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An ethnographic decision model of the initiation of gabapentin misuse among prescription and/or illicit opioid (mis)user

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ABSTRACT

Aims: Gabapentin is used in the treatment of seizures and neuralgia, and it is prescribed off-label to treat substance use disorders and withdrawal symptoms. Recent research documents misuse of gabapentin, especially among prescription opioid misusers. The present study contributes to this literature by examining the initiation of gabapentin misuse.

Methods: Qualitative interviews were conducted with prescription and/or illicit opioid (mis)users who reported a history of gabapentin misuse (N = 62) and who did not (N = 29). During semi-structured interviews, respondents provided descriptions of the first time they misused gabapentin. An ethnographic decision model was constructed to illustrate the factors that influence the initiation decision.

Results: Multiple individual, social, and environmental factors influence the decision to initiate gabapentin misuse. Respondents described the initiation decision related to: a) wanting to feel a psychoactive high during times of limited access to one's preferred drug because of institutional barriers (e.g., substance abuse treatment; jail; transitional living facility; N = 18); b) the desire to use multiple drugs, including for experimentation or to potentiate another substance (N = 18); and c) the need to self-treat withdrawal symptoms during periods of opioid nonuse or when opioids were unavailable (N = 16). Respondents also initiated gabapentin misuse to self-treat physical pain (N = 10).

Conclusions: Multiple approaches are needed to mitigate gabapentin misuse, including limiting availability in institutional settings and informal channels as well as addressing the needs of drug users who experience physical pain and withdrawal symptoms. Continued research is needed to examine therapeutic uses of gabapentin and behaviors related to misuse.

1. Introduction

Gabapentin, a γ-aminobutyric acid (GABA)-analogue, is widely used in neurology, psychiatry, and primary healthcare for the treatment of epilepsy and neuralgia, prescribed off-label for substance dependence disorders, and is also administered in combination with opioid analgesics for the treatment of pain (Schifano, 2014; Smith et al., 2016; Gilron et al., 2005; Chiappini and Schifano, 2016, Hanna et al., 2008). When taken orally, gabapentin is transported via the L-type amino acid transporter (LAT1), which results in dose-limited absorption, and therapeutic doses may present low addictive liability levels (Brockbrader et al., 2010).

At the same time, there are growing reports of gabapentin misuse. In addition to several case and clinical reports of gabapentin misuse (Smith et al., 2016; Wilens et al., 2015; Markowitz et al., 1997; Reccoppa et al., 2004; Mersfelder and Nichols, 2016), one recent cohort study of current drug users in rural Kentucky reported a 2850% increase in gabapentin misuse between 2008 and 2014 for the purpose of getting high (Smith et al., 2015). A subsequent qualitative study which included participants in the same cohort study found that not-in-treatment substance users would combine gabapentin with another substance (e.g., prescription opioids, benzodiazepines, cocaine) in order to produce a desired central nervous system effect (Smith et al., 2018). Similarly, law enforcement agencies have reported gabapentin being misused in combination with heroin for the purpose of getting high (Buttram et al., 2017).

Although literature documents the motivations for continued gabapentin misuse (Smith et al., 2018), there is scant data related to initiation. Considering this context, the aim of this exploratory study was to examine the initiation of gabapentin misuse. Specifically, we sought

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to understand the insider perspective of how opioid misusers make the decision to initiate gabapentin misuse. An ethnographic decision model was constructed to illustrate the individual, social, and environmental factors that influence this decision.

2. Methods

2.1. Study sample and design

The data were collected as part of an exploratory study investigating the initiation and consequences of gabapentin misuse. Qualitative interviews were conducted between January and December 2018 in South Florida (Miami-Dade, Broward, and Palm Beach counties). Eligible respondents were age 18 or over and reported past year use of illicit opioids and/or the misuse of prescription opioid medications. Given the aim of the study — the decision to misuse gabapentin or not to misuse — the sample was stratified to include respondents who also reported a history of gabapentin misuse (N = 62) with the remaining one-third serving as a comparator group of individuals who had not misused gabapentin (N = 29).

