RESEARCH ARTICLE

Andragogic principles in case-based discussion among medical interns in a tertiary hospital

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ABSTRACT

Background: Andragogy, the theory of adult learning is relevant to medical education especially in the clinical internship learning context. It focuses on the students, faculty, and patients interacting together while developing competencies as future practitioners. Medical interns are active adult learners, enhancing their development of knowledge, skills, and positive attitudes, and pursuing professionalism as they participate in case-based discussions (CBD).

Objectives: The study sought to identify the basic principles of andragogy while medical interns participate in case-based discussions including the end-of-course satisfaction. It also determined the selected demographic factors associated with the andragogic principles.

Methodology: Respondents included 80 interns by convenience sampling who rotated at the Department of Ophthalmology and Visual Sciences in a tertiary referral hospital. The study used a combination of descriptive quantitative and qualitative research design. A valid instrument using the Adult Learning Principles Design Elements Questionnaire (ALPDEQ) was used to measure the medical intern's andragogic orientation as well as end-of-course satisfaction. A direct, non-participant observation of case-based discussions conducted at the department was done by the researcher and research associate.

Results and Conclusion: The occurrence of andragogic principles specifically motivation, experience, need to know, readiness, and self-directedness was observed during the conduct of case-based discussion. There was no association between principles of andragogy and demographic factors such as age, gender, civil status, medical school, preparatory medical course, and place of origin. CBD is an effective learning strategy, which provides medical interns adequate venues to be self-directed and apply the principles of andragogy in a workplace-based setting.

Keywords: *andragogy, case-based discussion, self-directed learning, medical interns, ALPDEQ*

Introduction

Andragogy revolves around the art and science of helping adults learn. It is different from pedagogy which involves an adult accompanying a child so that he may become an adult. Andragogic principles involve an adult accompanying another adult to a more refined, enriched adulthood [1].

Knowles defined andragogy in the context of six basic principles, namely, intrinsic motivation to learn, readiness to learn, use of prior experience, orientation to learning, self-directed learning, and the need to know. The principle of "need to know" comes first in andragogy, as it reveals the purpose behind the learning experience to understand the effective planning of the tasks at hand. Adult learners alone then decide if they are motivated to learn something, they must be convinced of its importance, and that learning becomes efficient when it is related to their existing schema of things [2]. Readiness to learn refers to learning efforts that are incited by life or work challenges and prior experiences. This is related to orientation to learning with the ability of the learner to associate and transfer these learnings to real-life problems. The teachers then serve to create the environment to activate motivation, direct student's attention, and enhance the transfer of learning [2]. As a whole, being a self-directed learner can help an adult engage and take control of his learning.

Active learning is integral to andragogy. This is encouraged through active participation of adults in group discussion, feedback, and other activities which create an atmosphere wherein the learners are allowed to discuss content with each other. The content of the concepts should be connected with what they know and relevant to one's life and work.

Medical internship promotes autonomy of being a self-directed learner by giving opportunities for the intern's holistic development [3]. The rotation of interns at the University of the Philippines College of Medicine Internship Program in the Department of Ophthalmology and Visual Sciences aims to do this while providing medical interns with the experience and the environment to apply their medical knowledge and clinical skills in treating patients with common ophthalmologic problems.

Built-in in their two-week rotation is a workplace-based experience through case-based discussions (CBD). CBD starts with clinical scenarios of actual patients, followed by a discussion where interns apply knowledge of ophthalmic practice, and then structured feedback is given by the consultant. Interns develop patient management skills while the consultant facilitator is able to assess the intern's clinical reasoning and decision-making abilities. Feedback on the strengths and weaknesses of the intern's performance will help them develop self-reflection, their learning, and skill development [4].

Whether this process actually happens is yet to be determined. Interns' perception of their experiences with this method has not been looked into. Studying the application of the principles of andragogy in instruction can also help reshape the medical curriculum. This study explored the experiences of interns with case-based discussion in promoting autonomy and self-directed learning.

The study aimed to describe how case-based discussion is carried out for medical interns rotating in the Department of Ophthalmology and Visual Sciences. It also looked at the degree to which principles of andragogy, specifically motivation, experience, need to know, readiness, and self-directedness, are applied in case-based discussions as per direct observation and medical interns' perceptions. Included also in the objectives were the student's degree of satisfaction with the case-based discussion and the association of demographic factors such as age, sex, gender, civil status, medical school, preparatory medical course, and place of origin with the principles of andragogy.

Methodology

Research Design

The study is a combination of descriptive quantitative and qualitative research design.

