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Addressing Electroconvulsive Therapy Knowledge Gaps and Stigmatized Views Among Nursing Students Through a Psychiatrist–APRN Didactic Partnership

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Abstract

BACKGROUND: Knowledge gaps and stigmatized perceptions regarding electroconvulsive therapy (ECT) among patients and health providers contribute to the underutilization of an important therapeutic modality. The proactive education of future advanced practice registered nurses (APRNs) provides an opportunity to optimize the use of this evidence-based clinical practice. **AIMS:** As part of a general course in psychiatry during the first year of nursing school, we dedicated 1 hour to treatment-refractory depression, including ECT, and a second hour to a summary discussion of mood disorders. We evaluated the efficacy of this didactic offering, which was co-taught by a psychiatrist and a psychiatric APRN. **METHOD:** At baseline, consenting students ($n = 94$) provided three words they associated with ECT and then completed three validated instruments: (a) Questionnaire on Attitudes and Knowledge of ECT, (b) Opening Minds Stigma Scale for Health Care Providers, and (c) Self-Stigma of Seeking Help. Among the 67 students who repeated the assessment at endpoint, 39 attended the ECT didactic (Intervention group, 58%) and 28 did not (Control, 42%). **RESULTS:** After completion of the 3-month course, students showed improvement across all measures ($p < .001$). The only outcomes that improved differentially between the Intervention and Control groups were the Questionnaire on Attitudes and Knowledge of ECT Attitudes and Knowledge scales ($p = .01$). Word choice valence associated with ECT shifted favorably by endpoint ($p < .001$). **CONCLUSIONS:** An educational intervention co-led by a psychiatric-mental health APRN had a significant impact on nursing students' knowledge and perceptions of ECT. This approach can be readily implemented at other institutions. Future refinements will include the videotaped depiction of a simulated patient undergoing the consent, treatment, and recovery phases of ECT.

Keywords

electroconvulsive therapy, stigma, depression, nurse practitioner, undergraduate nursing education

Introduction

Electroconvulsive therapy (ECT), a type of treatment in which electric currents are passed through the brain in order to cause brief seizures, is a well-established treatment for depression and other psychiatric conditions (American Psychiatric Association Committee on Electroconvulsive Therapy, 2001). Despite the promise of new psychotropics and developing neuromodulatory techniques, ECT remains one of the safest and most effective treatments in the psychiatric armamentarium (Wilkinson et al., 2018; Wilkinson and Rosenheck 2017). However, ECT also remains an underutilized treatment owing to a complex set of structural, cultural, and region-specific

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legislative barriers (Wilkinson et al., 2018). Collectively, these factors have limited not only patient access to ECT but also opportunities for health care professionals to receive adequate training from experienced providers. Disparities in ECT education across health care specialties also perpetuate negative attitudes regarding ECT among both patients and providers, which remain an important factor in the success or failure of a referral to ECT (Payne & Prudic, 2009).

Although there are no ECT accreditation parameters specific to nursing, nurses have long been central to the treatment. In its official Position Statement, the American Psychiatric Nurses Association states how “[i]n addition to advancing evidence-based treatment modifications and developing advanced practice nursing roles in ECT, psychiatric nurses have been vital patient advocates, assuring that patients receive accurate information about ECT, educating the public, and influencing public policy” (American Psychiatric Nurses Association, 2001).

Many students in the health professions in the United States and abroad harbor negative attitudes toward ECT (Abbas et al., 2007; Aki et al., 2013; Clothier et al., 2001; Walter et al., 2002), including nursing students (Kavanagh & McLoughlin, 2009; Sharma et al., 2017). In a recent study on perceptions about psychiatry and mental illness we conducted among nursing students, views on ECT was one of only two items that paradoxically worsened (i.e., showed increased stigma) by the end of an introductory psychiatry course (Martin et al., 2019). We hypothesized that a combination of limited preparatory education, high acuity, and limited onsite supervision during a brief placement (of typically a single ECT session) could have explained the lower views by course’s endpoint. Popular media, including movies, television, and the Internet are common sources of information—and misinformation—about ECT. A systematic review of media portrayals of ECT showed that the majority of those depictions are exaggerated, frightening, and only loosely related to the actual practice (Sienaert, 2016). These cultural influences are as hard to ignore as they are unfortunate: ECT is a highly effective intervention, and patients who have undergone the treatment report positive impacts on their knowledge about and attitudes toward the procedure (Aoki et al., 2016).

