

A Pilot Study: Using the Health Belief Model to Understand Cannabidiol Use in One Amish Community¹

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Abstract: Amish use of complementary and alternative medicine is common, but little is known about their opinion of cannabidiol. Hemp legalization has popularized cannabidiol, making it available to Amish whose traditions limit access to scientific information. The purpose of this pilot study is to gain an understanding of cannabidiol use in one Old Order Amish community. A researcher-developed questionnaire was mailed to 60 members of one Amish district. The Medicinal Cannabidiol Survey for an Amish Population was adapted from the Medicinal Cannabis Survey for General Practitioners to the specification of cannabidiol, Amish cultural relevance, and the six theoretical constructs of the health belief model. A content validity survey was completed with an overall item-level content validity index score of .92. Most respondents reported hearing discussions in the Amish community regarding cannabidiol [81.8% ($n = 9$)]. Slightly more agreement was found within the 10 benefit construct statements (40%) compared to six barrier statements (36.5%). Low agreement was observed among all nine questionnaire statements addressing Amish perceived threat to using cannabidiol. The barrier statement that cannabidiol cost prohibits its use had the highest agreement [90.9% ($n = 10$)] among all statements, which may be a stronger barrier when considering Amish culture. Higher agreement among the benefit construct compared to lower agreement among statements surrounding Amish perceived threat of cannabidiol suggests the likelihood of their

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cannabidiol use. A major limitation of this study was the sample size; therefore, the tool should be used in a large Amish sample to explore the findings of this pilot study.

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Since the eighteenth century, the Amish have maintained a distinctive cultural presence in North America, drawing on Anabaptist religious ideals that dictate separation from urbanization, government, and many consumer technologies (Kraybill et al., 2013). Their separatism does not prohibit their use of conventional medicine; however, costly treatments are less accepted, and their distinctiveness from mainstream North American society, lack of health insurance, and preference of complementary and alternative medicine (CAM) create unique health care vulnerabilities (Armer & Radina, 2006; Farrar et al., 2018). Amish adoption of cannabidiol (CBD) products is only implied by their history of CAM use, including chiropractors, herbal remedies, vitamin supplements, and iridology (Reiter et al., 2009; Sharpnack et al., 2010). Reasons behind Amish CAM use appear to be embedded in their culture while aligning with their lifestyle as a cost-effective and more accessible health care service (Cuyún Carter et al., 2012; Reiter et al., 2009). Lessons incorporated into their primary education focus on skills necessary for their lifestyle and lack scientific topics, perhaps strengthening folklore as a guiding principle for Amish life (Gillum et al., 2011; Kraybill et al., 2013). Although Amish studies indicate Amish practice medical pluralism and report regular visits to a health care provider (HCP), their use and preference of CAM might not be discussed with their HCPs, who the Amish perceive may neither believe nor understand the benefits of CAM (Garrett-Wright et al., 2016; Reiter et al., 2009; Sharpnack et al., 2010). Similarly, medical marijuana (MM) studies have reported that users of MM utilize conventional medicine less because of perceived marijuana effectiveness. MM use and discontinuation of prescribed medication was often not disclosed to HCPs (Kruger & Kruger, 2019; Troutt & DiDonato, 2015). The emergence of CBD as a CAM suggests the likelihood of positive attitudes toward its use among Amish populations; however, the Amish adoption of CBD may be inversely correlated with the use of conventional medicine and Amish disclosure of CBD use may be low (Kruger & Kruger, 2019; Reed et al., 2015; Sharpnack et al., 2010; Troutt & DiDonato, 2015).

Cannabis has been grown as a natural medicinal for at least 6,000 years (Chandra et al., 2017). The acceptance of CBD use may be higher among Amish due to their beliefs in nature as God's handiwork and that the use of natural products brings them closer to God's intents (Kraybill et al., 2013; Reed et al., 2015). This naturalistic view of health is supported by their confidence in homeopathic books to guide health decisions (Rohr et al., 2019). Commonly used naturalistic health books might not include CBD or evidence-based guidance on its recommended use, necessitating cultural competence by HCPs when discussing CBD with their Amish patients. CBD research currently centers on its medicinal properties and adverse effects rather than on knowledge

and attitudes from users, with no information found regarding use of CBD among Amish. The purpose of this descriptive pilot study is to gain an understanding of CBD use in one Old Order Amish community.

