RESIDENT AS TEACHER IN CLERKSHIP: STUDENTS' AND RESIDENTS' PERCEPTION

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ABSTRACT

Background: Resident has a significant role and time allocation as a clinical teacher in the learning process of medical students at the clerkship stage in clinical settings. Unfortunately, residents were often not formally asked to be involved in the teaching process. Residents' role in medical students' learning process in clerkship is still ill defined. The aim of this study was to explore the perceptions of resident and medical students on residents' role as a teacher in clerkship using cognitive apprenticeship model.

Methods: This study used quantitative descriptive, cross sectional design. Samples taken with total sampling were 153 students (68.3%) and 214 resident (60.6%) of the total population. Respondents were asked to fill The Maastricht Clinical Teaching Questionnaire (MCTQ), and the results were analyzed using ANOVA and independent t-test.

Results: Results of quantitative analysis showed a difference of perception between students and residents in modeling (p = 0.008) and overall performance (p = 0.002) factor, in which students placed a higher point than the resident. These results were consistently found in three departments. While in three other, students gave a lower point than the resident. In addition, differences also found in the exploration factor based on residents' study period and residents' preferences for teaching.

Conclusion: Residents' role as a clinical teacher in clerkship is very important, especially as a role model for students. Taking into account of time allocations spent between students and the residents, improvement and optimalization of residents' role as a clinical teacher appears to be an important requirement.

Keywords: resident, student, MCTQ, role modeling

PERSEPSI MAHASISWA DAN RESIDEN MENGENAI PERAN RESIDEN SEBAGAI PEMBIMBING KLINIK PADA TAHAP PROFESI

ABSTRAK

Latar belakang: *Residen memiliki peran dan alokasi waktu yang cukup besar sebagai pembimbing dalam proses pendidikan mahasiswa pada tahap profesi. Sayangnya, residen seringkali tidak secara formal diminta untuk terlibat dalam proses pengajaran. Peran residen dalam proses belajar mengajar di tahap pendidikan klinik masih belum terdefinisikan dengan baik. Penelitian ini bertujuan untuk menilai persepsi residen dan mahasiswa mengenai peran residen sebagai pembimbing klinik pada pendidikan tahap profesi, dengan menggunakan cognitive apprenticeship model.*

Metode: *Penelitian ini menggunakan metode kuantitatif deskriptif. Sampel dipilih dengan total sampling sebanyak 153 (68,3%) mahasiswa dan 214 (60,6%) residen dari keseluruhan populasi yang ada. Responden menisci kuesiober yang diadaptasi dari The Maastricht Clinical Teaching Questionnaire (MCTQ), dan hasilnya dianalisis menggunakan ANOVA dan independen t-test.*

Hasil: *Hasil analisis kuantitatif menunjukkan adanya perbedaan persepsi antara mahasiswa dan residen pada faktor modelling (p=0,008) dan overall performance (p=0,002), dimana mahasiswa memberikan nilai lebih tinggi dibandingkan*

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residen. Hasil ini konsisten ditemukan di tiga departemen, sedangkan di tiga departemen lainnya mahasiswa memberikan nilai yang lebih rendah dibandingkan residen. Selain itu, juga ditemukan perbedaan faktor exploration pada analisis berdasarkan masa pendidikan residen dan preferensi residen untuk mengajar.

***Kesimpulan**: Peran residen sebagai pembimbing di tahap pendidikan klinik sangat penting, terutama sebagai role model bagi mahasiswa. Dengan mempertimbangkan banyaknya alokasi waktu kontak mahasiswa dan residen, diperlukan optimalisasi peran residen sebagai pembimbing klinik.*

***Kata kunci:** residen, mahasiswa, MCTQ, role modelling*

INTRODUCTION

Resident role as a clinical teacher of clerkship students is unavoidable these days. Time limitation and work load of supervisors with variety of roles led to their teaching roles are often represented by the resident, resulting in contact time between student and resident exceeds the contact time between supervisor and student.[1-3] In addition, there is an imbalance ratio of number of tutors and students therefore resident are often asked to help the supervisor to fill the shortage to make sure the learning process may still work well.[4]

It is estimated that as many as 25% of all resident activities spent on supervision, give instructions, and evaluate clerkship students and junior resident. It is not only a matter of time, but the quality of learning provided by the resident also valued quite highly by students.[5] Students found 25-30% of their learning time in clinical setting was filled with activities together with the resident.[6] Interaction between resident and students offer something different than the interaction of students and supervisors. Resident provide a learning experience that is different, more practical and applicable than supervisor.[7]