A growing evidence base suggests that even brief educational interventions, including videotaped observation of modern treatment (Andrews & Hasking, 2004; Trenton & Pelchat, 2016), can significantly improve student perceptions of ECT (Balhara et al., 2012; Battersby et al., 1993; Li et al., 2013; Pranjovic et al., 2017; Shah & Averill, 2009; Szuba et al., 1992; Warnell et al., 2005). Indeed, education about ECT for medical students unfamiliar with this treatment modality not only increases knowledge but also improves attitudes and diminishes

fear and misconceptions (Andrews & Hasking, 2004; Benbow, 1990). Similar effects been studied in nursing students (Sharma et al., 2017). However, didactic initiatives specifically tailored for advanced practice registered nurses (APRNs) have not been examined. We consider this an important gap given that training of APRNs may have a greater impact on the utilization of ECT in the future. APRNs will have a growing role in supporting the present deficit of community psychiatric providers (Levin, 2018; Satiani et al., 2018) and the high likelihood of encountering patients appropriate for referral during future practice [e.g., those with treatment refractory depression (Kellner et al., 2015; Lin et al., 2020)].

With these considerations in mind, we developed a pilot educational intervention for first-year nursing students in an accelerated program toward an APRN degree. We modeled our didactic intervention as a combined didactic on the subjects of treatment-refractory depression and the role of ECT in modern psychiatric practice. A unique feature of this intervention was the development and dissemination of content by a collaborative duo of a psychiatrist and an APRN working together in an academic ECT service.

Method

We used a quantitative approach to measure change in knowledge and attitudes regarding ECT before and after our educational intervention. Students were not randomly assigned to different study arms; instead, those who attended the educational session became the exposed group (Intervention), and those who did not, the unexposed (Control). As such, this was a naturalistic, rather than an experimental study. We supplemented our quantitative findings with a qualitative component, through which we analyzed the emotional valence of words students associated with ECT before and after the didactic intervention.

Setting and Participants

The Graduate Entry Program in Nursing (GEPN) at the Yale School of Nursing is an accelerated program designed for entrants with a bachelor’s degree but no prior nursing experience. Graduation from the program results in a Master of Science in Nursing degree as well as eligibility to take the National Council Licensing Examination-Registered Nurse. We invited first-year students of the program to participate and complete assessments at two time points: at the start (baseline) and after completion (endpoint) of their core curriculum’s 8-week course in psychiatric-mental health nursing.

This course (“Seminar in Psychiatric and Mental Health Nursing”) builds on skills learned in medical-surgical

nursing by providing clinical experience in the foundations of understanding and treating psychiatric illness within a bio-psycho-social-spiritual-cultural theoretical framework of health promotion and disease prevention. Course content includes the pathophysiology, assessment, diagnosis, treatment, and evaluation of cognitive, perceptual, emotional, behavioral, and interpersonal symptoms associated with common psychiatric diagnoses. The course addresses the needs of individuals with mental illnesses and their families across the life span. The format includes lecture and team-based learning activities across 4 hours of content per week. Concurrent to participation in the seminar, students engage in a clinical practicum of 90 hours working on a psychiatric inpatient unit (at both state and private facilities). All students participate in a clinical simulation on safety assessment, during which small groups of students, overseen by a faculty member, interview simulated patients experiencing suicidal ideation.

Educational Intervention

We dedicated 1 hour of didactic content to “ECT in modern psychiatry and the role of the APRN” as part of the seminar’s 4-hour module on mood disorders. Material was presented in a lecture format with time evenly divided between an interventional psychiatrist (a current ECT practitioner and neuromodulation expert) and a psychiatric APRN with experience in ECT. Both psychiatrist and APRN are team members in a comprehensive Interventional Psychiatry Service with dedicated roles in the management of patients receiving ECT. The session was grounded in best current practices (American Psychiatric Association Committee on Electroconvulsive Therapy, 2001; Rasmussen, 2019) and had as objectives for students to (a) learn the indications, proposed mechanisms of action, known risks/side-effects, and technical aspects of ECT; (b) understand the role of ECT in modern psychiatric practice; (c) consider barriers to receiving ECT from the patient and provider perspectives, as well as strategies for overcoming them; and (d) appreciate the role of the APRN in caring for patients undergoing ECT.

