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Relationship Between Fentanyl Misinformation and College Students' Intentions to Administer Naloxone

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RELATIONSHIP BETWEEN FENTANYL MISINFORMATION AND COLLEGE STUDENTS' INTENTIONS TO ADMINISTER NALOXONE

by

ZOE RYON

A thesis submitted in partial fulfillment of the requirements
for the Honors Undergraduate Thesis program in Health Service Administration
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and in The Burnett Honors College
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Thesis Chair: Barbara Andraka-Christou, Ph.D., J.D.

ABSTRACT

Background: The news media has spread misinformation about the toxicity and potency of fentanyl, exaggerating the extent to which bystanders could be harmed by fentanyl when responding to overdose situations. College students are increasingly among the victims of opioid overdose, and their peers may be the nearest person capable of administering naloxone – an overdose reversal medication. However, college students who fear incidental exposure to fentanyl may be worried about administering naloxone.

Objective: I sought to understand the relationship between undergraduate college students' perceptions of the risks of fentanyl and their intentions to administer naloxone in an overdose situation.

Methods: An online survey was formulated based on the Health Belief Model to measure beliefs about the harm of fentanyl and the likelihood of administering naloxone. The survey was distributed to students at a major public university in the Southeastern US in 2024. The survey was analyzed using a Spearman Rank Correlation to assess the relationship between the variables: intent to administer naloxone, beliefs about administering naloxone in an overdose, and perceptions about fentanyl. Additional analysis included the differences in beliefs about fentanyl among health versus non health majors and first year versus non first year students.

Results: Notable findings include no significant correlation between beliefs about fentanyl and intention to administer naloxone in a fentanyl overdose in the 182 respondents who completed the survey. However, a significant difference was found in intention to administer naloxone in a

fentanyl overdose in those who know what action to take in a fentanyl overdose versus those who do not.

Conclusions: This study is among the first of its kind to analyze the relationship between fentanyl beliefs and intentions to administer naloxone in a fentanyl overdose. As overdoses and overdose deaths continue to rise and students continue to be among the victims of accidental overdose deaths, universities should use this research to implement early training and resources to improve access to naloxone and naloxone administration.

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CHAPTER ONE: INTRODUCTION

College students are at risk to witness an opioid overdose (Hatteberg et al., 2022). When college students misuse opioids or obtain counterfeit medication contaminated with opioids, they may be surrounded by other college students (e.g., at a party; in a dormitory). Therefore, it is critical for college students to understand the symptoms of overdose and how to respond. Likewise, college students should feel comfortable administering naloxone, which is a life-saving overdose reversal medication. Unfortunately, misinformation about fentanyl, a common cause of overdose, could lead bystander college students to believe that helping an overdose victim is dangerous to the bystander, thereby preventing bystanders from helping. The overarching objective of this thesis was to determine whether students are more likely to intend to respond to an overdose if they hold accurate beliefs about fentanyl than if they are misinformed. The research project was based on the Health Beliefs Model, which posits that beliefs about a behavior predict the intention to perform the behavior and that the intention to perform the behavior predicts actual behavior. The resulting information could inform fentanyl and overdose education programs for college and university students.

CHAPTER TWO: LITERATURE REVIEW

Drug overdoses continue to rise in the US, and fentanyl is the primary substance currently involved in overdoses (National Institute on Drug Abuse, 2023). Naloxone, an opioid overdose reversal medication, can save the life of someone experiencing an overdose if administered by a bystander in a timely manner (McDonald & Strang, 2016). Unfortunately, bystanders may fear they risk toxic exposure to fentanyl themselves if they assist an overdose victim, thereby limiting bystander action in administering lifesaving naloxone to the overdose victim (del Pozo et al., 2021).