Literature Review

The term *marijuana* indicates intoxicant preparations occurring from THC (Δ^9 -tetrahydrocannabinol), the primary psychoactive component of cannabis and only one of more than 100 identified cannabinoids, or active constituents, found in the cannabis plant (Chandra et al., 2017). The second most common cannabinoid in cannabis is CBD, which is nonpsychoactive and found in fiber plants labeled as *hemp* (Chandra et al., 2017; Hemp Farming Act, 2018). The chemical composition of THC and CBD in each cannabis plant is influenced by cultivation techniques, climate, soil, and cannabis strain (Chandra et al., 2017). In addition to the modulation of various pain states, CBD has anxiolytic² properties in humans with minimal adverse effects (Chiang et al., 2012; Hurd et al., 2015; Kozela et al., 2017). The most frequently self-reported symptoms for CBD use include pain, anxiety, poor sleep, and depression (Corroon & Phillips, 2018; Urits et al., 2019; Wheeler et al., 2020). Compared to other cannabinoids, CBD is one of the most potent inhibitors of many cytochrome P450 enzymes,³ resulting in potential drug interactions (Zendulka et al., 2016). Although studies have found CBD to have a good safety record and suggest its use may have anti-cancer protective properties, anti-inflammatory properties, and anxiolytic and antidepressant effects, the only medically sanctioned use is for epilepsy (U.S. Food and Drug Administration, 2020; Iffland & Grotenhermen, 2017; World Health Organization, 2017).

The 2018 Farm Bill was amended to redefine hemp as separate from marijuana, legalizing the use and production of regulated hemp and CBD with a THC concentration of no more than 0.3% (Hemp Farming Act, 2018). The Farm Bill recognizes the distinction between marijuana and hemp-derived CBD. However, the United States Drug Enforcement Administration in the Controlled Substances Act defines marijuana as a Schedule I controlled substance, including all chemical components of the cannabis plant such as CBD (U.S. Food and Drug Administration, 2020). Nonetheless, language defining CBD in the 2018 Farm Bill Act has prompted state-specific legislation on hemp production and research programs and led to the emergence of hemp as a new cash crop among agrarian communities in which Amish reside (National Conference of State Legislatures, 2020).

Product research on the manufacturing of CBD indicates many CBD products have varying degrees of THC or inadequate concentrations of CBD (Bonn-Miller et al., 2017; Pavlovic et al.,

² A drug used to reduce anxiety.

³ Cytochrome P450 enzymes are a class of enzymes used by the body to process traditional and herbal medications. When more than one medication is taken that requires cytochrome P450 enzymes for its metabolism, they will compete with each other for binding sites to these enzymes (Deodhar et al., 2020). Because THC is metabolized by cytochrome P450, it effectively inhibits other medications with the same affinity, potentially leading to dangerously high levels of certain drugs in one's system. Similarly, medications that inhibit this enzyme taken concomitantly with CBD and THC products may inadvertently increase and prolong the bioavailability of CBD or THC.

2018). Concerns about the inconsistent dose delivery and quality control of CBD have prompted requests for policy changes and demand for the U.S. Food and Drug Administration (FDA) to institute more regulations on CBD products (Urits et al., 2019). Supercritical CO₂ technology is believed to extract the highest yield in CBD; however, the equipment's high cost may lead to the use of less expensive extraction techniques and contamination of CBD products with dangerous diluents (Pavlovic et al., 2018; Romano & Hazekamp, 2013). Although the FDA has published a list of companies whose concentrations of CBD are inconsistent (U.S. Food and Drug Administration, 2021), maintaining regulation amid growing CBD supply and demand is untenable. In a study exploring CBD use, attitudes, and knowledge among a population of 135 young adult respondents, 54.8% of CBD users reported at least one unexpected side effect (Wheeler et al., 2020). Two studies reported similar side effects from CBD among those who use it, with the most common including dry mouth, fatigue, euphoria ("feeling high"), and changes in appetite (Corroon & Phillips, 2018; Wheeler et al., 2020). The authors found that there is confusion regarding the legality and regulation of CBD, adding to safety concerns by CBD users with little knowledge of potential adverse effects of CBD (Corroon & Phillips, 2018; Wheeler et al., 2020).