Study Setting

The study was done with medical interns who rotated in the Department of Ophthalmology and Visual Sciences in a national tertiary referral center during their rotations in the emergency room, outpatient department, operating room, and the ward.

Study Population and Sampling

Medical interns of the school year 2018-2019 who rotated in a national tertiary referral center composed the population of this study. These referred to 160 students of the medical school and 180 post-graduate interns from other medical schools who were accepted for internship training in the same facility. From this population, convenience sampling of blocks of interns who completed their rotation in the Department of Ophthalmology and Visual Sciences of the medical center were selected as respondents and key informants. Informed consent was obtained from students and consultants who agreed to participate in the study. Approval from the Research Ethics Board of the state university was secured to ensure the standards of conduct in performing the study.

Data Collection Procedures

Data collection procedures included the use of a 28-item survey questionnaire accomplished by the interns. It was based on a self-report, psychometric instrument called the Adult Learning Principles Design Elements Questionnaire (ALPDEQ) designed by Lynda Wilson in 2005 [5], which measured five out of six andragogic principles and seven out of eight andragogic processes. The choices of responses include a five-point scale namely, (1) “Strongly Disagree,” (2) “Disagree,” (3)” Neither agree nor disagree,” (4)” Agree,” and (5) “Strongly Agree.”

The tool used for direct observation during case-based discussion is a five-point Likert rating scale from 1 (Strongly Disagree) to 5 (Strongly Agree). This tool was created to guide the observer in determining the presence of the principles of andragogy which are motivation, need to know, experience, readiness, and self- directed learning. The researcher and a

research assistant especially trained for this study observed a total of 14 CBDs. The field researcher observed while the CBD was taking place. The researcher observed the video-recorded sessions. They used the same observation checklist reflecting the principles stated in the ALPDEQ.

The statements used in the rating scale were sent for content validity to a group of consultants who are learning coordinators of the department. The statements were modified based on the suggestions of consultants to improve understanding, clarity, and readability. The final tool was developed based on their ratings.

Data Processing and Analysis

Data from the survey were encoded, summarized, and processed into an organized presentation. Demographic data (specifically age, gender, civil status, medical school, preparatory medical course, and place of origin) including ratings of the medical interns and direct observer were summarized. Statistical analyses were performed using STATA version 14.0. Encoding and analysis of the interns' responses on the ALPDEQ were summarized according to each principle of andragogy. Since all variables are qualitative, frequency and proportion were used to characterize the study participants. Principles of andragogy were summarized using mean and standard deviation. The two data set of observational rating scores were compared for the degree of inter-rater reliability or consistency using the Kappa analysis.

Results

Profile of Respondents

A total of 80 medical interns who rotated at the Department of Ophthalmology and Visual Sciences participated in the study and gave their consent for video recording. There were 34 male students and 46 female students with age ranging from 22-31 years old. Most of the participants belonged to the 24-26 age group. All of them were single with only one married student. Fifty-one of them were post-graduate interns; 29 of whom are from UPCM. Majority of the medical interns came from the provinces, while the remaining are from the National Capital Region (NCR). Seventy-seven students had a preparatory course related to medicine while the other three had non-medical courses (Table 1).

There were 14 sessions of case-based discussion conducted and observed in the Department of Ophthalmology and Visual Sciences. All of the sessions were video-recorded. Two sessions of case-based discussion were held per rotating block. Each session was attended by 5-6 medical interns with one consultant from the department serving as facilitator. It was held in the office inside the Department of Ophthalmology during the second week of the medical interns' rotation at the preferred day and time of the facilitator. The average time consumed per discussion took around 90 minutes.

How the Case-based Discussion was Carried Out During Internship

In the Department of Ophthalmology, medical interns were asked to find a patient from their encounters during their rotation. The CBD took place in a pre-planned time in an office inside the department. Each medical intern was given fifteen minutes to present the case.

During the discussion, interns presented the clinical history of the patient and the rest of the group asked questions regarding associated signs and symptoms. Volunteerism on the part of the students showed motivation. Details of the ocular examination of the eye as done by the medical intern were reported. The consultant asked questions on anatomy or physiology of the eye, analysis of the case, and different management strategies. The reporter defended the plan of management. Responses from the interns showed their readiness and the depth and variety of their responses defined self-directedness. The faculty facilitator pointed out several learning points during the discussion. The

Table 1. *Demographics of study participants (n=80)*

Demographic Characteristics	Number	Percentage
Age Range		
21-23	8	10.00
24-26	63	88.75
27 and above	9	11.25
Sex		
Male	34	42.50
Female	46	57.50
Civil Status		
Single	79	98.75
Married	1	1.25
Medical School		
UPCM	29	36.25
Non-UPCM	51	63.75
Prep Course for Medicine		
Medical	77	96.25
Non-Medical	3	3.75
Place of origin		
National Capital Region	30	37.50
Province	50	62.50

facilitator complimented the interns for being prepared for the discussion. Points were also allotted on the manner of delivery which included the systematic presentation and logical answers to the questions asked pertinent to the case. The feedback given at the end of the session in terms of which explanation was done right or better or with difficulty, added structure to the encounter (See Fig.1). It served as a forum for the intern to determine useful actions for learning or development.