Moral obligation to teach that charged to the resident in every department is something that cannot be avoided, because the residents as general practitioner (GP) are considered competent to teach medical students.[8] Unfortunately, the residents are often not formally asked to be involved in the teaching process, especially to teach medical students.[4]

Resident role in the learning process of medical students in clinical setting (clerkship phase) in Indonesia is still ill defined. Resident tutor role as a clinical teacher has not been listed in National Standard of Residency Training,[9] Brawijaya Faculty of Medicine Residency Program Handbook,[10] and Academic Standards for Medical Student, Faculty of Medicine Universitas Brawijaya,[11] whereas in reality the role of resident in clinical education is undeniable.

Problems occur when there is no guide for students, residents, and supervisors regarding the rights and obligations of resident as a teacher. This allegedly will affect the quality of the lessons learned by the students. Therefore, we wanted to explore the perceptions of students and residents about residents' role in learning process in clinical setting.

METHODS

This quantitative, descriptive, cross-sectional study was conducted from January to September 2014 with a sample of clerkship students and residents from Faculty of Medicine Universitas Brawijaya (FKUB) which studied in Saiful Anwar Hospital, Malang. Respondents from both groups were asked to answer a questionnaire translated from The Maastricht Clinical Teaching Questionnaire (MCTQ)[12] voluntarily after completing informed consent. In the process of translating the questionnaire, researchers assisted by an expert staff of the Language Department of FKUB. The MCTQ consists of 15 items with 4-points Likert scale and was developed based on cognitive apprenticeship learning theory,

which explains that the process of learning in the clinical environment can be described through three stages, and involves six factors the learning process. The process of the cognitive model of apprenticeship starts with modeling and safe learning environment in the first stage, followed by coaching in the second stage, and ending with articulation and exploration in stage three.[13,14]

Results of questionnaire from students and residents group then analyzed for differences in perceptions about resident teaching. Results of the questionnaire were analyzed based on department, residents' educational period (year of residency), and the preferences of the resident teaching. Statistical test was performed using SPSS 21.0 software. To see whether there is any variation in each group, researchers used one-way ANOVA test to look for differences in the perception of students and residents at each factor in MCTQ based on laboratories (departments), residents' educational period (years of residency), and resident teaching preferences, we used independent t-test.

RESULTS AND DISCUSSION

In this study, 153 (68.3%) student respondents from 224, and 214 (60.6%) resident respondents from 353 were collected. All respondents voluntarily complete and return the questionnaires. Participants from both students and the resident group were asked to fill in their name, gender, department of origin, as well as year of residency for the resident group, and the year of residency of the resident were assessed for the student group. FKUB has fourteen Specialist Program, where thirteen of them belongs to departments which also used for clerkship student clinical rotation. Description of the sample is based on distinguishing characteristics are listed in Figure 1.