Fentanyl Misinformation

Fentanyl exposure through the skin or via inhalation is extremely unlikely to cause a bystander to experience overdose symptoms (Public Health England, 2018, Vasylchuk, 2019), but fentanyl misinformation in the news media could lead some people to believe that assisting a bystander is dangerous. Inaccurate information about fentanyl is prevalent in news media and social media. One study of 551 news articles regarding fentanyl found that most news articles spread misinformation, with only 18 “corrective” articles that rebutted incidental fentanyl overdose risk to first responders (Beletsky et al., 2020). That study also found that news articles with misinformation about fentanyl received more Facebook shares per story than corrective articles (Beletsky et al., 2020). Even government agencies have participated in the spread of misinformation about fentanyl. In 2017, the US Drug Enforcement Administration released a video in which the agency claimed: “Whether in pill or powder form, fentanyl is exceptionally dangerous… It can be absorbed into the bloodstream through your skin, mucous membranes, or

by touching your mouth, nose, or eyes after exposure. Or even by accidentally inhaling small amounts of airborne powder" (DOJ, 2017, https://www.justice.gov/opa/video/roll-call-videowarns-about-dangers-fentanyl-exposure). This inaccurate video was shared with local police agencies nationwide (Attaway et al., 2021; Beletsky et al., 2020; del Pozo et al., 2021).

College Students and Beliefs about Fentanyl

No known study has examined college students' beliefs about whether it is physically dangerous or safe to assist victims of fentanyl overdose. College students may have been exposed to the same inaccurate news sources as police officers. Furthermore, it is possible that beliefs about the safety/risks of assisting fentanyl overdose victims may vary by college students' demographic characteristics, such as their gender, race, ethnicity, and political leanings; for example, politically conservative students may read different news media than politically liberal students, causing variation in beliefs about fentanyl. Additionally, research on other topics suggests that college students' health-related beliefs may vary by class standing (e.g., senior versus freshman) (Mackert et al., 2014) and by major/area of study (e.g., physics versus psychology) (Daniel et al., 2021; Dysband et al., 2019). For example, two studies found that college students in more advanced years of study (e.g., senior versus freshman) had more positive beliefs about the HPV vaccine, possibly because they had had more time to be exposed to education about the vaccine (Daniel et al., 2021; Dysband et al., 2019.)

The Conceptual Relationship Between Beliefs and Behavior

According to the Health Beliefs Model, a widely accepted conceptual model designed to outline factors that predict willingness to engage in health-related behaviors (Rosenstock, 1974),

beliefs about a behavior, including risks and benefits associated with the behavior, predict intention to engage in the behavior; and intention to engage in the behavior predicts actual behavior (Carpenter, 2010). The model includes two factors: (a) individual's beliefs about a behavior, including risks and benefits of engaging in the behavior, and (b) the individual's intention to engage in the behavior (see Figure 1). A large body of research supports the Health Beliefs Model. For example, studies have shown that positive beliefs about the COVID-19 vaccine predict intention to obtain the vaccine (Akthur & Nur, 2022; Gray & Fisher, 2022), and positive beliefs about the HPV vaccine predict intention to obtain the vaccine (Morales-Campos et al., 2023; Nan & Madden, 2012).

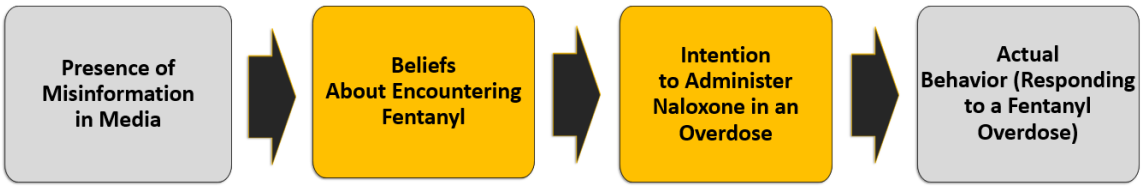

Figure 1. *Conceptual Model*

Fentanyl Beliefs and Intended Behavior

To date, no study has examined the relationship between beliefs about fentanyl exposure and college students' intended behavior, although some research has explored this relationship in law enforcement populations. For example, two studies among police suggest that fentanyl beliefs, including misconceptions, predict police behavior. The first study interviewed 23 officers across five law enforcement agencies, finding widespread beliefs that fentanyl contact could cause bystanders to overdose, thereby leading officers to use protective clothing when responding to overdose (Attaway et al., 2021). A second study found that officers who feared

fentanyl contamination as bystanders believed this fear could affect response time and willingness to interact with overdose victims (Bucerius et al., 2022).