The session included two video clips readily available on YouTube: (a) A 72-second clip from the 1975 film *One Flew Over the Cuckoo’s Nest*, which depicts an outdated practice and has contributed to common misconceptions and stigmatized views of ECT (Nicholson et al., 2002/1975) and (b) A 34-second clip from the 2018 *60 Minutes* documentary “Is shock treatment making a comeback?” in which Kitty Dukakis shares her experience as a patient underdoing the treatment as currently practiced in the United States (Cooper, 2018). An interactive review hour capped the mood disorders module, during which students were able to anonymously submit

questions to the teaching faculty. Questions were then discussed in an open format by the two presenters.

Instruments

Participants completed a demographic survey at baseline. At baseline and endpoint, they were asked to provide the first three words or short phrases they thought about when hearing the term “electroconvulsive therapy.” Following these free-text entries, participants completed three validated self-report questionnaires:

The *Questionnaire on Attitudes and Knowledge of ECT* (QuAKE; Lutchman et al., 2001) is a widely used instrument that has been shown to have good internal consistency (Cronbach $\alpha = .91$) and split-half reliability in a sample of mental health professionals (Guttman split-half score, .92). The QuAKE has two components: (a) *Attitudes*, for which respondents indicate how strongly they agree or disagree on a 5-point Likert-type scale with 16 positive and negative statements about ECT; and (b) *Knowledge*, a list of 16 factual items with a forced true or false response.

The *Opening Minds Stigma Scale for Health Care Providers* (OMS-HC; Kassam et al., 2012, Modgill et al., 2014) is a 15-item questionnaire scored on a 5-point Likert-type scale. The OMS-HC yields an overall score and three subscale scores: (a) *Attitudes* of health care providers toward people with mental illness, (b) *Disclosure* and help-seeking, and (c) *Social distance*. The OMS-HC has acceptable internal consistency (Cronbach $\alpha = .79$) and has been successful in detecting positive changes in various anti-stigma interventions. A recent systematic review of the psychometric properties of instruments to assess mental health-related stigma among health professionals and students in the health sciences found the OMS-HC to be the most widely used instrument across published studies (Sastre-Rus et al., 2019).

The *Self-Stigma of Seeking Help* (SSOSH; Vogel et al., 2006) is a 10-item scale scored on a 5-point Likert-type scale. It has good reliability (Cronbach $\alpha = .91$) and can predict attitudes toward and intent to seek psychological help. It can also differentiate individuals who seek psychological services from those who do not across a 2-month period. Like for the other instruments, some of its items are reverse-coded to reduce response acquiescence bias.

Ethics Approval

We obtained institutional review approval from the Yale Human Investigations Committee before starting data collection (Protocol No. 2000026843). The study was deemed exempt of review, with completion of the survey representing tacit consent. Students were encouraged to participate but informed that their participation was neither mandatory

nor relevant to their performance evaluation for the 8-week course. They were notified that results of the surveys would not be accessible to faculty responsible for their course evaluations. In order to track individuals' responses over time, each student provided a deidentified and anonymous study code.

Data Collection and Statistical Analysis

Students completed surveys through their preferred, WiFi-enabled personal devices during dedicated classroom time on two dates in January and March 2020. We collected information securely through Qualtrics (Provo, UT), and analyzed data using SPSS version 25 (Armonk, NY).

We used chi-square analyses to compare baseline demographic characteristics between endpoint survey completers ($n = 67$) and noncompleters ($n = 27$; $p > .05$ for all contrasts). Finding no differences, we restricted analyses to the completer group. We used chi-square analyses to compare the intervention and control groups and next examined the correlation between baseline ordinal characteristics and outcome measures using Spearman rho (ρ) coefficients. Coefficients significant at the $p \leq .05$ level were added as additional covariates to the corresponding outcome analyses. We analyzed our main outcomes of interest using general linear models, with marginal means to compare endpoint values to covariate ratings at baseline. We calculated F values with two-way Univariate Analyses of Variance in order to evaluate the main effects of time (endpoint – baseline) and intervention (vs. control).

We manually coded each of the free-text word entries for emotional valence by using a 7-point Likert-type scale that ranged from -3 (*extremely negative perception*), through 0 (*neutral*), to $+3$ (*extremely positive*). We used independent sample t -tests and chi-square tests to compare emotional valence as continuous and categorical variables, respectively. Finally, we used word cloud generator software (wordclouds.com; Zygomatic Inc., Vianen, The Netherlands) to visually depict students' word choices at baseline and endpoint.

