A review of the literature regarding stress among nursing students during their clinical education

A. Alzayyat1 RN, BSC, MSC & E. Al-Gamal2 RN, BSC, MSC, PhD

1 Teaching Assistant, 2 Associate Professor, Psychiatric & Mental Health Nursing, Faculty of Nursing, Department of Community Health Nursing, The University of Jordan, Amman, Jordan


Background: There has been increased attention in the literature about stress among nursing students. It has been evident that clinical education is the most stressful experience for nursing students.

Aim: The aim of this paper was to critically review studies related to degrees of stress and the type of stressors that can be found among undergraduate nursing students during their clinical education.

Methods: The search strategy involved the utilization of the following databases: MEDLINE (Medical Literature On-Line), CINAHL (Cumulative Index to Nursing and Allied Health Literature), PsycINFO (Psychology Information) and PubMed. Keywords were stress, undergraduate nursing students, clinical practice. The review included those studies published between 2002 and 2013, conducted in any country as long as reported in English, and including a focus on the clinical practice experience of nursing students. Thirteen studies met the eligibility criteria.

Results: Four themes were identified: initial clinical experience, comparison between different academic years, cross-cultural comparison, and eustress aspects of clinical experience.

Implications for nursing and health policy: This review expands current knowledge in the area of stress in clinical settings and calls for further research. Nursing teachers should utilize the findings of this review to direct their students during clinical practice. Moreover, hospital administrators need to promote policies to promote a training environment where students are supported and inspired.

Keywords: Clinical Practice, Literature Review, Nursing Students, Stress, Nursing Education, Clinical Education, Nursing

Introduction

Stress has been viewed as a 20th-century sickness (Evans & Kelly 2004). Stress could be defined as response based (i.e. emerging from a person’s reactions to incidents), stimulus based (i.e. consequences of incidents) or interactive (i.e. resulting from interaction between stimuli and responses) (Furnham 2005). Stress has both beneficial and harmful impacts on individuals (Behere et al. 2011; Burnard et al. 2007). As a beneficial impact, stress is able to force us towards achievement (Behere et al. 2011). Selye (1976) called this impact 'eustress'. As a harmful impact, literature reveals that stress has negative effects that might be classified into three groups: physical manifestations, such as headache and infections; psychological manifestations, such as anger, low self-respect and anxiety; and

Conflict of interest: No conflict of interest has been declared by the authors.

Correspondence address: Mr Abdulkarim Alzayyat, Faculty of Nursing, Department of Community Health Nursing, The University of Jordan, Amman 11942, Jordan; Tel: (962 6) 5355000; Fax: (962 6) 5300244; E-mail: a.alzayyat@gmail.com.

Ethical approval was obtained from the Research Ethics Committee at the Faculty of Nursing, The University of Jordan, on 12 December 2012 (Reference number: 8).
The topic of stress among university students has been extensively investigated by several researchers (Al-Zayyat & Al-Gamal 2014; Hamdan-Mansour et al. 2009; Pillay & Ngcobo 2010). Students experience numerous stressors from a variety of sources, and, typically, they react to these stressors in different ways (Hamaideh 2011). Sources of stress among university students could include academic demands (Elias et al. 2011), being away from home (Seyedfatemi et al. 2007) and financial pressure (Pillay & Ngcobo 2010).

There has been increased attention in the literature on stress among nursing students (Nicholl & Timmins 2005). Sources of stress among nursing students can be varied. Academic sources include examinations, fear of failure and workload. Clinical sources include clinical placements, fear of making mistakes and interactions with other staff members. Personal and social sources include financial concerns and the absence of leisure time (Pryjmachuk & Richards 2007). However, only studies that focused on clinical sources will be discussed here because the rest of the sources are outside the scope of this review.

Only one published review paper was identified which addressed sources of stress among nursing students (Pulido-Martos et al. 2012). This review included studies that reported quantitative analysis of the stress associated with nursing curricula. The vast majority of the revised studies in the review were about academic or social sources of stress. Only 8 studies out of 23 focused on clinical stressors. Therefore, the current paper is considered to be a novel contribution to the field, addressing degrees of stress and type of stressors among undergraduate nursing students during their clinical education. The scope of the previous review paper has been expanded by including both qualitative and quantitative studies.