Therefore, this study sought to evaluate the relationship between college students' beliefs about dangers (or lack thereof) in administering naloxone to fentanyl overdose victims and the intention to administer naloxone to (hypothetical) fentanyl overdose victims. It was hypothesized that students who believe it is dangerous to administer naloxone would be less likely to do so. Beliefs about the dangers of administering naloxone may be associated with demographic characteristics, such as gender, race, ethnicity, political leanings, class standing, and major/area of study. Therefore, this study also explored whether beliefs vary by students' demographic characteristics. It was hypothesized that college students with higher class standing (e.g., senior versus sophomore) and college students who study healthcare-related topics would be more likely to have been exposed to accurate information about fentanyl and would, therefore, be less likely to believe it is dangerous for bystanders to administer naloxone to fentanyl overdose victims.

CHAPTER THREE: METHOD

Ethics

This study was approved by the institutional review board of the University of Central Florida (see Appendix A). The survey began with an Explanation of Research (see Appendix B).

Recruitment

To recruit participants, a convenience sample was gathered through the psychology department's survey platform, SONA. Incentives were offered in the form of in-class extra credit. Inclusion criteria was that participants be: (1) active enrolment as a student at the University of Central Florida; (2) being at least 18 years of age or older; and (3) speaking English fluently.

Data Collection

The cross-sectional survey took approximately 10 minutes to complete and was administered through an online survey platform. The complete list of questions can be found in Appendix C.

Knowledge of How to Administer Naloxone

To ensure a similar baseline level of information about how to intervene when witnessing a fentanyl (or other opioid) overdose, the survey began with a brief one-minute and 20-second-long educational video (*The New York Times*, 2023) regarding how to administer naloxone. The video was immediately followed by a 7-point Likert-scale question assessing agreement with the

statement, “I know what action to take during a fentanyl overdose” on a scale of “*strongly disagree*” to “*strongly agree*.”

Demographics

Demographic information was collected about race, ethnicity, gender, class standing, major/area of study, and political leanings. The health major group was comprised of participant scores in the College of Nursing, College of Medicine, and College of Health Professions and Sciences. Questions about race and ethnicity were modeled on questions in the US Census Bureau survey (U.S. Census Bureau, 2020).

Likelihood of encountering an overdose

Two questions were included to assess the likelihood of someone encountering an overdose situation. Susceptibility is commonly measured in the Health Belief Model (Blavos et al., 2014) and is used to predict intention to engage in a behavior. Additionally, student susceptibility may have an impact on their general experiences with overdose and their knowledge of safe drug use. Respondents were asked to answer the following on a 7-point Likert scale ranging from “*very likely*” to “*very unlikely*”:

1. How likely are you to be in a situation where you consume drugs, suffer from fentanyl overdose, and need someone to administer Narcan?
2. How likely are you to go to a party or gathering where someone consumes drugs, experiences fentanyl overdose, and needs someone to administer Narcan?

Physical risks beliefs

Eight items were adapted from Persaud and Jennings (2020) to assess respondents' beliefs about the physical risks involved in administering naloxone as a bystander to a fentanyl overdose victim. The original questionnaire was used to assess first responders' risk perceptions of encountering fentanyl as bystanders. For example, respondents were asked to rate their agreement with the following items on a 7-point Likert scale ranging from "*strongly disagree*" to "*strongly agree*":

1. If I encountered fentanyl, I would not be concerned about needing emergency treatment for exposure.
2. If I encountered fentanyl, I would not worry about protecting my eyes and face.
3. If I encountered fentanyl, I would not be worried about having difficulty breathing.
4. I should be concerned about covering my nose and mouth if I were to encounter fentanyl.
5. It is safe to disturb fentanyl without PPE if you use caution.
6. Fentanyl in pill form is safe to handle.
7. Briefly touching fentanyl could be deadly.
8. Breathing airborne fentanyl is dangerous to my health.

Intended Behavior in Hypothetical Overdose Situations

The survey also included questions about the respondent's intention to administer naloxone, with questions modelled on those in the Blavos et al. (2014) instrument, which was originally designed to find intention of college students to call 911 during alcohol intoxication.

Respondents were asked to identify the likelihood of engaging in specific behaviors using a 7-point Likert scale ranging from "*very likely*" to "*very unlikely*."

1. If a stranger suffered from fentanyl overdose, would you administer Narcan?
2. If a friend suffered from fentanyl overdose, would you administer Narcan?

CHAPTER FOUR: ANALYSES

All analyses were completed in IBM SPSS software (Version 27).

Data organization

For beliefs items, questions were first reverse coded to point in the same direction with respect to fear of exposure, so that the higher the number (1 through 7), the lower the fear of exposure. Next, composite scores were created for the seven items for each respondent (ranging from 1 to 7) by averaging their score across the seven beliefs questions. Interrater reliability was generally high across the seven beliefs questions (alpha = 0.79).