All participants were recruited through flyers and advertisements placed in substance abuse treatment centers, public spaces, and a local weekly publication. Periodic public announcements about the study were also made at a local substance abuse treatment center. Recruitment materials invited individuals to participate in a confidential, in-person, one-on-one interview. Interested individuals were invited to call the research office to be screened for eligibility and to make an appointment to complete the interview.

At the time of the scheduled interview, respondents provided informed consent and were re-screened for eligibility. Confidential interviews lasted approximately 90 min and took place in private offices. All participants received a $50 stipend upon completion of the interview.

A semi-structured interview protocol guided the interview and included questions related to background and demographics; respondents were also asked to give a detailed account of the first time they misused gabapentin. Respondents were instructed that prescription drug misuse entails using a prescription drug not as instructed by a doctor, including to get high, for fun, to relax, or to come down from another drug. Two trained interviewers, each of whom possessed graduate degrees and more than ten years of interviewing experience, conducted the interviews employing a conversational style with topics being discussed as they naturally occurred, rather than maintaining a fixed format. The interviews were digitally audio-recorded and transcribed. Transcriptions were independently reviewed by the interviewers for accuracy. ATLAS.ti version 7 was used for data management and analysis.

2.2. Analysis

This study utilized ethnographic decision modeling to examine the initiation of gabapentin misuse. Ethnographic decision models (EDMs) use focused qualitative interviews to predict real-world decisions and to describe key factors that influence those decisions (Beck, 2005; Ryan and Bernard, 2006). Medical social scientists have used this method to examine client referrals for drug abuse treatment (Breslin et al., 2000) and needle sharing risk among heroin injectors (Johnson and Williams, 1993).

The process for constructing the EDM involved two phases. The first phase was an inductive process in which 47 individual interviews (32 gabapentin misusers; 15 non-misusers) were conducted until the interviews stopped yielding new decision criteria, reasons, and constraints. Memos were written, and an individual ethnographic decision model was constructed after each participant was interviewed. As additional interviews were conducted, individual decision models were combined to create a comprehensive model detailing the logical and ordinal relationships among the decisional factors, accounting for decision criteria, reasons and constraints (Bernard, 2011). Two members of the research team participated in the analytic process, which included revising the EDM to account for more decision-making criteria and to modify the order of criteria in the model. Regular discussions were held between the analysts that yielded insights to refine the models and facilitate agreement (Barbour, 2001). This iterative process occurred throughout phase one until no new decision-making criteria were elicited (Gladwin et al., 2001). The second analytic phase involved validation of the EDM through an additional 44 interviews (30 gabapentin misusers; 14 non-misusers) with an independent group of participants from the same population (Bernard, 2011; Beck, 2005). No additional decision-making factors emerged during the validation process. The result is a map of the decision-making processes; key factors are identified and displayed in Fig. 1 (Beck, 2005; Bernard, 2011).