Aim and objectives
The aim of this paper was to critically review studies related to degrees of stress and type of stressors among undergraduate nursing students during their clinical education. Beyond this broad aim, additional objectives of this paper are to: (i) identify the stressful periods of clinical education, and examine the relevance of the academic year of study when stress occurs; (ii) clarify positive and negative impacts of clinical stressors; and (iii) compare findings from different cultures.

Method
Search strategy
Part of the rigour of systematic searching is the effort made to ensure that all relevant literature is included to decrease selection bias (Hamer & Collinson 2005). Four databases were searched: MEDLINE (Medical Literature on-Line) for its coverage of international literature on medicine including allied health professions, biological and physical science, and humanities; CINAHL (Cumulative Index to Nursing and Allied Health Literature), because the topic of clinical stressors was more likely to be addressed by nurses and allied health professionals; and PsycINFO (Psychology Information) with its emphasis on psychological topics. Finally, PubMed was consulted for its coverage of health-related disciplines. Keywords included stress (equivalent terms such as eustress, distress and occupational stress), undergraduate nursing students (corresponding terms of baccalaureate nursing students and nursing education were included as well) and clinical practice (including the synonyms clinical training, clinical education and clinical experience) in different combinations.

Eligibility criteria of this review
Articles were included in the review according to these inclusion criteria: published between 2002 and 2013 in order to select recent publications; studies conducted in any country as long as they were reported in English; included a focus on stressors among nursing students; and addressing clinical education. Studies addressing stress reduction interventions for nursing students were excluded because they were beyond the scope of this review. All studies were subjected to a standardized method of critical appraisal, depending upon their design, to determine the quality and rigour of the findings (Long et al. 2002). To ensure a thorough and comprehensive search, and to ensure comprehensive consideration of all themes and arguments, a wide range of resources was accessed, including searching the university library catalogue and a manual search through selected journals that were not available electronically. Sixty studies were identified, of which 13 met the criteria. The review method is summarized in Fig. 1.

Results
Numerous difficulties in comparing the studies were encountered. The different sample characteristics, variety of tools utilized and differences in operational definitions of stress caused differences in findings. Moreover, there are fundamental differences globally in the composition of nursing educational programs, especially in the clinical parts of those programs. However, detailed findings of the current review are reported in terms of the subsequent four themes: initial clinical experience, comparison between different academic years, cross-cultural comparison and eustress aspects of clinical experience. Table 1 summarizes studies identified in this review.
Initial clinical experience

Literature revealed that the initial period of clinical education is highly stressful for nursing students (Karabacak et al. 2012; Shaban et al. 2012; Sheu et al. 2002). Sheu et al. (2002) employed a cross-sectional design and used the Perceived Stress Scale (PSS) (Sheu et al. 1997) to address the initial clinical experience. The sample consisted of 561 Taiwanese students from one nursing school. Results demonstrated that the most reported stressors were deficient knowledge and skills, caring for patients, and assignment workload. However, a convenience sample was adopted, recruited from a single nursing school, so generalization is restricted.

In contrast, Karabacak et al. (2012) conducted an experimental study to address the same issue among Turkish nursing students. The sample consisted of 52 students who were assigned randomly to an experimental group \((n=26)\) and a control group \((n=26)\). Students of the control group started hospital practice immediately after general laboratory training in ‘Essentials of Nursing’. Conversely, those who participated in the experimental group repeated all skills in the laboratory for 5 days before their hospital practice. The participants in both groups completed the Clinical Stress Questionnaire (Pagana 1988). The authors reported that students of the experimental group experienced less stress compared with those in the control group. However, although the authors performed a random assignment to guarantee equality of the study groups, Nieswiadomy (2008) indicates that pre-test is the only way for the investigator to verify that the groups were identical before conducting the desired intervention. The study by Karabacak et al. lacked this as a post-test only design. Therefore, no confidence can be placed in such findings.