For the two intentions questions, a composite score was created for each participant (score ranging from 1 to 7) by averaging the score across the two intentions questions.

For the question after the training video assessing respondent's self-reported knowledge about whether they know how to respond to an overdose, level of agreement was categorized as "agree," and any level of disagreement or "unsure" as "disagree."

For the Likelihood of encountering an overdose question, a composite score was created for each participant (score ranging from 1 to 7) by averaging the score across the likelihood of encountering an overdose questions.

For the question after the training video assessing respondent's self-reported knowledge about whether they know how to respond to an overdose, level of agreement was categorized as "agree," any level of disagreement or "unsure" as "disagree."

Descriptive statistics

Descriptive statistics analyses were performed to describe the beliefs composite score, the intention composite score, self-reported knowledge about how to intervene in an overdose following the video, likelihood of encountering an overdose composite score, and demographic characteristics.

Inferential statistics

Differences in responses by demographic characteristics

A Mann-Whitney U test was used to assess the differences in composite beliefs scores between health and non-health majors, White versus non-White respondents, Hispanic versus non-Hispanic participants, men versus women, and first-year students versus upperclassmen.

H1: It was hypothesized that respondents form health majors would have a significantly higher composite beliefs score than respondents from non-health majors.

H2: It was also hypothesized that respondents who were upperclassmen would have a significantly higher beliefs score.

Differences in responses by self-reported knowledge of how to intervene in an overdose

A Mann-Whitney U-test was computed to assess differences in the composite intention score between (a) respondents who agreed that they knew what action to take during a fentanyl overdose versus (b) respondents who disagreed that they knew what action to take during a fentanyl overdose or were unsure.

H3: It was hypothesized that respondents who agreed that they knew what action to take during a fentanyl overdose would have higher composite intention scores.

Relationship between beliefs and intention

Spearman's rank correlation was used to analyze the relationship between the composite belief score and the intention composite score.

H4: It was hypothesized that respondents with a higher composite belief score would be more likely to have a higher composite intention score.

Relationship between likelihood of encountering an overdose situation and intention

Spearman's rank correlation was used to analyze the relationship between the composite likelihood of encountering an overdose situation score and the intention composite score.

H5: It was hypothesized that respondents with a higher likelihood of encountering an overdose situation composite score would be more likely to have a higher composite intention score.

Relationship between likelihood of encountering an overdose situation and beliefs

Spearman's rank correlation was used to analyze the relationship between the composite likelihood of encountering an overdose situation score and the beliefs composite score.

H6: It was hypothesized that respondents with a higher likelihood of encountering an overdose situation composite score would be more likely to have a higher composite beliefs score.

CHAPTER FIVE: RESULTS

Participants

Two hundred and eleven participants completed the survey. Of those, 29 participants were not included due to bot detection, incomplete data, straight lining (giving the same response in at least six of the seven matrixes), and/or unusually fast response times (fewer than 2 seconds per question), leading to a total of 182 respondents. Bot detection was determined using the bot detection feature on Qualtrics. Participants with a reCAPTCHA score less than 0.5 were removed.

Descriptive statistics

Demographic characteristics

Most of the respondents (62.2%; n = 122) were women. A small minority of respondents (6.7%; n = 13) selected "other" or "non-binary" for gender. Anyone who selected a race other than White was categorized as "non-White." Of those categories, 59.9% (n = 109) were White and 40.1% (n = 73) were non-White.

Beliefs composite score

The average beliefs composite score across all participants was 2.53 (on a scale of 1 to 7). See Table 1 for the distribution of composite beliefs scores. The highest percentage of respondents had scores 2 and 3.

Table 1 *Distribution of composite beliefs scores.*

Composite score (rounded to the nearest whole number)	N	%
1	28	15.3
2	63	34.4
3	61	33.3
4	20	10.7
5	9	4.7
6	0	0.0
7	0	0.0
Missing	1	0.5

Intentions composite score

The average intention composite score across all respondents was 5.83 (on a scale of 1 to 7). The highest percentage of respondents had scores 7 and 6. See Table 2 for the distribution of composite intention scores.