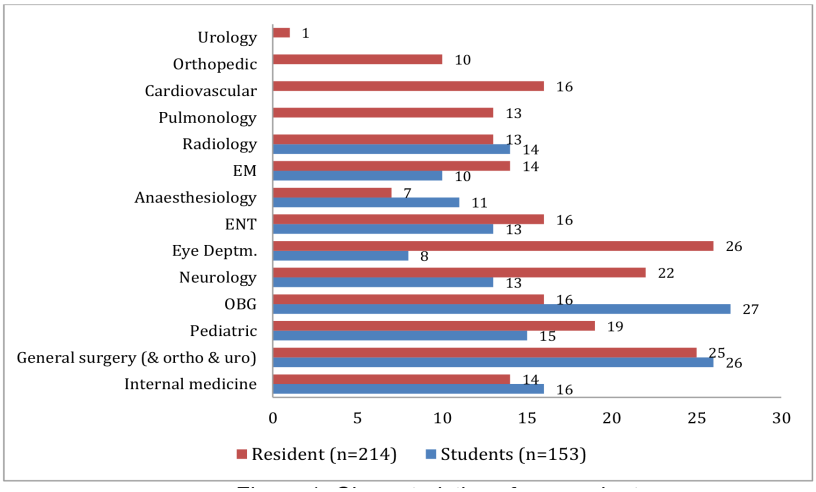

Figure 1. Characteristics of respondents

The perception of students and residents about residents' clinical teaching was compared using The Maastricht Clinical Teaching Questionnaire (MCTQ). This instrument was constructed based on the theory of Cognitive Apprenticeship assessing six factors in the clinical teaching, which are modeling, coaching, articulation, exploration, safe learning environment, and overall performance[12]. Data were analyzed using independent t-test to look for differences in the perception of students and resident on residents' teaching on each factor in MCTQ. Result showed that there is a difference between the perception of students and residents in the modeling factor (p-value: 0.008; $p < 0.05$), and the overall performance (p value: 0.002; $p < 0.05$) (Table 1). Perceptions on both of these factors are significantly different, in which students give higher values than the resident's perception of their teaching.

Table 1. Overall comparation of students' and residents' perception on resident teaching

Factors in MCTQ[13,14]	Independent sample t-test		
	Students *mean*	Resident *mean*	Sig
Modelling	3,43	3,24	**0,008***
Coaching	3,54	3,43	0,108
Articulation	3,32	3,29	0,690
Exploration	3,17	3,16	0,909
Safe learning environment	3,58	3,61	0,646
Overall performance	7,08	6,71	**0,002***

Variation in MCTQ value of resident and student groups based on department and years of residency were analyzed using one-way ANOVA test. Result based on department indicate significant variation on resident group on articulation (p: 0.006; p <0.05) and the exploration factor (p: 0.002; p <0.05). In students group we found significant of variation in all six factors. On modeling, coaching, exploration, and overall performance factor (p <0.001; p <0.05), as well as on factors articulation and safe learning environment (p = 0.001; p < 0.05).

Analysis with independent t-test test was used to see the differences in students' and residents' perception in each department. Independent t-test result at each department with significant difference are listed in Table 2. several laboratories. In General Surgery, significant differences were found in modeling (p = 0.001), coaching (p = 0.001), articulation (p = 0.002), safe learning environment (p = 0.046), as well as overall performance (p = 0.002). In Neurology, we found differences in all factors in the MCTQ. The differences in modeling (p = 0.001), coaching (p = 0.002), articulation (p = 0.022), exploration (p = 0.022), safe learning environment (p = 0.025), and overall performance factors (p = 0.001). In Ophthalmology, differences found in modeling factors (p = 0.015) and overall performance (p = 0.002). In all factors in each of mentioned departments, obtained a positive mean difference, which means that students valued residents' performance significantly higher than the residents value themselves.

Table 2. Independent t-test result in each MCTQ factor based on department (significant differencea only)

Dept.	Modelling		Coaching		Articulation		Exploration		Safe learning env.		Overall performance	
	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.
Gen. Surgery	0,63	0,001*	0,74	0,001*	0,48	0,002*	0,42	0,059	0,36	0,046*	0,78	0,002*
Pediatry	-0,61	0,023*	-0,45	0,118	-0,54	0,055	-0,70	0,043*	-0,83	0,011*	-0,75	0,171
ObGyn	0,01	0,983	-0,10	0,516	-0,39	0,044*	-0,50	0,040*	-0,39	0,083	-0,02	0,941
Neurology	0,89	0,001*	0,71	0,002*	0,57	0,022*	0,78	0,022*	0,74	0,025	1,47	0,001*
Opthalmology	0,46	0.015*	0,49	0,077	0,40	0,340	0,28	0,500	0,41	0,278	1,13	0,002*
EM	-0,15	0,622	-0,22	0,546	-0,23	0,370	-0,75	0.017*	-0,34	0,171	-0,34	0,465

In the Pediatric Department, there were significant differences in modeling (p = 0.023) and exploration (p = 0.043), as well as on the safe learning environment factors (p = 0.011). In Obstetrics and Gynecology differences found in articulation (p = 0.044) and exploration (p = 0.040). In Emergency Medicine, significant differences found in the exploration factor (p = 0.017). At three department mentioned earlier, we found that mean difference was negative, which means that students give a lower value than the residents judge themselves.

The next analysis conducted based on resident education (years of residency). From the analysis of ANOVA from student group, variation found in articulation (p = 0.002; p <0.05) and exploration (p = 0.008; p <0.05). While the results of ANOVA from resident group, there are no significant variation of resident teaching based on their residency period.