Comparison between different academic years

Another group of studies analysed clinical stress in terms of students’ academic years (Chen & Hung 2013; Edwards et al. 2010; Gorostidi et al. 2007; Jimenez et al. 2010; McKenna & Plummer 2013; Suresh et al. 2012). In the Indonesian context, a hermeneutic phenomenological study (McKenna & Plummer 2013) was conducted to investigate the meaning of lived experience of clinical stress for six female novice students. The students were recruited from one nursing school through a purposive sampling technique. Data were collected from the
Table 1  Summary of the studies investigating clinical education stress among nursing students

<table>
<thead>
<tr>
<th>Author(s) and setting</th>
<th>n</th>
<th>Target nursing students</th>
<th>Design</th>
<th>Instrument or data collection method</th>
<th>Types of clinical stressors</th>
<th>Strengths and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheu et al. (2002), Taiwan</td>
<td>561</td>
<td>Students at initial clinical experience</td>
<td>Descriptive, cross-sectional</td>
<td>PSS (Sheu et al. 1997) (29 items) Cronbach’s alpha (α) = 0.89 Content validity index equals 0.94</td>
<td>Deficient knowledge and skills, caring of the patients, and assignment workload</td>
<td>The authors utilized a tool with strong psychometric properties. Moreover, the sample size was adequate to achieve statistical conclusion validity (Polit &amp; Beck 2008). However, the sample was convenience so the generalization is restricted.</td>
</tr>
<tr>
<td>Shaban et al. (2012), Jordan</td>
<td>270</td>
<td>Students at initial clinical experience</td>
<td>Descriptive, cross-sectional</td>
<td>PSS (Sheu et al. 1997) (29 items) α = 0.87 Content validity was confirmed by a panel of experts</td>
<td>Assignment workload, clinical environment, teachers and nurses</td>
<td>The use of power analysis to calculate the sample size assists in decreasing the risk of false statistical outcomes (Faul et al. 2009). Conversely, generalization is limited because the sample was convenience.</td>
</tr>
<tr>
<td>Karabacak et al. (2012), Turkey</td>
<td>52</td>
<td>Students at initial clinical experience</td>
<td>Experimental, post-test only control group</td>
<td>CSQ (Pagana 1988) (20 items) α = 0.7 Construct validity was confirmed by the factor analysis</td>
<td>CSQ designed to measure stress degrees not stress types</td>
<td>This study yielded robust findings as control in the experimental studies is greater than that in descriptive studies (Polit &amp; Beck 2008). However, the pre-test was lacking in this study, thus the equality of the two study groups is doubtful (Nieswiadomy 2008).</td>
</tr>
<tr>
<td>McKenna &amp; Plummer (2013), Indonesia</td>
<td>6</td>
<td>Novice students</td>
<td>Hermeneutic, phenomenological</td>
<td>Telephone interviews</td>
<td>First, feelings of pressure include assignments and initial clinical experience. Second, challenging relationships include relationships with patients and nurses.</td>
<td>The study design helps in investigating the meaning of stressors from students’ perspective (Polit &amp; Beck 2008). Nevertheless, the sample size was very small, therefore data saturation may be hindered (Onwuegbuzie &amp; Leech 2007).</td>
</tr>
<tr>
<td>Chen &amp; Hung (2013), Taiwan</td>
<td>101</td>
<td>Junior students</td>
<td>Descriptive, cross-sectional</td>
<td>PSS (Sheu et al. 1997) (29 items) α = 0.91 Content validity index equals 0.94</td>
<td>Patients’ care, assignment workload, teachers and nurses</td>
<td>PSS is reliable and valid. However, this study recruited a convenience sample, therefore results cannot be generalized widely. Moreover, information about sample size calculation is limited in this study.</td>
</tr>
<tr>
<td>Jimenez et al. (2010), Spain</td>
<td>357</td>
<td>Students from all years</td>
<td>Descriptive, cross-sectional</td>
<td>Modified PSS (Sheu et al. 1997) (30 items) α = 0.92 Spearman–Brown coefficient equals 0.80 (P &lt; 0.001).</td>
<td>Patients suffering, incapability to give suitable responses to teachers’ questions, and inability to meet patients’ needs</td>
<td>The utilized tool has strong psychometric properties. However, the use of cross-sectional design hinders the ability to track changes of stress experiences (Edwards et al. 2010).</td>
</tr>
<tr>
<td>Gorostidi et al. (2007), Spain</td>
<td>69</td>
<td>First year students</td>
<td>Descriptive, longitudinal</td>
<td>KEZKAK tool (Zupiria et al. 2003) (41 items) Zupiria et al. reported that KEZKAK had α = 0.95 and the construct validity was confirmed by the factor analysis</td>
<td>Lack of capability, powerlessness, uncertainty, and relationships with clients, teachers and colleagues</td>