Research indicates that the use of CAM is higher among Amish than non-Amish populations (Cuyún Carter et al., 2012; Reed et al., 2015; Sharpnack et al., 2010). Preference for CAM among Amish women compared to Amish men has been observed, with Amish men often consulting with their wives regarding herbal remedies (Ballou, 2004; Reed et al., 2015). Knowledge of herbal remedies and folk medicine is influenced by female-directed generational wisdom and spread through community networks and personal testimonies on the effects of remedies (Farrar et al., 2018; Purnell, 2021). Herbal remedies used by Amish and non-Amish are embraced as safer alternatives to conventional medications, often disregarding their potential adverse effects (Ekor, 2014; Garrett-Wright et al., 2016; Reed et al., 2015). The Amish use CAM as their first option for health care, often waiting to seek traditional interventions until the alternative approach has failed or more severe symptoms have developed (Garrett-Wright et al., 2016; Schoessow, 2014).

Theoretical Framework

The health belief model (HBM) is a conceptual framework that can be used to explore why Amish may or may not use CBD products by examining knowledge, attitudes, and beliefs that influence their choice to use CBD (Janz & Becker, 1984). Five constructs identified in Becker's HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action) were used in this study, with the addition of Rosenstock's added concept, self-efficacy (Garner, 2014, pp. 321–322). The opposing forces of susceptibility and severity beliefs *versus* outweighed benefits *against* barriers beliefs have been postulated to create decision-making action. However, additional HBM constructs—cue to action and self-efficacy—were developed to identify additional triggers that predict one's action (Conner & Norman, 2005). Four main constructs of the HBM (susceptibility, severity, benefits, and barriers) are theorized to explain the readiness of Amish to take CBD. The HBM was operationalized in this study by defining *susceptibility* as Amish-perceived risk of using CBD; *severity* as Amish feelings about the

seriousness of contracting an illness (both social and medical consequences) from using CBD; *benefits* as the perceived belief by Amish that using CBD can improve overall health or reduce disease threat; *barriers* as the perceived belief by Amish that using CBD will result in negative consequences; *cues to action* as the perceived external or internal pressures by Amish that stimulate them to use CBD; and *self-efficacy* as the perceived confidence by Amish in their abilities to use CBD appropriately. It is likely Amish will take CBD if they believe there are low risks to taking it (low susceptibility), few consequences both socially and medically (low severity), and more benefits that outweigh the risks and consequences of taking CBD than obstacles to taking it.

Methodology

To understand CBD use in one Amish community, a descriptive design was used to conduct this pilot study. Approval was obtained from a university review board. Permission was granted from the local Amish bishop to survey adult Amish community members in one rural southern community in the United States. Inclusion criteria were that the community members were age 18 years or older and read and understand English. There were no exclusion criteria.

Instrument

The literature was void of a tool that addressed the Amish population or assessed the knowledge and attitudes about CBD among the general population. With permission from the authors, a questionnaire was developed and adapted from the Medicinal Cannabis Survey for General Practitioners tool (Karanges et al., 2018). Eighteen of 46 knowledge and attitude statements were adapted from this tool to create statements addressing the HBM constructs (susceptibility, severity, benefits, barriers, cue to action, and self-efficacy). The Medicinal Cannabidiol Survey for an Amish Population contains three sections: (1) demographics, (2) health practices, and (3) 11 knowledge and 18 attitude statements addressing the six HBM constructs. The statements are on a 5-point Likert scale from “strongly disagree” (1) to “strongly agree” (5). Because demographics are modifying variables that can affect CBD use through direct or indirect HBM constructs, age, gender, and education level were included in the tool (Conner & Norman, 2005). Amish health practices included type of primary HCP, number of annual visits to a HCP, and number of times in the past month the respondent reported hearing CBD discussed in the Amish community. An area for open-ended comments was included on the questionnaire to allow respondents to report additional CBD opinions.