The grading sheet provided by the department's internship committee allotted 20 points each on the history, ophthalmologic examination, differential diagnosis, management, and overall presentation with a total of 100 points. The students' preparation also reflected in the high scores given by the students in the evaluation surveys used in the study.

Clinical cases encountered included cataract, eye trauma cases, systemic problems associated with the eye like Diabetes and Thyroid disease, pediatric conditions like strabismus and retinoblastoma.

Combined observation ratings of the CBD ranged from 4.21 for need to know to 4.36 for self-directedness (Table 2).

Figures show that the two raters had moderate inter-rater reliability in terms of the interns' first-hand experience (Kappa = 0.55) while going through the CBDs. There was a slight agreement between the two raters in terms of motivation (0.07) and need to know (0.05). Fair agreement was seen between raters in terms of self-directedness, given a score of 0.36. The lowest was with readiness, given a score of -0.2245, which showed poor and negative agreement between raters.

Degree in which the Principles of Andragogy are Perceived by Interns as Applied in the Case-based Discussion and Student's Overall Level of Satisfaction on their Experience

The scores obtained from the ALPDEQ reflected the perceptions of medical interns regarding their experience of CBDs. Responses were high from Agree to Strongly Agree. Overall mean scores obtained among the 80 participants was

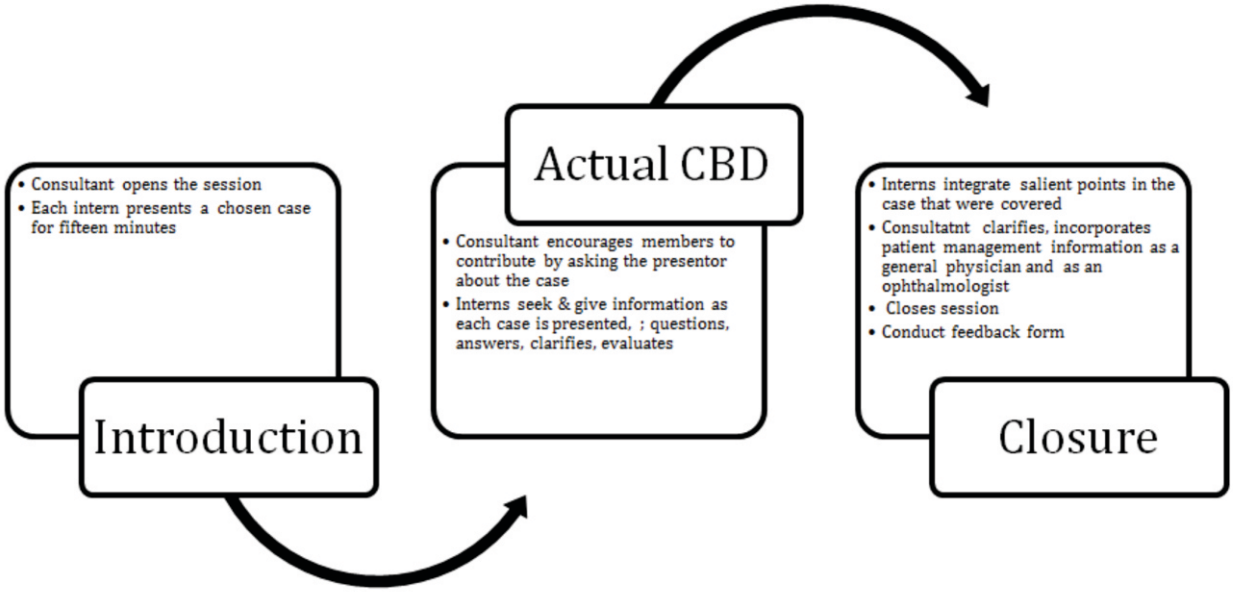

Figure 1. *Schema of CBD*

Table 2. *Overall mean ratings and Kappa inter-rater reliability test on how the case-based discussion was carried out (n=14 CBDs)*