<td>Employing the prospective design enabled the measuring of changes in stress experiences. However, the psychometric properties of KEZKAK were not tested in this study. The sample size of 69 is also small for this study (Polit &amp; Beck 2008).</td>
</tr>
<tr>
<td>Author(s) and setting</td>
<td>n</td>
<td>Target nursing students</td>
<td>Design</td>
<td>Instrument or data collection method</td>
<td>Types of clinical stressors</td>
<td>Strengths and limitations</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----</td>
<td>-------------------------</td>
<td>---------------------------------</td>
<td>--------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Edwards et al. (2010), UK</td>
<td>169</td>
<td>Students from all years</td>
<td>Descriptive, longitudinal, cohort</td>
<td>Stress in Nurse Education questionnaire (Rhead 1995) (32 items) ( \alpha = 0.89 )</td>
<td>Patients suffering, the pressure of examinations, having to read after training, and committing mistakes</td>
<td>Employing the prospective design enabled the tracking of changes in stress experiences. However, the results reflected stressors associated with particular curriculum program.</td>
</tr>
<tr>
<td>Suresh et al. (2012), Ireland</td>
<td>120 nurses and 128 students</td>
<td>Newly qualified nurses and fourth year students</td>
<td>Cross-sectional, triangulation</td>
<td>Nursing Stress Scale (Gray-Toft &amp; Anderson 1981) (34 items) and open-ended questions ( \alpha = 0.79 )</td>
<td>Unmet learning needs, complex working relationships, and workload</td>
<td>Results of this study aid in designing interventions to facilitate the transition from students to graduate nurses, therefore helping to maintain this important human resource within nursing. However, the personal characteristics of the participants were not measured in this study and could have added further insights into the results.</td>
</tr>
<tr>
<td>Timmins &amp; Kalizer (2002), Ireland</td>
<td>110</td>
<td>Third year students</td>
<td>Descriptive, comparative, cross-sectional</td>
<td>Questionnaire that designed ad hoc (12 items). A 1-week part test–retest reliability was statistically significant ( (r &gt; 0.5, P &lt; 0.05) ), Content validity was confirmed by a panel of experts</td>
<td>Clinical placements, relationships with nurses, and patients’ death</td>
<td>This study is valuable as it evaluates Irish nursing students’ clinical stressors from an international perspective. However, these findings should be interpreted carefully, given that it was a small exploratory study.</td>
</tr>
<tr>
<td>Burnard et al. (2008), Albania, Brunei, Czech Republic, Malta and Wales</td>
<td>1707</td>
<td>Students from all years</td>
<td>Descriptive, cross-sectional survey</td>
<td>SNE questionnaire (Rhead 1995) (32 items) Edwards et al. (2010) reported that SNE had reliability coefficient of 0.89</td>
<td>Death of patients, seeing patient suffering, and the pressure of examinations</td>
<td>Investigating clinical stress among nursing students from international perspective broads the scope of literature. However, there are cultural variations among the participants that cannot be accounted for in a study of this nature (Robotham &amp; Julian 2006). Moreover, psychometric properties of SNE were not reported in this study.</td>
</tr>
<tr>
<td>Gibbons et al. (2008), UK</td>
<td>16</td>
<td>Final year students</td>
<td>Phenomenological study</td>
<td>Focus groups</td>
<td>Eustressing factors: patient care chances and practical learning</td>
<td>This study adds unique data about beneficial clinical stressors in the current literature. Nevertheless, the students were in final year and this may affect the results.</td>
</tr>
<tr>
<td>Gibbons (2010), UK</td>
<td>171</td>
<td>Final year students</td>
<td>Descriptive, cross-sectional</td>
<td>Index of Sources of Stress in Nursing Students inventory (Gibbons 2008) (29 items) ( \alpha &gt; 0.70 ) Face validity was confirmed</td>
<td>Eustressing factors: placement demands and support opportunities</td>
<td>Measuring beneficial aspects of clinical stress using a quantitative method considered exclusive in the literature. However, the long experience of the participants may affect the results.</td>
</tr>
</tbody>
</table>

CSQ, Clinical Stress Questionnaire; PSS, Perceived Stress Scale.
students by telephone interviews that lasted for around 30 min.
The data analysis revealed the following main themes: ‘feelings of pressure’ and ‘challenging relationships’. This study is significant because it reflects the novice students’ perspective of clinical stress. However, the sample size was very small (only six participants) and this undermines the usefulness of the reported findings. The sample size of qualitative studies is recommended to be between 10 and 20 participants for interview studies (Francis et al. 2010; Onwuegbuzie & Leech 2007).