A content validity survey was completed by a panel of six experts in Anabaptist studies and rural research. An item-level content validity index (I-CVI) score was computed with an I-CVI cutoff of 1.00 used to guide revision, deletion, or substitution of items (Polit & Beck, 2006). The overall mean I-CVI was .92 with construct mean I-CVI ranging from .75 to 1.0 (see Table 1).

Table 1*Mean Item-Level Content Validity Index for Health Belief Model Constructs and Total Scale*

	<i>M I-CVI</i>
Health belief constructs	
Susceptibility (4 statements)	1.00
Severity (5 statements)	1.00
Benefits (10 statements)	.88
Barriers (6 statements)	1.00
Cue to action (2 statements)	.75
Self-efficacy (2 statements)	.75
Questionnaire	.92

Note. I-CVI = Item-level content validity index.

Sample

A convenience sample of adult Amish members was obtained from one Amish district of 20 families with approximately 60 adult members. Amish surveyed in this study are considered Old Order Amish and follow a relatively strict *Ordnung* in comparison with other Anabaptists. English is well-understood by Amish adults (Kraybill et al., 2013); thus, paper questionnaires were written in English. To solicit as many Amish respondents as possible, three copies of the questionnaire were mailed to each address with instructions inviting any household member age 18 years or older to complete a questionnaire. A cover letter with survey directions, which was signed by the bishop and the researcher, accompanied the questionnaires to encourage participation. Implied consent was indicated by return of the questionnaire.

Data Collection and Analysis

Three copies of the Medicinal Cannabidiol Survey for an Amish Population questionnaire, an explanatory cover letter cosigned by the bishop and the researcher, and an informed consent were mailed to the 25 addresses received from the bishop. Five envelopes were returned as undeliverable from the U.S. Postal Service. One week later, a follow-up note card was sent to the valid 20 addresses thanking those who responded and encouraging the participation of nonresponders. A second copy of the questionnaire was enclosed with the note card, and a deadline was included. A postage-paid envelope addressed to the researcher was included in both the original and the follow-up mailing. Returned questionnaires remained in a collection box outside the researcher's home for 72 hours before handling to decrease the possibility of SARS-CoV-2 exposure (van Doremalen et al., 2020). All returned envelopes were destroyed after the questionnaires were removed. Five questionnaires were signed by respondents in the comment area, and all identifiable information was removed with a permanent marker.

The Statistical Analysis System (SAS) 9.4 TS was used for statistical analysis. Descriptive statistics including frequencies and ranges were used to examine data. Low levels of agreement were considered with statements answered at any level of disagreement or neutrality, or ≤ 3 on the

Likert scale. High levels of agreement were considered when respondents answered at any level of agreement to statement items, or > 3 on the Likert scale. The qualitative comments were transcribed and examined for common themes by the researcher.

Results

There was an 18% response rate, with 11 of 60 of the estimated adult population returning questionnaires. The majority of respondents were ≥ 30 years old [63.6% ($n = 7$)], female [54.5% ($n = 6$)], and had an 8th grade education level [70% ($n = 7$)]. Physicians were reported as the most frequented PCP in ages ≥ 30 years [33.3% ($n = 2$)], while chiropractic providers were cited as the most frequented PCP by respondents ages < 30 years [50% ($n = 2$)]. The majority of respondents reported hearing discussions about the use of CBD in their local community one to five times in the past month [81.8% ($n = 9$)], with only two respondents (18.2%) reporting no discussions. Refer to Table 2 for all demographics and Table 3 for Amish health practices.

Of the four main HBM domains, the highest percentages of agreement were found in statements related to benefits, followed by barriers, susceptibility, and severity statements, respectively (see Table 4). Cue to action and self-efficacy domains represent varied motivations for Amish to use CBD and are viewed along with demographics as modifiable factors that influence the four main HBM domains.

