clinical training. Partial correlation analysis to examine the relationship between stress factors and coping behaviors while controlling for SOC score, a confounding	Seven stress factors have been identified among nursing students during fundamental clinical training. "Relationships with teachers and clinical instructors," "lack of knowledge and skills," "reflecting on patient care experiences," "relationships with patients, families, and healthcare staff," "conferences," "peer relationships," and "daily planning in clinical practice."	32
4	Cestari, V.R., Barbosa, I.V., Florêncio, R.S., Pessoa, V.L., & Moreira, T.M. 2017. Brazil.	Stress in nursing students: study on sociodemographic and academic vulnerabilities.	To analyze the association between the presence of stress in nursing students and sociodemographic and academic vulnerabilities	455 Nursing Students	Data were obtained by means of a questionnaire to identify sociodemographic and academic vulnerabilities, and by the Lipp's Stress Symptoms inventory. The association between variables was tested by Pearson's chi-square (p <0.05), the strength of this association by odds ratio, and logistic	Among all students, 64% presented stress with the following associated factors: sex (p <0.010), age group (p <0.029), marital status (p <0.001), children (p <0.001), occupational status (p <0.001), cost of education (p <0.009) and current study period (p <0.001). In the final model these factors remained: sex, marital status and current study period.	30.5
5	Llapa-Rodriguez, E.O., Marques, D.A., Neto, D.L., López-Montesinos, M.J., & Oliveira, A.S.A. 2016. Brazil.	Stressful situations and factors in nursing in clinical practice	To assess the risk factors for stress in undergraduate students of nursing in clinical practice	116 Nursing Students	The bilingual KEZKAK questionnaire, validated for Portuguese, was used. Cross-sectional descriptive study from the fifth to the ninth study period.	The factors which were most associated with stress were: Lack of competence ; Impotence and uncertainty ; and Patients seeking a closer relationship. The students of the sixth period were the most vulnerable to stress. The studies showed the main risk factors for stress among students of nursing in their clinical practice.	34.5

6	Suen, W.Q., Lim, S., Wang, W., & Kowitlawakul, Y. 2016. Singapore.	Stressors and expectations of undergraduate nursing students during clinical practice in Singapore	To identify the contributing factors of stress and the clinical environment expectations of undergraduate nursing students during their clinical practice	285 nursing Students	Questionnaires were used to collect the data. cross-sectional descriptive study design using validated surveys was adopted.	The results showed that third year nursing students had higher stress levels than first year and second year students. Satisfaction in terms of fulfillment among nursing students during clinical practice was found to be the most influential factor in predicting stress.	31.5
7	Blomberg, K., Bisholt, B., Engström, A.K., Ohlsson, U., Johansson A.S., & Gustafsson, M. 2013. Sweden.	Swedish nursing students' experience of stress during clinical practice in relation to clinical setting characteristics and the organisation of the clinical education	To describe nursing students' experience of stress during clinical practice and evaluate the risk of stress in relation to the clinical setting characteristics and the organisation of the clinical education	184 final Year nursing students.	Data were collected by means of a numerical rating scale for the assessment of stress and questions about the clinical setting characteristics and the organisation of the education. A cross-sectional study with evaluative design.	Nearly half of the students (43%) experienced high level of stress during clinical practice. the absolute risk of stress was 57% in students with placements in hospital departments, as compared to 13% in students with placements in other clinical settings.	34
8	Bosso LO, Silva, R.M., & Costa, A.L. 2017. Brazil.	Biosocial-academic profile and stress in first and fourth year nursing students.	To compare the biosocial and academic profile and stress levels between first- and last-year nursing students.	83 nursing Students	This is an analytic and quantitative study. A biosocial and academic form and the instrument for Assessment of Stress in Nursing Students	Insufficient income and extracurricular activities contribute to higher levels of stress in both groups of students assessed. Fourth-year students showed higher levels of general stress, particularly generated by the factors: performance of practical activities, professional communication, environment and professional training. Time management produces higher stress in first-year students	31

9	Zhang, Y., & Peters, A. 2018. USA	Perceived Stress Mediates the Associations between Sleep Quality and Symptoms of Anxiety and Depression among College Nursing	Mental illnesses, such as anxiety and depression, are top concerns among college students. Poor sleep quality intensifies the risk of mental illnesses. However, the mechanism for the associations between sleep quality and mental illnesses in college students is not well understood	242 undergraduate nursing students at a public university	Online surveys were collected. Multivariate linear regression models	This study suggested that in addition to sleep promotion, effective interventions to identify unique stressors in nursing students and facilitate the development of appropriate coping strategies are needed to enhance their mental health and well-being.	30
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Appendix B: analysis process.