Results

All students in the Graduate Entry Program in Nursing course ($N = 105$) were invited to participate; 94 (90%) completed the baseline, and 67 (64%) both baseline and endpoint assessments. Our results are based on this working sample of 67 completers of both assessments. Baseline characteristics did not differ between the exposed and unexposed groups, as summarized in Table 1. Many students had experiences with mental illness: in a friend or relative (45%), or personally themselves (22%). About a

third (29%) had already been involved in the care of patients with mental illness. A small minority (13%) was part of the psychiatric/mental health APRN track but had not yet begun postgraduate specialty studies. Students in this group did not differ on baseline characteristics from those in the other tracks.

As depicted in Table 2, we found significant correlations between baseline OMS-HC and SSOSH scores and students' experiences with mental illness—in their friends, relatives, and especially themselves. We included the relevant baseline characteristics in the appropriate outcome analyses described next.

Table 3 presents the study's main outcomes, calculated using general linear models and depicted as marginal endpoint means adjusted for baseline covariates. After completion of the 3-month course, students showed improvement across all measures ($p < .001$). The only outcomes that improved differentially between the Intervention and Control groups were the QuAKE Attitudes and Knowledge scales ($p = .01$).

The emotional valence of words that students associated with ECT shifted markedly from baseline to endpoint (-0.8 ± 1.1 vs. 0.1 ± 0.7 , $t = 11.47$, $df = 513$, $p < .001$). Figure 1 provides a visual rendering of all words offered at baseline and endpoint, weighted by frequency and highlighted in colors representing each of the emotional valence categories (warmer colors, negative; grey scale, neutral; cooler colors, positive). Table 4 organizes the same information across seven valence categories and includes representative word examples.

A representative sample of the questions related to ECT that emerged during the postlecture discussion is included as an appendix.

Discussion

The nursing profession has been involved in ECT from the days of its first development. In what may be the earliest reference on the role of nursing in ECT, Day and Moser presciently noted back in 1938 that

convulsive therapy offers an excellent opportunity for teaching student nurses since it combines many aspects of medical and psychiatric nursing. (Day & Moser, 1938)

Despite such lofty promise, and notwithstanding the long track record of ECT as a safe and effective treatment modality (Janicak et al., 1985; UK ECT Review Group, 2003), general nursing students are at best likely to be unfamiliar with the practice—and to have outdated and stigmatized views about it at worst. Work by Sharma et al. (2017) has documented ongoing negative perceptions of ECT among nurses. Indeed, in our recent work we found that ECT was the one area within the nursing

Table 1. Baseline Characteristics of First-Year Nursing Students ($n = 67$).

Characteristic	Control ($n = 28$)		Intervention ($n = 39$)		Statistic		
	N	%	n	%	χ^2	df	p
Sex					0.19	1	.66
Female	26	93	35	90			
Male	2	7	4	10			
Age					0.94	2	.62
24 and younger	11	16	11	16			
25 to 29	12	18	19	28			
30 and older	5	8	9	13			
Nurse practitioner track					3.50	4	.48
Adult/geriatric	4	6	6	9			
Family	8	12	14	21			
Midwife and/or women's health	8	12	8	12			
Pediatric	6	9	4	6			
Psychiatric/mental health	2	3	7	10			
Experience with mental illness					0.33	1	.56
Involved in the care of a patient with							
No	12	18	14	21			
Yes	16	24	25	37			
Have a friend or relative diagnosed with					0.80	1	.37
No	2	3	1	2			
Yes	26	39	38	57			
Ever been diagnosed with					0.75	2	.69
No	16	24	21	31			
Prefer not to respond	0	0	1	2			
Yes	12	18	17	25			

Table 2. Correlation Matrix (Spearman ρ coefficients).

Scale/subscale	1	2	3	4	5	6	7	8	9
OMS-HC									
1. Attitudes									
2. Disclosure	.310*								
3. Social distance	.523**	.372**							
4. Total	.740**	.700**	.797**						
QuAKE									
5. Attitudes	.386**	.060	.293*	.260*					
6. Knowledge	.472**	.115	.277*	.205	.538**				
SSOSH									
7. Self-stigma	.323**	.626**	.304*	.567**	-.035	.031			
Experience with mental illness									
8. Personal	.323**	.098	.366**	.416**	.127	-.021	.293*		
9. Care of patient	.047	-.053	.046	-.010	.055	.030	-.006	.286*	
10. Friend or relative	.217	.205	.218	.247*	-.017	.181	.249*	.195	.124

Note. OMS-HC = Opening Minds Stigma Scale for Health Care Providers; QuAKE = Questionnaire on Attitudes and Knowledge of ECT; SSOSH = Self-Stigma of Seeking Help.