Table 2
Amish Demographics

	<i>n</i> (%)	Range
Age in years ($n = 11$)		
< 30 years	4 (36.3)	20–27
≥ 30 years	7 (63.6)	30–60
Gender ($n = 11$)		
Male	5 (45.5)	
Female	6 (54.5)	
Highest level of education ($n = 10$)		
Less than 8th grade	3 (30)	
8th grade	7 (70)	
More than 8th grade	0 (0)	

Note. n = total number of respondents after removing missing data.

Table 3
Amish Health Practices

	All <i>n</i> (%)	< 30 years old <i>n</i> (%)	≥ 30 years old <i>n</i> (%)
Primary care provider (<i>n</i> = 10)			
Chiropractor	2 (20)	2 (50)	0
Community member	2 (20)	1 (25)	1 (16.7)
Nurse practitioner	1 (10)	0	1 (16.7)
Physician	2 (20)	0	2 (33.3)
Self	1 (10)	0	1 (16.7)
None	2 (20)	1 (25)	1 (16.7)
Times heard discussions of CBD (<i>n</i> = 11)			
0 times	2 (18.2)	1 (25)	1 (14.3)
1–5 times	9 (81.8)	3 (75)	6 (85.7)
6–10 times	0	0	0
> 10 times	0	0	0
Average visits to HCP per year (<i>n</i> = 11)			
0	6 (54.5)	2 (50)	4 (57.1)
0–5	2 (18.2)	0	2 (18.2)
1–3	1 (9.1)	0	1 (9.1)
1–5	1 (9.1)	1 (25)	0
5–10	1 (9.1)	1 (25)	0

Note. *n* = total number of respondents after removing missing data; CBD = cannabidiol; HCP = health care provider.

Susceptibility and Severity

Amish respondents' perception of the risks (susceptibility) and possible social and medical consequences (severity) of taking CBD helps to define their decision to use or not use CBD. (See Table 4 for HBM constructs and selected statements.) Respondents disagreed with all susceptibility statements except for one. Three respondents (30%) agreed with the statement about hesitation to take CBD out of concern for varying product strengths. No respondents agreed to the susceptibility statement about not taking CBD products due to known adverse effects. Similarly, none agreed to any severity statements on the questionnaire, including the belief that there is little difference between marijuana and CBD. Low agreement was observed among all of the nine questionnaire statements that address Amish-perceived susceptibility and severity, or their perceived threat to using CBD.

Table 4*Percentages of Agreement Among HBM Constructs and Selected Construct Statements*

HBM constructs and selected construct statements	<i>n</i>	%
Susceptibility	11	7.5
I would not take CBD products due to the known adverse effects	0	0
Taking CBD can interact with my other medications	0	0
I hesitate to take CBD as strengths of the products may vary	3	30
Severity	11	0
I am not comfortable discussing CBD use with my HCP	0	0
I would not take CBD for fear of disappointing my family/community	0	0
Benefits	11	40.0
CBD is available in different forms making it easy to take	6	54.5
CBD is effective in treating neurologic disorders	8	72.7
CBD is a natural product and therefore does not have any adverse effects	6	54.5
CBD is more effective than essential oils	0	0
There are members in Amish community who may benefit from CBD	7	63.6
Barriers	11	36.5
The cost of CBD prohibits its use	10	90.9
I cannot trust the quality of CBD as it is often diluted	3	27.3
Cue to action	11	22.75
I am more likely to use CBD if recommended by member of community	5	45.5
I would never take CBD unless it is recommended by my HCP	0	0
Self-efficacy	11	50.0
My knowledge of CBD has been obtained from advertisements	7	63.6
I am well-informed on the risks and benefits of taking CBD	4	36.4

Note. HBM = health belief model; *n* = total number of respondents after removing missing data; CBD = cannabidiol; HCP = health care provider.