Gorostidi et al. (2007) performed a descriptive prospective study with the intention of assessing the progression of nursing students’ perception of clinical stress throughout their program. Sixty-nine students studying at one Spanish nursing school completed the KEZKAK tool, which is a bilingual questionnaire in English and Spanish designed to assess nursing students’ practical training stressors (Zupiria et al. 2003). There were four data collection points (before starting practical training, end of the first year, end of the second year and at the end of students’ studies). The participants reported these factors as the most significant stressors throughout the course of their studies: lack of capability, powerlessness and uncertainty, inability to set limits in relationships with clients, teachers and colleagues. However, the stressors scores were diminished throughout the course of clinical education. The author (Gorostidi et al. 2007) stated that this decrease in stress levels was probably caused by continuous contact with clinical work, observational learning and the progressive gaining of experience.

In another similar study (Edwards et al. 2010), the authors used the Stress in Nurse Education (SNE) questionnaire (Rhead 1995) with a sample of 169 British nursing students. The students completed the study tool at different time points of their study program (after two clinical rotations, at the commencement of the second year, after five clinical rotations, at the commencement of the third year, and after the third year). The results showed that levels of stress significantly varied between the different data collection times. Contrary to the previous study findings (Gorostidi et al. 2007), this study indicated that the highest levels of stress were reported at the final (third) year. The authors rationalized this finding by suggesting that more professional stressors are placed on third year students compared with the students in earlier years. The use of longitudinal designs in the previous discussed studies (Edwards et al. 2010; Gorostidi et al. 2007) facilitates measuring the changeable nature of stress. However, the major limitation of these two studies is that they reflect the stressors related to the particular curriculum program. In other words, the generalization of the findings in other countries with different nursing curricula may be restricted.

A cross-cultural comparison
Few studies had focused on cross-cultural comparisons (Burnard et al. 2008; Timmins & Kaliszer 2002). Burnard et al. (2008) carried out a longitudinal study to compare the perceptions of 1707 worldwide nursing students concerning levels and sources of stress during their education. The sample was selected across five different countries (Albania, Brunei, Czech Republic, Malta and Wales). The authors used the SNE questionnaire (Rhead 1995) for data collection. The results indicated that nursing students internationally share much in common. The most frequently reported clinical stressors were the death of a patient and seeing a patient suffering. The types of stressors reported by Burnard are consistent with those reported by Edwards et al. (2010) (see Table 1). Burnard’s study broadens the scope of current literature by investigating clinical stress among nursing students from an international perspective. However, there are possible cultural variations among student groups that cannot be accounted for in a study of this nature. Those cultural variations may contain factors such as teacher–student affiliations, feelings and thoughts towards education processes, and perception about the manner of caring. All of these issues will probably have impacts on stress levels (Burnard et al. 2008; Robotham & Julian 2006).

Similarly, Timmins & Kaliszer (2002) conducted a review of international literature that investigated the stressors among nursing students and compared Ireland with these results. Based on themes from this review of the literature, the authors developed a 12-item questionnaire for data collection. The questionnaire was distributed to 110 third year nursing students at two separate hospitals in Dublin. Concerning the clinical stressors, the findings showed that the majority of the participants considered that clinical placements, relationships with nurses in the hospitals and being involved with the death of a client are sources of stress. This coincided with earlier results in this field. However, these findings should be interpreted carefully, given that it was a small exploratory study that dealt with only 12 universal sources of stress among nursing students. Each of these individual stressors might be investigated in further detail. For instance, the clinical settings can have a multiple number of stressors and this was studied only as one item in the study questionnaire.