* $p < .05$. ** $p < .01$.

mental health curriculum in which negative views *worsened* after a general preclinical course in psychiatry (Martin et al., 2019). It was these precedents, together

with work showing the beneficial effects of an educational intervention early during nursing school (Dawood et al., 2013) that motivated this study.

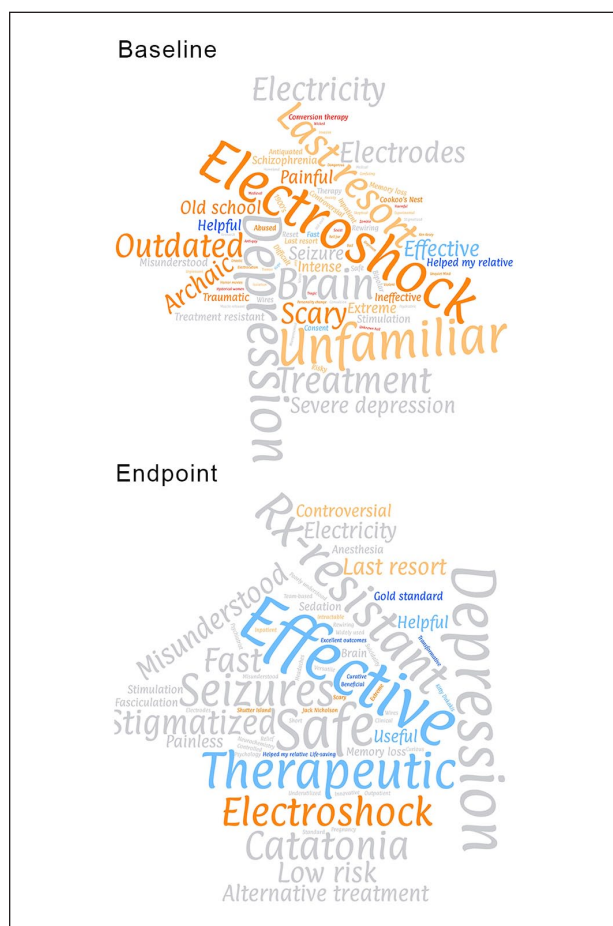
Table 3. Main Outcomes of ECT Training Intervention (General Linear Models).

Scale/subscale	Control (n = 28)		Intervention (n = 39)		Statistic			
	Mean	SD	Mean	SD	Time		Intervention	
					F _{df = 1}	p	F _{df = 1}	p
QuAKE*								
Attitudes	54.6	6.4	58.8	6.5	23.48	<.001	7.07	.01
Knowledge	9.4	2.6	11.1	1.9	10.80	.002	6.54	.01
OMS-HC**								
Total ^{a,b}	63.5	5.3	62.4	5.8	32.93	<.001	0.11	.74
Attitudes ^a	30.9	2.7	29.7	2.6	18.60	<.001	1.97	.17
Disclosure	15.2	2.5	15.1	2.7	43.07	<.001	0.04	.85
Social distance ^a	22.2	2.5	21.9	2.4	18.21	<.001	0.09	.77
SSOSH**^{a,b}								
	40.9	5.5	39.5	5.6	20.46	<.001	0.98	.33

Note. Marginal means compare outcomes at endpoint to covariate ratings at baseline. *F* values were calculated by univariate analysis of variance and show main effects of time (endpoint – baseline) and intervention (vs. control). QuAKE = Questionnaire on Attitudes and Knowledge of ECT; OMS-HC = Opening Minds Stigma Scale for Health Care Providers; SSOSH = Self-Stigma of Seeking Help.

Additional covariates include the following: ^apersonal history of and ^binvolvement in the care of patients with mental illness.

*Higher scores indicate more favorable attitudes and more knowledge. **Higher scores indicate more stigmatizing views.

