

Clinical Learning Environment at Shiraz Medical School

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Abstract- Clinical learning occurs in the context of a dynamic environment. Learning environment found to be one of the most important factors in determining the success of an effective teaching program. To investigate, from the attending and resident's perspective, factors that may affect student leaning in the educational hospital setting at Shiraz University of Medical Sciences (SUMS). This study combined qualitative and quantitative methods to determine factors affecting effective learning in clinical setting. Residents evaluated the perceived effectiveness of the university hospital learning environment. Fifty two faculty members and 132 residents participated in this study. Key determinants that contribute to an effective clinical teaching were autonomy, supervision, social support, workload, role clarity, learning opportunity, work diversity and physical facilities. In a good clinical setting, residents should be appreciated and given appropriate opportunities to study in order to meet their objectives. They require a supportive environment to consolidate their knowledge, skills and judgment.

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Introduction

Learning environment has been found to be one of the most important factors in determining the success of an effective teaching program. A ward is a context that is potentially rich in teaching and learning opportunities. It is an appropriate clinical context for medical education and convenient professional socialization (1). The quality of educational atmosphere has been identified to be crucial for effective learning. The current study was conducted with the following objectives;

- (1) To identify the important determinants operating in clinical learning environment at Shiraz Medical School.
- (2) To portray attributes of clinical setting which are important from the perspective of the educators and residents.
- (3) To compare the quality of the current and ideal learning climate in hospital setting as perceived by residents.
- (4) To identify the opportunities to practice clinical skills and available resources in teaching hospitals, in Shiraz University of Medical Sciences (SUMS) and the views of resident about more specific strengths and weaknesses of work environment.

- (5) To study the residents' perception of their clinical performance through self assessment.

Materials and Methods

This study combined the qualitative and quantitative methods to assess the determinants of learning environment. The subjects of this study were medical residents and faculty members in four major hospital wards (internal medicine, gynecology, surgery and pediatrics). The study was conducted in four phases. At first the published medical literature about the attributes of learning environment was reviewed. The perception and experiences of medical specialists about such attributes were explored by Delphi's technique, leading to identification of key determinants of effective learning in hospital settings.

In the second phase, the views of the medical residents about the attributes derived from the initial phase were elicited. The importance of the each attribute was rated on a 5-point Likert-type scale with 5 for 'very important' and 1 for 'not at all important'.

The attributes of clinical setting were rated by residents as the important key domain that were found to be effective in clinical learning and what they presumed

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to be considered in clinical setting.

In the third phase the quality of clinical learning environment in the major hospital wards was evaluated by medical residents. Information of this phase was obtained through a self-administered questionnaire including 45 items developed based on the items of clinical teaching characteristics derived from the first phase. The content validity of the questionnaire was established. Cronbach's alpha used to estimate the reliability was 0.76.

Each item ranged from strongly agree as five and strongly disagree as one. Items with a mean score of three or more were considered as positive points and a mean score of two or less as problem area. A mean score between two and three were taken as features of learning environment that should be improved.

In the fourth phase, another approach for improvement of residency programs was directed. We used resident self assessment to approach the description of environment as being an effective factor on residents' competency. The residents filled in a self assessment questionnaire about their perception of their competency regarding the clinical learning environment. The data were analyzed using descriptive statistics such as means and standard deviation as well as t-test and one-way analysis of variance (ANOVA), using SPSS software, version 15.

Results

What is known about clinical learning environment through medical literature was reviewed in this study. Ten domains were found to be important in effective clinical learning environment in several studies. The medical faculties (n=52) and residents' (n=132) views about the importance of such domains were asked through a questionnaire survey (Tables 12). Generally, eight broad attributes were indicated by medical faculties as the key determinants that contribute to an effective clinical teaching.

Table 1. Rating of the importance of the domain in the view of medical faculties.