Principles on Andragogy Observed	Mean Scores		Combined Mean Ratings	Interrater Agreement % agreement (Kappa)	Interpretation
	Rater 1	Rater 2			
Motivation	4.18	4.39	4.29	57.14% (0.07)	Slight agreement
Experience	4.43	4.36	4.39	78.57% (0.55)	Moderate agreement
Need to Know	4.04	4.39	4.21	39.29% (0.05)	Slight agreement
Readiness	4.14	4.39	4.27	25.93% (-0.22)	Poor agreement
Self-directedness	4.32	4.39	4.36	67.86% (0.36)	Fair agreement

4.60. The mean rating for need to know was 4.59, experience was 4.55, and readiness at 4.44 (Table 3). The standard deviations were noted to be comparable among the principles of motivation, experience, need to know, readiness, and self-directedness which ranged from 0.40 to 0.50. The ratings from the end-of-course satisfaction questions obtained a standard deviation of 0.34.

All of the comments obtained from the questionnaire showed the agreeable findings on the observation of the research assistant and researcher. These include, "I highly appreciate a supportive, kind, but firm facilitator that invites inquiry regardless of how stupid they may be, than someone who shuns inquiry considering them as unprepared," and also, "High yield discussion with Sir," "The preceptor was very intelligible, considerate, and facilitated a good flow of discussion which is just apt for us medical interns to be soon GPs (not considering Ophtha as specialty)."

Discussion

The Case-based Discussion

The case-based discussion being conducted in the Department of Ophthalmology and Visual Sciences served as a structured learning activity within a small group. It became a useful encounter for the students given access to an instant and contextual feedback from the facilitating consultant. The limited number of medical interns as participants in the discussion enhanced the learning and contact time required to achieve high yield of learning. It engaged the student to freely discuss topics as well as set focus to agree or disagree on certain ideas as well. This was reflected in the comments given by the medical interns after the sessions.

Reflection in the learning process served as a mark in the transition of the students from pedagogy to andragogy. The conduct of the case-based discussion proved the role of experiential learning wherein learning experiences are created to facilitate learning through discovery. The activity served as evidence to determine if the method being used is able to assess clinical and curricular competencies. A tool like the case-based discussion, as used in this study but is regarded as a workplace-based assessment tool, allowed this process by giving formative assessment and feedback. An average of 90-minute allotted time during the CBDs in the Department of Ophthalmology and Visual Sciences was consistent with the typical method done in other medical institutions.

Norcini [6] implied the same finding that assessment of actual practice provided a better reflection of the trainee's performance than under test conditions. Discussion of the case by the interns, starting from the proper way of doing a routine ophthalmologic examination to defending their choice of diagnostic techniques specific with their case stimulated observational and group dynamic skills. In this kind of environment of discussion, the teacher's role shifts from a transmitter of information to a facilitator of learning. With this role, the facilitator was able to create and manage meaningful learning experiences for the students. The facilitator sets the climate, organizes resources, and helps elicit and clarify the discussion [2].

The feedback given by the facilitator during the discussion as done in a study by Mehta, was also valued by the medical interns. The trainees valued feedback because the case-based discussion served as an opportunity for good quality learning with a commitment in the process between the student and facilitator.

Degree by which the Principles of Andragogy are Observed in the CBD

The different levels of agreement between the two raters who observed the CBD may be due to dissimilar levels of background as well as involvement of factors during the conduct of the discussion affecting the factor of observer accuracy. Being present during the discussion as compared to watching a video of the discussion may give a lot of difference in the perception of the observer. The significance of having the different levels of agreement between raters also signified the lack of bias and showed independence of the observers. The scores of raters' observations in terms of analysis may have been different, however, both ratings of the observer were in agreement that the principles being observed during the case-based discussion are exhibited. This was seen in the principles of motivation and need to know. In terms of the principle of andragogy pertaining to experience, wherein the raters have moderate agreement, this may be attributed to the same background of the observer being both from the science field. Poor agreement was observed in the aspect of readiness, since, even if both observers came from the same field, the level of depth of training background of study may be different. The observer should fully understand the nature of both the doctor's practice and relevant curricula which helped mold the intern's competency.