**Figure 1.** Word clouds of terms students associated with ECT.

Note. Words at baseline (n = 275) and endpoint (n = 240) are weighted by frequency and highlighted in colors representing seven emotional valence categories (warmer colors, negative; grey scale, neutral; cooler colors, positive).

We found that a didactic co-learned by an interventional psychiatrist and a psychiatric APRN increased knowledge about, and improved perceptions surrounding ECT. These effects were specific only to those students who participated in the didactic, as reflected by statistically significant changes from baseline on the QuAKE instrument that were not apparent in the control group (*p* for intervention = .01). Apart from these changes on a well-validated quantitative instrument, the beneficial effects of the intervention were apparent in the notable change in the terms and emotional valence that students associated with ECT. The changes visualized in the word clouds at baseline and endpoint are most apparent when considering the 30% increase in terms noted in the gray scale (i.e., neutral and data-based terms). Stated alternatively: the change in perceptions had more to do with increased knowledge and factual information among those with previously jaundiced views than with a shift toward unrealistic or idealized views. In visual shorthand, we can conclude that the word clouds become “less red and orange” and “more gray,” though not necessarily “more blue.” Of note, more extreme views regarding ECT seemed to recede in response to the educational intervention—particularly those associating the treatment modality with sexist or anti-gay views, or with the thoroughly discredited conversion therapy (American Academy of Child and Adolescent Psychiatry, 2018; American Psychiatric Association, 2018).

In contrast to our previous study, all four domains of stigma that we measured improved by the conclusion of this course (*p* for time < .001). These positive effects were unrelated to the ECT didactic and did not differ between the intervention and control groups (*p* ≥ .17). Although we cannot identify which elements of the

Table 4. Emotional Valence of Words Students Associated With ECT.

	Baseline, <i>n</i> = 275		Endpoint, <i>n</i> = 240		Representative word examples
	<i>n</i>	%	<i>n</i>	%	
Emotional valence ^a					
Extremely negative	11	4	0	0	Harmful, medieval, sexist, tragic, wicked
Very negative	79	29	12	5	Archaic, electroshock, ineffective, outdated, traumatic
Somewhat negative	63	23	9	4	Controversial, extreme, memory loss, unfamiliar, last resort
Neutral	104	38	164	68	Catatonia, depression, misunderstood, seizure, treatment
Somewhat positive	11	4	47	20	Effective, fast, hope, therapeutic, useful
Very positive	7	3	8	3	Curative, gold standard, helpful, lifesaving, transformative
Extremely positive	0	0	0	0	

^a $\chi^2 = 134.92$, $df = 5$, $p < 0.001$.

syllabus specifically contributed toward these changes, we can conclude that (a) this 8-week course improved stigmatized views around mental health in the four areas of attitudes, disclosure, social distance, and willingness to seek help; and (b) the instruments that we selected were psychometrically sensitive to detect such change. It is worth emphasizing both points, as they provide a hopeful counterpoint to earlier views (Sherwood, 2019; Thornicroft et al., 2016), including our own, that “even a strong academic curriculum is not sufficient to change stigmatized perceptions about mental illness, psychiatric care, and mental health nursing as a profession” (Martin et al., 2019).

We incorporated visual media in the form of two short, widely available video clips: one representing what patients often say they envision when discussing ECT, and another that accurately portrays both the procedure and the experience from a modern patient perspective. A video-enhanced didactic approach is more feasible from a logistic perspective and allows wider dissemination, particularly at training health care settings that do not provide ECT to patients. Moreover, videos have been shown to be as effective as observation in teaching ECT to medical students (Andrews & Hasking, 2004; Battersby et al., 1993; Westreich et al., 1995).

Our study sample included not only nine individuals with a declared commitment to psychiatric specialization but a plurality of nursing students (87%) with other areas of interest. We consider a strength of our study this varied and nonspecialized group of future nurses. In whatever clinical area they ultimately settle to practice in, nurses will be in the frontlines of identifying common psychopathology and be in a position to advocate for appropriate treatment. Indeed, at a global level, nurses and general practitioners increasingly provide first contact care for the detection and management of mental health problems (Heim et al., 2020). Nurses with evidence-based knowledge and unbiased views stand at

a critical juncture to advocate for appropriate psychiatric care—including ECT, when clinically indicated.