Benefits and Barriers

Benefits are described as the perceived belief by Amish that using CBD can improve their overall health or reduce their disease threat. In contrast, barriers are defined as the perceived belief by Amish that using CBD will result in negative consequences. These competing thoughts must be addressed to adequately represent the cost-benefit decision-making strategy in the HBM. The benefit statements respondents agreed with most included “CBD is effective in treating neurological disorders” [72.7% (*n* = 8)], followed by “Amish community members may benefit from CBD use” [63.6% (*n* = 7)], “CBD is a natural product and therefore does not have any adverse effects” [54.5% (*n* = 6)], and “CBD is available in different forms making it easy to take” [54.5% (*n* = 6)]. The barrier item that CBD cost prohibits its use had the highest agreement [90.9% (*n* = 10)] among all questionnaire statements. None of the respondents agreed to the statement that their HCP does not believe in the benefits of CBD. Respondents agreed to 40% of the benefit statements, only slightly outweighing their agreement to 36.5 % of barrier statements. (See Table 4.)

Cue to Action and Self-Efficacy

Cues to action can be defined as perceived external or internal pressures by Amish that stimulate them to use CBD. Self-efficacy is defined as one's belief that a behavior or action is within one's control and can be seen with the perceived confidence by Amish in their abilities to use CBD appropriately. Table 4 identifies percentages of agreement between cue to action and self-efficacy domain statements; however, they should be viewed as independent predictive utility that may activate Amish respondents' readiness to use CBD, adding analytic perspective to the four main HBM constructs, rather than the percentage of an overall construct agreement.

Themes

Five respondents made qualitative comments regarding CBD. Four themes identified from comments include (1) having limited knowledge regarding CBD with the desire to learn more about it, (2) the high cost limiting its use in the Amish community, (3) personal experience of pain-alleviating properties of CBD, and (4) use of CBD for children. One respondent wrote, "CBD salve and oil works wonders to relieve earache in children," while another respondent wrote, "Some use it to calm nerves, especially on children & say it really helps."

Discussion

Based on findings from this pilot study, lower percentages of agreement among perceived threat and barrier constructs contrast with higher percentages of agreement with the benefit construct statements, which suggests that, for the Amish, the perceived benefits of CBD may outweigh the perceived threat of using CBD. Amish-perceived susceptibility and severity related to CBD use can be viewed as a combined perceived threat to the use of CBD. According to the HBM, the perceived benefits of CBD must outweigh the perceived barriers and threat of CBD to use it (Conner & Norman, 2005). Amish-perceived benefits for CBD are consistent with CBD studies reporting efficacy in treating pain, anxiety, poor sleep, and depression (Chiang et al., 2012; Corroon & Phillips, 2018; Hurd et al., 2015; Kozela et al., 2017; Urits et al., 2019; Wheeler et al., 2020). However, this sample's perceived efficacy of CBD in the treatment of neurological disorders may be more difficult to generalize within Amish communities who suffer from different ailments.

Studies evaluating HBM constructs show barriers to be the most reliable predictor of behavior (Conner & Norman, 2005). Unsurprisingly, the perceived barrier of CBD cost was identified and supported by qualitative comments. Most Amish communities rely on a cash economy and value frugality (Kraybill et al., 2013). Because higher quality and possibly safer CBD may be found in more expensive products, the Amish may buy lower quality CBD or create their own tinctures that yield varying quality and results (Pavlovic et al., 2018). Furthermore, information regarding CBD regulation by the FDA is unlikely to reach Amish communities who do not access the Internet. Unlike studies showing Amish may underreport their CAM use to HCPs and hold negative attitudes toward outside HCPs (Garrett-Wright et al., 2016; Reiter et al., 2009; Sharpnack et al.,

2010), respondents in this study reported low levels of agreement with discomfort in discussing CBD with HCPs.

Most of the Amish reported not visiting their HCP in the past year. Infrequent visits to an HCP may be related to cultural views about health being more strongly affected by fate than by the control of others, frugality related to health-related costs, and belief that faith and humility take precedence over the credentials and status of medical providers (Armer & Radina, 2006; Kraybill et al., 2013). Discussions regarding CBD use among community members and use of physicians as HCPs were reported more frequently among Amish adults 30 years or older, suggesting this age group may have more comorbidities and/or indications for CBD use. Based on research by Reed et al. (2015), Amish respondents with a known medical condition were more likely to see a physician than non-physician providers.