Domains	Mean \pm SD
Autonomy	3.53 \pm 0.81
Supervision	4.73 \pm 0.53
Social support	4.16 \pm 0.76
Work load	4.31 \pm 0.59
Role clarity	4.44 \pm 0.65
Learning opportunity	4.31 \pm 0.63
Work diversity	3.96 \pm 0.70
Physical facilities	3.93 \pm 0.72

Mean scores equal or over three reflected a positive point for the items. Key characteristics were highlighted and shown in Table 1.

Out of one hundred thirty two residents, 66 completed the questionnaire and the data were available for analysis. With return rate of 50% of the medical residents who were placed in four major wards (surgery, internal medicine, pediatrics and gynecology) of different teaching hospitals of SUMS. Using Wilcoxon-Mann-Whitney test for comparing the mean scores between the domains, female residents scored higher than male ones in physical facilities ($P=0.022$). There were no significant gender differences in other domains in spite of higher mean score by females.

Comparison of the mean score of the domains indicated a significant difference between perspectives of the faculties and residents ($P<0.01$), except for supervision. Analysis of variance showed significant differences ($P=0.006$) between social support (the highest mean score=4.99) and supervision (the lowest mean score=3).

We also had the opinion of medical residents about any other attributes which should be considered as the effective determinant of educational environment that facilitate teaching and learning in a residency program. Perceived importance of the domains to learning compared with what exists in reality and importance given to these domains in the clinical setting are shown in Table 2.

Table 2. Comparison of the importance of the domains to learning with what exists in reality as rated by residents (n=63).

Domain	Importance of the domain	Current Situation	Significance P-value
Autonomy	4.56 \pm 0.69	3.13 \pm 1.29	$P<0.001$
Supervision	4.49 \pm 0.80	2.97 \pm 1.26	$P<0.001$
Social support	4.84 \pm 0.62	2.78 \pm 1.37	$P<0.001$
Work load	4.65 \pm 0.79	1.73 \pm 1.11	$P<0.001$
Role clarity	4.70 \pm 0.25	2.54 \pm 1.20	$P<0.001$
Learning opportunity	4.65 \pm 0.79	2.38 \pm 1.11	$P<0.001$
Work diversity	4.71 \pm 0.63	3.00 \pm 1.24	$P<0.001$
Physical facilities	4.62 \pm 0.96	2.35 \pm 1.26	$P<0.001$

Table 3. Residents' rating of their own competency (self assessment).

Competency	Mean \pm SD
Ability in performing clinical responsibilities	3.26 \pm 0.63
Ability to communicate with patients and families	3.19 \pm 0.65
Ability to communicate with other health care workers outside the hospital	3.00 \pm 0.77
Ability in self improvement	2.87 \pm 0.76

Various strengths of correlation between the aspects of conceptual domains were identified. A highest correlation was found between social support and learning opportunities (0.54). The opportunity to apply knowledge by the residents can increase autonomy (correlation coefficient=0.42).

The presence and quality of the aspects of the learning environment in recent clinical rotations were studied. The residents' perception concerning desirable importance was compared with the perceived importance given to these domains in clinical settings. The mean score obtained for all domains was lower than desirable condition. This difference was especially significant in the case of workload ($P<0.01$). Nonparametric statistical analysis, using Wilcoxon signed rank test, revealed significant differences between the present clinical learning environmental status and desirable condition.

81.9% of the residents believed that they have a duty to do along with a lot of clerical and other nonmedical tasks. 60.6% of the respondents reported that they were given opportunities to actively attend the case presentation conferences. 47% of the respondents stated that educational programs such as workshops and seminar programs were efficient and 59.4% of them participated in such programs. Only 30.8% of the residents found sufficient time to participate in educational activities and

53.1% said they had no sufficient teaching rounds. 68.8% of the respondents reported that they had not been given sufficient supervision and feedback by staff faculties and have been poorly supervised.

More than fifty percent (54.7%) of the respondents indicated that they were assessed less than their expectation. More than two thirds of the participants believed in insufficient use of assessment methods. 57% of the respondents stated the inadequate definition of their duties and ward expectations.

On the scale of one to four with four indicating very good, residents rated their competency as shown in Table 3.