Study	Content analysis	Subcategory	Main category
Cestari et al. 2017	Undergraduate nursing student shows stress during the first semester because adaptation process to adulthood.	Adaptation phase difficulties	Stress development during adaptation phase and studying in the school.
Cestari et al. 2017	Demanding higher competencies, skill and requirements in first year student in each study period	Adaptation phase difficulties	
Bosso, Silva & Costa 2017	The first-year students present adaptive experiences in new environment.	Adaptation phase difficulties	
Tomaschewski-Barlem et al. 2014	Stress is developed by 3 factors: full time courses, academic pressure, and self-expectation in class performance.	Curriculum complications	
Tomaschewski-Barlem et al. 2014	Burnout syndrome and levels of stress are developed by completion of the degree	Curriculum complications	
Suen et al. 2016	Exam mark expectation from nursing student's parents and tutors.	Curriculum complications	
Suen et al. 2016	Stress experiences because of tight syllabus with exam, heavy assignments, projects, and clinical practice.	Curriculum complications	
Bosso, Silva & Costa 2017	New students overburden and struggling time management with academic, social, and personal life.	Curriculum complications	
Bosso, Silva & Costa 2017	Inadequate content address in class and unadaptable schedule.	Curriculum complications	
Graham et al. 2016	Stress develops in moderate and high levels during class lecture with clinical rotation.	Curriculum complications	
Llapa-Rodriguez et al. 2016	Mandatory curricular workload with extracurricular activities affect quality of life	Curriculum complications	
Tomaschewski-Barlem et al. 2014	Students who work during study show less effective in their study.	Factors arise with conflict situation and balancing	
Tomaschewski-Barlem et al. 2014	Nursing students experience conflicting situation in different settings such as: classroom, laboratory, emergency etc.	Factors arise with conflict situation and balancing	

Bosso, Silva & Costa 2017	Interpersonal relationship difficulties arise between classmates and staff in clinical placement	Factors arise with conflict situation and balancing	
Llapa-Rodriguez et al. 2016	Main stress factors for nursing student is inadequate knowledge and the fear of harming patient in clinical place.	Inadequate theoretical and clinical knowledge in clinics	Factors of stress affecting undergraduate nursing student at clinical placements.
Suen et al. 2016	Nursing student's confidence are significant different because stress level develops over the nursing programme. So, the third-year student shows the highest rate of stress than first year.	Inadequate theoretical and clinical knowledge in clinics	
Kaneko & Momino 2020	There are differences between skills used in clinical practice and laboratory at school. Students have inadequate knowledge and skills about treatments or diseases.	Inadequate theoretical and clinical knowledge in clinics	
Bosso, Silva & Costa 2017	The fourth-year students have higher stress than first year student by presentation of professional training and clinical activities	Inadequate theoretical and clinical knowledge in clinics	
Blomberg et al. 2013	Nursing students do practice in hospital department rise level of stress than in community/primary care. Clinical source of stress: inadequate knowledge, professional ability, less familiarity with medical terms and history, unfamiliar situation, and technical instruments.	Inadequate theoretical and clinical knowledge in clinics	
Tomaszewski-Barlem et al. 2014	The fears come from contracting with patient's diseases and implementing caring procedures in hospital environment	The fears in practical placement	
Graham et al. 2016	Students appear the fears when they are unable to apply theory in practice and identify resources when needed.	The fears in practical placement	
Graham et al. 2016	Feeling of being overwhelmed and confronted in the first clinical practice	The fears in practical placement	
Graham et al. 2016	The fear of clinical mentor's evaluation, difficult patients, and the toughness of clinical environment.	The fears in practical placement	
Graham et al. 2016	Majority of students had fears of harming patients and contract a disease from patient.	The fears in practical placement	