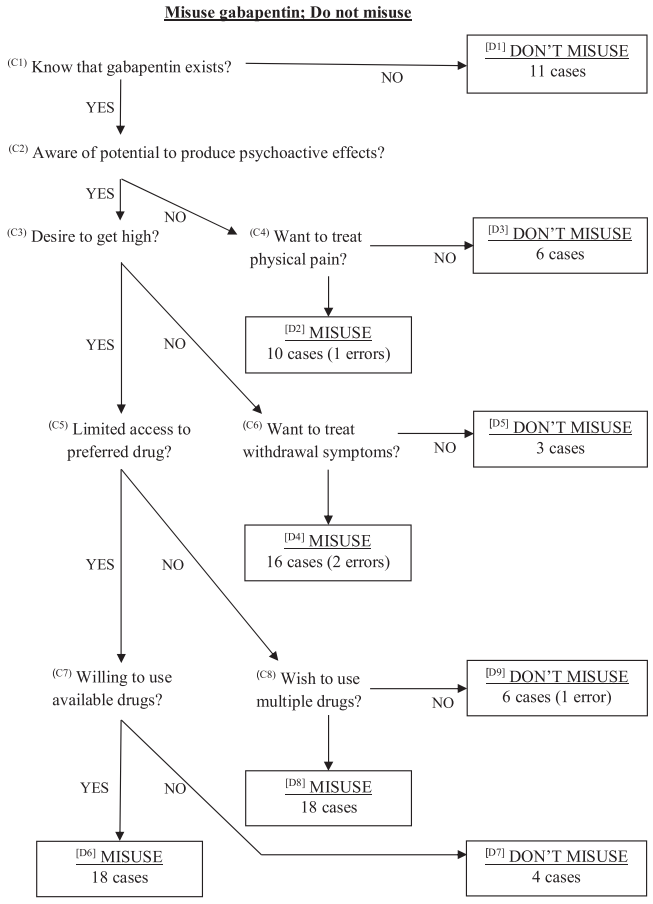

Fig. 1. Ethnographic decision model of initiation of gabapentin misuse.

When properly constructed, the ethnographic decision model correctly predicts behavior 80–90% of the time (Ryan and Bernard, 2006; Gladwin, 1989). Given that a small number of respondents in any sample rely on idiosyncratic and/or infrequently used criteria when making decisions, no decision model can perfectly capture all decision-making criteria in a given population (Gladwin, 1989). Thus, every decision model contains errors: instances in which a respondent's decision-making criteria cohere with each section of the model but not the final decision.

3. Results

3.1. Study sample

Demographics are shown in Table 1. The sample included Black (13.19%), white (58.24%), and Hispanic (24.18%) respondents.

Table 1
Demographics (N = 91).

	N	%
Race/ethnicity		
Black	12	13%
White	53	58%
Hispanic	22	24%
Other	4	4%
Female	30	33%
Age		
19–29	43	47%
30–39	22	24%
40–49	13	14%
50–59	9	10%
60–64	4	4%
Past month income		
$0	18	20%
$1–$999	22	24%
$1000–$1,999	14	15%
$2000–$2,999	14	15%
$3000–$3,999	3	3%
$4000–$4,999	7	8%
$5000–$5,999	5	5%
$6000–$6,999	4	4%
≥$10,000	4	4%
Education - 12 or more years	77	85%

Approximately one-third of the sample was female (32.97%). In general, the sample was young with nearly three-quarters of respondents under the age of 40 (71.43%). Past month income was low for most respondents. Many reported no income (19.78%) or monthly income less than $1000 (24.18%). The majority of respondents completed a high school education or more (84.62%).

3.2. The ethnographic decision model

The EDM is shown in Fig. 1. The model can be read from the top with the initial set of choice alternatives, "Misuse gabapentin; do not misuse." Dichotomous decision-making criteria are presented as questions in subsequent sections of the model (labeled CX). Affirmative and negative responses to each criterion are presented in subsequent branches, all leading to the final decision outcomes presented in boxes at the end of each branch (labeled DX). Errors in the model are presented in parentheses for each final decision.

3.2.1. Decision 1 – do not misuse gabapentin

In Fig. 1, the first branch of the model occurs at C1 and assesses whether or not a respondent has knowledge that gabapentin exists. For participants who possessed no knowledge of gabapentin, C1 is the only criterion relevant to the decision not to misuse gabapentin (D1). The largest proportion of respondents who did not misuse gabapentin said they did not previously know about it. One 39-year-old Hispanic woman described her preferred drugs as Xanax, morphine, and Roxicodone. She went on to say, "I'm the old school drug user. I stick to the old school methods." A 30-year-old white woman said that she "didn't have a clue" about gabapentin, and a 45-year-old Black man mentioned that he had never heard of it and his dealer had never offered it.