Table 2 *Distribution of composite intention scores.*

Composite score (rounded to nearest whole number)	N	%
1	2	1.1
2	4	2.2
3	3	1.6
4	16	8.8
5	19	10.4

6	57	31.3
7	81	44.5

Self-reported knowledge of how to intervene in an overdose

See Table 3 for the distribution of knowledge scores.

Table 3 *Distribution of knowledge scores.*

Knowledge	**N**	**%**
Agree	117	64.3
Disagree/Unsure	65	35.7

Likelihood of encountering an overdose

The average likelihood of encountering an overdose composite score across all respondents was 2.12 (on a scale of 1 to 7). The highest percentage of respondents had scores 1 and 2. See Table 4 for the distribution of composite likelihood of encountering an overdose score.

Table 4 *Distribution of the composite scores for likelihood of encountering an overdose.*

Composite score (rounded to the nearest whole number)	**N**	**%**
1	81	44.5
2	45	24.7
3	16	8.8

4	25	13.7
5	5	2.7
6	6	3.2
7	4	2.1

Inferential statistics

Differences in responses by Demographic Characteristics

There was no significant difference in composite belief scores between health and non-health majors, White versus non-White respondents, Hispanic versus non-Hispanic participants, men versus women, and first-year students versus upperclassmen when using a Mann-Whitney U test.

Differences in Responses by Self-Reported Knowledge of How to Intervene in an Overdose

There was a significant difference in composite intention score between (a) respondents who agreed that they knew what action to take during a fentanyl overdose versus (b) respondents who disagreed that they knew what action to take during a fentanyl overdose or were unsure. Those who knew what action to take had greater intention to administer naloxone in a fentanyl overdose than those who do not ($z = -3.06$, $p = .002$).

Relationship Between Beliefs and Intention

There was no statistically significant relationship between composite beliefs scores and composite intention.

Relationship Between Likelihood of Encountering an Overdose Situation and Intention

There was no statistically significant relationship between likelihood of encountering an overdose situation and intention.

Relationship Between Likelihood of Encountering an Overdose Situation and Beliefs

There was no statistically significant relationship between likelihood of encountering an overdose situation and beliefs.

CHAPTER SIX: DISCUSSION

Opioid overdose deaths continue to rise in the US, largely driven by fentanyl, and college students are among the overdose victims. Naloxone is a lifesaving treatment for people experiencing opioid overdose and could be administered to overdose victims by bystanders. Previous research among police suggests that inaccurate beliefs about fentanyl contamination, however, are widespread and that inaccurate beliefs about dangers of contamination could prevent bystander administration of naloxone(Attaway et al., 2021; Bucerius et al., 2022). This current study is the first to examine the relationship between beliefs about the physical dangers of administration of naloxone as a bystander and intention to intervene as a bystander among college students.

Also, as expected the current study found that self-reported knowledge of how to administer naloxone was positively associated with intention to administer naloxone. A large body of public health literature suggests that self-efficacy in a health behavior is associated with – and predicts – likelihood of engaging in that health behavior (Holloway & Watson, 2002). Unfortunately, even after watching a brief video about how to administer naloxone, only 64.3% of respondents indicated that they had knowledge of what to do in a fentanyl overdose, suggesting that a short video is likely insufficient education on the topic for college students. Video interventions for overdose prevention and naloxone training are shown to be effective when tested on knowledge when the video is longer than the one in the current study (Sisson et al., 2023). Furthermore, self-efficacy in providing naloxone, is likely a broader concept than mere knowledge of how to administer naloxone. Given the higher dosage of naloxone required to reverse a fentanyl overdose, fentanyl should be paid special consideration in the conversation

about naloxone distribution (Moss & Carlo, 2019). When naloxone is available at a university pharmacy, or even common area, universities need to ensure its usefulness in these increasingly prevalent overdoses.

Surprisingly, many of the other hypotheses of the current were not supported. Most notably, there was no significant relationship between respondent belief about the dangers of fentanyl and their intention to administer naloxone in the case of a fentanyl overdose. This finding strays from previous literature about the Health Belief Model, which assumes that beliefs about a health action are related to the intention (Carpenter, 2010). This finding also conflict with results of studies in other populations, namely first responders, where beliefs about dangers of administering naloxone to fentanyl overdose victims are related to intentions to administer naloxone (Attaway et al., 2021; Bucerius et al., 2022). Likely, several other factors come into play when considering intervening in a fentanyl overdose, such as potential criminal implication.