Eustress aspects of clinical experience
Positive effects of clinical stress have received little attention in the literature (Gibbons 2010). The following studies investigated the eustress effect of clinical stressors among final year British nursing students (Gibbons 2010; Gibbons et al. 2008). Gibbons et al. (2008) conducted a qualitative study to identify students’ experiences that provoke both eustress and distress.
Sixteen participants were selected from a cluster of nursing students. The author collected the data through four focus groups. In relation to clinical stressors, the findings indicated that initial clinical experience, attitudes of nurses and working on short-staffed settings were considered distressing factors. In contrast, patient care opportunities and experiential learning were considered as eustressing factors. Gibbons (2010) conducted a further cross-sectional study with a convenience sample of 171 nursing students in one school in the UK. The Index of Sources of Stress in Nursing Students inventory (Gibbons 2008) was used to measure stress. The results indicated that placement demands and support opportunities are capable of providing essential eustress experiences that help students achieve and learn. These two studies (Gibbons 2010; Gibbons et al. 2008) are unique in the body of the literatures because little research considers those stressors expected to improve nursing students’ well-being and their educational process. However, participants were final year students; thus their long experience had probably influenced the given stress responses compared to those students in the earlier stages of their studies.

Discussion

Context of the studies reviewed
This review illustrated that most of the studies were conducted in Europe, primarily in Ireland and the UK. Few studies were conducted in the Middle East. However, in terms of globalization, the findings derived from studies that focused on cross-cultural comparisons reported that nursing students share similar clinical stress experiences internationally (Burnard et al. 2008; Timmins & Kaliszer 2002). More research studies are needed in other countries such as the USA and the Middle East. This helps in addressing the influence of the cultural factors such as the acceptable ways of stress expression on the nursing students’ clinical stress experiences (Robotham & Julian 2006).

Methodological considerations
The majority of the studies were descriptive and quantitative in nature. Only one study was experimental, and two studies were qualitative. The use of quantitative measures (such as self-report questionnaires) may yield objective findings, especially if these measures have adequate psychometric properties (Polit & Beck 2008). However, such structured measures may restrict the in-depth understanding of the students’ reaction to stress (Nieswiadomy 2008). Therefore, future studies should pay more attention to qualitative approaches for investigating clinical stress among nursing students. Most of the studies were cross-sectional, and only two studies utilized a longitudinal design. This indicated that the dynamic nature of clinical stress has not been investigated adequately in the current literature. Future research should measure this changeable nature of stress by employing prospective designs (Edwards et al. 2010).

Sample sizes and nature were so varied in these studies, the range was from 6 to 1707 nursing students. This implied that the generalizability of the literature findings may be limited in those studies with small sample sizes. It is highly recommended for nursing researchers to use a sample size that can achieve higher levels of power (Faul et al. 2009). In this case, the results can be transferred and applied in other similar settings (Polit & Beck 2008).

There was much variability in selected instruments. Only two tools were utilized in more than one study, and in some cases modified version was employed. PSS was used by three studies (Chen & Hung 2013; Shaban et al. 2012; Sheu et al. 2002) and modified by Jimenez et al. (2010). The SNE questionnaire was also used by two studies (Burnard et al. 2008; Edwards et al. 2010). One study designed ad hoc instrument to measure stress (Timmins & Kaliszer 2002). In the remaining five studies, the utilized tools were different. This variability was also evident in the structure and content of the utilized instruments. In the reviewed studies, instruments had 12–41 items, all with the intent of evaluating clinical stress among nursing students. This illustrates heterogeneity in the ways of reporting the resulting clinical stressors. However, the majority of the tools had adequate psychometric properties (see Table 1 for details). This illustrates that clinical stress was measured through high-quality measurement tools, though applied irregularly.

The most common reported stressors
It is difficult to compare findings among studies as a result of the great number of stressors and use of different tools. Nevertheless, academic demands, relations in the clinical environment, and caring for patients and families were considered to be the highest reported stressors. Accordingly, nurse educators need to address student needs to handle these stressors effectively. Such measures may include giving more attention to clinical parts of training, minimizing the required paper work, preparing all professionals involved in training of the nursing students adequately, and offering simulation measures that enable the students to provide care for patients before entering the actual clinical context (Al-Zayyat & Al-Gamal 2014).