We recognize three limitations to our study. First, the possibility of a Hawthorne effect among participants in the didactic session, who through social desirability bias may have answered the surveys more favorably at the second time point. Although this effect could have affected results, it is unlikely to explain them in full, particularly given their strong statistical significance. Second, we are aware that showing a video clip of an outdated practice could have reinforced prejudiced views, given the depiction in Milos Forman’s film, which includes the lack of informed consent or general anesthesia and shows the use of forceful physical restraint (Nicholson et al., 1975/2002). Similar effects in reifying stigmatized views have been noted in a range of commonly available film depictions (Sienaert, 2016; Walter et al., 2002), including those widely available on YouTube (Genc et al., 2020). Our reliance on such material highlights the paucity of widely available and equipoised depictions of modern ECT well suited for health professional training. Future efforts by our group will focus on developing such materials toward improving knowledge and attitudes in various training settings. Finally, we recognize that even as the effect of our intervention led to a marked change in attitudes and knowledge, we do not know whether this effect is durable. A single course might not be sufficient to have an enduring effect; a spiral curriculum could be beneficial, wherein repeat encounters with ECT as a treatment modality reinforce previous learning.

Conclusions

An educational intervention co-led by a psychiatrist and psychiatric APRN had a significant impact on nursing students’ knowledge and perceptions of ECT. This didactic approach can be readily implemented at other institutions. Future refinements will include videotaped depictions

of a simulated patient undergoing the consent, treatment, recovery, and follow-up phases of ECT. By enhancing knowledge and perceptions on ECT among future APRNs,

we ultimately hope to improve the availability, time lag and proper utilization of this often overlooked and highly effective treatment modality.

Appendix

Representative Questions Related to ECT That Emerged During the Post-Lecture Discussion.

1. Can you talk more about the history of ECT? My negative associations have more to do with the way it has been misused, like in gay conversion therapy. How do you have conversations with patients about this, or acknowledge it in your understanding of patients' hesitations?
2. If grand mal seizures are something dangerous that we try to avoid, why are they not dangerous in the context of ECT?
3. Are there any negative consequences to having tonic-clonic seizures three times per week?
4. What are some of the advancements being made in ECT?
5. How has ECT changed since the 1960s, 1990s, and so on? What, exactly has changed about the procedure to result in fewer side effects? In more safety?
6. How are safety and efficacy determined in pregnancy? (e.g., are there longitudinal studies that track not only gestational parents but their children as well? Could ECT induce preterm labor?)
7. What about the potential of using psilocybin to treat treatment-resistant depression (TRD)? Now that ketamine is an option, which would you recommend first: ECT or ketamine?
8. What is the price of one ECT treatment with/without insurance?
9. What is the process of getting court approval for a patient if the patient's family refuses? (And the patient is not able to consent?)
10. Considering the data shown in the STAR-D study, why isn't ECT used as first-line therapy? Do you foresee/anticipate ECT moving to a first-line therapy in the future?
11. Are there any medications that are proven to work better than others following response to ECT?
12. What are the long-term effects of ECT on children's/adolescents' brains? Have studies been done? Is there long-term research?
13. Other than Anderson Cooper's report with Kitty Dukakis, are there any videos/resources you show to patients when talking about ECT?
14. If ECT is not a "last resort" treatment, what do you tell patients when it does not work?
15. If ECT is statistically so much more effective than first-line medication therapy (e.g., SSRIs), is there discussion of it being implemented earlier on, that is, before it becomes TRD?
16. Would you generally start with behavioral/social interventions and medications before initiating ECT, or a combination of all of these? Would like to know more about treatment selection considerations.
17. What longitudinal studies are there about the long-term effects of ECT? Particularly in children and their brain development. What are common "nodes" or brain areas targeted in ECT and why?
18. Are there control studies? What would happen if someone without depression got ECT?
19. In the video of Kitty Dukakis, it looked like the anesthesiologist was touching the patient—how do they not get electrocuted?
20. Can you speak to the consistency of ECT across different providers/treatment centers across the United States? The world? What laws/regulations/standards help maintain consistency around consent, patient safety, minimizing side effects?
21. Can you talk about catatonia: what it is, why it occurs, and the impact of ECT on it?

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Author Roles

BMK and AM conceived the study and determined the methodology. TW and DR led the Seminar in Psychiatric and Mental Health Nursing. BMK and TC led the ECT educational intervention. TW, DR, and AM collected the data. AM took the lead in analyzing the data and in writing and organizing the article. RD provided valuable input on medical education scholarship. All authors reviewed the final article before submitting it for publication.

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