Independent t-test were also used to see the difference in perception between students and residents based on resident education period, we continued our analysis by independent t-test test at each year residency. From the analysis of independent t-test, found differences in the overall performance factor in the first-year resident (p = 0.042), the second (p = 0.048), and fourth (p = 0.001). It also found significant differences in the exploration factor resident three years (p = 0.038). In all of these factors mean difference be obtained is positive, meaning that the students give more appreciation than residents judge themselves. Results of independent t-test analysis can be seen in Table 3.

Table 3. Independent t-test result in each MCTQ factor based on year of residency

	Modelling		Coaching		Articulation		Exploration		Safe learning env.		Overall perform	
Year of residency	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.	Mean diff	Sig.
Year I	0,31	0,060	0,28	0,091	0,11	0,590	0,12	0,591	0,09	0,660	0,56	**0,042***
Year II	0,27	0,087	0,24	0,084	0,19	0,189	0,07	0,729	-0,01	0,970	0,51	**0,048***
Year III	0,20	0,339	0,25	0,207	-0,01	0,972	0,57	**0,038***	0,02	0,964	0,25	0,432
Year IV	0,27	0,081	0,04	0,801	0,24	0,100	0,30	0,122	0,15	0,353	0,76	**0,001***
Year V	0,31	0,271	-0,19	0,637	-0,58	0,168	-0,89	0,094	-0,23	0,577	-0,14	0,826

The next analysis was based on the residents' and students' preference for resident teaching. From the 224 respondents of the resident group, 175 (81.7%) of respondents chose "yes" to teach, whereas 39 (18.3%) of respondents chose the answer "no" to teach clerkship students. Independent t-test on MCTQ result was used see the difference in perception residents' preference to teach. Results of this analysis (Table 4), there are significant differences in the exploration factor (p = 0.050) alone. Mean difference in this factor is positive, which means the resident who chooses to teach gives a higher value than the non-teaching.

From the 153 student respondents, 150 (98%) of students choose to be taught by the resident and the remaining 3 students (2%) chose not to be taught by the resident. Furthermore, to look for differences in perception between students who choose to be taught by resident, we also use independent t-test on the MCTQ result from student group (Table 5). As the result, we found significant differences in modeling (p = 0.001), coaching (p = 0.016), and exploration factor (p = 0.019), safe learning environment (p = 0.002), and overall performance (p = 0.001). Differences in scores on these five factors were positive, meaning that students who prefer to be taught by the resident give higher grades than students who do not prefer to be taught by resident.

Table 4. Independent t-test result in resident and student group based on resident teaching preferences

MCTQ Factors	Residents' preference to teach			Students' preference on resident teaching		
	Yes (81.7%) *Mean*	No (17.3%) *Mean*	Independent t-test Sig.	Yes (98%) *Mean*	No (2%) *mean*	Independent t-test Sig.
Modelling	3,27	3,13	0,246	3,46	2,00	0,001*
Coaching	3,45	3,39	0,656	3,57	2,67	0,016*
Articulation	3,32	3,19	0,343	3,33	2,67	0,103
Exploration	3,23	2,92	**0,050***	3,20	2,00	0,019*
Safe learning environment	3,65	3,46	0,177	3,61	2,22	0,002*
Overall performance	6,78	6,47	0,119	7,13	5,00	0,001*

Results of this study showed that the resident has a significant role in the learning process of clerkship students. This is indicated by the response from students where almost all students (98%) choose to be taught by the resident, despite the quality of teaching is still considered moderate (overall performance score of 7.08). Nowadays the students assume the resident is their most important teachers while studying at clinical setting,[15] with a portion of 50-80% of the total time used by the students and residents in their daily life in clinical setting, it is undeniable that the instruction by the resident dominate the learning process of students. This finding is also consistent with research that says that up to a third of students' learning experience in clerkship is given by resident.[5,6]

The students consider the importance of the resident as teachers more than the resident judge themselves. This is indicated by a significant difference in modeling and overall performance. The importance of modeling and the overall performance of a resident in student's perception is consistent with findings in other studies in which role-modeling is a teaching method which are most often received by medical students.[16,17] Referring to the theory of cognitive apprenticeship as a model of learning in the clinical environment, the results of this study also indicate that the role modeling and safe learning environment is a first step and prerequisite of clinical learning process.[14]

Embodiment of cognitive apprenticeship in clinical teaching is dependent on three factors, namely learning environment, characteristics of the clinical instructor and student characteristics. Characteristic of each department in Teaching Hospital as a learning environment in turns give considerable influence in the implementation of the learning process in clinical setting. Role modeling occurred in the three interrelated educational environments, for example in the formal curriculum, the informal curriculum, and hidden curriculum.[18] These three curricula also occur in the clinical environment. Differences in curriculum, especially the informal and hidden curriculum in each department will certainly affect the learning process of students.