Self-efficacy and cue to action have been suggested as strong independent predictors for health behavioral action (Conner & Norman, 2005). Amish respondents did not feel their HCP needed to recommend CBD before use and were more likely to use CBD if recommended by a member of the Amish community. These findings are supported by previous research, which suggests Amish rely on their community for health advice (Farrar et al., 2018; Gillum et al., 2011; Purnell, 2021). Qualitative comments wishing for more information on CBD and the agreement that they are not well-informed on the risks and benefits of taking CBD were found in this sample of Amish adults. Amish reported lower agreement with being well informed on the risks and benefits of CBD and higher levels of agreement with obtaining knowledge of CBD from advertisements. These findings increase the concern for their safe and appropriate use of CBD.

Strengths and Limitations

Accessing an Old Order Amish community, whose inaccessibility has been a barrier for researchers and amid the SARS-CoV-2 pandemic, is a strength of this study (Colyer et al., 2017). In addition, the novel tool developed for this study based on HBM constructs is timely, with CBD only recently becoming legalized, and is ideal for use in future Amish research. The small sample size and use of a convenience sample limits generalizability of the findings. This study was conducted in August 2020 during the SARS-CoV-2 pandemic. The researcher was unable to conduct the originally intended face-to-face survey, a method used in many Amish-related studies to build trusting relationships within the community (Colyer et al., 2017; Hillier et al., 2014). Another unfortunate drawback to the use of a convenience sample in this survey-based study was undercoverage of this Amish community due to nonresponse bias. Amish member addresses used for this sample were provided by the Amish bishop, which may have influenced voluntary bias. It is unknown if any Amish respondents were involved in hemp farming at the time of this study. Hemp farmers may represent a volunteer bias with strong opinions on the benefits of CBD. Social desirability should be considered as a limitation to this study as it is not yet known if CBD use among Amish aligns with their socioreligious values and may skew their responses given this small sample size in a tight-knit community. Similarly, response bias cannot be excluded as much is unknown about Amish feelings toward CBD and survey response options may be considered

leading. Further, the study may have interrupted the community's farming practices in August and taking the time to complete this questionnaire may not have been a priority.

Implications

The most important implication for future research would be to replicate this study with a larger Amish sample. A comparative study of Amish from several different Amish church districts may reveal a more distinct cultural heterogeneity in the adoption of CBD as a CAM. This would include exploring associations or differences related to age, exposure to hemp farming, and conflicting government regulations. The use of focus groups in a qualitative study may be necessary to fully explore Amish perceptions of CBD as a new and evolving CAM. Personal interviews with Amish individuals can capture the lived experience of their use of CBD, including CBD preference over other CAMs, where they first learned of CBD, preparations used, origin of CBD products used, and self-reported indications for its use, adding to the knowledge of how CBD information has been diffused in this population. Their apparent knowledge deficit related to CBD and comments requesting more information on CBD products implies their combined interest and hesitation in using CBD. Amish people may wait to seek care from outside HCPs after trying CAM and other community resources; however, those who consult HCPs may value advice on CBD efficacy. A study addressing their knowledge deficit with an educational intervention may be revealing and thus guide HCPs on how to educate their Amish patients regarding safe CBD use. The implications of marijuana legalization within Amish society must be considered in the future, with legislative leniency regarding CBD accessibility within the United States increasing Amish exposure to CBD as a CAM. Examining the evolving trends in CBD use among Amish is important to research as their relative separation from mainstream society leaves them vulnerable to trying new CAMs without professional guidance.

Conclusion

CBD benefits appear to outweigh barriers, yet the perceived high cost of CBD may have more impact in limiting its safe use. Amish cultural principles of frugality and practicality may lead them to use lower quality CBD products, either manufactured as home tinctures or purchased at a lower cost. Amish use of CBD with little knowledge of its efficacy and safety is worrisome given their heavy reliance on their community for recommendation of CBD observed in this study. The absence of evidence in this study regarding Amish-perceived CBD use and lack of relevant CBD research among other populations reveals a major gap in the literature and need for further research to evaluate the knowledge, attitudes, and potential HCP barriers to CBD among Amish and other Plain Anabaptist communities.

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