3.2.2. Decision 2 – misuse gabapentin

For respondents who knew of the existence of gabapentin (C1), the second criterion of the model represents respondents' awareness of the potential to misuse gabapentin to produce desired psychoactive effects (C2) and it leads to two subsequent branches. For respondents who described no awareness, the next criterion in this branch, C4, distinguishes between respondents who do and do not have physical pain. The desire to self-treat physical pain was a factor in the decision to misuse gabapentin, represented in box D2. The cases constituting this decision were generally older respondents with chronic pain and physical health problems. One 61-year-old white woman who suffers from arthritis pain and does not have health insurance described her decision this way: "So, I've been on the opioids and, you know, the gabapentin because sometimes it seems that I get relief from pain and I can sleep." A similar story was told by a 45-year-old mixed race woman who has pain resulting from a stroke. She said, "Well, I didn't have a prescription… I didn't have my health insurance… so I got it from a person that I knew and I was feeling really bad on that day." Finally, a 26-year-old Hispanic woman told of her "pre-existing back issues and nerve problems." Although she had a prescription for gabapentin, she did not refill her prescription and instead took a friend's gabapentin pills which were a higher dose than what she had previously taken. She said, "Just one 800 mg, I felt like I just smoked a blunt or something. I felt stupid high."

3.2.3. Decision 3 – do not misuse gabapentin

Respondents who lacked awareness of the potential to misuse gabapentin to produce desired psychoactive effects (C2) and did not describe a desire to self-treat physical pain (C4) did not misuse gabapentin (box D3). A 25-year-old white woman said, "I didn't even know you could abuse it until [treatment]. I totally missed the memo… I was trying to do the right thing, you know. I was trying not to do that stuff anymore, so I didn't really think about it." Similarly, a 33-year-old white male respondent said he had been prescribed gabapentin for anxiety. Upon arrival at a substance abuse treatment facility, he was informed that gabapentin could be abused, and he was tapered off his prescription.

3.2.4. Decision 4 – misuse gabapentin

As indicated in the model, for respondents who knew of gabapentin's existence (C1) and potential to misuse gabapentin to produce desired psychoactive effects (C2), the next criterion, C3, assesses one's desire to misuse gabapentin for the purpose of getting high. The path for respondents who responded negatively to this criterion leads to C6, which assesses one's desire to self-treat withdrawal symptoms. Affirmative responses to C6 resulted in the decision to misuse gabapentin, represented in box D4. One 32-year-old white man said, "When I felt like [dope] sick or whatever, it would – I would just snort a bunch of those to make me try to feel better… [Gabapentin] was easier to find, it was just very easily accessible. No one ever wanted 'em or whatever and I thought it made me feel better." Another 32-year-old white man succinctly described his decision this way, "The first time I heard about gabapentin or Neurontin – same thing – I had been using Percocets with this guy, and he had had a bunch of those, and so I ended up taking a handful to try to not be sick from withdrawal." It was common for respondents to describe becoming acquainted with gabapentin while in detox, treatment, or jail. For example, a 36-year-old Hispanic man said, "When I would try to come off the heroin, that's when I would go in with the gabapentin and the Neurontin because somebody had mentioned to me it helps with the pain. And a couple of times I'd be in jail, and that's what they would give some of the people, so when I would be on the outside… I would get that." Finally, a 43-year-old Hispanic man told about his experience in substance abuse treatment, in which "they gave me an option to deal with [withdrawal] with the gabapentin they prescribed or do it on my own. And, it kinda worked for the detox for from then on… it was just something I used to detox. Take five, six, at a time. See, once you got a tolerance for heroin, the gabapentin… I don't notice that I don't feel it or my receptors are like, "that's not what I want" so I really don't really get too much pleasure out of it. It just kinda soothes the detoxing; the gabapentin is good for that."

3.2.5. Decision 5 – do not misuse gabapentin

The path for respondents who knew of gabapentin's existence (C1) and potential to misuse gabapentin to produce desired psychoactive effects (C2), but who did not wish to get high (C3) or self-treat withdrawal symptoms (C6), led to the decision not to misuse gabapentin,

represented in box D5. Three participants described not having any interest in misusing gabapentin, even though they knew of others who did so. For example, a 26-year-old Black woman stated that she decided not to misuse gabapentin because "Someone told me they had seizures on it… I was always scared to take that."