Additionally surprising, there was no difference in beliefs about dangers between health and non-health college majors. It is possible that no significant variation exists between health majors and non-health majors with respect to exposure to information about fentanyl or naloxone information – or that any differences in exposure are not strong enough to affect beliefs. Also, there was no association between self-reported likelihood of encountering an overdose situation and either beliefs about the safety of administering naloxone or intention to administer naloxone. This finding, however, may reflect a limitation in the sample size of respondents who reported they would be likely to encounter an overdose situation.

Perhaps most importantly, the study found that 86.2% of students surveyed would be willing to intervene in a fentanyl overdose as a bystander. This suggests students, when given

proper resources and training, intend to provide life-saving intervention. This intention should be encouraged via training and other educational avenues to both assure students who already intend to intervene and influence intention of students who may be more hesitant.

Limitations

Results should be cautiously interpreted in light of several limitations. First, data was collected via self-report, which could be inaccurate due to desirability bias or lack of insight into one's future, hypothetical actions. Nevertheless, it is not uncommon for studies based on the Health Belief Model to measure intention rather than action, as intention is often predictive of action with respect to health behaviors. Second, the extent to which the results are generalizable to college students in general is unknown. Although data was collected from a major public university in the Southeastern US, it is possible that students in this university differ in important ways from students at other universities. For example, students in the Southeast may hold different values than those in other regions of the country. Students self-selected into the survey and knew the topic in advance, which could also bias the sample. For example, students with more knowledge or stronger beliefs about fentanyl may have been more willing to participate in the survey. Third, some of the analyses were limited by small sample sizes or skewed distribution of the data.

Conclusion

This study is the first to examine the relationship between beliefs about the physical dangers of administration of naloxone as a bystander and intention to intervene as a bystander among college students. Results indicated that beliefs about the lack of danger in administering

naloxone to overdose victims did not correlate with an increase in intention to administer naloxone to an overdose victim. A future study could use an experimental approach to test different education modalities about how to administer naloxone on students' beliefs and intentions to administer naloxone.

APENDIX A: EXEMPTION DETERMINATION

UNIVERSITY OF CENTRAL FLORIDA

Institutional Review Board
FWA00000351
IRB00001138, IRB00012110
Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

October 12, 2023

Dear Barbara Andraka-Christou:

On 10/12/2023, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study
Title:	Effects of Fentanyl Misinformation on College Students' Intentions to Administer Naloxone
Investigator:	Barbara Andraka-Christou
IRB ID:	STUDY00005977
Funding:	None
Documents Reviewed:	• Naloxone video to be embedded in survey, Category: Other; • Study 5977 HRP-254 - FORM - Explanation of Research Zoe track changes.pdf, Category: Consent Form; • Study 5977 HRP-255 - FORM - Request for Exemption Zoe track changes BAC.docx, Category: IRB Protocol; • Survey instrument.docx, Category: Survey / Questionnaire;

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in is detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Kristin Badillo
Designated Reviewer

APENDIX B: EXPLANATION OF RESEARCH

EXPLANATION OF RESEARCH

Title of Study: Effects of Fentanyl Misinformation on College Students' Intentions to Administer Naloxone

Principal Investigator: Barbara Andraka-Christou, J.D., Ph.D.

Other Investigator(s): Zoe Ryon

You are being invited to take part in a research study. Whether you take part is up to you.

The purpose of this research is to describe student beliefs about fentanyl and their intention to administer naloxone in an overdose situation.

In this study, you would participate in an online survey that asks about your beliefs regarding fentanyl, your intention to administer naloxone (i.e., overdose reversal medication) during a hypothetical overdose situation, and your self-perceived knowledge about how to administer naloxone. The survey will begin with a short instructional video about how to administer naloxone and will end with a few demographic questions. The survey will take approximately 15 minutes to complete.

Your participation in this study is voluntary. You are free to withdraw your consent and discontinue participation in this study at any time without prejudice or penalty. Your decision to participate or not participate in this study will in no way affect your relationship with UCF, including continued enrollment, grades, employment or your relationship with the individuals who may have an interest in this study. You will be free to skip any questions you do not feel comfortable answering during the survey.

We will not collect identifiable information. Your data will be stored securely in a password protected OneDrive folder only accessible by the study team. The information will be retained for a minimum of 5 years after study closure. Your information or samples that are collected as part of this research will not be used or distributed for future research studies, even if all of your identifiers are removed.