From a different perspective, the majority of the reviewed studies were aimed to identify distressing elements of training. Conversely, few studies have addressed those elements of training that are perceived as eustressing (Gibbons 2010; Gibbons et al. 2008). Future research should pay more attention to those
beneficial aspects of clinical education that promote knowledge attainments, skills acquisitions and prospective nurses’ development (Gibbons 2010).

Stressful periods of clinical education
It has been reported that many nursing students experience several difficulties during their initial clinical experience (Sheu et al. 2002). It seems that current nursing curricula do not prepare nursing students adequately to handle this experience (Karabacak et al. 2012). Consequently, reviewing nursing curricula is an important issue for nursing educators (Shaban et al. 2012). The inclusion of video films about clinical settings, inviting expert guest speakers and frequent field visits (during orientation period) may decrease initial clinical stress (Penn 2008).

There is inconsistency in the reported findings concerning those studies that compare stress degrees across different academic years. Some studies reported that students experienced higher degrees of clinical stress at early academic years such as the first year (Gorostidi et al. 2007). On the other hand, other studies reported that those experienced nursing students (in third or fourth year) perceived higher degrees of stress than novices (Edwards et al. 2010; Jimenez et al. 2010). Therefore, the current literature provides inconclusive data regarding which stage suffered higher degrees of stress. Carefully controlled studies (such as randomized controlled trials) are required to resolve these controversies (Polit & Beck 2008).

Implications of the findings from this review
This review updated nursing researchers, educators and students regarding stress experiences of nursing students during their clinical education. The findings of this review present significant implications for nursing education and call for further research.

Implications for nursing education
Although the findings are sometimes conflicting, nursing lecturers, clinical instructors, preceptors and nurses from different nursing departments can utilize the findings of this review to direct their students during clinical practice. This might help in improving the clinical education programs to promote the psychosocial well-being of the students (Pulido-Martos et al. 2012), thus improving the patients’ quality of care. Nursing educators should provide supportive interventions for students from the initial time of their clinical education (Shaban et al. 2012). Moreover, nursing educators should encourage students to discuss their feelings and their stressors in order to provide appropriate interventions (Penn 2008).

Policy implications for stakeholders in nursing education
Nursing school administrators should establish a student support system through which the students can be equipped with effective coping strategies (Robotham & Julian 2006). Moreover, school administrators should develop training courses in communication skills for their nursing educators that enable them to work effectively with students (Al-Zayyat & Al-Gamal 2014). Hospital administrators need to promote those policies that facilitate a training environment where students are supported and inspired while they engage in their clinical practice (McKenna & Plummer 2013). Furthermore, hospital administrators should develop continuous education programs for their staff on the appropriate way to deal with students (Gorostidi et al. 2007).

Implications for future research
It is important that nursing researchers conduct methodological studies with the purpose of establishing and refining a standardized instrument for assessing stress among nursing students during their clinical education (Pulido-Martos et al. 2012). Future research should give more attention to the beneficial aspects of clinical education (Gibbons 2010). Additional research is needed to explore the perception of clinical instructors regarding the stressors faced by nursing students during clinical education (Penn 2008).

Limitations of the review
The following limitations were identified in this review. First, the prerequisite is that the included studies written in English may have precluded valuable data published in different languages. Second, the heterogeneity of the included studies in terms of sample characteristics, utilized tools and the differences in the operational definitions of the stress led to difficulties when attempting to generalize the results.

Conclusion
This paper discussed stress among nursing students in clinical settings. The findings of this review present worthy data for clinical educators in identifying nursing students’ stressors, facilitating their clinical education and establishing successful clinical teaching methods. Moreover, this review provides up-to-date empirical data (about clinical stress among nursing students) and calls for further research. Future research is recommended to broaden the scope of this review by addressing the coping strategies that are utilized by nursing students to deal with clinical stress.

Acknowledgement
The authors would like to thank The University of Jordan- Deanship of Academic Research (Grant No. 2013-2014/ 12) for funding this study.
Author contributions
Abdulkarim Alzayyat: Study conception and design, literature review, drafting of manuscript, and final approval of the version to be submitted. Ekhlas Al-Gamal: Study conception and design, drafting of manuscript, critical revisions of manuscript for important intellectual content, and final approval of the version to be submitted.

References
Copyright of International Nursing Review is the property of Wiley-Blackwell and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.