3.2.6. Decision 6 – misuse gabapentin

Most respondents who reported gabapentin misuse described a desire to misuse gabapentin for the purpose of getting high (C3). The next criterion in this branch, C5, represents respondents who had limited access to their preferred drug of choice, largely because of institutional barriers (e.g., drug abuse treatment; jail; transitional living facility). For respondents who did describe limited access, the next criterion, C7, assesses their willingness to use any available drugs as opposed to only using their drug(s) of choice. These criteria were directly related to the decision to misuse gabapentin, which is represented in box D6.

Decision 6 includes 7 cases in which respondents were in residential substance abuse treatment; for most, this is where they learned to misuse gabapentin. Exemplifying this scenario is a 43-year-old Hispanic man who said, "I was in rehab and of course we talk. This guy tells me, 'Just say that you got a sciatica pain and the doctor will give you gabapentin.' And he goes, 'But you gotta take a lot of them.'" A 25-year-old male respondent said, "I went to my first rehab and they had prescribed me gabapentin. I misused it, like, a couple of times, but it was just so stupid to me. It's insane because you gotta take, like, 2000 mg to feel anything and it's just, if you're gonna get high… why not do a shot of heroin?" This participant later misused gabapentin out of boredom when he had been given extended-release injectable naloxone.

Seven cases described initiation of gabapentin misuse inside of a transitional living facility. One 32-year-old white man summed up his decision in this way: "I didn't know you could abuse it. I was just taking it for the nerve pain in my ankles. And everybody at the house… they just started eating them, like 10 at a time. So we were, like, stuck out in this big house and we would just eat gabapentin and drink Red Bulls and stuff." Finally, four participants described similar experiences while in jail, and two participants stated that the decision to misuse gabapentin was because they temporarily lost access to their supply of preferred drugs.

3.2.7. Decision 7 – do not misuse gabapentin

Respondents who described a desire to get high (C3), reported limited access (C5) but not a willingness to use any available drugs besides their drug(s) of choice, C7, opted not to misuse gabapentin, as shown in box D7. Most respondents' decisions not to misuse gabapentin were similar to this 24-year-old white man who said, "Gabapentin was just kind of there for them to abuse because it was allowed. It's not a narcotic, so it was more easier to get and more accessible. You could use it and not fail a drug test. For me, because the consequences from living in a halfway house or a controlled environment like that, if I'm going to get high, I'm going to go use my drug of choice. I don't want to just use something and not get what I want to feel. You know what I mean? And I know what heroin does. I know what the pills, Oxy and stuff, do and that's what I want." Of the cases included in this decision, one 28-year-old white man said he decided not to misuse gabapentin because he wanted to "do the right thing."

3.2.8. Decision 8 – misuse gabapentin

Many respondents seeking to get high (C3) did not describe limited access to drugs (C5). The next criterion in their decision was the desire to use multiple drugs, not just opioids (C8). Individuals who responded affirmatively to this criterion described the decision to misuse gabapentin, shown in box D8. Most respondents in this branch stated that they decided to misuse gabapentin to "try something new" or "experiment." One 28-year-old Hispanic man described his experience this way, "Well, the first time me and my friend, we didn't have no money and he had told me his mom has medication so when we looked through it we saw that she had the Neurontin. But, the name of it made us focus our attention on that. So, I kind of said, 'Oh, this must be strong by the name or something.'" Similarly, a 25-year-old white man said, "I think I was 16 or 17. Uh, my aunt had just got a script of it and she was talking about how much she loved it… She gave me… probably at like, 800–1000 mg of it, then and there… It was just something she told me would make me feel good. I took it and it definitely made me feel different.'"

Three respondents described initiating gabapentin misuse to potentiate the effects of opioids. For example, a 35-year-old white man said, "A friend of mine, he took it for seizures, but he never really took 'em so he just had bottles and bottles of that stuff, so he would just give 'em to me, you know. So, you know, somebody told me that, you know, it prolongs the effects of heroin, you know, if you take it so that's when I first started taking it." A 29-year-old white man told a similar story, "I'd heard that it was a nice additive to use while doing opiates… My father had an entire script and I told him I had some muscle cramping going on. Because I knew he had them and so he gave me like four or five. That was the first time I ever took them… I was using them to … as an additive to the opiates I was using at the time."