Graham et al. 2016	Major of stress comes from unfamiliarity with medical techniques and terminology, and unit.	The fears in practical placement	
Graham et al. 2016	Poor interpersonal relationships present among nursing students, clinical staff, and nursing mentor.	The relationship between clinical staff and practical student	
Graham et al. 2016	In the clinical area, nursing students are afraid of preceptors shaming them before peers, other clinical staff, and patients.	The relationship between clinical staff and practical student	
Graham et al. 2016	Final year nursing student identifies that clinical area was a significant source of stress. The interpersonal relationships affect to learning experience during clinical practice.	The relationship between clinical staff and practical student	
Graham et al. 2016	Nursing students perceived the unhelp and disrespect from nursing staff, inadequate orientation to unit and alienation from the team	The relationship between clinical staff and practical student	
Graham et al. 2016	High expectation of nursing instructor and the mistake critique	The relationship between clinical staff and practical student	
Suen et al. 2016	In the system, nursing students were recognized by uniform and were indicated in lower rank in working system. This lowers the effective communication between students and clinical staffs.	The relationship between clinical staff and practical student	
Suen et al. 2016	Both preceptors and nursing student feel stressed about tight working time. Preceptors meet challenges when they had to guide, teach students and work at the same time.	The relationship between clinical staff and practical student	
Tomaschewski-Barlem et al. 2014	The relationship between students and nursing staffs are affected by negative and inattention viewpoint of nursing staff in caring patient.	The relationship between clinical staff and practical student	
Tomaschewski-Barlem et al. 2014	Nursing students have lack of support for dealing with difficulties	The relationship between clinical staff and practical student	
Suen et al. 2016	Nursing student's practices occur in overcrowded patient and understaffed environments with high demand of nursing staffs	The clinical setting expectation and student's expectation	
Suen et al. 2016	Nursing staffs have higher expectation on third year students	The clinical setting expectation	

		and student's expectation	
Suen et al. 2016	Nursing students have different experiences at clinical environment than their expectations.	The clinical setting expectation and student's expectation	
Suen et al. 2016	Nursing students feel the lack of orientation's support, innovation, and involvement.	The clinical setting expectation and student's expectation	
Suen et al. 2016	In expectation, nursing students learn better in supportive environment and good teamwork.	The clinical setting expectation and student's expectation	
Tomaschewski-Barlem et al. 2014	Clinical environment unmet student's expectation and causes the difficulties of dealing with stress in practical classes and internships.	The clinical setting expectation and student's expectation	
Tomaschewski-Barlem et al. 2014	Lack of satisfaction of the students' professional choice along with professional environment and relationships	Personal issues	Personal and sociodemographic factors influencing on nursing students' stress excluding academic issues.
Tomaschewski-Barlem et al. 2014	Less awareness about the selected degree program is lead the emotional dissatisfaction, frustration and increasing stressful situation	Personal issues	
Graham et al. 2016	Financial burden is demonstrated the maximum source of stress generating among second year nursing students during the clinical studies.	Personal issues	
Suen et al. 2016	Financial difficulties are increased the stress among the students. So, the students who do part time jobs as a solution illustrates less effective in studies due to time management problems.	Personal issues	
Suen et al. 2016	Nursing students stress is interlinked with depression, anxiety and sleeping quality	Personal issues	
Graham et al. 2016	Sleeping time, socialize time is less for the nursing students because of intense nursing study period.	Personal issues	
Graham et al. 2016	Emotional experience is clear during clinical practice like fear, exhausted, anger, disappointed and inferior thought	Personal issues	
Cestari et al. 2017	Nursing students have varied emotions mostly seeing suffering and pain of the patients .	Personal issues	
Blomberg et al. 2013.	Nursing students who practice in hospitals have high stress level due to national	Personal issues	

	clinical final exam. Congesting hospital wards also one of stress factor for some nursing students.		
Llapa-Rodriguez et al. 2016	Marital status is a source of stress to nursing students as heavy workload, relationships and responsibilities lies with that.	Sociodemographic factors.	
Suen et al. 2016	Higher level of stress is indicated among the female nursing students compared with male nursing students. So, gender affects the stress of nursing students	Sociodemographic factors	
Cestari et al. 2017	Study with mandatory university studies managing family responsibilities is heavy workload. Elevated responsibilities can increase production of adrenaline and cortisol level 2:1 ratio respectively female and male which end up with depression etc.	Sociodemographic factors	
Cestari et al. 2017	Having a child is a stress causing factor during undergraduate nursing studies.	Sociodemographic factors	