The effect of each department characteristics as a learning environment at perceptions of student-resident could be seen from MCTQ scores where students give lower scores on articulation-exploration at Pediatric, Obgyn and Emergency Department. Articulation-exploration factor which is the third stage of the cognitive apprenticeship process, seems often not achieved because of the limited time from both student and resident (not enough time to really focus in observing and train students). A limited time on clinical rotation in each department often

lead the teaching activities to only focus on stage one (modeling-safe learning environment) and stage two (coaching).[14] In addition, the results of quantitative analysis also shows that the differences in the perception of these factors are also found in modeling factors and safe learning environment in the three laboratories, while both of these factors is the first stage of the cognitive model of apprenticeship and is necessary for a learning process. Hence, if the resident as a teacher is not capable of being a good role models and are not able to create a comfortable learning environment for students, the next process becomes hampered or even not implemented.

Resident as a clinical teacher is a second factor that is important in clinical learning. The involvement of a clinical teacher in the teaching-learning process depends on their personal characteristics.[14] The two main things that comes up is the experience as a physician and teacher, and motivation or enthusiasm in teaching. In this study, we highlight the personal characteristics based on years of residency and resident preferences for teaching.

Differences in perceptions of students and residents based on years of residency found on the overall performance and exploration factors. From the analysis, the students gave a higher score of resident teaching on the overall performance factor for resident of the first, second, and fourth year of residency. As stated by other research,[16] that residents' behavior (overall performance) who meets student in daily basis is more instructive for students compared with the theory and the fact that they learned at ward. Differences in perception on the exploration factor for third year resident seems to be more related to the formal curriculum in the department. Differences in perception on the overall performance in the fourth resident is also related to the formal curriculum in each department. The influence of the characteristics of the formal curriculum in residency education towards the difference in perception still needs further exploration.

The third and fourth year resident are considered competent to teach because they already pass through half period of their education, so that their experience as a clinician and teacher is considered sufficient as a basis to guide the students. The obligation to teach and insufficient experience is a positive thing to motivate resident in teaching. Students also saw the senior resident has the characteristics as a role model, because in terms of medical knowledge and clinical experience, they were able to represent the ability of the supervisor. Similar finding was delivered in another study, in which the positive attributes of a role model that is interpreted by his junior are great level of knowledge and clinical skills, have the experience and ability to teach and also committed to the development of the students, as well as personal qualities such as integrity and good leadership.[19]

Resident's motivation and enthusiasm for teaching can be seen from their preference for teaching. A physician or resident who is basically like teaching, will automatically search for and provide a special time to be able to provide guidance to the three stages in this model accomplished.[14] In this study, a significant difference between resident who prefer to teach and who do not prefer to teach only found in the exploration factor, which is the third stage of cognitive apprenticeship models. Residents who do not prefer to teach tend to avoid in spending more time to guide students so that the third stage of this learning model cannot be reached.

Learning in clinical settings are complex environments and many things are still unexplored. Our study is limited to the perception of students and residents only, while the resident actually possesses the intermediary role of the supervisor and the student. An overview of the process of education and teaching in the clinical environment will be more clearly defined with the input and perceptions of supervisors, especially in relation to the policy in each department. Department characteristics as a learning environment, as well as the influence of residency program formal curriculum on student learning process also requires more detailed explanation, particularly in the search for the causes of the variation of student and resident perceptions of differences in each department and inter-year residency.

In addition, the study was conducted at only one institution alone, while the clerkship curriculum in other institutions would have a different characteristic and will determine what factors affect the learning

environment. Further research is needed to see the transferability of our results in other medical educational institutions.

CONCLUSION

Students appreciate the presence of the resident as a clinical teacher as very important, exceeds the resident assessment of themselves. There are differences in perception between students and residents about the role of the resident as a clinical instructor, especially in terms of modeling and overall performance. Students have a high preference to be taught by the resident, this needs to be balanced by exploring the factors that influence differences in perception between students and residents to improve and optimize quality of residents' teaching.

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