3.2.9. Decision 9 – do not misuse gabapentin

The last decision in the model is represented in box D9. These respondents expressed a desire to get high (C3) but did not describe limited access to their preferred drug (C5) or a desire to use multiple drugs (C8). As a result, these respondents did not misuse gabapentin. One 30-year-old male participant said, "It's just not appealing to me. It's something I don't think I'll like. I like hard drugs and that just don't seem hard enough for me, like a narcotic." His sentiment was echoed by others who stated that their focus was on heroin or prescription opioids.

4. Discussion

The decision to initiate gabapentin misuse is guided by several individual, social, and environmental factors, including the knowledge and awareness of gabapentin's ability to produce desired psychoactive effects; desires to treat physical pain, get high and engage in multi-drug use; and institutional barriers to accessing one's preferred drug(s). Nearly equal numbers of respondents described the initiation decision related to: a) the experience of being in substance abuse treatment, jail, or a transitional living facility and wanting to feel a psychoactive high, even if one's preferred drug was unavailable; b) the desire to use multiple drugs, whether out of curiosity, experimentation, or to potentiate another substance; and c) the need to self-treat withdrawal symptoms during periods of opioid nonuse or when opioids were unavailable. A smaller number of respondents decided to initiate gabapentin misuse to self-treat physical pain.

Findings from this study indicate several approaches which may curb gabapentin misuse among opioid (mis)users. First, in a large number of cases the decision to initiate occurred inside institutions, including substance abuse treatment and transitional living facilities. Several studies suggest that gabapentin may be beneficial for patients in detox and substance abuse treatment, as it can reduce withdrawal and mental distress symptoms (Mason et al., 2014, 2012; Salehi et al., 2011; Moghadam and Alavinia, 2013). Maintaining patient access to this medication may be necessary for patients who need it, yet institutions must continue to monitor the administration of gabapentin to patients, enact stricter controls over the medication, and educate patients about the potential for misuse. Additional research should be conducted in these settings to clarify how best to use gabapentin therapeutically while not encouraging misuse and to understand which patients may be most likely to benefit from or misuse gabapentin.

The initiation of gabapentin misuse by multi-drug users and opioid users seeking to ease withdrawal symptoms speaks to the wide availability of gabapentin through informal channels. Recent data from a national sample of law enforcement and regulatory agencies showed

increasing rates of gabapentin diversion (Buttram et al., 2017). Gabapentin is not scheduled under the federal Controlled Substances Act, but it became a Schedule-V medication in the state of Kentucky in 2017 (Peckham et al., 2018). Several additional states are considering similar legislation or have required gabapentin prescriptions to be reported to state prescription drug monitoring programs (Peckham et al., 2018). Such policy interventions will likely contribute to a reduction of gabapentin misuse. Continued post-marketing surveillance of misuse and diversion may indicate additional intervention opportunities at the individual-, institutional-, or policy-levels.

4.1. Limitations

This study has several limitations which must be noted. Qualitative research involves the potential for interviewer effects and the underreporting of socially undesirable behaviors. The interviewers' training, experience, and the use of a semi-structured interview guide likely mitigated these effects. Given the levels of substance use described by participants, the underreporting of these or other behaviors would appear to be uncommon. Participants were drawn from a convenience sample in South Florida, and the findings may not be generalizable to other locations or populations.

4.2. Conclusions

In conclusion, the decision to initiate gabapentin misuse is based on several individual, social, and environmental factors. Efforts to mitigate gabapentin misuse will require multiple approaches and address availability in institutional settings and through informal channels, as well as the needs of drug users to address opioid withdrawal symptoms and physical pain. Continued research into the therapeutic uses of gabapentin, behaviors related to misuse, and post-marketing surveillance of diversion and misuse are warranted.

Contributors

MEB conceptualized the study, collected the data, performed data analyses, and wrote the initial draft of the manuscript. SPK contributed to study conceptualization, interpretation of findings, and manuscript development. JRH and TJC contributed to the interpretation of findings. All authors contributed to and approved of the final version of the manuscript.

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None.

Declaration of Competing Interest

No conflicts declared.

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