Perceptions of Interns on their Experience in the CBD

In terms of the interns' perception of andragogic principles during the case-based discussion, the high means obtained in the Likert scales of the ALPDEQ reflected the influence of the

Table 3. *Mean ratings and Standard Deviations of interns' perceptions of their rotation through CBD (n=80)*

Constructs	Means	Standard Deviation	Overall means per construct
Motivation		**0.42**	**4.60**
1. The learning experience tapped into my inner drive to learn	4.56		
2. The learning experience motivated me to give it my best effort	4.61		
3. The learning experience motivated me to learn more.	4.74		
4. I feel better to perform work tasks due to this learning experience	4.58		
5. I feel my mastery of this material will benefit my work	4.61		
6. The knowledge gained in this learning experience can be immediately applied to my work	4.64		
7. I feel this material will assist me in resolving a work problem	4.50		
8. I feel that this learning experience will make a difference in my work	4.53		
Experience		**0.48**	**4.55**
9. I felt my prior work experiences helped my learning	4.64		
10. My life & work experiences were a regular part of the learning experience	4.50		
11. I felt my life & work experiences were a resource for this learning	4.53		
Need to Know		**0.40**	**4.59**
12. I felt responsible for my own learning in this learning experience	4.60		
13. I felt I had a role to play in my own learning during this learning experience	4.70		
14. It was clear to me why I needed to participate in this learning experience	4.64		
15. The life/work issues that drove me to this learning experience were understood	4.42		
Readiness		**0.40**	**4.44**
16. The life /work issues that motivated me for this learning experience were respected	4.48		
17. This learning experience was just what I needed given the changes in my life/work	4.36		
18. I understood why the learning methods were right for me	4.47		
Self-directedness		**0.44**	**4.60**
19. I was satisfied with the extent to which I was an active partner in this learning experience	4.59		
20. I felt I had control over my learning in this learning experience	4.58		
21. I knew why this learning experience would be beneficial for me	4.64		
End-of-Course Satisfaction		**0.34**	**4.79**
22. You would recommend the instructor	4.80		
23. The instructor demonstrated expertise and was professional	4.82		
24. Presentation by faculty contributed to course objectives	4.78		
25. The instructor was organized and managed the course successfully.	4.84		
26. Sufficient time was allocated to learn content	4.84		
27. Individual assignments were appropriate	4.67		
28. The course contributed to practical knowledge I use in my job	4.78		

case- based discussion as a work place-based assessment tool. The use of the ALPDEQ, perceived as the first instrument with sound psychometric qualities to successfully measure andragogy, is considered a significant advancement for andragogy [5]. Scores obtained in each of the principles such as motivation, readiness, experience, need to know, and self-directedness, reflected the assimilation of the learner's engagement and knowledge retention. This will help the curriculum planners to develop high yield, effective sessions within the perspective of andragogy.

The motivation to learn reflected the learner's behavior to connect with the topic. This exercise initiated internal motivation among the students realizing its application in their own life experience, especially in the practice of medicine. The case-based discussion helped influence competence, autonomy, and relatedness in learning.

The interns' awareness of their need to know also gave them the reality of the negative consequence of not learning. The facilitator helped the medical interns become aware of this need as seen in the response of the medical interns in the questionnaire. This helped them plan and later reflect, making them prepared when faced with the same task or problem.

The principle of readiness to learn is based on the relevance of the topic being discussed. The curriculum or syllabus used in case-based discussion helped draw a practical aspect of a doctor's activity. The favorable scores showed their interest in exploring different issues during the discussion.

Self-directedness signals a person's maturity, moving from dependency to autonomy. It signified that a physician is a student for life. Professionals continue to engage in continuing professional development due to challenges and complexities of tasks as what was identified in health profession education. As trainees, they engage in learning for expertise on the job, starting as medical clerks and later on as medical interns. It showed the growth of the students from low learner maturity phase to full learner autonomy [7]. As the individual becomes autonomous in learning, his focus shifts from competence to capability. The scores obtained showed that the group discussion was transformative. It helped triggered the learner to understand the relevance of learning in ophthalmology for future practice as a doctor. Their exposure to reflection on learning and feedback helped them imbibe the skill of self-improvement which is relevant in one's professional practice as a doctor.

The end-of-course satisfaction obtained high scores which showed the favorable stand of the students with the activity. It showed encouraging feedback which is very useful in planning strategies and shaping the learning environment for medical interns in the institution. It showed that the institution's program is guided by the adult learning theory as demonstrated by the positive students' perception of the strategy.

Conclusion

The study measured the principles of andragogy using case-based discussion among medical interns. It reflected the different facets of small group discussion as the foundation of case-based discussion. The medical interns played different roles while the facilitator served different tasks during the session.

The conduct of case-based discussion helped show the structures of andragogy through its principles, among medical interns during their rotation in the Department of Ophthalmology. This was measured with the results from the ALPDEQ survey as well as the end-of-course satisfaction ratings by the medical interns after the case-based discussions. The favorable results gave an overview on the presence of andragogy using case-based discussion as an intervention or a workplace-based assessment.

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