You must be 18 years of age or older to take part in this research study, be actively enrolled as a student at UCF, speak English fluently, and be enrolled in SONA.

You will receive .25 SONA credits to a course of your choosing after submitting the survey for your participation. You are permitted to skip questions.

Instead of being in this study, your choice would include finding a peer-reviewed article about naloxone and reading it.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints: Barbara Andraka-Christou, Principal Investigator, Assistant Professor, School of Global Health Management & Informatics at barbara.andraka@ucf.edu, or Zoe Ryon, Co-Investigator, Undergraduate Student, Department of Psychology, College of Sciences, at zo113029@ucf.edu.

IRB contact about your rights in this study or to report a complaint: If you have questions about your rights as a research participant, or have concerns about the conduct of this study, please contact Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research

Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901, or email irb@ucf.edu.

APENDIX C: SURVEY INSTRUMENT

Please watch the following short video about how to administer naloxone to an overdose victim: How to Use Narcan Nasal Spray - The New York Times (nytimes.com)

Please answer the following questions. You may skip any question you feel uncomfortable answering.

1. I know what action to take during a fentanyl overdose.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

2. If I encountered fentanyl, I would not be concerned about needing emergency treatment for exposure.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

3. If I encountered fentanyl, I would not worry about protecting my eyes and face.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

5. If I encountered fentanyl, I would not be worried about having difficulty breathing.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

6. Fentanyl in pill form is safe to handle.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

7. I should be concerned about covering my nose and mouth if I were to encounter fentanyl.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

9. It is safe to disturb fentanyl without PPE if you use caution.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

10. Briefly touching fentanyl could be deadly.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

11. Breathing airborne fentanyl is dangerous to my health.

[ ] Strongly Agree [ ] Agree [ ] Slightly Agree [ ] Unsure [ ] Slightly Disagree [ ] Disagree [ ] Strongly Disagree

12. If a stranger suffered from fentanyl overdose, would you administer Narcan?

[ ] Very Likely [ ] Likely [ ] Somewhat Likely [ ] Unsure [ ] Somewhat Unlikely [ ] Unlikely [ ] Very Unlikely

13. If a friend suffered from fentanyl overdose, would you administer Narcan?

[ ] Very Likely [ ] Likely [ ] Somewhat Likely [ ] Unsure [ ] Somewhat Unlikely [ ] Unlikely [ ] Very Unlikely

14. How likely are you to be in a situation where you consume drugs, suffer from fentanyl overdose, and need someone to administer Narcan?

[ ] Very Likely [ ] Likely [ ] Somewhat Likely [ ] Unsure [ ] Somewhat Unlikely [ ] Unlikely [ ] Very Unlikely

15. How likely are you to go to a party or gathering where someone consumes drugs, experiences fentanyl overdose, and needs someone to administer Narcan?

[ ] Very Likely [ ] Likely [ ] Somewhat Likely [ ] Unsure [ ] Somewhat Unlikely [ ] Unlikely [ ] Very Unlikely

16. What is your race/ethnicity? Check all that apply.

[ ] African/African American/Black [ ] American Indian/Native American [ ] Asian/Asian American

[ ] Biracial/Multiracial (please specify):

[ ] Caucasian/European American/White

[ ] Hispanic/Latino/Latina/Latinx/Latine [ ] Middle Eastern or North African

[ ] Pacific Islander/Pacific Islander American [ ] Self-identify:

29. What is your gender?

[ ] Cisgender Man [ ] Cisgender Woman [ ] Non-Binary [ ] Transgender Man [ ] Transgender Woman [ ] Other

17. What is your class standing?

[ ] First-Year [ ] Sophomore [ ] Junior [ ] Senior [ ] Other

18. In which of the following colleges is your major? If you have more than one major, mark all that apply.

[] College of Arts and Humanities

[] Burnett Honors College

[] College of Business

[] College of Community Innovation and Education

[] College of Engineering and Computer Science

[] College of Health Professions and Sciences

[] College of Medicine

[] College of Nursing

[] College of Optics and Photonics

[] Rosen College of Hospitality Management

[] College of Sciences

[] College of Undergraduate Studies

19. Which party best matches your political identity?

[ ] Republican [ ] Democrat [ ] Independent [ ] Libertarian [ ] Green Party

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