The correlation between the self assessment of residents' competency with present clinical learning

environmental status was evaluated, using nonparametric analysis and Pearson's spearman correlation test. The mean score obtained for the present clinical setting was correlated with the residents' self assessment rating ($P<0.01$). It appeared that residents' self assessment can identify the present clinical learning environmental climate and important determinants that influence their learning. Linear regression analysis showed that the mean score of the present learning attributes perceived by the residents can be used as a predictive value for evaluation of clinical learning environment.

Discussion

The environment provides a network of forces and factors which surround and engulf one (2,3). The clinical environment encompasses all that surrounds the residents, including the clinical settings, equipment, staff, patients and faculty members. The clinical environment, on the other hand, is very hard to control (4). For desired learning to take place, several aspects have to be considered and, as far as possible, planned and/or controlled.

The hospital practice setting is an important factor in the whole learning process of residents. We evaluated the residents' perception of clinical learning experiences in the context of the clinical learning environment. The residents' mean overall ratings on working climate domains were computed for the relatively low and high scoring items. In general, the residents did not have a favorable perception about the attributes of learning environment. They underscored the quality of the present clinical climate compared to desirable condition. Six out of eight item ratings were less than three (Table 2), which suggests a need for improvement. The rating of the attributes was higher with regard to the level of autonomy and work diversity (highest score). The least rated score level was workload management (1.68 \pm 1.16). Overall there was disparity between present and desired condition in hospital setting as shown in the views of the residents. Their understanding and expectation from clinical environment differed with

what exists in reality. Therefore, identification of the shortcomings of clinical teaching environment is necessary since their improvement will result in the promotion of learning. The greatest difference between the mean of the groups (1.8) was found for supervision.

Within the domain of work diversity, there was almost unanimous agreement that residents had access to a variety of patients appropriate for the level of training (4.3 ± 0.71). There was less agreement that there were available facilities to acquire relevant skills (2.71 ± 1.41). The same result was found by self assessment as well (2.17 ± 0.76).

The highest correlation was found between social support and learning opportunities (0.54). This may reflect that an efficient social support enables the residents to apply knowledge and skills.

There was sufficient autonomy (3.77 ± 1.02) to take advantage of the patient diversity and learning opportunities.

In the present study satisfaction with the domain of supervision and social support was the same and needs enhancement (between 2 and 3). This finding was in line with result of a previous study conducted by Dolmans et al. in which students noted that clerkship-sites needed sufficient supervision and feedback (5).

Kilminster and Jolly defined supervision as “the provision of monitoring, guidance and feedback on matters of personal, professional and educational development in the context of the doctor’s care of patients (6,7). Helpful supervisory behaviors include direct guidance on clinical work, linking theory and practice, and offering feedback and role modeling. In residents’ attitudes, providing observation and constructive feedback are key features of effective clinical learning experiences. Effective supervision in practice settings and giving frequent and immediate feedback to residents on the quality of their learning appears to be the key to the success of clinical learning. This means that having a valid, reliable system for assessing the resident's performance would be necessary.

The residents believed that they had insufficient time to reflect their learning. The level of satisfaction with role clarity and residency learning programs needs to be improved (between 2 and 3). In conclusion, the findings of this study identified the factors supposed to affect the residents’ learning in clinical settings. Although some aspects of clinical learning environment were indicated well, strengthening the positive aspects and correction of weaknesses represents an effective step towards achieving the high levels of quality and meeting the residents’ expectations. The residents perceived that

hospital setting needed improvement in the learning environment domains. We identified several key determinants that influence the effectiveness of resident learning in a clinical environment. These included staff–resident relationships, faculty members' commitment to teaching, patient relationships, good co-operation among the staff members and good teamwork, a good atmosphere, resident satisfaction and supervision of interpersonal relationships were identified as being very significant within the clinical learning environment. On a good clinical environment, the residents were appreciated and given appropriate opportunities to study in order to meet their objectives. They require a supportive environment to consolidate their knowledge, skills and judgment and begin to develop clinical expertise.

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